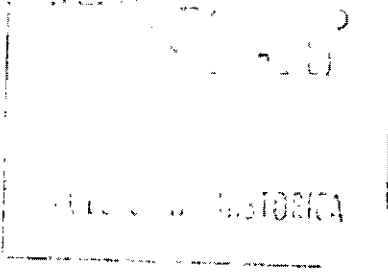


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~~Investing in People~~

The Farmer-researcher as the
Protagonist in Rural Development

UNIDAD DE INFORMACION Y
DOCUMENTACION
93025

Foreword

This is no ordinary final project report to a donor. It is unconventional in both content and style.

To take the content first. The report describes a new and radically different approach to participatory research and development.

Participation is a much used word in development circles these days. Like other fashionable words in the past, it is in danger of becoming debased, since some use it only to provide a veneer of respectability to situations which are, if the truth were told, not in the least participatory. The sad fact is that, in much adaptive on-farm research today, whether or not it is called participatory, farmers are still passive recipients of advice and inputs handed down from above by the high priests of science and technology.

The approach we will describe stands in marked contrast to this situation. It is one in which farmers really do take the lead in identifying research priorities, designing and implementing experiments, evaluating and disseminating the results.

The outcome of our experiments with this approach has astonished and delighted us. By taking charge of the research process, farmers experience a new sense of purpose in life. They make the connections between research and development that so often evade formal researchers. They see research as an opportunity to escape from poverty and to help others in their community do the same. And they grasp that opportunity with both hands. They are, in short, empowered.

Most reports to donors are written in a dry, impersonal style. They give all the facts—so many trees planted, so many people trained—but they fail to capture the meaning of the work done. We needed a different style—one that would convey the essence of our approach and the excitement we feel about it. We have, therefore, cast formality aside in favour of a more personal tone. We have mixed anecdotes in with our analysis, and attempted to qualify rather than merely to quantify.

Participatory research and development is nothing if it is not people-centered. That is why people take pride of place in this report. One of the first arts that practitioners of a participatory approach must learn is to listen to others. Accordingly, we have kept our own voices down (though we chip in occasionally) and given prominence to the views of our partners. Farmers occupy center stage, fittingly so, since it is they who have taken the lead in testing our approach, adapting it to their needs, sharing its benefits. But people from many other walks of life—national researchers, extensionists, NGO workers, paraprofessionals, university teachers—have also played important supporting roles, and they too tell their story.

These different actors have shaped the structure of the report. While the main text narrates their experiences, the "soundbites" in the margins allow their voices to speak directly to the reader. The four "snapshots" provide a closer look at individuals selected to represent different types of actor.

We hope you will find our report so refreshingly different to the standard project report that you will read it from cover to cover. But in case you haven't time for this, short sections at the end of each chapter, entitled "In a Word", will provide you with the main lessons and conclusions drawn from our work.

Buen provecho!

Ann Braun
on behalf of the CIAT-IPRA team



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Power to the Poorest

This report is about a new kind of institution—one in which resource-poor farmers take charge of an agricultural research process that benefits both them and their community. What does the institution 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 be any different?

At 3500 meters, the track leveled out abruptly on a bare shelf of hillside. Round a corner a small, tin-roofed building came into view amidst windswept fields. Outside it, a sign: "Comité de Investigación Agrícola 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.

*"...And the last shall be first"—
Matthew 19: 30.*



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

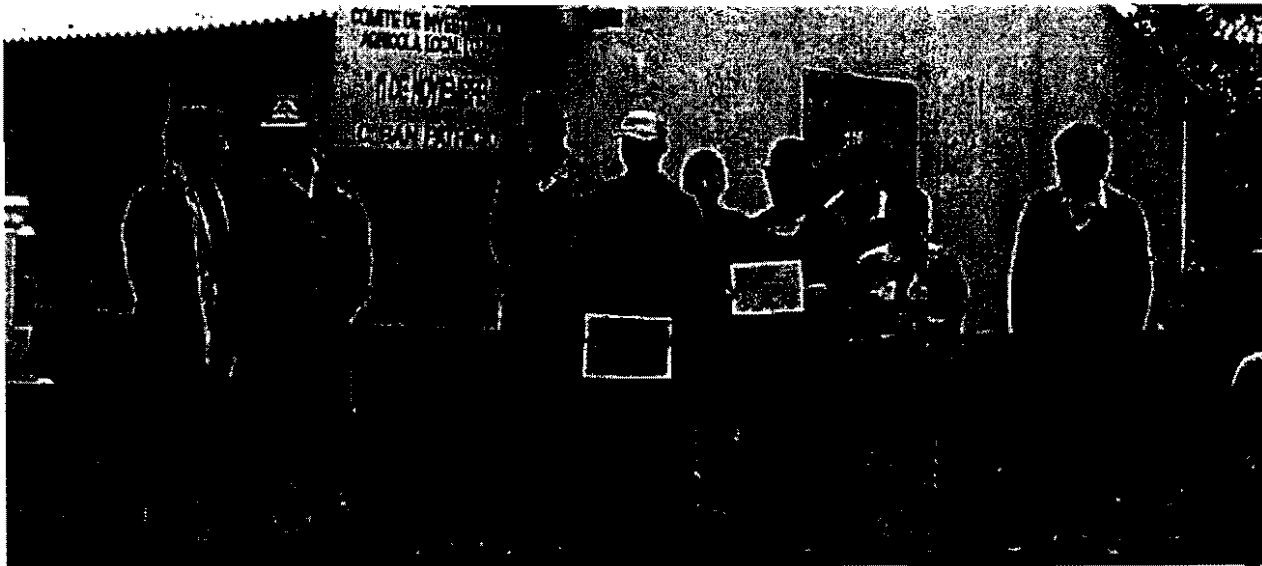
As the two men spoke, the officials felt their interest quicken. The group had tackled a problem vital to the livelihoods of the community, that much was clear. Yields of potato, the community's main subsistence and cash crop, had been falling for several years as pests and diseases took hold. With the 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.

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 "replicate". 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 had 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 de 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 Gualpulema and Villaroel 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 labor-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?

Villaroel 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 research and development (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 farmers take responsibility for the 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 often 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.* 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 three successive experiments. In the first experiment, known as the exploratory or preliminary trial, the CIAL tests innovations on small plots. These may have several treatments, such as different crop

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



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 experiment or validation trial. This leads to the selection of two or three treatments for application over still larger areas in the third experiment, the production plot. 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 committee members to test new technology without taking too great a risk.

Each CIAL has 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\$ 50-120.

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. If the research is unsuccessful or the initial fund proves insufficient to scale up production, the CIAL can apply for a top-up. This is normally allowed provided the initial fund has not been mismanaged.

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 uncovering a rich seam of spontaneous experimentation in such systems. Many farmers were avid collectors of new crop species or varieties, which they

"The CIAL is a means of testing new technology at low risk."—

Tomás
Barakona,
leader, CIAL
Lavanderos,
Honduras.



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 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 laborious 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 extreme variability of upland rainfed farming environments leads to a mosaic of different varieties dotted about the landscape, making it difficult to match new germplasm accurately to agro-ecological conditions and users' needs.

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 center of the research process. In much on-farm research the farmer was still treated as little more than a provider of land and labor. 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.

Scientists who were dissatisfied with farming systems research began trying to make their own 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 and research managers 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 CIAT methodology can be seen as a synthesis of rival traditions in agricultural R&D. 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. At the same time, unlike PTD it exerts a demand pull on the products and services 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 1982 a sociologist named Jacqueline Ashby began work on a collaborative project between CIAT and the International Fertilizer Development Center (IFDC). The project 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 that would simultaneously train researchers in a participatory approach while further developing



the methodology for such an approach. The Kellogg Foundation, which had long had a policy of "investing in people", expressed keen interest and committed funds for a three-year project from 1987 to 1990. Entitled *Investigación Participativa con Agricultores (IPRA)*, the project was implemented by a new team of social scientists and agronomists recruited by CIAT—the CIAT-IPRA team.

The project caught the mood of the moment. During its three-year span it exposed over 600 professionals to participatory research, reaching beyond Colombia to Ecuador, Bolivia and Brazil as interest in the approach grew.

The methodology development component of the project was based in Cauca Department, where Ashby worked with farmers to find out whether increasing their participation in the diagnostic and design phases of the research process would alter the conclusions reached and hence the recommendations made. The farmers were divided into 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 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".

"June is the hardest month. The maize and bean harvests don't come in until July-August, so people run out of food and money. Often children go hungry to school. We don't sell anything during that month. In the past 10 years, life has stayed the same or got worse. The land used to be fertile, but now maize yields have gone right down. We never know when the rains are going to come. People lose their seeds."— Village shopkeeper, Carreto, Honduras.

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 smallholder 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. Many who live here suffer from hunger and malnutrition, especially in the empty weeks before harvest.

The department 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 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 El Crucero de Pescador, provided an opportunity to involve an NGO in establishing and guiding the CIAL, while a fifth, Cinco Días, had no pre-existing institutions that might support the process.

In a word

To sum up

- *The CIAL is a radical concept in rural R&D offering new hope for resource-poor farmers.*
- *It is a farmer-based research service answerable to the local 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 drawing on the products of formal research.*



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 its members experience a new feeling of control over their lives. This may turn to disillusion 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



"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 learned. I have grown up a lot."—Ernesto Quintanillo, CIAL leader, Palmichal, Honduras.

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. Yet this is 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.

What makes 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 230 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



Adelmo Celambez

Adelmo Celambez, a young man from a village in the mountains of the Cordillera Oriental, was the first to...

Adelmo is of a noble lineage, born in the 18th century of a family of nobles...



In the early days of the revolution, Adelmo Celambez was a member of the...

Adelmo Celambez was a member of the Cordillera Oriental Revolutionary Front...

Because of his reputation for his revolutionary activities, Adelmo was elected...

Adelmo Celambez was a member of the Cordillera Oriental Revolutionary Front...

But the days of glory are all behind Adelmo's perception of himself. In a different season...



Zully Pajoy

Do you like being a researcher?

"Sí. A mí me gusta mucho investigar." (I like being a researcher very much.)

The speaker is the young girl Zully Pajoy, who lives with her family in San Isidro, a village in the coastal region north of Quito. She is a member of the CLAP, the national committee of the state-owned oil company, CENACE, which is in charge of distributing the processed fuel throughout the country.

Opportunities to learn more about the CLAP came first in the village where she studies. It is a small school with only 12 students. The CLAP has a small office in the village. The CLAP is a national organization that provides services to the village through its position.

For example, Zully has learned to distribute fuel for the village. She has learned to use the village's small office. She has learned to use the village's small office. She has learned to use the village's small office. She has learned to use the village's small office.

The CLAP is conducting research on San Isidro. The CLAP is conducting research on San Isidro. The CLAP is conducting research on San Isidro. The CLAP is conducting research on San Isidro. The CLAP is conducting research on San Isidro.

Last year Zully received her first job. She has learned to use the village's small office. She has learned to use the village's small office. She has learned to use the village's small office. She has learned to use the village's small office.

Zully's dream is to go to a technical college. She has learned to use the village's small office. She has learned to use the village's small office. She has learned to use the village's small office. She has learned to use the village's small office.

"But you have to be able to overcome difficulties and you have to be patient." And Zully smiles again.



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 (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 gusta 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!

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

"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.

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."

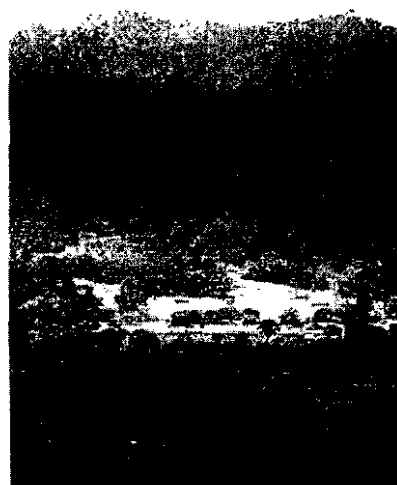
Women's aspirations are similar to men's, except in one vital respect. Both men and women are interested in increasing food security and cash income, but women often see a separate CIAL of their own as a route to emancipation. "We wanted to do something *for us*," said



one member of an all-female CIAL at Cinco Días 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 be 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 phaseolus 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 Colombia's Cauca Department, 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), soybean, peanut, potato and several vegetables, in addition to the staple food crops, maize and phaseolus beans. In Cundinamarca, which has the vast urban market of Bogotá on its doorstep, CIALs work on several commercial crops, including snapbean.

Many CIALs are conducting research to protect the natural resource base at the same time as they explore new crop varieties. At El Paraíso, 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.



Why become a CIAL member?

Being a CIAL member quickly brings benefits. The most tangible of these is exposure to new farming practices and technologies. CIAL members are usually the first in their communities to transfer the results obtained on the experimental plots to their own fields. Their family's nutritional status and income improve as a result.

Another early benefit experienced by CIAL members is increased status in the eyes of the rest of the community. This benefit reflects their role as the holders and dispensers of knowledge.



"The difference between CIALs and other farmers' groups is that CIALs know what their goal is. They know they can achieve it and they have the commitment to do so."—

Hernando Castro, extension agent, UMATA Rosa, Colombia.

"We can get inputs when the technicians help us, but when we try by ourselves we lack resources. We analysed this problem in our CIAL and decided to sow a collective plot, half maize, half beans. We'll select the best

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.

Through their contact with outsiders, CIAL members learn about the techniques of formal research, which can enrich their own traditional experimentation. A study conducted by the CIAT-IPRA team showed that this learning benefits both the formal and the informal research process. Around 75% of plots in CIAL trials produce results that are statistically analyzable as well as interpretable by farmers.

Learning the techniques of formal research also enhances the mutual understanding of farmers and formal researchers. "We know what you do," one CIAL member in Cauca's Cabuyal watershed told a group of visiting scientists, "because we do research here too." CIAL members may even take on some of the characteristics of formal researchers. The CIAL leader at Lavanderos, in Honduras, is careful not to give away too much seed of the new bean varieties under research by the committee. "We need to do another year's testing before we can be sure enough to recommend anything," he says, displaying a caution more typical of the plant breeder or agronomist than of the farmer. CIAL members even scoff at each others' experiments like formal researchers sometimes do. One CIAL, in Cundinamarca, had conducted research on the hilling of



potatoes as a means of controlling a burrowing pest and had just announced that it had found the practice effective. "I knew that 30 years ago," said a member of a neighboring CIAL.

The experience of working in a team with a common purpose boosts morale. Because the CIAL has clearly defined objectives and, through its fund, the means with which to achieve them, members soon sense that success could be just round the corner. The hard work and energy displayed by the CIAL sometimes stand in marked contrast to the apathy and aimlessness that characterize other groups in the same village.

All too conscious of their powerlessness in the past, CIAL members quickly acquire a taste for the self-reliance that now lies within their grasp. "We want to build our capacity to do research *on our own*," says Tomas Barakona, leader of the CIAL at Lavanderos, Honduras. At nearby Tontolo, CIAL members noticed how dependent they were on the help of external technicians in obtaining inputs. Together, they worked out a strategy for overcoming the problem, using the CIAL fund to sow a collective plot that would raise enough cash to buy the inputs themselves. Operations of this kind are typical in the second year of the CIAL, as CIAL members realize that they can use the fund to plan their exit route from poverty at the same time as building their capacity for research.

Teething problems

Being a CIAL member is not for everyone. Many groups experience a turnover of at least a quarter of 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

seeds for sowing next year, then sell the rest at market. Half the proceeds we'll use to build our research fund and the other half we'll share between us."—

Taurino Castellanos, CIAL secretary, Tontolo, Honduras.



hard to fit in CIAL activities because of their many other commitments. When people drop out, the remaining members of the committee seek community approval to replace them, usually with volunteers who have shown enthusiasm for the CIAL from the start.

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 Cundinamarca, a poorly designed integrated pest management (IPM) 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.

Unrealistically high expectations at the outset of the CIAL process can cause a CIAL to falter when its early results do not live up to expectations. This is especially likely to happen when CIALs conduct research on unfamiliar crops, in the hope of developing a profitable new enterprise. At El Diviso, in Cauca, a second CIAL was launched by a group of women when they saw how successful the first CIAL had been (see pg. 36). Whereas the first CIAL had worked on maize, the area's major food crop, the second one opted for peanut, a much riskier crop given the area's high rainfall. Harvests were poor and the women found shelling the crop too laborious. The leader of the first CIAL says the women have become demoralized and have stopped attending their CIAL meetings. He is not sure whether the CIAL will continue.

"An experiment is a success as long as we learn something from it."— José Domingo García, CIAL leader, Ventanas.



CIALs can overcome setbacks of this kind, provided there is a common understanding that their primary purpose is to generate knowledge, not to raise incomes. While the CIAL is still a new concept to a community, the role of the outsider may be crucial in fostering this understanding. At Ventanas, in Cauca, the community had asked the CIAL to conduct research on a long-stemmed green onion for which there was a steady demand from nearby urban markets. The outsider did not appreciate the CIAL's function as a local adaptive research service. Indeed, he was impatient with the whole idea of research, seeking instead to achieve a quick development success. As he worked with the CIAL members, he encouraged them to believe they were on to a real money-spinner.

The CIAL carried out a well designed experiment that showed that it was *not* profitable to grow green onion locally. Instead of perceiving this to be a useful result, the CIAL members blamed each other for the "failure" and stopped working together. The outsider also blamed himself for the fact that the CIAL had not made money. Only when a CIAT-IPRA team member called the CIAL members and the outsider together to conduct a fresh analysis of the experience did the group reach the conclusion that the experiment had been a success after all. The group redefined success as an experiment from which the community could learn something. The CIAL at Ventanas went on from this experience to become a strong, creative group.

Lessons in the risks of research can come especially hard when CIALs ignore the recommended procedure of starting small. At San Bosco, in Cauca, 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 phaseolus 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 Cauca, 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 shell 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 threshing machine.

"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

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 neighbors to give back any seed they had taken. Red-faced, the neighbors 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. María Gutiérrez was the secretary of the newly formed 11 de 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 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 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 behavioral norms rather than accepting the challenge of working together in new, more egalitarian 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 one that had also used small experimental plots to introduce innovations. That project had left its

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."—
María Gutiérrez, secretary, 11 de Noviembre CIAL, Ecuador.

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



participants with few lasting changes for the better in their lives, so they weren't queuing up for a repeat performance.

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 from you." The six or so CIALs in the watershed are today among the weakest in Cauca. Many participants say they are tired of meetings 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 meters 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. The women have renamed their community 19 de Septiembre—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 María Gutiérrez 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.

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 house and turn it into a training center for other farmers.

"Flor Naciente", "Esperanza", "Nuevo Pensamiento", "El Progreso"—the names that people give to their CIALs, like



"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 Ati, leader,
Flor Naciente
CIAL, Ecuador.

those of the communities that host them, 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.

In a word

To sum up:

- *Most resource-poor farming communities welcome the idea of launching a CIAL.*
- *Putting farmers in control of research 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 three or four years the benefits of the CIAL process begin 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. And other benefits follow, some of them unexpected. In this chapter we visit El Diviso, a community of 83 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*—Colombia's colorful open-sided buses—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 Carlosama, 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 selected seed. In the 4 years it has been in commercial production the CIAL has sold 7 tons of seed with an estimated value of US\$7,000.

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. 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 programs. The extension service, which previously had no alternative supplier, is using the seed to run demonstration plots in six other communities.



Despite the broadening customer base, meeting demand from the El Diviso community remains the CIAL's top priority. Seed is sold to community members at a price 30% below the normal market price, placing it within the reach of many farmers who previously could not afford it.

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 so long to reach maturity that only one crop per year could be grown. The plant often fell over in the high winds of August, as the crop approached maturity. Yields, at around 820 kg/ha, were falling while demand was rising, as farmers struggled to feed not only their own growing families but also the extra laborers recruited to harvest coffee. 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 a higher density, has three heads instead of one, is highly responsive to fertilizer and races to maturity in only four months, allowing farmers to harvest two crops a year. All that adds up to a massive gain in production, which has risen by nearly 50% to an average of 1200 kg/ha/year. More remains to be achieved through further intensification, but the gain has been more than enough to move the community into food surplus.

"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 Carlosama, leader, El Diviso CIAL.



Besides increasing, production has become more stable—a very important advantage for resource-poor farmers exposed to the risks of cropping in unpredictable rainfed environments. The shorter cycle of the new maize enables it to perform well when rainfall is poor, ironing out the extreme inter-



annual fluctuations in yields characteristic of the traditional variety. 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 good 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 surpluses created by the CIAL's work have raised family farm incomes substantially. The CIAT-IPRA team estimate the value of additional maize production derived from El Diviso's seed at US\$70,000 to 80,000 annually.

Despite—or perhaps 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 Carlosama. Next on the CIAL's list of priorities is phaseolus bean, the community's second most important food crop and one for which Carlosama and his colleagues are receiving a growing number of requests. They plan to start by learning from the bean experiments already conducted by neighboring CIALs.

Adding value

Seed production is the first enterprise of most mature CIALs that choose varietal selection as their research priority. Many go on to invest the profits in new threshing and milling equipment, providing a further service to the community.

At El Diviso, having a mill in the village center saves everyone huge amounts of time—a long trudge to a distant town or a whole day spent milling by hand an amount that takes three minutes by machine. It also saves money, 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 farmers' 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 further boost to the village's poultry production, and could also be used to feed pigs.

Unexpected benefits

For most of El Diviso's inhabitants, going shopping in the distant market town 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 unexpected benefits that have flowed from the CIAL's work.

For the CIAL itself, the most important of these benefits is access to more land. In 1996, the CIAL members joined with two other farmers in the community to make an application to the Instituto Colombiano de Reforma Agraria (INCORA), the government agency responsible for land reform. 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.



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, the majority of whose inhabitants are landless laborers. 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 to INCORA.

It was one of many such visits. "People come from near and far," says Carlosama, "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 benefits 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, to obtain assistance in developing its feed concentrate. According to Carlosama, 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.

Self-sustaining R&D

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

On every kilogram 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

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

"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 Mellizo, Extension agent, UMATA Rosa, Colombia.



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

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 Carlosama, who regards the program as an important new development in the village. "The CIAL has made many farmers in our community more interested in innovating."

Carlosama, 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.

In a word

To sum up:

- *The El Diviso CIAL has moved its community from food deficit to food surplus*
- *The CIAL has established profitable seed production and milling enterprises*
- *Benefits have also been felt in livestock production and in access to land, credit and training*
- *The CIAL has drawn the attention of formal research and extension services to farmers' concerns and priorities.*



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 village 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 from *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 a special committee for agricultural research. 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 three 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 of its farmers now had access to new varieties of potato and the village had its own milling service for barley and legumes. Almost everyone had benefited, 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 whether or not to have a CIAL. If it decides in favor, the CIAL members are then elected. 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 for being 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. Sometimes they have better endowed farms and are wealthier or more influential than the community's "average" members. This does not matter provided they are willing to share the results of the CIAL's research with others.

The motivational meeting is also the occasion on which the ground rules by which the CIAL operates are explained. It is made clear that the CIAL fund belongs to the community, not the committee, and that CIAL members are elected by the community to act on its behalf.

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, who led the CIAT-IPRA team until 1998, 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.

Some communities overcome this potential for bias by launching more than one CIAL. While the first CIAL addresses a majority interest such as a major food crop, the second is typically started by a marginalized group—often women—looking for new enterprises to raise itself out of poverty.

The procedure followed during the diagnostic meeting is designed to minimize the chances of the participants' choosing a topic of interest only to the few. Anyone present can propose a topic, which is added to a list displayed on a flip-chart or blackboard. All the topics listed are then screened according to a set of questions related to the costs and benefits of conducting



research on them, including the crucial question, "Who will benefit?"

CIAL members have a strong incentive to ensure that the diagnostic meeting results in a topic relevant to the broader community. A faulty diagnosis—one that sets them to work on a minor concern—makes it difficult for the CIAL to continue to command the community's interest, respect and support. Lack of support can inhibit the CIAL process, as community members withhold their labor contributions to communal tasks such as the sowing of trials, or stop attending meetings.

As a result, 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.

It has been known for communities to change their minds about the research topic chosen. At El Diviso, for example, the first diagnostic meeting resulted in the decision to conduct an experiment on squash. The following week the community met again to discard this topic in favor of research on maize, because this would be of benefit to more people. In such cases the role of the outsider facilitating the meeting can be crucial. He or she must resist the temptation to push a special interest.

The feedback meeting is the community's chief means of ensuring that the CIAL remains accountable to it. At this meeting the CIAL's leader or extensionist reports on the research results achieved, while the treasurer explains how the fund has been used and how any profits are being distributed. The meeting is the community's opportunity to sack committee members and elect different ones if they wish to do so.

In communities with a strong CIAL the evaluation meeting is held after each experiment, at least until the production stage is reached. Weaker CIALs sometimes allow the meeting to lapse after the first or second experiment. 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, the current 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, the second-order organization of CIALs established in Cauca Department has recently signalled its concern over this issue by introducing a tough new rule for the CIALs under its umbrella: a CIAL that fails to present its results to the community will not receive support from the organization's fund when it sows its next year's trial.



The three meetings are the most important formal 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, anyone who asks to see it may do so. Almost all CIALs have an extensionist, whose responsibility is to spread awareness and provide advice and help to others, often through field days or visits to other CIALs. 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'm doing, so I have a teaching process under way."

Sometimes a larger group or even the whole community becomes involved not only in priority setting and evaluation but also in trial implementation. The people of Nuevo Pensamiento, in Nicaragua's 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 Quirós, 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.





"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 shown us 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

In northeast Brazil, a larger group of 12-15 people commonly accompanies the four committee members whenever trial activities are implemented. Participants in these larger groups often train each other in research methods and new farming practices, helping to spread knowledge of these at the same time as maintaining the quality of trial implementation and hence the reliability of the results. Many core CIAL members in this region are part-time farmers who leave the community for long periods to work elsewhere. Members of the extended CIAL fill in for them while they are away. The larger group is thus a useful adaptation of the CIAL methodology to conditions in which the rural workforce is becoming more mobile.

Are the CIALs elitist?

Elitism is the criticism most frequently levelled against the CIAL concept by other workers in participatory research and development. Elitist CIALs, it is alleged, retain 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 and information. 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.

As more CIALs reach maturity, there is mounting evidence to refute the allegation of elitism. The change in the community's acceptance of the CIAL at 11 de Noviembre is a clear indicator that the CIAL's results were successfully disseminated over time. At El Diviso, an estimated 80% of the community's families have benefited from the CIAL's research. 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 community, some 6 years after the CIAL was established. Almost all the non-CIAL members of the community who were interviewed said they had been positively affected by the CIAL's work, citing the use of new seed and milling equipment as the chief benefits.

A study in Cauca 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 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

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 milling machine is a wonderful service for the whole community.

Before we had to mill 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.

"Previously, our community was isolated. The CIAL has opened the door for



institutional support. For example, the UMATA of Santander came and organized a women's 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.

launches first a seed production and then a small-scale milling enterprise. Both types of enterprise bring benefits that spread widely within the local community and beyond. The profit motive of individual CIAL members is not at odds with the CIAL's objective of sharing results widely. In fact, it contributes to this objective.

Elitism is therefore not a problem in this type of CIAL, but there are other types in which it might be considered 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.

The Asopanela CIAL, in Cauca, was formed within an existing farmers' association 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 modern medium-sized sugar plants, short of orders for refined sugar, began competing with the small-scale producers. The CIAL sought to recapture its market by making "organic" *panela*, a higher-value product that excludes the use of a bleaching chemical known to cause human health problems. It also sought ways of increasing the efficiency of the ovens used for boiling the crude sugar. And it began testing new, more productive sugar cane varieties.

When the CIAL's research showed promise, other producers who had dropped out of the association before it formed a CIAL wanted to rejoin. Understandably, the CIAL required these producers to meet the new quality standards as a pre-condition for re-joining, since failure to do so would have meant risking the rejection of

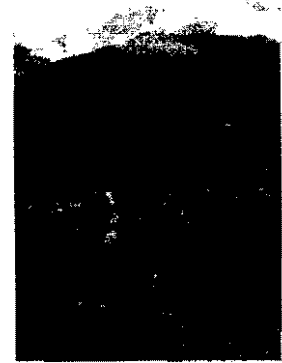
the enterprise's cooperatively produced *panela*. The CIAL also levied a hefty re-entrance fee, effectively keeping some producers out. Since then the committee has started selling its expertise in the adaptation of ovens to other associations, so far only on a cost recovery basis. It also plans to establish a regional school for teaching the organic production of *panela*.



The Asopanela CIAL is evolving into a small business that protects and develops its market, but it cannot be accused of elitism. Indeed, Ann Braun, the current coordinator of the CIAT-IPRA project, believes the group needs to get more hard-headed in marketing its expertise. As if to banish any suspicion that it may have benefited at the expense of others in the community, the CIAL has announced its intention to donate its research fund, now 40% higher than it was at foundation, to a new committee that is forming to conduct research on plantain.

Another form of elitism may be suspected when CIAL members invite their relatives to join the CIAL. Of the 12 members of one CIAL in Honduras, nearly all are related to each other by blood or marriage. CIALs of this kind risk being seen as a "cosa nuestra"—a family business intent on protecting the interests of a clan or grouping within the community. However, there is no evidence that such groups do in fact withhold information or resources from non-members. In isolated rural communities it can 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 collaborating with 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 project 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.



Poverty and the community spirit

As a rule, CIALs tend to work well in poor 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. In



these areas farmers have access to alternative sources of innovation and inputs, so there is less need for a CIAL.

Experiences in the contrasting environments of Cauca and Cundinamarca illustrate this tendency. Cauca 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 where the CIAL was formed within a pre-existing farmers' association or self-help group have shown a particularly high success rate. These institutions, which often organize communal production and other cooperative ventures, foster the spirit of solidarity 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," one CIAL member at Pasca remarked. At Arbelaez, where the CIAL is conducting research on snap beans for market, tensions in the committee are occurring as its members experience conflicting demands on their time. This stands in marked contrast to San Bosco, whose landless laborers made time for CIAL activities despite their long working day. Where time is money, farmers are less generous with it.

There are exceptions to the rule, however. Being a poor community is not always synonymous with having a strong self-help tradition. Some 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 Cabuyal watershed ran into difficulties because a technician recruited locally was a controversial choice in the eyes of the Indian community, who resented his relatively large land holdings and the low wages he had paid them as laborers.

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 to the land 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 CIALs reach the marginalized?

When landless laborers in San Bosco wrote to the CIAT-IPRA team asking for help in forming a CIAL, the letter 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 laborers, in particular, would not have the time and energy to do research. Others argued that to ignore such a request would be to betray the poor 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.

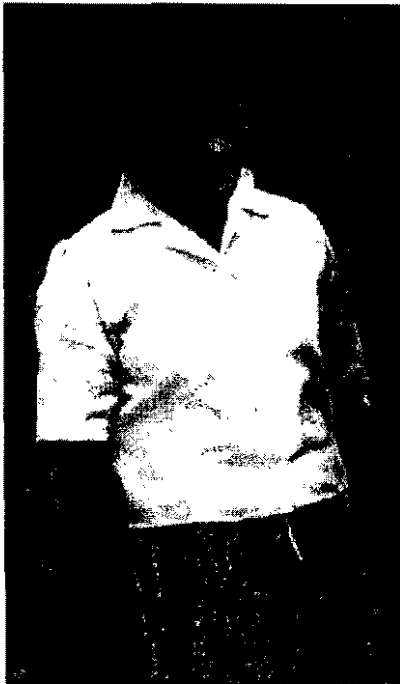
The pattern of farming in San Bosco reflects its location, in an area of steeply sloping hillsides prone to erosion and declining soil fertility. Good land holdings close to the village are scarce. When the CIAL was founded, most of its adult male inhabitants, including three out of four CIAL members,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

The CIAL's work has benefited these landless laborers 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 laborers have even been able to relinquish these plots in favor of newly cleared land closer to the homestead. Effectively, they have become land holders, with greatly increased returns to their labor 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 everyone 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 participating in the CIALs are 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 Totoró, in Colombia, has re-introduced a crop lost to the community over 20 years ago. Totoró's CIAL process started when village elders told visiting CIAT-IPRA agronomist 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 Popayán, where they bought bread of inferior quality. Roa wrote to the Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT), known to be a source of resistant germplasm. Today the CIAL is experimenting with no less than 14 new wheat varieties and there are plans to restore the community's abandoned flour mill.



Women form a third marginalized group in many rural communities. Of all the CIALs formed so far, around half consist entirely of men. In Cauca, for example, 50% of CIALs are men only while 46% are mixed. In the mixed groups women form the minority, often participating as secretary because of their higher educational levels and literacy skills. Pilar Guerrero, sociologist with the CIAT-IPRA 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. At Palmichal, in Honduras, Andrea Hernández, 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. As yet, relatively few all-women's groups have been formed—only 4% of CIALs in Cauca, for example. Among those that have, several have shown courage and determination, as well as a robust good humor, 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, a member of the Cinco Días womens' CIAL at Alfonsa, Colombia. Campo was one of several women present at the motivational meeting that had launched

"We women used to be considered as housewives only. We were not encouraged to leave our homes. 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 life and the way we share work. The men now accept our status as researchers." — Ana Margot Campo, extensionist, Cinco Días CIAL, Colombia.



Alfonsa's first CIAL, back in 1990. She and the others had listened in silent resentment as the men had simply 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 unofficial 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 tossed it into the pot. Beans? The men are already researching 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 women's plans came to the boil, at which point they could no longer be concealed from the men. When the women told the men of their intentions, 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 members to the group. They then launched their research, comparing different varieties of *mora* bush for fruit productivity and quality. Initially dependent 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 women'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.

In a word

- In mature CIALs, the benefits of the CIALs' research are widely shared in the community
- There is no evidence that CIALs are elitist
- Marginalized groups participate strongly in 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 Blas Santos renewed the Kellogg Foundation's challenge to the CIAT-IPRA team at the end of the pilot phase. The team's new goal was to disseminate the CIAL methodology more widely in Latin America. Launched in 1995, this phase initiated CIAL programs 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 the dissemination phase. 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, a high concentration of CIALs would be developed in sites close to partner institutions. These "focus" 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, an 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 program. Experience in Cauca 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 desirable 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 institutional partnerships, proved the key resource in building a successful CIAL program.

The CIAT-IPRA team estimate the total number of CIALs launched in partner countries by the end of the dissemination phase at 236. Numbers alone do not tell the whole story, of course, since they give no indication of the quality of the CIAL process. However, 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 Programa de Investigación 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 nine potato production regions. These CIALs provide useful feedback to PROINPA about IPM and other technologies under development. One is host to an experiment to explore the use of Participatory Plant Breeding (PPB) to complement other approaches to breeding. Since PROINPA works mainly on potatoes, the CIALs have been encouraged to contact other institutions for support in conducting research on other crops and technologies. Several NGOs began their own CIAL programs 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 1998 the country had 18 active CIALs, 17 of which sent representatives to the country's first CIAL meeting held in July of that year.

- *Brazil.* There are now 26 CIALs, known locally as Comitês 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 Projeto Proteção Fitosanitária Sustentável da Mandioca (PROFISMA), a collaborative cassava IPM project between CIAT and the Centro Nacional de Pesquisa Mandioca y Fruticultura (CNPMPF), a commodity research center of the Empresa Brasileira 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.

- *Colombia.* The CIAL program in CIAT's host country goes from strength to strength. Cauca Department now has over 50 active CIALs, which have formed their own umbrella organization, the Corporación para el Fomento de los Comitês de Investigación Agropecuaria Local (CORFOCIAL). The Cundinamarca region, near Bogotá, has become a second center of activity, with 25 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 started in the Valle and Santander Departments. 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.

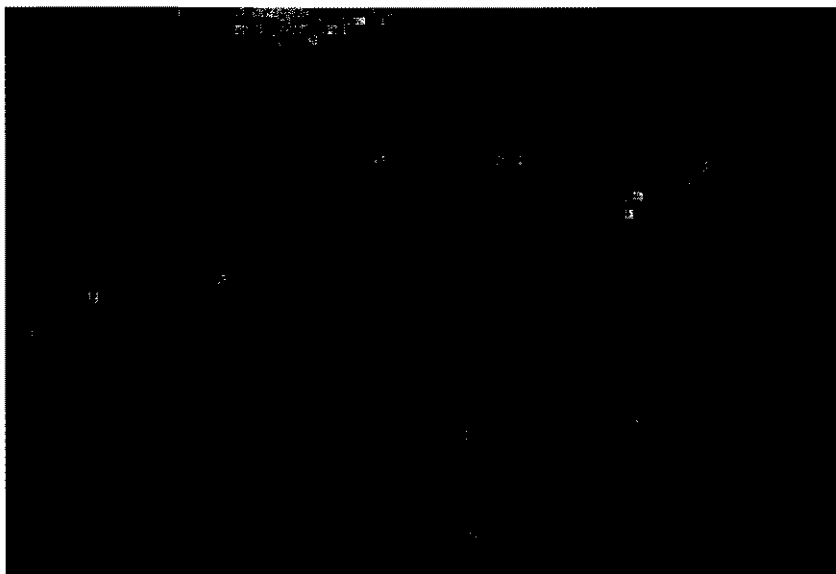
- *Ecuador.* The main protagonists in Ecuador are the Programa Nacional de Investigación de la Papa (FORTIPAPA), a potato research project of the Instituto Nacional de Investigaciones Agropecuarias (INIAP), and the International Institute of Rural Reconstruction (IIRR), an NGO dedicated to rural development. INIAP has launched an active CIAL program through its extension arm, the Unidades de Validación y Transferencia de Tecnología (UVTTs). Many of these CIALs work with the institute's plant breeders to evaluate and select promising potato clones from crosses made by breeders or by trained farmers. 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. IIRR, following a period of experimentation with the methodology, is currently scaling up its activities through collaboration with farmers' organizations, the Ministry of Agriculture and other NGOs. It has held training courses for these organizations, and also for paraprofessionals. A university social science program, the Fundación Latinoamericana de Ciencias Sociales (FLACSO), has made valuable training inputs on gender analysis and has also promoted the use of the CIAL methodology in natural resource management. At the last count the country had 21 CIALs.

- *El Salvador.* Activities here began when an NGO, the Fundación para la Cooperación y el Desarrollo Comunal de El Salvador (CORDES), contacted CIAT-IPRA for information and support. A course was organized and was attended by representatives from CORDES and eight other institutions, including the Entidad Natural de Cooperación Estratégica (ENLACE), the Unión Nacional de Agricultores y Ganaderos de Nicaragua (UNION) and a rural development project of the Universidad Católica de Occidente (UNICO). Following the course, eight CIALs were launched, several of them in areas devastated by the country's

10-year civil war. A professor from the Universidad de San Salvador became interested, provided some support and will include the methodology in the course he teaches. The national agricultural research institute, the Centro Nacional de Tecnología Agropecuaria (CENTA), has yet to become fully involved.

- *Honduras.* Progress in Honduras has been rapid, with 53 CIALs now established. Activities began in 1993, as a CIAT-IPRA pilot project called Investigación Participativa en Centro-América (IPCA). Since 1995 this has been funded by Canada's International Development

Research Centre (IDRC) through the University of Guelph. Staffed by three Honduran agronomists, the project is based at the Centro Universitario Regional del Litoral Atlántico (CURLA), the north-coast campus of the national university, and is active in three areas of north-central Honduras. IPCA is now seeking independent status as an NGO and plans to



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

broaden its activities to other Central American countries. In 1996 the Escuela Agrícola Panamericana (EAP) at Zamorano, began its own CIAL program in the south of the country. University staff are linking with the national agricultural research institute, a regional bean breeding network and several NGOs to form a partnership with the CIALs in which national bean and maize breeding efforts will be decentralized. A national NGO, the Fomento Evangélico para el Progreso de Honduras (FEPROH), has also established a CIAL program in the center of the country. Staff from IPCA, EAP, FEPROH and several other institutions have received training from IPRA-CIAT and have gone on to train others.

- *Nicaragua.* Here CIAT-IPRA works with a Swiss-funded NGO network, the Proyecto de Agricultura Sostenible para las Laderas Centroamericanas (PASOLAC), which has extensive links with national institutions. A course was held in 1996 for 18 participants from two universities and nine NGOs selected by PASOLAC, after which eight CIALs were established. The Instituto de Promoción Humana (INPHRU), a rural NGO, launched three CIALs and is keen to launch more, provided it can obtain seeds of improved varieties. Several other NGOs have become interested through exposure to INPHRU's experience. The Instituto Nicaragüense de Tecnología Agropecuaria (INTA) is attempting to respond to the rising demand for seed through its links with EAP in Honduras. 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. A second-order organization of CIALs in the Río Cállico watershed was formed and held its first CIALs meeting in 1997. In 1998 a second training course was held for NGOs and for CIAL members keen to become paraprofessionals.

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 better known as "Zamorano." The project is responsible for introducing the CIAL concept to an academic community whose wide-ranging regional activities and busy teaching program have in the past kept it somewhat aloof from the farmers in its own backyard, the fertile plains and surrounding hillsides of the Yeguaré 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 proc-



ess 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 agronomy program, headed by Dr Juan Carlos Rosas. Beans have been the main focus of attention so far, but there are plans to extend the approach to maize.

"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 program's scientists were initially sceptical of the methodology. The turning point came when Rosas attended the feedback meeting of the CIAL at Lavanderos, a village in the nearby hill country. There he listened to Yolanda Núñez, 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 Rosas' endorsement of the methodology encouraged others in his program to take an interest in it. Now the program's staff frequently accompany Gamero to the field and regularly attend the diagnostic phase of the process. And the program plans to have its own CIAL activities independently of UNIR.

A little learning...

Older, more established scientists may be sceptical, but the rising generation of would-be scientists—today's students—are embracing the CIAL methodology with enthusiasm. At CURLA in northern Honduras, as at EAP, students are taught the methodology even though 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 Gonzáles, assistant professor at CURLA. "Some become very interested and stay involved long after we've covered it." Like Gamero, Gonzáles 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 labor 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

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' national 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 Atlantida 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 10 CIALs under his care.

Having at first learned about the process solely from manuals, Juan attended a CIAL-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.

"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.



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!

Driven by technology

González 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 getaway car in a gangster film.

González is on his way to the regional research station of the Dirección de Ciencia y Tecnología Agropecuaria (DICTA), Honduras' national agricultural 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 his entire CIAL program. González 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 Central 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

"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

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 program's demand for maize and bean seed every year.

González' race 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 programs 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 from CIAT-IPRA, Fierro and his colleagues decided to launch a CIAL program 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 already 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

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.

"The CIAL program 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.

Transfer Program. 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 program 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 CIALs 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 farmers. 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 PROFISMA, the project had previously been concerned with a narrow range of IPM problems, focusing mainly on the 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, focusing more sharply on farmers' priorities and linking with state and national agronomists in the search for solutions.

While PROFISMA is testing the CIAL methodology, another special project in CNPMF is using a 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-IPRA and applied by cassava breeders and their colleagues 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 at CNPMF are rivals and haven't yet realized that the two methodologies are complementary," says Carlos Iglesias, one of the breeders. "But we expect a synthesis to occur soon." A third special project financed by the International Fund for Agricultural Development (IFAD) will shortly test a PPB approach within six existing CIALs.

Meanwhile, CIAT pathologist Luis Alfredo Hernández has developed a tool that should enable plant breeders to extract more precise information on farmers' selection criteria from the CIAL process. At present, farmers express their reaction to the new varieties in their trials by filling in a simple preference ranking table, in which they check a column headed by a smiling face, a "neutral" face or a glum face. Hernández has developed a way to use these data to analyze farmers' preference order. His matrix analysis software bridges the gap between preference data from CIALs 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 PPB surveys and analyzed 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.

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



Héctor 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 used by some women's groups working to improve cassava processing in coastal Ecuador. The techniques include participatory map-making, as a means of stimulating discussion of land use and natural resource management issues. The maps are made on old sheets previously used for bedding.

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 CIAL 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 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. The CIALs can benefit greatly from training in the principles underlying complex technologies such as IPM and integrated crop and soil management. In the case of IPM, much could be gained by borrowing from the farmer field school (FFS) approach, originally developed in Asia for IPM in rice. The FFS approach invests heavily in enriching farmers' knowledge, teaching them ecological principles as well as encouraging experimentation.

The CIALs do their best research when this clash between the old and the new is turned into an opportunity. Farmers' existing practices can be tested against new options proposed by external scientists in an atmosphere of genuine enquiry that allows both



sides to learn from the experience. When the existing practice is a traditional one, it is vital that scientists resist the temptation to assume that their solutions are superior. At Buenavista, in Cauca, the CIAL set out to test two methods for controlling the nematodes that affected their *lulo* fruit bushes. The first method, which relied on indigenous knowledge, consisted of pouring hot water around the bushes, while the second, proposed by the scientists, involved chemical treatment. The hot water treatment proved most economical and effective.

Such problems also raise the issue of resource allocation. Should a national research institute, program 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 of a difficulty when the entity concerned is responsible for a major food crop of widespread importance to farmers, as are FORTIPAPA and PROINPA. Such entities can locate their CIALs in areas where their crop is grown and refer the CIALs to other organizations in the few cases when they identify a different priority. However, the issue could arise more often in the future, as food needs are met and farmers seek to diversify. It is often argued that research institutes should adapt their commodity 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 believe that the crop or technology won't perform, or that the experimental design is faulty? Jacqueline Ashby 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.

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 Cauca Department's second-order organization of CIALs, provided training in the CIAL methodology to staff at the local branch of the government 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. And his staff need training all over again if they are to continue with the CIAL program 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 guaranteed some stability, 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 go on a training course 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 Timbío, 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 already 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.

Practise what you preach!

NGOs have proved enthusiastic and energetic adopters and promoters of the CIAL methodology in nearly all countries. By

and large successful, their performance has nevertheless suffered from several shortcomings.

The NGOs that have made a success of the methodology tend to have a positive attitude towards research. They are often staffed by professionals with a background in agricultural research or extension. Such organizations are keen to promote farmers' access to the products and services of formal research and open to the idea of teaching scientific methods to farmers. Among these better performers are FEPROH in Honduras, CEDEAGRO in Bolivia, CORDES in El Salvador and IIRR in Ecuador. FEPROH, for instance, now supports around 25 CIALs, has adopted the methodology throughout its programs and is keen to market the approach to other NGOs in Latin America. In Ecuador IIRR has formed 18 CIALs and has offered 5 CIAL training courses to participants from a variety of development organizations, projects and universities.

The NGO movement espouses the causes of farmer participation and empowerment, often accusing formal researchers of not observing these principles. It is therefore ironic that the less successful NGOs can be tarred with the same brush.

Some NGOs have programs that sit uneasily with the CIAL's open-ended diagnostic process. 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 programs—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 program and the withdrawal of credit facilities.

In a few cases, NGOs used the CIAL process to dominate the research agenda or to 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.

"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.

Several NGOs sought to retain control over the research process by withholding the CIAL fund. Some offered to provide inputs instead, but these usually arrived late, blighting the CIAL's future by spoiling its first trial results. "A CIAL without a fund is like a stool with one leg missing," comments Jacqueline Ashby. "When farmers cannot decide how to use resources for their research, the balance of power between them and the outsider becomes too unequal."

One NGO put inexperienced students in charge of the CIAL process, and then offered credit to farmers venturing into the commercial production of beans for a local supermarket chain. The harvest was plentiful, but was rejected by the supermarket because it did not meet the required quality standards. It turned out that no one, least of all the students, had discussed the quality criteria (color, 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.

The most disappointing experiences occurred with NGOs that view the products and services of formal research as part of a system allegedly designed to exploit resource-poor farmers. Such organizations typically rejected the CIAL methodology altogether, claiming they already had their own participatory methods. These usually relied only on farmer-to-farmer technology transfer and lacked mechanisms for the systematic comparison and evaluation of technologies. Where such organizations did agree to collaborate, the relationship was often a strained one, with the NGO unwilling to provide feedback on the performance of the CIALs they had started.

Bolívar Muñoz

Bolívar Muñoz knows all about life on a farm. He was born on one.

His earliest memories are of helping his parents and three brothers tend the family's crops of coffee and plantain on the smallholding where they lived near the village of Cabuyal, in one of the poorest areas of Cauca Department. It was here that he went to primary school, before going on to complete his secondary education in nearby Pescador.

Bolívar is typical of Colombia's younger generation of farmers—better educated and demanding more out of life than his parents. Keen to improve his own lot as well as that of his community, he became a founder member of the CIAL in Cabuyal in 1991. So impressive was his performance as a CIAL member that he was invited to join CORFOCIAL as a paraprofessional when it was established in 1993.

Today Bolívar is responsible for providing advice and assistance to 18 CIALs near his home village in northern Cauca. As a paraprofessional, he has earned new respect from farming families that knew him as a child. His ambition? To gain a better knowledge of research methods and modern farming practices and technologies, so that he can improve the quality of the support he provides still further.

What are the underlying reasons for these problems? First, reflecting the region's extremes of rich and poor, NGOs in Latin America tend to be more radical than in Asia or Africa. Deeply mistrustful of government and all its works, some cling to their traditional role of challenging formal research rather than risking collaboration with it. Second, the movement is more fragmented than in other regions. Colombia, for example, is thought to have over 50,000 NGOs, most operating at the local or regional level with no overarching body that



"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, Director of Research, CIAT.

coordinates their activities. Many of these smaller NGOs have budgets that are inadequate to support their ambitious programs. They also lack staff with sufficient knowledge and experience to manage projects effectively and to access resources from outside the farming system.

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 53 CIALs.

Funded from the interest on an endowment provided by an anonymous benefactor, 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 "upholding 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 IPM. When the women's group at San Isidro ran into difficulties in processing its soybean 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 soybean. Now they are helping the group obtain funding for a mechanical thresher.

CORFOCIAL's bird's-eye view of Cauca's CIALs 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. Bolívar 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'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 endowment, CORFOCIAL has been able to add other income, raised mainly from government training programs. "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. 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 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 establish rural telecenters connecting CORFOCIAL, the sustainable agriculture consortium, CIPASLA (see pg. 107), 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.

Farmers spread the word

Visiting El Paraíso for the day, Eliverio Orellano's brother wouldn't stop talking about his experiences as a researcher. It was mainly to keep him quiet and to move the conversation on to other things that Orellano promised him he would come over to see for himself.

Orellano's brother was a member of the CIAL at La Playa, a village a few kilometers from El Paraíso in Honduras' Santa Bárbara Province. A few weeks later, Orellano fulfilled his promise by attending the CIAL's evaluation meeting, which was held in the committee's experimental plots shortly before harvest. He returned to El Paraíso with a glowing account of what he had seen. "They had an excellent harvest and were using new bean varieties," he told his friends. Having formed a 20-strong group of interested farmers, Orellano's next step was to contact the IPCA project to ask for support in starting El Paraíso's own CIAL. Today, as the CIAL's leader, he is anxiously awaiting the results of its first experiment, testing the same new bean varieties.

The spontaneous transfer of the CIAL methodology between communities is the strongest possible evidence that the methodology works and is popular with farmers. The steps in the methodology, and its basic principles, are easy to grasp and hence to pass on to others. Cases of spontaneous transfer have been

observed in nearly all the countries participating in the dissemination phase.

Most spontaneous transfer takes place informally, via individuals such as Orellano's brother. Some CIAL members not only talk compelling about the methodology but actively demonstrate it or teach it to other communities. CIAL leaders such as Adelmo Calambáz at San Bosco and Medardo Carlosama at El Diviso find that an increasing proportion of their time is taken up by such activities.

Occasionally, CIALs undertake more formal efforts to disseminate the methodology. These efforts tend to occur in areas where collective action is a strong feature of the local culture.

One CIAL, at Tukma Baja in Bolivia, went to great lengths to spread the word. When it invited surrounding communities to visit its experimental plots, at first few people came. The CIAL felt that what it had to show was so important for others that it must find ways of attracting a wider audience. But how? Then the committee members realized two things: they and all the other young male farmers for miles around had one passion in common, namely football; and second, by a happy coincidence, their experimental plots adjoined Tukma Baja's football pitch. They decided to organize a match, challenging a team consisting of the best players drawn from all the surrounding villages. The home team, consisting of CIAL members and their close collaborators, was formed; a day for the match was chosen, timed to coincide with the height of the growing season; and written invitations were sent out. On the day, the team wore shirts printed with the words "CIAL Tukma Baja". Before the match began a crowd of spectators assembled along the touch-line. But just as the CIAL had intended, most of them had their backs to the pitch and were admiring the CIAL's healthy looking crops. Kick-off was postponed as CIAL members took the visitors on a tour of the plots, offering their help to other groups wishing to set up their own CIAL.

The event was a public-relations triumph. In the weeks that followed, two or three additional CIALs were launched in the area.

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

Basic principles

Experiences during the dissemination phase 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 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.

In a word

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.*

Learning to Listen

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 300 people in eight 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 of 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 how that attitude changed when the course participants visited Cauca 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

"Putting the last first means reversals in learning."—
Robert Chambers,
Fellow, Institute
of Development
Studies,
University of
Sussex.

methodology as it passes out of CIAT's hands into the programs 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 CIAT-IPRA team have designed an intensive two-week course that combines a theoretical introduction to the CIAL methodology with hands-on practice in implementing it.

The course begins with a classroom session on the meaning of participation. According to CIAT-IPRA trainer José Ignacio Roa, 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 owns 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. The sessions also deal



with the issues that commonly arise at each step, such as the outsider's role in accessing 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 required 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 together 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 CIAT-IPRA's 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.

Around 300 farmers in the communities where the first five CIALs were launched were invited to evaluate the content, language and drawings of 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 handbooks to their own local circumstances. A modified set is being prepared for Central America. In Nicaragua, special materials have been developed for use when literacy rates are low.

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 available, and a kit of CIAL monitoring and evaluation tools is under development.

Supporting replication

Training the trainers was the central plank in the CIAT-IPRA team's strategy for disseminating the CIAL methodology. The aim 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 CIAT-IPRA team had organized 11 introductory courses for 323 participants from institutions in Bolivia, Brazil, Colombia, Ecuador,

El Salvador, Honduras, Nicaragua and Venezuela. 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 some initiatives 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 programs request their own training. At this point, CIAT-IPRA trainers 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 program leaders sent their scientists and technicians on an intensive tailor-made five-week course at CIAT, then followed this up with their own in-country training. A nine-strong national group of experts in participatory research was formed and a workshop held to train the group to train others.

"Before, I used to go looking for plots, not people. I saw farmers as a labor 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

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 participating in the dissemination phase are not as far advanced as Ecuador in their training, but several are heading in the same direction. In Colombia, CORPOICA has secured support from a government agency to scale up its training activities. Brazil's national research institute is searching for funds for the same purpose.



From conviction to action

Like Fierro, most alumni of the courses say their experience of CIAL groups in the field 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.

The experience of Carlos Amaya, a technology transfer specialist with the Honduran NGO, FEPROH, is typical. Amaya used to conduct conventional on-farm research before going on a CIAT-IPRA 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 neighboring 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 programs.

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.

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 area

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, FEPROH, Honduras.



near its main offices in Bogotá, where 25 CIALs have been launched. And the institute has recently announced its intention to "go national" with the methodology.

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 started 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, CIAT-IPRA staff began providing training and advice to



interested scientists and technicians of the national potato research group, PROINPA. Since then, the group has successfully established 10 more CIALs.

Several experiences demonstrate the importance of exposing

an institution's senior staff to the methodology if the subsequent CIAL program 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

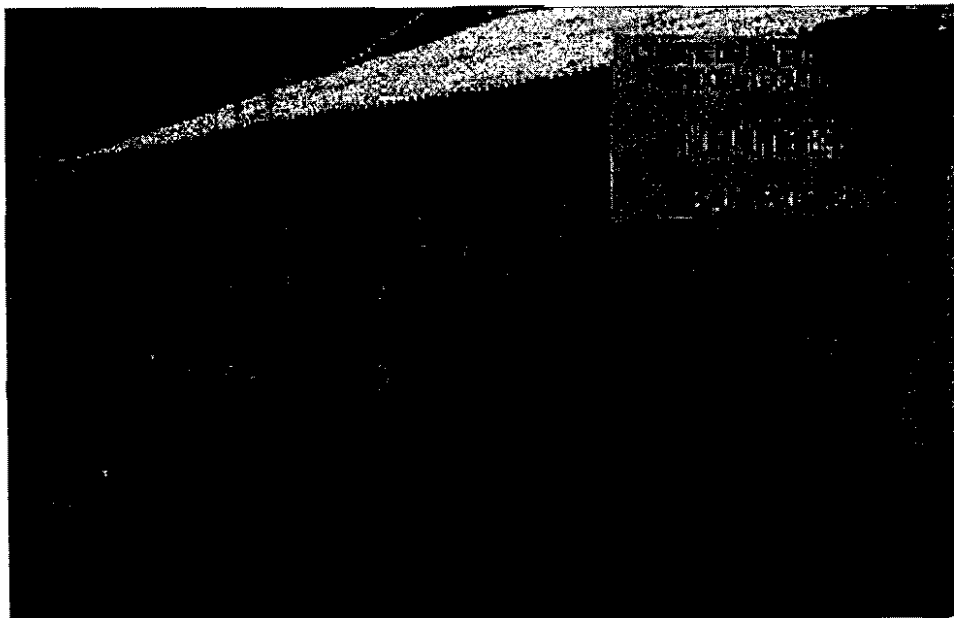
Training paraprofessionals in the CIAL methodology is a vital part of scaling up. Paraprofessionals can make two major contributions to the process.



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 save time and money for the overstretched technical services of government organizations.

Second, 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 inclined to trust a fellow farmer than a professional. 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.



"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."— Héctor Andrade, plant breeder with the FORTIPAPA project, INIAP, Ecuador.

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 Cauca, 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. So far, two paraprofessionals from Nicaragua and one from Ecuador have been trained.

Farmers notice the difference

Whether support for the CIALs comes from a professional or a para-professional, the subtle difference in attitude engendered by training in participatory techniques is not lost on farmers. At Tontoló, 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 Héctor 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. Andrade epitomizes the factors that make a



participatory approach so much more effective in developing and disseminating technology than approaches in which scientists pre-determine 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.

In a word

To summarize

- Good training is essential for instilling the basic principles of the CIAL methodology and hence ensuring its successful replication.
- The CIAL-IPA can serve as highly effective in this respect and can be replicated by other organizations.
- A well-trained core national team can initiate a self-sustaining process of replication.
- CIAL-IPAs 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.



Measuring Impact

Two questions must be addressed when assessing the impact of the CIALs. First, do the CIALs provide an effective local research service? And second, how does their research affect development?

Evolution: the big unknown

The CIAL movement is still very young. Of the 53 CIALs in Cauca Department—the area where the movement started—around half are still at the preliminary testing stage. The other half are divided roughly equally between the validation and production stages. Most of the CIALs at the production stage have only just reached it. Only a tiny handful are in their fourth or fifth year of production.

The youth of the movement means that we know little about how the CIALs will evolve. All CIALs start by conducting research, but will they all continue with it? Once they have found a marketable product or service, the CIALs face a choice. Some decide to stop conducting research in order to go commercial with their results, starting a small business. Others attempt to continue with research at the same time as running a business, perhaps in the hope of adding to their range of products and services. Still others switch to research on a different topic, leaving dissemination and commercialization of their results to others.

Examples of all three cases can be found. At Arbeláez, where the CIAL intends to go into large-scale seed multiplication in snap bean, its leader doubts whether the committee will do research on another commodity, mainly because of conflicting demands on members' time. The CIAL at El Diviso, in contrast, already runs a maize seed production and milling business and hopes to repeat its success by extending its research to phaseolus beans. About the most prolific CIAL in terms of research results is Tukma Baja, in Bolivia, where the committee has tackled potato, peppers, snap beans and phaseolus beans—and is still going



strong. Tukma Baja funds its research by selling seeds of potato and bean, but only on a small scale.

Some CIALs solve the problem of choosing between research and business activities by handing the fund on to another group. The Asopanela CIAL, for example, intends to donate its fund to a new CIAL wishing to conduct experiments on plantain. This will free it to market its expertise in processing to other sugar cane producers.

Many of the CIALs testing new food crop varieties will probably aim to disseminate their results by multiplying and selling seed. There is plenty of scope for the growth of such businesses. In Colombia, for example, improved seed is scarce owing to the financial difficulties experienced by the larger seed companies, some of which have recently ceased trading. Nevertheless, the market for improved seed will eventually become saturated, so not all CIALs testing new varieties can expect to become seed enterprises, especially in the longer term.

Becoming a seed enterprise for a major food crop is only one of the possible development paths open to the CIALs. Other paths include the production and processing of minor crops, such as soybean, of fruits such as *mora* and *lulo*, or small-scale animal breeding, for example guinea pig. Some CIALs may attempt to market their expertise in such areas as IPM. In the longer term, tree nurseries or other agroforestry-based businesses might become more common. And eventually the agenda could move beyond agriculture altogether, to new areas such as tourism.

The unknown future of the CIALs means that none but the most foolhardy would attempt to extrapolate from individual cases in order to forecast the overall impact of the CIALs on rural development. It is far too early to do this. However, it is *not* too early—in fact it is the right time—to ask whether the CIALs are fulfilling the precondition for impact by providing an effective research service. Only by doing so will they produce usable results that can be widely adopted.

Delivering a research service

What constitutes an effective research service and how can this be measured? A process in which the human being is the chief



variable does not lend itself to empirical analysis and the easy certainties of laboratory research. The CIAT-IPRA team have met this challenge by devising a special survey. The survey sets out to measure three sets of indicators marking different stages or milestones along the CIALs' road to success.

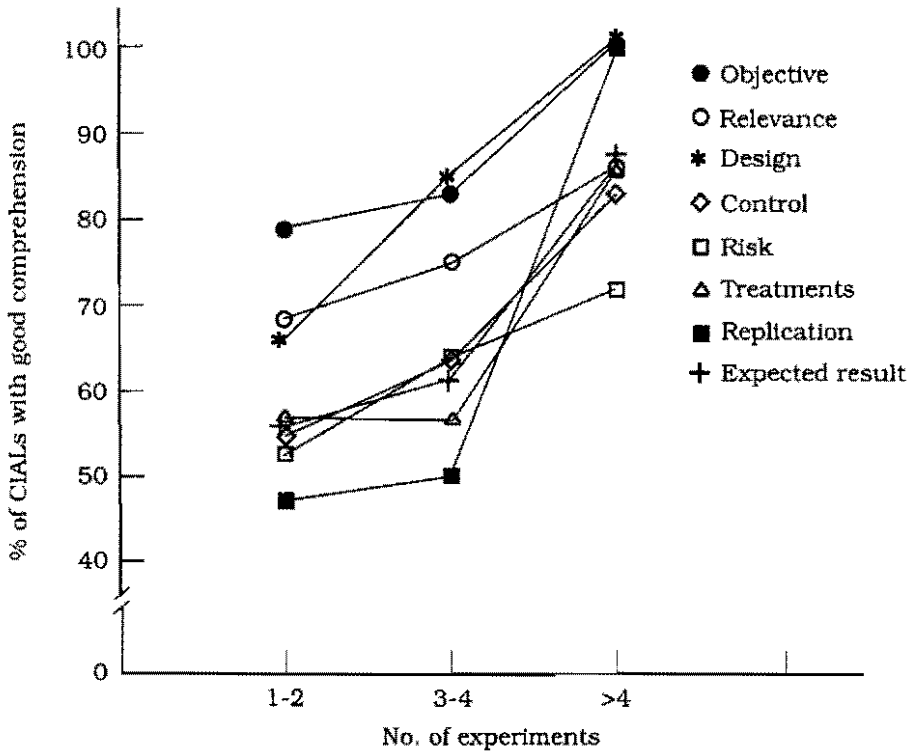
The first milestone is the capacity to conduct experiments systematically. This capacity is a prerequisite if the CIAL is to produce reliable results of use to the community. It is measured by assessing CIAL members' understanding of the research process. Are CIAL members able to explain the objective of their experiment and the research methods they are using? Have they grasped the experimental design, and the reasons why there are controls and replications? And do they appreciate the need to manage risk when testing new ideas?

The second milestone is the CIAL's capacity for self-management. The set of indicators here is designed to assess the ability of the CIAL to run its own affairs independently of external support. This is crucial, because CIALs that become dependent on their outsider often follow a research agenda that does not meet farmers' real needs, leading to little or no impact. Such CIALs also offer no cost saving over conventional ways of conducting on-farm research. The indicators include the frequency of visits made by the outsider, the ability to administer the CIAL fund, the success rate in replenishing the fund, the ability to seek external support directly (without the assistance of the outsider), attendance by committee members at CIAL activities, group cohesiveness and the ability to resolve conflicts.

The third milestone and corresponding group of indicators cover the CIAL's relationships with the community and with formal R&D institutions. These relationships, which become important as the CIAL approaches maturity, indicate the CIAL's ability to disseminate its results and to exert a demand pull on the products and services of formal research and extension. The indicators include the level of adoption of CIAL technologies, the amount of experimentation by non-CIAL members of the community, changes noted in the attitude of the R&D professionals interacting with the CIAL, and use by R&D organizations of the results of the CIAL's research.



Figure 1. The CIALs' understanding of the research process.

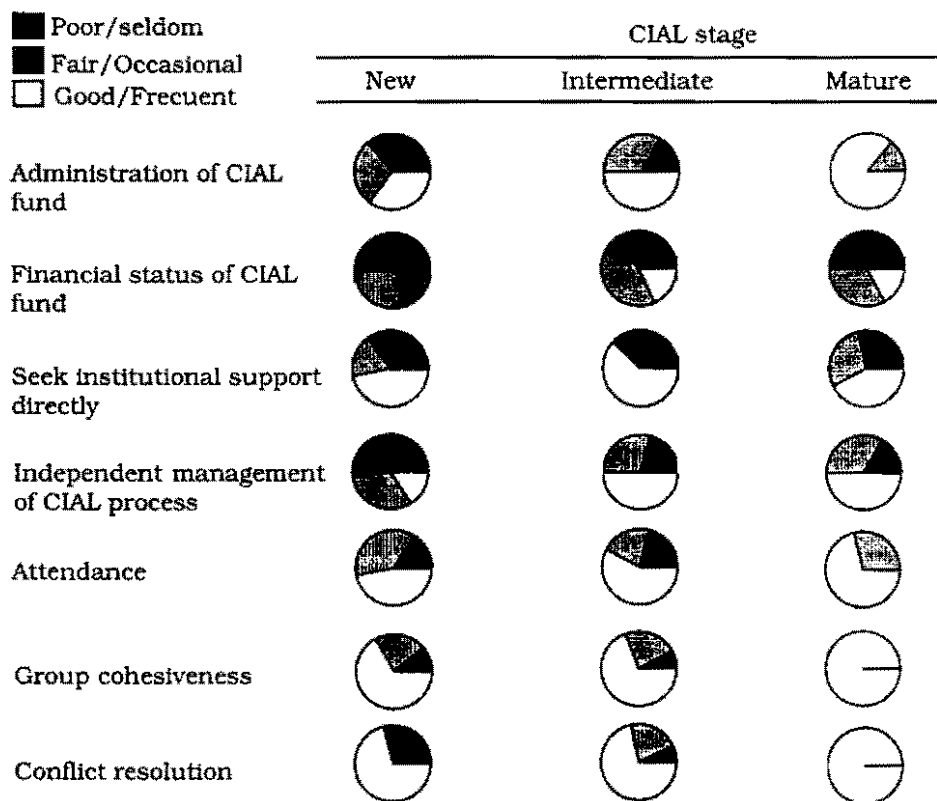


First developed and applied in Cauca, the survey is now used in all the countries that have CIAL programs, where it forms part of the routine follow-up provided by CIAT-IPRA trainers to former course participants who are starting up their own CIALs. So far, the CIAT-IPRA team has analysed the survey data from Cauca only.

The analysis shows that the CIALs in Cauca learn the rudiments of systematic research quickly (Figure 1). Even during their preliminary trial, over 50% of CIALs understand the methods they are using. They are able to articulate the objective of their research, describe the design of their experiment clearly and explain the need for controls and replications. They also understand the need to manage risk when testing new ideas. Another great leap forward in understanding the process of



Figure 2. The CIALs' capacity for self-management.



research is made by mature CIALs with experiments at the production stage. All the main principles of research are understood by 72% of such CIALs.

The results for the self-management indicators are also generally encouraging (Figure 2). Dependence on external support for conducting the CIAL process reduces as the CIAL ages. By the validation stage, 50% of CIALs need only one visit a month by their outsider. As they mature the CIALs also become more proactive in seeking information: in around 57% of CIALs, individual members have taken the initiative to contact institutions for advice or assistance without waiting for their outsider to help them. Around half the CIALs have learned to administer their fund competently by the validation stage and this rises to 86% in



CIALs at the production stage. The greatest management challenge is replenishment of the CIAL fund, and this is slowest to develop: only 20% of CIALs have so far been able to add to their fund from CIAL activities.

The data on links with the community and with external organizations show that these too are healthy. Just over half the CIALs in Cauca have made recommendations to their communities derived from their research results. Around 83% of CIALs conducting preliminary trials have held at least one meeting to inform the community of their progress. This high level of feedback to the community is maintained by the more mature CIALs, many of which not only hold a meeting but also make a progress report available to their communities. Most important, 80% of mature CIALs cite major changes in their communities, including widespread testing of their recommendations and greatly increased interest in spontaneous research. These data are a further nail in the coffin of the allegation that the CIALs are elitist.

By the production stage, about half the CIALs report positive changes in the R&D professionals interacting with them. The changes include better listening, greater willingness to allow the CIAL to take its own decisions and more frequent fulfilment of commitments. About half of all mature CIALs report at least one example of the information or products resulting from their research being used by R&D organizations.

Implications for development

What can be said about the likely impact of the CIAL process on the three major aspects of rural development: economic growth, social equity and the sustainability of agriculture? Let's take each of these aspects in turn:

- *Growth.* As events at El Diviso demonstrate, the CIAL process can stimulate rapid growth in the rural economy. Where the CIAL conducts research on a major food crop, such as maize, the benefits are likely to be widely felt. Farmers' incomes go up and, in the medium to longer term, the price of food falls. Both producers and consumers gain.



So far, maize yields in El Diviso have shown only a moderate increase compared with those achieved by some other CIALs. In El Crucero de Pescador, for example, the yields of farmers adopting CIAL technology have risen from about 820 kg/ha to 1400 kg/ha for the first harvest of the year and to the spectacular level of 2000 or even 3000 kg/ha for the second harvest. Farmers in El Crucero de Pescador increased their sowing densities and applied much more chicken manure than in El Diviso, partly because it is cheaper here (the community is nearer the city of Cali, where there are large chicken farms). Clearly, factors such as proximity to markets and the relative prices of inputs and outputs will strongly influence the growth effects of CIAL research, as they do in any other kind of research.

When surplus maize is fed to livestock, there is a further positive effect on farmers' incomes and the price of food. Given the rising demand for livestock products, this seems likely to happen whenever and wherever a surplus is created. So far, maize has been fed to chickens and pigs, but it could also be used to feed dairy cows.

The growth effects of the CIALs' research will be felt particularly strongly when CIALs are able to combine increases in production with value added through processing. This is the case in many of the CIALs conducting research on maize, where the income from yield gains is typically re-invested in milling equipment. But combinations of this kind are by no means restricted to major food crops. Many of the CIALs conducting research on new or minor crops, such as soybean or *mora*, are also processing their output for sale on local markets. In these cases the value added through processing is often enhanced by the creation of products that are new to the local market.

Research on sugar cane production and processing by the Asopanela CIAL provides a powerful example. The CIAL identified three areas as crucial to the profitability of its members' enterprise, the small-scale production of *paneta*. First, it is testing new sugar cane varieties, which promise higher yields from an earlier maturing plant that can be cut more often, allowing better (year-round) utilization of the processing plant. The cane from these new varieties is softer, bringing a quality advantage alongside the yield gain. Second, the CIAL has



pursued efficiency gains in the ovens used for processing, lowering costs by cutting the consumption of fuel. Whereas several fuels had to be used in the past, including rubber tires and fuelwood, now only bagasse, itself a byproduct of sugar cane processing, need be used. Third, the CIAL has created a new, higher-value product—organic *panela*—which it produces under contract. The product seems likely to catch on with consumers, since it avoids the use of a harmful bleaching chemical known to cause headaches and diarrhoeia. The gains achieved in each of these areas reinforce one another. Together, they could raise producers' incomes substantially.

- *Equity.* With its emphasis on empowerment, the CIAL process is likely to have highly positive equity effects. Several cases demonstrate that the process has been enthusiastically taken up by very poor or marginalized groups normally left behind by development. Examples already discussed in this report include landless laborers at San Bosco, Indian farmers at Flor Naciente and women at Cinco Días. With the exception of San Bosco, most of these CIALs have been started too recently to enable their full impact to be gauged. However, a case study of San Bosco showed pervasive impact on livelihoods throughout the community.

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.

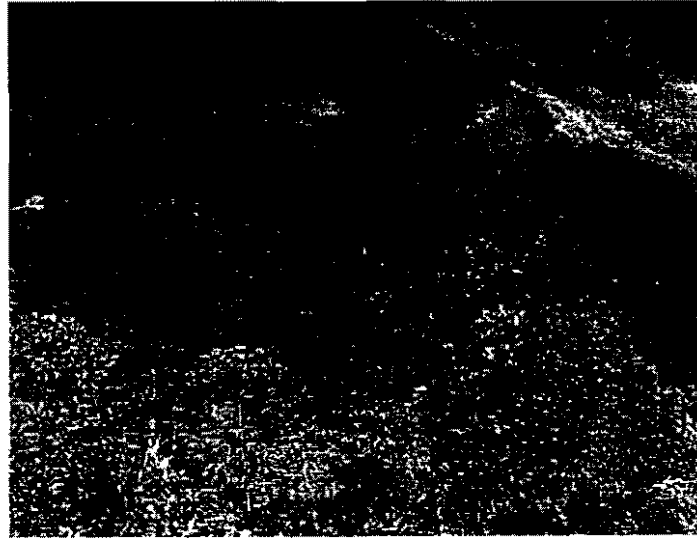
Marginalized groups in communities typically conduct research on minor crops or animals not of interest to the majority of farmers. Examples are research on peanuts by women at El Diviso, on soybean by women



at San Isidro and on guinea pigs by a group at Portachuelo. This research will not have the broad impact associated with research on major food crops, but the groups doing it are looking for new sources of income to raise them out of poverty. Their involvement, which would probably not have come about if a conventional project-based approach had prevailed, demonstrates the unique contribution that the CIAL process can make to a more equitable rural society.

While many of the groups conducting research on minor crops are successful, some are struggling. Their difficulties may be agro-ecological, reflecting the choice of a crop that is susceptible to pests and diseases or otherwise difficult to grow in the prevailing soil or climatic conditions. Alternatively, they may be associated with attempts to process an unfamiliar crop without the proper equipment. Where the difficulties are agro-ecological, unless new technology comes to the rescue the research may do little more than demonstrate why the minor crop concerned has remained minor. In the case of processing difficulties, the perseverance shown by some of the groups, together with their initiatives in attempting to obtain new equipment, bode well for the outcome, but for most of them it is still too early to say whether or not they will succeed.

If the equity potential of the CIAL process is to be fully realized, there is a strong argument that outsiders supporting the CIALs should concentrate more on these struggling groups than they do at present. At El Diviso, for example, the successful men's CIAL working on maize has become good at attracting resources and gets most of the attention from visitors—so much so that it almost overshadows the much weaker women's CIAL in the same village. Some CIALs formed by marginalized groups complain that they are more or less neglected by their outsider, especially if the latter knows little of the crop they are researching.



- *Sustainability.* The impact of the CIAL process on the sustainability of production is difficult to predict. Since the process places decision-making power in the hands of the farmer, the adoption of technology that favors sustainability is by no means guaranteed. Resource-poor farmers must make choices that favor their incomes today, whether or not these benefit the natural resource base.

At San Isidro, for example, members of the women's CIAL are funding their activities by growing maize, phaseolus bean and soybean on a steep hillside perilously vulnerable to erosion should 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 on maize and onions failed. They have considered the use of live barriers on sloping fields—but believe that 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.

These considerations aside, many CIALs are testing technology that, if widely adopted, will protect the natural resource base. Often, they are doing so in the context of a growing awareness of the environmental damage done by previous generations of farmers—an awareness derived both from personal experience and through public education campaigns. The CIAL at El Paraíso, 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. They are typical of the growing number of farmers in this country who are now conscious of the negative consequences of burning and have renounced the practice as a result. Where CIALs work in such a context, they can often serve a useful research and demonstration function, establishing the superiority of sustainable practices and leading their adoption by the community.

Some technologies that intensify production also help to protect the resource base. In Colombia and several other 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. In these cases, the CIALs' research benefits sustainability via its effects on growth and equity.

Many CIALs are conducting research on the integrated management of crop pests and diseases. One group, the El Progreso CIAL in Ecuador, has succeeded in halving the number of fungicide applications to potato from 14 to 7 in a season. As well as benefiting the environment and human health, this has brought farmers a saving of approximately US\$ 280 per season. Another group, in Colombia's Valle Department, has developed new indigenous technology to combat nematodes attacking *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 CIALs' 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 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 motivated to reach out to resource users beyond the community or to enter the complex negotiations that may be needed to settle difficult resource management issues." CIALs in Cauca's Cabuyal watershed are participating in the Consorcio Interinstitucional para Agricultura Sostenible en Laderas (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.



Experience so far suggests that the two types of institution could be highly complementary.

CIAT's impact study

In 1998 CIAT began a study to assess the impact of the CIAL program on local agriculture. The study compares four communities that have no CIAL with four that have one. For the communities with a CIAL, the situation before foundation is being compared with that four to five years afterwards. All the communities are in Cauca.

Three caveats surround this study and its findings. The first is that data analysis is still in progress, so only the early results



are yet available. The second is that the level of impact so far demonstrated is conservative, since the study does not cover any of Cauca's more mature CIALs, whose results are known to be widely disseminated in the community. An urgent task facing the CIAT-IPRA team is to conduct more case studies on such CIALs.

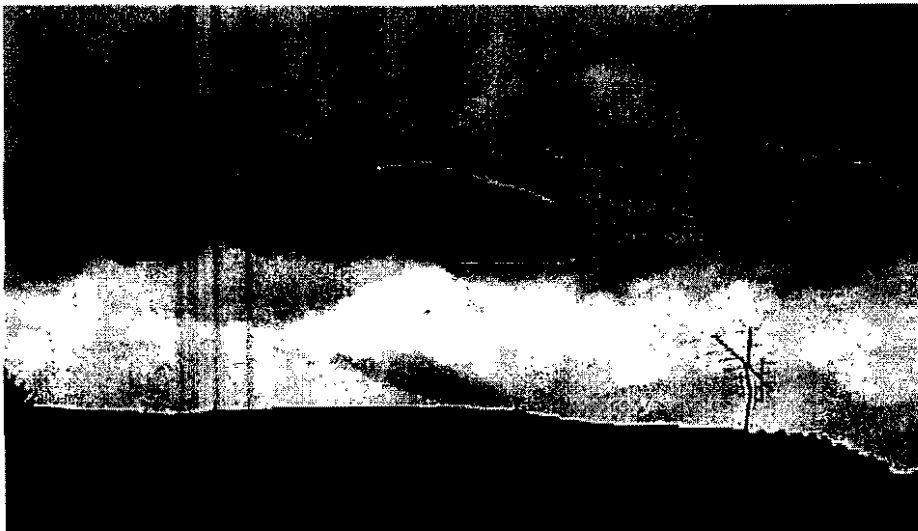


The third caveat is that, although broadly similar, the two sets of communities differ in one important respect: those with CIAs lie close to a main road and are more market-oriented than those without. This market orientation is a possible confounding factor in some (though by no means all) of the data. The origin of this weakness in the study is not poor experimental design but rather the fact that the study's baseline data were originally collected for a quite different purpose, namely earlier thesis research by an undergraduate on the level and type of indigenous experimentation and how this varies with socio-economic circumstances. When four of the communities chosen for this earlier research subsequently launched CIAs in the early 1990s, CIAT took the opportunity to re-analyse the baseline data and collect further data in both sets of communities, in the hope of shedding light on the CIAs' impact.

Despite the caveats, the study reveals important differences between the two sets of communities. In those with CIAs, 57% of the people interviewed claimed that new technology developed by their CIA had led to increases in agricultural production. Many more farmers in CIA communities cultivate beans—70% compared with only 48% in non-CIA communities—and most of these farmers have adopted at least one improved variety. The data on maize show a similar trend. Farmers in CIA communities also grow more vegetables, have greater access to

"There is a romantic view of indigenous knowledge systems that advocates their isolation and protection from the corrosive effects of modern science and technology. 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."—

Douglas Pachico,
economist, CIAT.

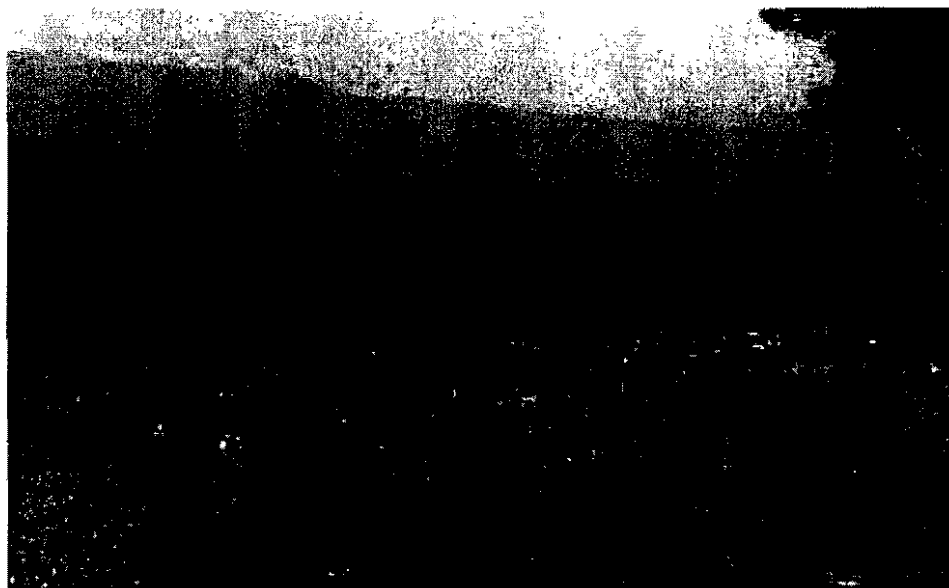


credit and have more off-farm activities—all signs of a more dynamic village economy.

Encouragingly, over a third of interviewees in non-CIAL communities also claimed that technology obtained from a CIAL had improved their production. This indicates considerable penetration of the results of the CIALs' work into surrounding areas, sometimes over quite long distances.

Differences in incomes were not very marked, perhaps reflecting the fact that the CIALs studied have only recently reached maturity. On average, 36% of interviewees in all communities said that their economic situation was better than 5 years ago. In communities with CIALs this proportion rose slightly, to 38%. People in communities with CIALs had a little more disposable income and were more likely to own a refrigerator, a stereo or a television, or to have improved their homes in some way. Although most of these people acknowledged that CIAL technologies had increased their crop production, many felt that the resulting gains in income were being eroded by the rising cost of living.

Somewhat fewer families suffered food shortages during some period of the year in communities with CIALs than in those



without. However, at 68 and 72% of all families respectively, the proportions are still disappointingly high. On this as on many other issues, it is vital to obtain data from communities with more mature CIALs.

One important difference between CIAL and non-CIAL communities is that the former had more information-seeking behavior. Some 28% of the households interviewed in communities with CIALs reported that they contact R&D organizations directly to seek advice or assistance, either for themselves or for a subgroup in the community. More households in CIAL communities applied for training opportunities or sought project funds—13 and 9% respectively compared with 7 and 0% in non-CIAL communities.

Critics of the CIAL methodology sometimes argue that teaching farmers scientific methods will suppress indigenous knowledge and destroy their spontaneous capacity for experimentation. The impact study shows that this fear is wholly unfounded. Communities with CIALs had far 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.

In both sets of villages, indigenous experimentation was nearly universal. Only 3 and 5% of farmers respectively in communities with and without CIALs reported that they had not conducted any experiments of their own. But communities with CIALs had more experimentation per farmer and experimented on a broader array of topics.

Farmers in CIAL communities experimented a great deal with new crop varieties, a finding also borne out by anecdotal evidence from members of the CIAT-IPRA team. This experimentation mimics the small plots with controls and experimental treatments used by CIAL members. Much of it is made possible by the small gifts of seed that CIAL members make to other members of the community before large-scale dissemination takes place.

Thus, in 1998, farmers in CIAL communities reported experimenting with 27 different new varieties and 19 new crops, whereas only 14 new varieties and 8 new crops were tried in

"The CIALs have increased the amount of experimentation in their communities.

I have often seen non-CIAL members in CIAL communities conducting small experiments just like those of the CIAL, comparing new varieties with their local control."—Carlos Arturo Quirós, CIAT-IPRA team.



non-CIAL communities. A decade previously, farmers experimenting on new varieties had focused only on beans, maize, coffee, plantain, pastures and sugar cane, whereas today the range of crops is much wider, including peanuts, soybean and several new vegetables. The study also picked up big differences in the amount of experimentation on fruit species, such as *lulo* and *mora*. Over 60% of farmers in CIAL communities conducted research in this area, compared with 23% in non-CIAL communities.

All this is good news for biodiversity. Interestingly, the stresses experienced by the production system in Cauca have not, as might have been expected, led to a reduction in diversity in farmers' fields (though they may have done so in surrounding bush or forest areas). Rather, farmers are trying new varieties and crops as a way of maintaining their yields and spreading their risks while raising their incomes. The experimentation inspired by the CIALs is playing an important part in their search and is thus contributing directly to increased biodiversity.

Besides crop varieties, farmers showed considerable interest in experimenting with fertilizers and other means of improving and protecting their soils. This reflects the serious problems of erosion and declining soil fertility that have afflicted Cauca, like so many other parts of the Latin American hillsides, over the past decade. In 1998, more experimentation with fertilizers occurred in CIAL than in non-CIAL communities. And more farmers in CIAL communities tested conservation-oriented practices such as sowing without prior burning, weeding with a machete rather than a hoe (which leaves weed roots in the soil, keeping the soil in place), mulching with weeds, and the use of live barriers in sloping fields. These findings provide further evidence that the CIAL process can have a positive effect on the sustainability of production.

Pest and disease control was another popular area of research. Nearly 80% of respondents in CIAL communities did their own experiments on this, compared with only 38% in non-CIAL communities. Over the decade, pesticide use fell in communities that formed CIALs but remained about the same in those that did not. These findings almost certainly reflect training in IPM given by CIAT and other institutions to communities in CIAL villages.



Clearly, the training boosted peoples' confidence in this complex area of experimentation.

In conclusion, CIAT's assessment of impact from the CIALs' work is far from complete. Watch this space!

In a word

To summarize

It is still too early to assess the impact of the CIALs on movement of rural development

Most CIALs in Costa Rica Department are delivering more science research service to their communities

The CIAL process has highly positive implications for rural development equity

CIALs do benefit sustainability, although this depends on farmers' choices

An impact study conducted by CIAT suggests that communities with CIALs conduct more research and grow more new crops and improved varieties than communities without CIALs

Where Do We Go from Here?

CIAT-IPRA has so far focused 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 Department. 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 are increasingly disseminating 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 programs. 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 programs with seeds and diagnostic services. One region has formed a second-order organization to protect and promote the CIAL process, and others intend 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 program 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 from 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 CIAT-IPRA sociologist 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-bearing 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 behavior 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 that is all process and no product will not command the support of the community for long.

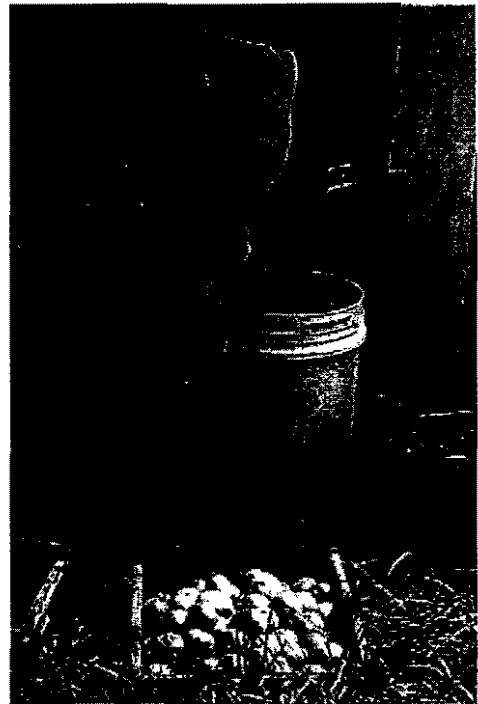


As CIALs mature they become more self-sustaining, but not wholly self-sufficient. While they are less dependent on external support for mere survival, they may have even greater need of external inputs and services in order to prosper, especially as they become more market-oriented. This is a critical 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 an endowment, providing it with interest from the capital sum invested. 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. 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. Churches, businesses, professional associations, even theatrical companies, are other possible sources of support. Such institutions respond generously when short-term emergencies occur.



At the same time, they often express a wish to contribute to long-term solutions.

- *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 Arbeláez, 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 money is needed to access extra land.

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 Chris Wheatley, the project's small business development specialist. "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 collateral 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 center, 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. Farmers' contacts tend to be limited to the buyer or middleman, who typically expects them to

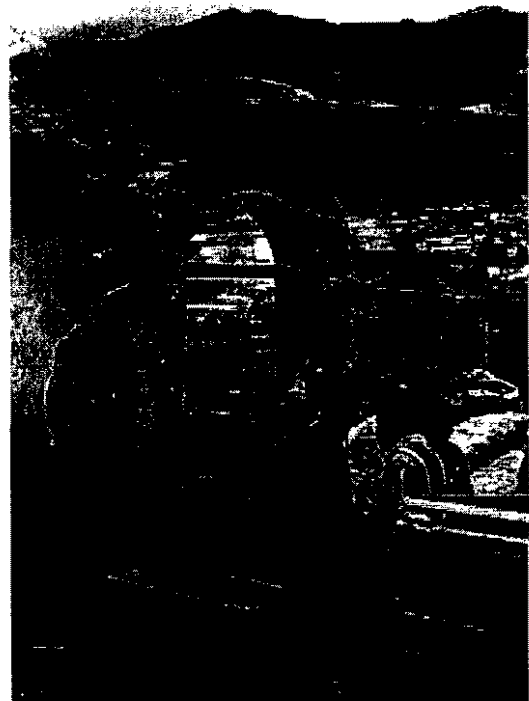


provide the best quality produce at the lowest possible price and offers little help or advice in meeting quality standards. The CIALs could do more to reach back further up the marketing chain to wholesalers or retailers, extracting information from them on what consumers are demanding and passing it on to farmers. 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 (see pg. 76), there is much still to be done in this area. CORFOCIAL is making a start by contacting a supermarket chain that is opening a new store in Popayan, the departmental capital of Cauca. The store could constitute a promising new outlet for nearby CIALs.

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.

Ann 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 to empowerment, they can figure out where their 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. For example, besides becoming a training center 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 outsiders and the farming community, as occurs in the FFS. 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?

These questions arise 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 these professionals 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 glum 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.

- *Adaptations.* The CIAL has proved itself an admirable institution for conducting adaptive research on agriculture within single communities. And the communities hosting CIALs have shown that, within certain limits, the CIAL can be adapted to suit local circumstances. However, more radical adaptations to both the structure and the process may be needed if the CIALs are to cope with the broader, more complex agenda of the future.

For example, natural resource management issues frequently require planning and action at a watershed rather than a community level. Where networks or consortia that operate at this level already exist, the CIALs can be linked to them (as in the Cabuyal watershed). But what if they do not? Could a multi-community or watershed-level CIAL be established? If so, could it accommodate the complex negotiations that natural resource management issues often require?

Again, topics such as the selection and growing of new tree varieties require research over a much longer period than is implied by the current process, which has been developed for annual crops. Arguably, a CIAL should not have to report back to its community when all it has to say is that the trees it planted grew by 2 centimeters in diameter and 8 centimeters in height. But without regular feedback meetings, how would the community's interest and support be sustained over these longer periods? And how would the CIAL's accountability be guaranteed?

As the CIALs' agenda moves beyond agriculture, there will be an increasing need to complement field research with other activities, such as lobbying policy makers or contacting potential new sales outlets. These activities imply a possible need for new functions within the committee—for example, a sales representative.



Two approaches are possible to research on adaptations of the CIAL process and structure: some situations will require pro-active efforts on the part of the CIAT-IPRA team or other outsiders to solve specific problems as they arise in the community; in others, a *laissez-aller* attitude will be more appropriate, allowing communities to reach their own solutions without outside intervention. In these cases, CIAT-IPRA could still observe the outcome and derive lessons from it for transfer elsewhere.

- *Access to information.* If the CIALs are simultaneously to increase their links to markets, broaden their horizons beyond purely agricultural problems and enrich their research with more specialized knowledge, they will need more efficient ways of accessing and sharing information.

Rural telecenters, allowing access to the Internet, are a powerful means of linking isolated communities both to each other and to the wider world. CIAT is currently developing a proposal to connect selected CIALs, CORFOCIAL and other local organizations in Cauca to the Internet. If successful, the project could be extended to other regions and countries.



- *Group conflicts.* In a survey of CIALs in Cundinamarca, 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.

- *Impact.* A final area needing continuing study by the CIAT-IPRA team is the assessment of impact. As we have seen, there is an urgent need to conduct more case studies of mature CIALs. In the longer term,



it should be possible to use more sophisticated techniques to assess impact at the macro-economic level.

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—something that the formal sector, by virtue of its structure and its modes of operation, simply cannot do.

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

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,



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

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 takes over its management from the farmer. Especially when donors are about to visit, money and labor 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 is a complete contrast to this approach. Its basic principle is to empower farmers by stimulating them to organize and participate in a locally accountable research service. Seed money is used to get the service off the ground, and the freedom to decide how to spend it is vital to the success of the venture. The money protects farmers from the risks of research while allowing them control over the research process. The result is profound and lasting change in the 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 labor 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.



In a word

To summarize

- The CIAI methodology is likely to be widely adopted
- Besides training, the CIAI-IPSA team needs to address the issues of CIAI's enabling links to markets, process, institutional arrangements, access to information, group conflicts and financial assessment
- The CIAI methodology could have a considerable impact on resource mobilization
- It could also increase the efficiency of public sector and community development services



Fun at 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 street is a large, brightly colored 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.

To prove the point, the town has lent its handsome Spanish-style theater 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, bringing a

"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.



welcome fillip to trade for the towns' guest houses and shops. At various times during the three-day event their numbers will be swollen by additional family members tagging along for the occasion, representatives of supporting organizations 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 theater 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 Días, maize bran from San Bosco, or *panela* products from Portachuelo. Suddenly a threshing machine from Santa Barbara leaps noisily into life, drowning conversation but demonstrating its efficacy to a group of fascinated 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 threshing 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 two- or three-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 Popayán whose 250-year-old baroque church of San Antonio de Padua provided an unusually beautiful setting. The 1997 meeting, in contrast, was hosted in the remote mountain community of Totoró 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-honored 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 leader—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.

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 small businesses. 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 threshing 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 Calambáz, leader of the San Bosco CIAL, first met the El Diviso group that had successfully applied for additional land from the government land reform agency. They inspired him to prepare his own application and told him the procedure, saving him considerable time and effort. Similarly, María Gutiérrez, secretary of the 11 de Noviembre CIAL in Ecuador, first saw a mechanical thresher 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 another ethnic group.

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 program. Two directors of the national training institute SENA attended the 1998 *encuentro*, together with a director of CORPOICA. For SENA, 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

"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, CORFOICIAL coordinator.



to fund a course for CORPOICA staff and the scaling up of the institute's activities to a nationwide program.

In 1997, CORPOICA launched an annual *encuentro* for the CIALs of Cundinamarca. 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 program. "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 program.

And the idea of the *encuentro* shows every sign of spreading still further afield. Among the countries participating in the dissemination phase, Honduras was first off the mark, organizing its first national *encuentro* at Yojoa Lake 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 Rosas, as darkness falls, an intimate band of cornets, flutes, guitars and tambours strikes up and a group of singers delights the crowd with the closely harmonized Spanish-language ballads of the valleys. At Totoró, in contrast, the keening sound of the *quena*, 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 Piendamó, a village influenced by the nearby urban culture of Popayán, a larger, more raucous band played *salsa* and there was dancing on the village square.

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 behavioral 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, *agricultores!*



Contacting IPRA

If you would like to learn more about the CIALs, about training materials and courses, or if you would like to support the CIALs in any way, please contact the IPRA project, IPCA, or visit the IPRA website (<http://www.ciat.cgiar.org/IPRA/>).

Contact	Address	Telephone	Fax	E-mail
IPRA	IPRA CIAT Apartado Aéreo 6713 Cali Colombia	57-2-4450000 or 1-650-833-6625	57-2-4450073 or 1-650-8336626	ciat-ipra@cgiar.org
IPCA	Proyecto IPCA Apartado Postal 561 La Ceiba Honduras	504-400720	504-430700	ipca@caribe.hn



The CIAT-IPRA Team

Jacqueline Ashby

When I was doing my doctoral dissertation research in Nepal on green revolution rice, an elderly farmer whom we always visited in the village after a tiring day doing questionnaires, squatted on his porch and asked me why I was so interested in how people grew rice.

"You don't realize that we aren't as worried about growing rice as we are about storing the rice we already grow. If only we had a way to store the surplus for a few months until the prices go up, we'd be much better off! If you really want to help people in this village you'll help us to find a way to build a community store house."

I remember my lasting reaction at the time to this unusually frank criticism, was one of paralysis: how could I drop my busy schedule of completing questionnaires and get involved in a development crusade? How could I get my Cornell committee to let me change my dissertation topic? And so on. But I felt there was something wrong.

A couple of years later doing field work in Colombia the same frustration grew. Despite all their affectionate tolerance of our questionnaires, farmers weren't really speaking to us about the things high on their agenda. The research institutes we worked for seemed as gripped by paralysis as I had been in Nepal. Something had to change; and it did as the IPRA team began to branch out into participatory plant breeding in the early 1980's when we evaluated thousands of varieties with farmers and began to listen instead of mainly asking questions. Our challenge became to provide a strategy and systematic methodology that enabled us to take advantage of farmer's own research capacity and to develop real working relationships between farmer and scientific institutes like CIAT, identified as "Centers of Excellence." This was the crucible of the CIALs.

Although I have graduated with my PhD from Cornell, and have gone from being one of the first few social scientists in the CGIAR system (as IPRA project coordinator and CIAT Hillsides Program Leader) to Director of Research — when I think about this experience as part of my biography, I see that the relationships with farmers and scientists I have been privileged to be involved in over these years are really the most important professional experiences of my life — degrees, publications, promotions and other honors notwithstanding. And that is all I have to say about that!

Ann Braun

I worked for CIAT from 1983 to 1993 on very narrowly focused disciplinary research—studying the biology and ecology of natural enemies of insect pests and selecting species for biological control. In 1992 I had a professional crisis. I had focused my career on the cassava green mite, a pest that had invaded Africa in the 1970s. Now, 20 years later we were still trying to solve this problem and I began to question the approach we had taken to setting our priorities. I felt so frustrated that I was considering leaving the pest management field and ending my career as a scientist altogether. A colleague said that this would be a waste. She told me it would be more constructive to change the way I

worked. She suggested I contact the Escuela Agrícola Panamericana in Zamorano, Honduras, where anthropologist Jeff Bentley was giving a course for farmers and extensionists on a participatory approach to biological control and sustainable agriculture.

Sceptically, I contacted Bentley and arranged to attend the course. After two weeks of daily work with farmers I left a changed person, realizing that in my decade of research I had never bothered to consider the role that farmers could play in identifying problems and in conducting research to solve them. I had never considered how the technologies that I'd been involved in developing might be viewed by them. These revelations prompted me to accept an offer to join the regional office of the Centro Internacional de la Papa (CIP) in Bogor, Indonesia, where I worked for nearly 5 years on the development of Farmer Field Schools for potato and sweet potato and "earned my wings" as a participatory researcher. I returned to CIAT in January 1998 as the coordinator of the CIAT-IPRA project.

Carlos Arturo Quirós Torres

I am an agronomist and did an MSc in plant protection and integrated pest management. When I joined CIAT in 1981, I worked with Jacqui Ashby collecting socio-economic data in Cauca Department. My involvement in the development of participatory research methods really began in 1983, when we started finding out why farmers were not adopting fertilizer recommendations. Our next step was to involve the farmers in the design of experiments. By 1985 we had realized that farmers had to be involved as decision makers in all stages of the research process and that we needed to develop a methodology for this. We began developing the methodology during on-farm trials on new bean and cassava varieties and then applied it in other fields.

When the CIAT-IPRA team was formed in 1987, a more intensive phase of further methodology development and dissemination began. I worked in participatory research on IPM in a project with CIAT's bean program and a national research group in Cundinamarca. And in 1990 I became involved in the development of the CIAL concept and the establishment of the first CIALs in Cauca Department.



In 1991 I went to Costa Rica for on-the-job training at CATIE, working on an IPM project. I returned to CIAT in 1993 as coordinator of CIPASLA, the CIAT-led consortium working on sustainable watershed development in Cauca. When the dissemination phase of the Kellogg project began in 1995, I rejoined the CIAT-IPRA team as a trainer, responsible for spreading the CIAT methodology in participating countries. I also follow up CIATs and evaluate their progress.

Luis Alfredo Hernández Romero

I am the most recent member of the CIAT-IPRA team, which I joined in 1998. However, I have long been involved in a participatory approach to research.

By profession I am a plant pathologist. I started my work with CIAT colleagues in Cauca Department, where we evaluated new cassava varieties with farmers. Based on this experience, I was able to develop a glossary of farmers' varietal selection criteria, including desirable agronomic and post-harvest characteristics. I then worked in the cassava-growing area of Colombia's north coast, where we set up a large net-

work of trials at representative sites, involving 25 other professionals and around 1000 farmers. During this period I was involved in the development and testing of the participatory plant breeding method now used elsewhere in Latin America, including Ecuador and Brazil.

José Ignacio Roa Velasco

I was born in Cali, but my earliest memories are of the countryside. My father had a *finca* in the hillsides, where we went for holidays and at weekends. We played football to keep warm and went fishing with the sons of the laborer who lived there, who was Indian. Afterwards he would give us *arepas* to eat, washed down with large cupfuls of steaming hot chocolate.

I went to the Jesuit school in Cali. Here I learned compassion for the poor. Every Friday we had to bring something to eat, or some small change, to put in a large hamper outside the door of the classroom. The Hampers were distributed in Las Isla, a poor district of the city. I was

also impressed by my great aunt, Eufemia, who used to feed children from poor families in her home. She founded the Christmas Club, now well-known in Cali for its work with poor children.

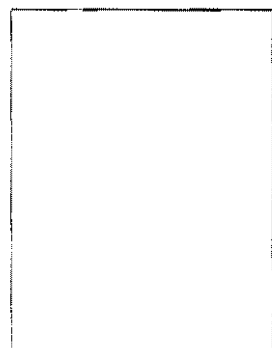
After I had finished school I studied agronomy at the Faculty of Agriculture in Palmira. I did my thesis in CIAT's Biotechnology Unit, under Dr William Roca. I remember my impressions of CIAT at that time: it seemed a place where no farmers ever came, and I wondered, "Why don't they, if we are working for them?" I then went to Carimagua, where I worked with CIAT's



Pastures Program for four years. It was a wonderful experience and I learned a lot about managing experiments and working in a team.

In 1987 the guerillas struck Carimagua, an event that triggered my return to Cali. I learned that CIAT was starting a new participatory research project, under Dr Ashby, but was warned that she was difficult to work for! I thought, "I've got nothing to lose," and applied for a job as her research assistant. The interview lasted two hours, at the end of which I was offered the job. I was overjoyed, as the idea of participatory research seemed so relevant. Because I had grown up in a farm environment, I took to it like a duck to water. My work for the CIAT-IPRA team at present involves training and follow-up of newly formed CIALs.

María del Pilar Guerrero Arango



I was born in Cali but educated in the USA and Bogotá before going to university in Puerto Rico, where I read sociology. After I graduated, I spent quite some time wondering what sociology was useful for (besides earning one a reputation for being a socialist, that is). After a while my father, who was getting fed up with having an anti-imperialist pseudo-socialist part-time teacher under his roof, forced me to drop in on CIAT. I was first introduced to Dr Ashby—the only sociologist at CIAT at that time—who was excited at the prospect of having a colleague on staff but said she could not afford to recruit me just then. I was then sent to see Dr Pachico, who needed enumerators for a consumer survey being

carried out by the bean program. I served a two-month contract, after which I left.

Two years later, in 1984, I dropped by CIAT again, to say hello. It so happened that some agronomists in the bean program had made a mess of interviewing farmers, so Dr Pachico very wisely decided to recruit me to do it instead. As a single woman sociologist with little or no interest in nail varnish, I was considered the ideal person to send 500 miles out into the Andes, near Colombia's frontier with Ecuador. It was during my four years there that I learned what Colombian farmers looked like and how they behaved with us—taciturn, passive, never saying "no", bowing before the great God technology—suffering, in short, from paternalism.

These first experiences with CIAT taught me that it wasn't just through giving farmers our time, technology or sympathy that we could alleviate their poverty. A new, revolutionary approach was needed.

In the summer of 1989 I joined the CIAT-IPRA team, starting work in Cauca Department. I spent the first 2 years getting to know the farmers and setting up bean, cassava and maize trials. I asked the farmers to rank the varieties, taking hours and hours of their time. We used to turn it into a game, a beauty contest, which they enjoyed. Many of the farmers became my friends. One of our best women farmers asked me to be godmother to one of her daughters. I am part of their family now.



In 1990 I facilitated the motivation meetings for the first five CIALs in Cauca. I also participated in their first diagnostic, evaluation and feedback meetings. Since then I've lost count of the number of CIAL activities I have attended! I have also made many follow-up visits to assess the progress of the CIALs and written (with difficulty!) some training materials. And I was involved in the formation of the first ever all-women's CIAL, at Cinco Dias.

Teresa Gracia Camargo

Since I was a girl, I have always asked questions. I think one should never be afraid to ask questions, of oneself and of others. I always try to read behind the facts, to understand why things are so.

Born in Cali, I did my bachelors' degree in social sciences at the Universidad Javeriana, in Bogotá. Then I went to the University of Michigan, in the USA, where I did a masters. I also have a diploma in rural sociology from the University of the Sorbonne, in Paris. My work experience before joining CIAT was first in a research center for rural development attached to the University of Cali, then in a United Nations project in Spanish-speaking Africa, and finally with a rural development program run by Colombia's Coffee Board, in Valle Department.

I've now been with the CIAT-IPRA team for 10 years. When I joined, in 1988, I became responsible for training technicians and developing training materials. Latterly, I have undertaken other activities as well, including follow-up of CIALs and a study on the reasons why CIALs fail.

Trudy Brekelbaum

My first step on the path to participatory research began while doing my graduate work. I had the opportunity to take a summer course in nonformal education at Michigan State University in 1981. There I met with a number of people applying participatory research in the area of health and popular education. I learned about all the exciting pioneers in the field, becoming enamored of the work of people like Paulo Freire and Facundo Cabral. I was also exposed to the process of training paraprofessionals by teams from Cornell and the U. of Massachusetts. Before long, I was hooked. Then when CIAT asked me to join the organization as Head of Special Projects, I volunteered as thesis advisor to

Masters students in Community Development with emphasis on participatory research at the local St. Bonaventure's University, where I was able to put many of those principles into action.

As CIAT's Projects Officer, I first collaborated with the IPRA team in an advisory capacity. I became more directly involved in 1995 and 1996 in the development of the relationships between NGOs, national research institutes and universities that were forming CIALs, and in the



establishment of the CIPASLA consortium. Unfortunately my health did not permit continuing the intensive work required by the program.

Facundo Cabral said, "We come to sow, not to harvest." In 1998 I had the opportunity to see a couple of presentations about CORFOCIAL and CIPASLA made by local people. It was a truly momentous occasion for me to see a small part of that harvest-to see how they had come along so far in these last few years.

When we first started this work the tendency was for the farmers to turn to us, asking what we the "doctores" thought. We would smile gently, but firmly, and pass the potato back to them....



The CIALs in 1998

CIAL/Community	Location	Research topic	Support institution	Date est.
Bolivia				
Th'olapampa	Mizque	Evaluation of oat varieties	CEDEAGRO	9/97
Tukma Baja	Mizque	Control of potato pests	CEDEAGRO	2/94
Poligino	Callejas altas	Control of onion pinkroot	CEDEAGRO	3/97
Tin Tin	Tin Tin	Control of garlic pinkroot	CEDEAGRO	1/98
Buena Vista	Mizque	Evaluation of maize	CEDEAGRO	7/97
Incañasi	Mizque	Control of onion diseases	CEDEAGRO	1/98
Mizquepampa	Mizque	Multiplication of potato seed	CEDEAGRO	2/98
Cebada Jichana	Cebada Jichana	IPM of Andean potato weevil	PROINPA	10/97
Piusilla Morachata	Piusilla	Evaluation of potato varieties	PROINPA	9/97
Pomari	Aroma	IPM of Andean potato weevil	PROINPA	3/97
Kollana	Tarakollo	IPM of Andean potato weevil	PROINPA	8/96
Leuquepampa	Chuquisaca	Resistance to potato late blight	PROINPA	10/97
Monte Grande	Monte Granof	Resistance to potato late blight	CARE	7/97
Pozuelos	Pozuelos	Resistance to bean angular leaf spot	CIAT	9/96
Brazil				
Bahia				
Buril	Alagoinhas	Resistance to cassava green mite	EBDA	3/94
Chapada	Aporá Alagoinhas	Resistance to cassava root rot	EBDA	3/94
Cadetê	Cruz das Almas	Cassava fertilizing systems	EBDA	3/94
Roberto Santos	Inhambupe Alagoinhas	Resistance to cassava green mite	EBDA	3/93
Barra	São Miguel das Matas	Resistance to cassava white flies	EBDA	7/95
Sumaré	Piritiba	Production of good quality cassava planting material	EBDA	4/95
Caldeirao	Piritibá	Production of good quality cassava planting material	EBDA	6/94



CIAL/Community	Location	Research topic	Support institution	Date est.
Umbuzeiro	Feira de Santana	Effect of green manure on cassava production	EBDA	6/94
Ceará				
Nova Veneza	Ubajará	Resistance to witches' broom	EMATER	10/94
Valparaíso	Tianguá	Effect of green manure + compost on cassava production	EMATER	3/95
Vila Moura	Acarau	Effect of green manure + compost on cassava production	EMATER	2/95
Lagoa Grande	Acarau	Evaluation of cassava varieties	EMATER	2/95
Paraíba				
Gameleira	Alagoa Nova	Resistance to cassava root rot	EMATER	7/95
Souza	Salgado de São Felix	Resistance to cassava root rot	EMATER	10/94
Quiteria	Alagoa Grande	Resistance to cassava root rot	EMATER	10/94
Pernambuco				
Tatu	São Bento do Una	Cassava fertilizing systems	EMATER	10/94
Boa Vista	Araripina	Effect of green manure on cassava production	EMATER	2/96
Campina Nova	Vitoria de Santo Antao	Resistance to cassava root rot	EMATER	11/94
Gameleira	Gloria de Goitá	Resistance to cassava root rot	EMATER	10/94
Colombia				
Cauca				
Betania	Betania	Evaluation of bean varieties	CORFOCIAL	6/91
Cabuyal	Cabuyal	Green manures	CORFOCIAL	9/91
El Diviso	El Diviso	Evaluation of plantain varieties	CORFOCIAL	9/91
La Esperanza	La Esperanza	Evaluation of pea varieties	CORFOCIAL	9/93
San Bosco	San Bosco	Evaluation of maize varieties	CORFOCIAL	2/91
Santa Bárbara	Santa Bárbara	Evaluation of maize varieties	CORFOCIAL	2/91
El Socorro	El Socorro	Evaluation of sugar cane varieties	CORFOCIAL	2/94



CIAL/Community	Location	Research topic	Support institution	Date est.
Asopanela	Asopanela	Evaluation of sugar cane varieties	CORFOCIAL	4/92
Cinco Dias (women)	Cinco Dias	Evaluation of blackberry varieties	CORFOCIAL	3/92
Santa María	Santa María	Propagation of granadilla	CORFOCIAL	9/92
Buenavista	Buenavista	Organic fertilizers for beans	CORFOCIAL	6/93
Pan de Azúcar	Pan de Azúcar	Evaluation of cassava varieties	CORFOCIAL	8/93
La Paz	La Paz	Evaluation of papaya varieties	CORFOCIAL	6/93
Palermo	Palermo	Evaluation of snap bean varieties	CORFOCIAL	9/91
Camposano	Camposano	Evaluation of potato varieties	CORFOCIAL/ UMATA Timbio	8/93
La Chapa	La Chapa	Planting system for peas	FUNCOP	4/92
Campo Alegre	Campo Alegre	Evaluation of maize varieties	CORFOCIAL	2/92
Crucero del Rosario	Crucero del Rosario	Evaluation of plantain varieties	CORFOCIAL	8/94
Alto Farallones	Alto Farallones	Potato fertilization	CORPOTUNIA	10/92
Nuevo Amanecer	El Porvenir	Commercialization of beans	CORFOCIAL	10/93
Altamira	Totoró	Evaluation of soybean varieties	CORPOTUNIA	9/93
El Moral	El Moral	Evaluation of sugar cane varieties	CORPOTUNIA	9/93
Ventanas	Ventanas	Blackberry staking practices	CORFOCIAL	7/93
Frontino	Frontino	Evaluation of bean varieties	CORFOCIAL/FUNCOP	3/93
Quebrada Azul	Quebrada Azul	Evaluation of snap bean varieties	CORFOCIAL/FUNCOP	1/90
San Pedro	San Pedro	Evaluation of lulo varieties	CORFOCIAL	7/93
Aguablanca	Aguablanca	Evaluation of potato varieties	CORFOCIAL	10/94
El Turco	El Turco	Pastures	CORFOCIAL/UMATA Quilichao	9/94
Los Quingos	Los Quingos	Evaluation of maize varieties	CORFOCIAL	1/90
San Isidro	San Isidro	Evaluation of maize varieties	CORPOTUNIA	1/91
El Jardín Cerro Alto	El Jardín Cerro Alto	Evaluation of bean varieties	CORFOCIAL	9/93
Andalucía	Andalucía	Evaluation of bean varieties	CORFOCIAL	7/95
La Palma	Pueblo Nuevo	Diseases of lulo	CORFOCIAL	5/95
Alto Miraflores	Alto Miraflores	Evaluation of bean varieties	CORFOCIAL	10/94
San Antonio	San Antonio	Evaluation of maize varieties	CORFOCIAL	8/95
El Carmen	El Carmen	Fertilization for peas	CORFOCIAL	7/94
Altamira	Totoró	Fertilization for peas	CORFOCIAL/ Cabildo Totoró	12/95



CIAL/Community	Location	Research topic	Support institution	Date est.
Carpintero	Carpintero	Evaluation of bean varieties	CORFOCIAL	10/95
La Esperanza	El Moral	Evaluation of sugar cane varieties	CORFOCIAL	2/93
Promoción Social	Hato Viejo	Propagation	CORFOCIAL	8/95
Portachuelo Alto	Portachuelo Alto	Evaluation of guinea pig diets	CORFOCIAL	8/95
Chambimbe	Chambimbe	Intercropping Cassava/ Beans/Maiz	CORFOCIAL	9/96
El Centro	El Centro	Evaluation of potato varieties	CORFOCIAL	1/96
Betania	Totoró	Evaluation of wheat varieties	CORFOCIAL	10/96
Bellavista	Bellavista	Evaluation of bean varieties	CORFOCIAL	3/97
La Pradera	La Pradera	Evaluation of maize varieties	CORPOTUNIA	8/97
Santa Isabel	Santa Isabel	Staking of peas	CORFOCIAL/ Cabildo Totoró	10/97
La Aurora	El Tengo	Evaluation of maize varieties	CORFOCIAL	2/97
La María	La María	Evaluation of maize varieties	CORFOCIAL	8/96
Pioyá	Pioyá	Evaluation of onion varieties	CORFOCIAL	4/96
San Isidro (men)	San Isidro	Evaluation of cassava varieties	CORFOCIAL	9/96
San Isidro (women)	San Isidro	Evaluation of soy varieties	CORFOCIAL	10/96
El Carmen	Piendamó	Evaluation of bean varieties	CORFOCIAL	9/94
La Cabaña	La Cabaña	Blackberry fertilization	UMATA Timbio	5/96
El Placer	El Placer	Evaluation of maize varieties	FUNCOP/CORFOCIAL	8/96
Boyacá				
Jurpa	Ventaquemada	IPM of potato tuber moth	CRECED/UMATA Ventaquemada	5/96
San Pedro	Macanal	IPM of potato tuber moth	CRECED Valle de Tensa	6/96
Boquerón	Umbita	IPM of potato tuber moth	CRECED Valle de Tensa	5/96
San Pedro de Muceño	Macanal	Lulo IPM	CRECED Valle de Tensa	7/96
El Olivo	Sta.Rosa de Viterbo	IPM of potato late blight	CRECED Duitama	6/96
Motavita (women)	Motavita	IPM of potato tuber moth	CRECED Valle of Tensa	5/96
Siativa	Tinjacá	Lulo fertilization	CRECED/UMATA	7/96
Portachuelo	Sta. Rosa de Viterbo	Evaluation of forage varieties		6/96
San Luis	Belén	IPO	CRECED Duitama	6/97



CIAL/Community	Location	Research topic	Support institution	Date est.
Cundinamarca				
Nemogá	Fúquene	Evaluation of pea varieties & staking	CRECED/Chiquinquirá	5/96
Cumba	Chípaque	IPM of potato bacterial wilt	CRECED Oriente	7/95
Salitre	Une	IPM of potato late blight	CRECED	5/96
Potrero Grande	Choachi	Control of onion diseases	CRECED/UMATA	6/96
Ojo de Agua	La Mesa	Control of spittlebug in sugar cane	CRECED	5/96
Cabuyal	La Peñas	Evaluation of sugar cane varieties	CRECED	1/97
Bojacá	Chía	Evaluation of guinea pig diets	CRECED/UMATA	5/96
Apulo	Apulo	Evaluations poultry diets	CRECED	7/97
El Cucubo	Duitama	Evaluation of alfalfa varieties	CRECED Duitama	5/96
Pacho	Pacho	Evaluations poultry diets	CRECED	6/97
Santa Bárbara	Arbeláez	Evaluation of snap bean varieties	CRECED Sumapaz	5/97
Volsalice	Fusagasugá	Rational use of water resources	CRECED Sumapaz	9/97
Mesitas	Fusagasugá	Forages	CRECED Sumapaz	5/97
Bocas de Monte	Pasca	IPM of potato tuber moth	CRECED Sumapaz	5/97
Meta				
El Carmen	San Juanito	Varietal resistance of peas	CRECED Oriente	7/97
San Antonio	El Calvario	Control of fruit drop in lulo		6/97
Ecuador				
Las Playas de Pulpaná	San Francisco	Evaluation of fruit varieties	UNOCANC/IIRR	6/97
S. Luis de la Campiña	Cusabamba	Resistance to potato late blight	IIRR	6/97
Nuevo Amanecer	San Agustín	Guineapig breeds	IIRR	3/96
Nuevo Amanecer	Baeza Napo	Evaluation of fruit varieties	IIRR/FUNAN	6/97
El Cóndor	San Alfonso	Evaluation of guinea pig breeds	IIRR/FUNAN	5/96
Shingashina	Aloquincho	Resistance to potato late blight	MAG	4/96
La Victoria	La Playa	Evaluation of potato varieties	MAG	5/96
S. Pedro de Anagumba	Anagumba	Evaluation of guinea pig breeds	IIRR/MAG	6/97
Futuro Mejor	San José de las Minas	Fertilizers	IIRR/MAG	5/96
Las Orquíofas	Las Orquíofas	Evaluation of blackberry varieties	IIRR/MAG	6/97
Las Palmas	Las Palmas	Cattle milk/meat production	FUNAN/MAG	6/97
El Aliso	El Ángel	Evaluation of blackberry varieties	FLACSO	7/97



CIAL/Community	Location	Research topic	Support institution	Date est.
Chambapungo	Chambapungo	Evaluation of guinea pig breeds	INIAP	6/97
Guaranda	Bolivar	Evaluation of maize varieties	INIAP	8/97
Flor Naciente	Guabug	Evaluation of potato varieties	INIAP	8/97
El Progreso	Llacud	Resistance to potato late blight	INIAP/FORTIPAPA	5/96
11 de Noviembre	Pusnia	IPM of potato	INIAP/FORTIPAPA	4/96
Chanchalo	Chanchalo	Evaluation of potato varieties	INIAP	8/97
Chaupí	Cotopaxi	Evaluation of potato/pastures varieties	INIAP	8/97
El Progreso	Pichincha	Evaluation of carrot varieties	INIAP	9/97
San José de la Huaca	Carchi	IPM of potato	INIAP	8/97
Asoprocaña	Trujillo	Election of CIAL	FONALAP Trujillo	2/98
El Aliso	El Tocuyo	Organic fertilization of coffee	MRN/Centro Gumillas	2/98
Urachiche	Comunare	Evaluation of maize varieties	FONALAP/Yacuy	2/98
El Salvador				
San José de las Flores	S. J. de las Flores	Evaluation of maize varieties	CORDES	5/97
San Francisco	San Francisco	Evaluation of maize varieties	CORDES	6/97
Papaturro	Papaturro	Evaluation of maize varieties	CORDES	7/97
Las Peñas	Las Peñas	Evaluation of maize varieties	CORDES	6/97
Teosinte	San Francisco	Evaluation of maize varieties	CORDES	5/97
Nueva Esperanza	Tejutla	Evaluation of maize varieties	CORDES	6/97
Izotalillo	La Reyna	Evaluation of maize varieties	CORDES	6/97
Cooperativa El Tronador	El Paisnal	Chicken husbandry	CORDES	5/97
San Carlos Lempa	Tecaña	Evaluation of tomato varieties	CORDES	5/97
Pepeto	Tenancigo	Evaluation of maize varieties	CORDES	6/97
Honduras				
Mujeres en Acción	San Antonio	Evaluation of cassava varieties	SERTEDESO	7/96
Tierra Fría	Tierra Fría	Evaluation of maize varieties	FUPNAPIB	5/96
La Playa	Concepción del Sur	Evaluation of bean varieties	PRR	3/96
El Cerrón	El Cerrón	Evaluation of maize varieties	PRR	4/96
San Francisco	Arizona	Evaluation of cassava varieties	IPCA	5/95
Río Arriba	Sulaco	Organic fertilization of maize	IPCA	3/96
Vallecillos	Vallecillos	Evaluation of maize varieties	IPCA	1/96



CIAL/Community	Location	Research topic	Support institution	Date est.
Antorchas Encendidas	El Tontolo	Evaluation of bean varieties	IPCA	5/96
San Marcos	La Masica	Evaluation of maize varieties	IPCA	4/95
Recreo	La Masica	Organic fertilization of maize	IPCA	4/96
4 de Marzo	California	Evaluation of bean varieties	IPCA	3/96
El Pital	La Ceiba	Evaluation of bean varieties	IPCA	3/96
Luz y Vida	Yorito	Evaluation of bean varieties	IPCA	11/97
Nueva Suyapa	Yorito	Evaluation of onion varieties	IPCA	11/97
El Zapote	Jesús of Otoro	Evaluation of maize varieties	IHDR	3/96
Cafetales	Victoria	Diagnosis	SERTEDESO	2/98
Santa Cruz	Yorito	Diagnosis	SERTEDESO	3/98
San José de Mora	S. José de Mora	Evaluation of bean varieties	FEPROH	4/96
San Isidro	Vallecillos	Evaluation of bean varieties	FEPROH	4/97
El Esfuerzo de Tuliapita	Vallecillos	Evaluation of bean varieties	FEPROH	9/97
El Encinal	El Encinal	Resistance to bean pests & diseases	FEPROH	2/97
Nuevo Paraiso	Tabla Grande	Evaluation of bean varieties	UNIR/ZAMORANO	3/96
Silisgualagua	Guinope	Evaluation of bean varieties	UNIR/ZAMORANO	9/97
Los Limones	Morocefi	Evaluation of bean varieties	UNIR/ZAMORANO	9/97
La Lima	La Lima		UNIR/ZAMORANO	9/97
Nuevos Horizontes	Lavanderos	Evaluation of bean varieties	UNIR/ZAMORANO	3/96
Sagrado Corazón de Jesús	El Ocotál	Evaluation of bean varieties	UNIR/ZAMORANO	9/97
Unión del Llano del Ocotál	Llano Ocotál	Evaluation of bean varieties	UNIR/ZAMORANO	9/97
Chaguíte Grande	Oropoli	Evaluation of bean varieties	UNIR/ZAMORANO	9/97
Luquigue	Luquigue	Evaluation of bean varieties	IPCA	2/96
Palmichal	Taulabé	Chemicals for maize organic fertilizers	IPCA	3/96
El Paraiso	Concepción del Sur	Diagnosis	IPCA	3/98
Sabana de San Pedro	Yorito	Evaluation of bean varieties	IPCA	2/98
Nueva Espranza	Nueva Esperanza	Evaluation of maize varieties	IPCA	3/96
Los Aguajes	Las Vegas	Evaluation of maize varieties & fertilizers	IPCA	5/95
El Tontolo	Las Vegas	Evaluation of maize varieties	IPCA	5/96
Guaco (women)	Yorito	Evaluation of maize varieties	IPCA	11/97
Jalapa	Yorito	Evaluation of onion varieties	IPCA	11/97



CIAL/Community	Location	Research topic	Support institution	Date est.
Vallecillos	Yorito	Evaluation of maize varieties	PDA	2/97
Mina Honda	Yorito	Evaluation of bean varieties	PDA	3/97
Guaco	Yorito	Evaluation of maize varieties	PDA	11/97
Nicaragua				
Nuevo Pensamiento	Cuyas	Evaluation of bean varieties	INPRHU	8/96
Experimento 96	El Guayio	Evaluation of bean varieties	INPRHU	8/96
Luchar Unidos	El Porcal	Evaluation of bean varieties	INPRHU	9/96
El Jicaro	Matagalpa	Green manures for maize varieties	CIAT/Hillsides	9/97
Piedras Largas	Matagalpa	Evaluation of bean varieties	CIAT/Hillsides	8/97
Wibuse	Matagalpa	Evaluation of bean varieties	CIAT/Hillsides	9/97
Las Jagüitas	Esquipulas	Green manures for plantain	CIEETS	9/96



Acronyms

CEDEAGRO	Centro de Desarrollo Agropecuario (Bolivia)
CENTA	Centro Nacional de Tecnología Agropecuaria (El Salvador)
CIAL	Comité de Investigación Agrícola Local
CIAT	Centro Internacional de Agricultura Tropical
CIEETS	Centro Intereclesial de Estudios Tecnológicos y Sociales (Nicaragua)
CIMMYT	Centro Internacional de Mejoramiento de Maíz y Trigo
CIP	Centro Internacional de la Papa
CIPASLA	Consortio Interinstitucional para Agricultura sostenible en Laderas
CNPMF	Centro Nacional de Pesquisa Mandioca y Fruticultura (Brazil)
COPAL	Comités de Pesquisa Agrícola Local (Brazil)
CORDES	Fundación para la Cooperación y el Desarrollo Comunal de El Salvador
CORFOCIAL	Corporación para el Fomento de los Comités de Investigación Agropecuaria Local (Cauca, Colombia)
CORPOICA	Corporación Colombiana de Investigación Agropecuaria
CORPOTUNIA	Corporación para el Desarrollo de Tunía (Colombia)
CRECED	Centro Regional de Estudios de Capacitación, Educación y Desarrollo (Colombia)
CURLA	Centro Universitario Regional del Litoral Atlántico (Honduras)
DICTA	Dirección de Ciencia y Tecnología Agropecuaria (Honduras)
EAP	Escuela Agrícola Panamericana (Honduras)
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuaria
ENLACE	Entidad Natural de Cooperación Estratégica (El Salvador)
FEPROH	Fomento Evangélico para el Progreso de Honduras
FFS	Farmer Field School
FLASCO	Fundación Latinoamericana de Ciencias Sociales (Ecuador)
FONAIAP	Fondo Nacional de Investigaciones Agropecuarias (Venezuela)
FORTIPAPA	Programa Nacional de Investigación de la Papa (Ecuador)
FUNCOP	Fundación para Comunicación Popular (Colombia)
FUNAN	Fundación Antisana (Ecuador)



FUPNAPIB	Fundación Parque Nacional Pico Bonito (Honduras)
IDRC	International Development Research Centre (Canada)
IFAD	International Fund for Agricultural Development
IFDC	International Fertilizer Development Center
IHDR	Institución Hondureña de Desarrollo Rural
IIRR	International Institute of Rural Reconstruction
INCORA	Instituto Colombiano de Reforma Agraria
INIAP	Instituto Nacional de Investigaciones Agropecuarias (Ecuador)
INPRHU	Instituto de Promoción Humana (Nicaragua)
INTA	Instituto Nicaraguense de Tecnología Agropecuaria
IPCA	Investigación Participativa en Centro-América
IPM	Integrated Pest Management
IPRA	Investigación Participativa con Agricultores
MAG	Ministerio de Agricultura
MRN	Ministerio de Recursos Naturales
NGO	Non-Government Organization
PASOLAC	Proyecto de Agricultura Sostenible para las Laderas Centroamericanas (Nicaragua)
PDA/Yoro	Proyecto Desarrollo de Area Yoro (Honduras)
PPB	Participatory Plant Breeding
PROFISMA	Proyecto Proteção Fitosanitária Sustentável da Mandioca (Brazil)
PROINPA	Programa de Investigación de la Papa (Bolivia)
PRR	Programa de Reconstrucción Rural (Honduras)
PTD	Participatory Technology Development
R&D	Research and Development
SENA	Servicio Nacional de Aprendizaje (Colombia)
SERTEDESO	Servicios Técnicos para Desarrollo Sostenible (Honduras)
UMATA	Unidad Municipal de Asistencia Técnica Agropecuaria (Colombia)
UNI-N	Unión Nacional de Agricultores y Ganaderos de Nicaragua
UNICAM	Universidad Campesina (Nicaragua)
UNICO	Universidad Católica de Occidente (El Salvador)
UNOCANC	Unión de Organizaciones Campesinas del Norte de Cotopaxi (Ecuador)
UVTT	Unidades de Validación y Transferencia de Tecnología (Ecuador)



Training Materials

Videos:

The IPRA Method

This video, with an accompanying study guide, presents the evaluation of agricultural technology in the overall context of participatory research with farmers. VHS (NTSC-PAL-SECAM).

IPRA Didactic Video

This 3-part video for trainers interested in participatory research methods covers the following topics:

- Essential skills for participatory research with farmers.
- Planning agricultural research with rural communities through CIALs
- Strengthening farmer experimentation through CIALs.

A trainers' guide accompanies the video.

Handbooks and Manuals:

IPRA Handbooks

Farmers have taken agricultural research into their own hands in Cauca, Colombia. And now they speak for themselves, in a set of thirteen handbooks. The books share the first-hand knowledge of six CIALs. These pioneers, have worked with IPRA researchers since 1990.

Each handbook introduces a step in the process of forming or operating a CIAL and describes the research done in that stage. The books are designed for hands-on use by farmers, extension workers, and researchers interested in participatory research.

English versions of the handbooks will be available in 1999.



The handbooks are:

In Spanish:

1. El Ensayo
2. Los Comités de Investigación Agrícola Local
3. El Diagnóstico
4. El Objetivo del Ensayo
5. La Planeación del Ensayo
6. La Evaluación del Ensayo
7. Cosas que Pueden Pasar
8. Compartimos los Resultados de Nuestro Ensayo
9. Un Caso Real
10. Las Experiencias también Cuentan
11. Las Cuentas Claras
12. Es Bueno Saber a Tiempo si Vamos Bien
13. Guías para Conocer Nuestro Camino.

In English:

- The Experiment
- The Local Agricultural Research Committee
- The Diagnosis
- The Objective of the Experiment
- Planning the Experiment
- Evaluating the Experiment
- Things That Can Go Wrong
- Sharing the Results of our Experiment
- A Real Case
- Experience Counts
- Keeping Track of Our Accounts
- Checking on How We Are Doing
- Guidelines to Help Us Along the Way



**Farmers Evaluation of Technology: Methodology for Open-ended Evaluation.
Instructional Unit No. 1**

Quirós, C.A.; Gracia, T.; Ashby, J.A. 1991
92 pages. 21.5 x 28 cm.
ISBN 958-9183-31-X

This instructional unit is for practicing and teaching the skills required for farmer evaluation of technology.

**Farmer Evaluation of Technology: Preference Ranking.
Instructional Unit No. 2**

Guerrero, M.P.; Ashby, J.A.; Gracia, T. 1993.
129 pages. 21 x 27.5 cm.
ISBN 958-9183-44-1

This Unit can help agricultural researchers concerned with generating technology for small farmers. Preference ranking makes it possible to identify concepts or criteria farmers use to assess the usefulness and acceptability of new technology. Practical exercises are included.

Evaluating Technology with Farmers. A Handbook

Ashby, J.A.
1990 (Reprinted 1994)
96 pages. 21.5 x 27.5 cm. Saddle stitched.
ISBN 958-9183-29-8

This handbook presents general principles of a participatory approach to evaluating technology with farmers, with examples of techniques.



Evaluer des Technologies Avec les Paysans. Un Manuel

Ashby, J.A.

1992

105 pages. 21 x 27.5 cm.

ISBN 958-9183-39-5

This is the French version of "Evaluating Technology with Farmers: A Handbook."

Método CIAL: Guía de Capacitación. Vol. 1.

IPRA

1999. Método CIAL: .

187 pages. 8.5 x 11 in.

This is the first of a two volume, comprehensive manual in Spanish offering resources for training of trainers in the CIAL methodology. An English version (The CIAL Method: A Guide for Trainers) will be available in 1999.

Método CIAL: Guía de Capacitación. Vol. 2.

IPRA

1999. Método CIAL.

207 pages. 8.5 x 11 in.

This is the second of a two volume, comprehensive manual in Spanish offering resources for training of trainers in the CIAL methodology. An English version (The CIAL Method: A Guide for Trainers) will be available in 1999.



Gender Analysis in Agricultural Research

Herpen, D. van; Ashby, J.A. (Editors)
 1991 (Reprinted 1992)
 104 pages. 21 x 27.5 cm.
 ISBN 958-9183-36-0

Includes materials for training in gender analysis: case studies, exercises, background readings, study questions, and instructor notes. These materials are designed to promote awareness of gender issues in agriculture.

Methodology for the Participation of Small Farmers in the Design of On-Farm Trials

Ashby, J.A.
 1986
 20 pages. 16.5 x 24 cm. Saddle stitched.

Evaluates and describes three methodologies for farmer participation in the design of on-farm fertilizer trials. (A reprint from Agricultural Administration published by Elsevier Applied Science Publishers, England.)

Instrumentos Metodológicos para la Toma de Decisiones en el Manejo de los Recursos Naturales: Metodología de Análisis de Grupos de Interés para el Manejo Colectivo de una Microcuenca

Ravnborg, H., M.P. Guerrero, and O. Westermann.
 1998
 Working Paper
 CIAT/BID/IDRC

This is a handbook in Spanish on methodology for stakeholder analysis drawing upon experiences in natural resource management for watersheds.



Statistical Applications:

Logistical Preference Ranking Analysis: An application for EXCEL v.7.0 for Windows95. Instruction Manual.

Regresión Logística en Análisis de Preferencia. Una Aplicación para EXCEL v.7.0 para Windows95. Manual de Instrucciones.

Hernández, L.A.

1998.

CIAT. Cali, Colombia.

Beta version.

This user-friendly statistical application for analysis of farmer preference ranking data on available in English and Spanish.



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