ANNUAL REPORT 2003

CIAT PROJECT SN-3

Editor: **Carlos A. Quirós**
Susan Kaaria

Translator: **Trudy Brekelbaum**

October 2003

TABLE OF CONTENTS

OUTPUT 3. PROFESSIONALS AND OTHERS TRAINED AS FACILITATORS OF THE PARTICIPATORY RESEARCH APPROACH (227 kb)
Milestones
Professionals trained in the use of PR tools and methods
Participatory monitoring and evaluation workshop, Toralapa, Bolivia
Promoting a business and market orientation in CIALs from Colombia, Ecuador and Bolivia: Report of follow-up activities to the Second Workshop on "Design of Integrated Agroenterprise Development Projects." Part 1: Cauca (Colombia) and Ecuador

OUTPUT 4. MATERIALS AND INFORMATION ON PARTICIPATORY RESEARCH APPROACHES, ANALYTICAL TOOLS, INDIGENOUS KNOWLEDGE AND ORGANIZATIONAL PRINCIPLES, DEVELOPED (289 kb)
Extension through farmer research: Local Agricultural Research Committees (CIALS) in Latin America
A participatory procedure applied to selecting and developing forages with farmers (PPSF)
Talks prepared by the SN-3 team and presented at events

OUTPUT 5. IMPACT OF SN-3 PROJECT ACTIVITIES DOCUMENTED (538 kb)
Milestones
Impact Assessment of Local Agricultural Research Committees (CIALs) in Colombia
Impact study of CIALs El Jardín, Las Cruces, San Bosco (men and women), Cinco Días
CIAL experiences with agro enterprises: Linking research to development in Cauca – Project progress report
Poverty and rural livelihoods in Uganda, Malawi and Tanzania: A baseline study of BAPPA project sites
Visitors attended by staff from the SN-3 FPR team, Oct. 2002 - Sept. 2003

OUTPUT 6. INTERNAL PROJECTS AND OTHER INSTITUTIONS SUPPORTED AND STRENGTHENED IN CONDUCTING PR (435 kb)
Milestones
"Sharing learning experiences" - Workshops among organizations that have begun joint work in Central America, CIAT, CIPASLA and community groups in Cauca Province, Colombia"
A methodology designed to promote sustainability of a second-order organization
Indigenous women process potatoes
"Training the future" – Young researchers: Learn how to run a cial.

OUTPUT 7. CAPACITY OF THE SN-3 TEAM, STRENGTHENED (157 kb)
Milestones
FPR team attendance at training events during the working year 2001-2002
STAFF
DONORS SN3
APENDIX
Acronyms and Abbreviations

OUTPUT 1. PARTICIPATORY RESEARCH APPROACHES ANALYTICAL TOOLS AND INDIGENOUS KNOWLEDGE THAT LEAD TO THE INCORPORATION OF FARMERS´ AND OTHER END-USERS´NEEDS IN INTEGRATED AGROECOSYSTEM MANAGEMENT, DEVELOPED FOR INTERESTED R&D INSTITUTIONS

Milestones

- ✴ Moving from constraint to opportunity
- ✴ Procedure of Monitoring and Evaluation developed to be evaluated and disseminated in some Countries
- ✴ Procedure for participatory selection of cassava varieties, analyzed

Learning from PME experiences in Latin America: A strategy to capture the results of development changes at the community level

Researcher: *Luis Alfredo Hernández R.*[2]

Highlight:

Successful strategy for obtaining M&EP results-chain has been developed.

Abstract

Farmer groups have tested several ways to verify expected community results from the Participatory Monitoring and Evaluation (PME) process in Latin America. In some cases, however, these have failed to identify and measure short-term results (outputs), medium-term results (outcomes) and long-term results (impact) efficiently at the level of farmers' groups. It has now been recognized that there are problems that limit facilitators' abilities to interpret and find appropriate indicators for measuring those results. Conceptualization of monitoring, evaluation, participation and indicators and developing a strategy to explore in depth the meaning of those terms at the community level could be a successful way to resolve those problems. This article, based on the author's experience in Cauca Colombia, describes some alternatives for resolving these barriers. More importantly, the author explains how these apparent obstacles in the process can actually be exploited as opportunities to enhance the PME process and thus result in benefits for farmers' groups and scientists.

[2] Research Associate I, SN-3 Project, CIAT, Colombia

Introduction

Participatory monitoring and evaluation (PME) has a dual purpose: It is a management tool that enables people to improve their efficiency and effectiveness. It is also an educational process in which participants increase awareness and understanding of the various factors that affect them (Stephens, 1988). This means participation by the target beneficiaries in decision-making and planning throughout the implementation process and in sharing benefits. Hence monitoring and evaluation (M&E) demand an in-depth comprehension of the processes, a strong commitment to develop the PME systems further themselves, and an efficiently strategy for understanding information generated during the process.

Research questions

These barriers pose serious constraints to an effective PME process and must be resolved by answering the following research questions:

- How to obtain a better understanding of the M&E process
- How to reach short-term results (outputs), medium-term results (outcomes) and long-term results (impact)

This paper draws on the author's experience of working with farmers' groups to discuss ways of moving from constraints to opportunities in PME in order to improve the information obtained. The purpose of this paper is to promote a better understanding of PME results through a useful strategy for taking information and teaching the process. It is targeted toward facilitators and farmer groups involved in the PME process.

Case study and directions

The strategies proposed here are based on the author's involvement in experiences with PME in Cauca, Colombia. The author analyzed a sample of 9 CIALs with an established PME process (La Unión 1 and 2, San Isidro, Carpintero, El Pinar Mujeres, La Esmeralda 1 and 2, and Las Lajas). The preliminary results of this analysis permitted testing the following procedure:

Understanding key concepts

- *Strategy1 and directions*. Farmers and facilitators of PME should have a clear vision of the process. Without a clear vision of what PME hopes to achieve, it is difficult to define results clearly (Stephens, 1988). Consequently, we should explain, "What does participation mean within a PME process? In other words, farmers need to understand that PME has been found especially valuable for small farmer development. This means that PME requires the involvement of communities members in:

- Planning the general and specific objectives at the community level and the areas to monitor and evaluate
- Deciding the activities that permit reaching those objectives
- Selecting indicators
- Collating and tabulating data
- Analyzing the results
- Sharing information with others members of the communities
- Using PME information for their own purposes.

This proposal consists in designing a step-by-step procedure, describing relationships in each one (using graphics is the best way). Figure 1 describes a sequential process and introduces the cycle concept.

- *Strategy 2 and directions*. There are different levels of results that seek to capture the development changes that occur: Short-term results or outputs, medium-term results or outcomes, and long-term results or impact (CIDA, 2000). PME has similar results linked to what is commonly referred to as a "results chain," so it is possible to find the cause-effect relationship of results as follows: Objectives, specific objectives, outputs, outcomes and impact should be defined as the "results chain." From the overall objective it is possible to derive specific objectives and then outputs, outcomes, impact and indicators can be identified as shown in Table 1.

1. Planning objectives
(key question: why are you grouped as a CIAl?)

7. Using PME information

2. Deciding activities

Cycle

6. Sharing information

3. Selecting indicators

5. Analyzing the results.

4. Collating and tabulating data,

***Cartoons adapted by the author.**

Source: Cartoons drawn by Dave Daniel In: "Developing forage technologies, with smallholder farmers" Werner and Peter Horne. ACIAR Monograph No. 8

Figure 1. How to reach ours goals? (procedure designed by author)

At the beginning of the process, build up the overall objective and then break it down into specific objectives. For each specific objective, find strategies (activities or actions, conditions and criteria) and indicators (see the sequential order proposed in the following list).

- Overall objective
- Specific objectives
- Outputs or short-term results and indicators
- Outcome or medium-term results and indicators.
- Long-term impact and indicators

Preliminary information from the PME process in the CIALs in Cauca, Colombia (La Unión 1 y 2, San Isidro, Carpintero, El Pinar Mujeres, La Esmeralda 1 y 2, and Las Lajas) has been used to identify the following common objectives in all the CIALs in Cauca:

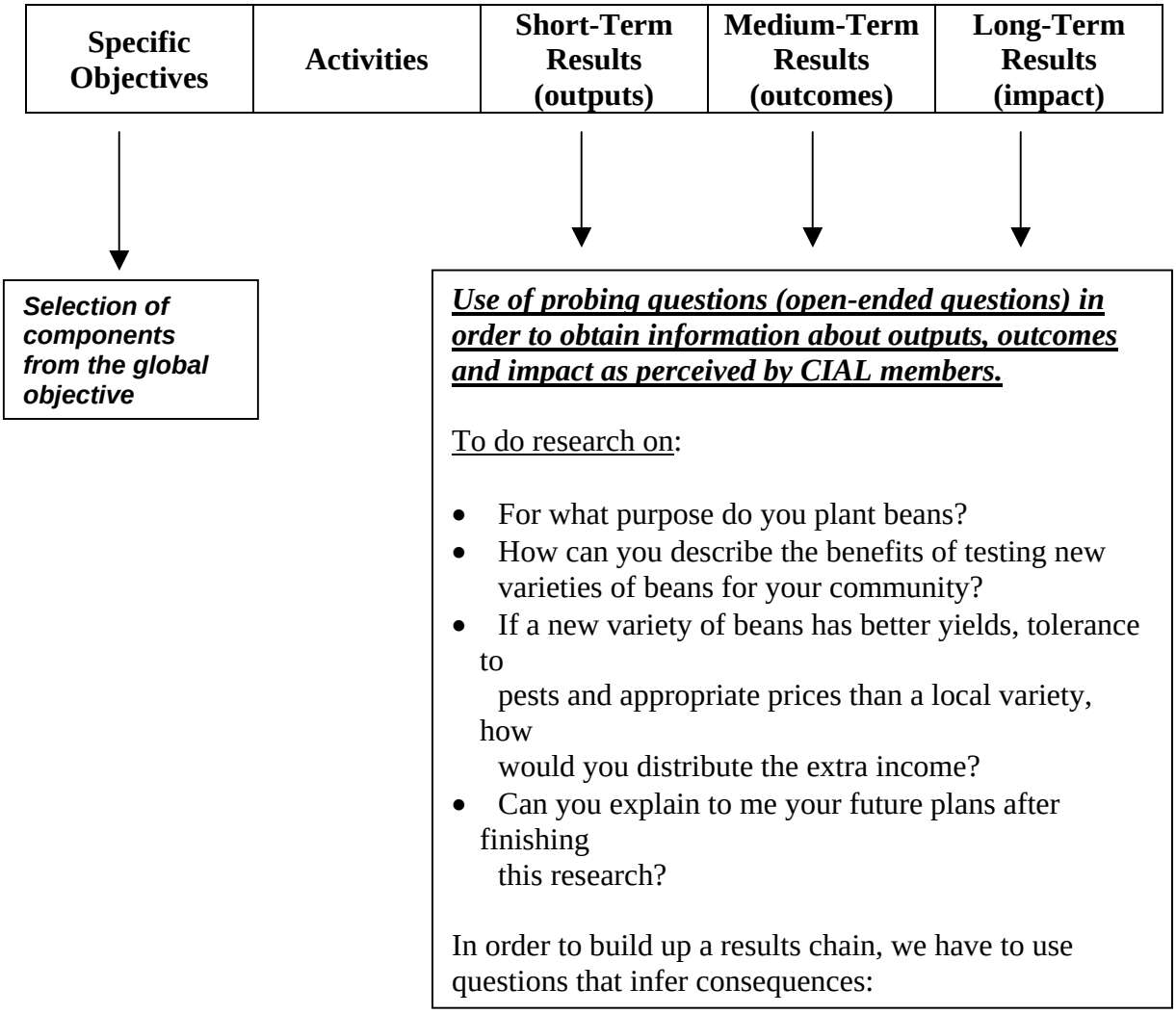
- Do research in: common beans, maize, cassava, sugarcane, potatoes, etc.
- Look for funds
- Improve the CIAL's organization
- Manage projects
- Develop rural agroenterprises

Based on this information, the author developed a proposal of the "results chain" for two specific objectives (Table 1).

Table 1. Chain results (adapted by author, 18 July). Source Cauca CIALs.

Specific Objectives	Activities	Short-Term Results (outputs)	Medium-Term Results (outcomes)	Long-Term Results (impact)
Do research on:				
Beans, maize, cassava, sugarcane, potatoes or varieties	Planting new alternatives under farmers' conditions (technological supply)	Preliminary selection of new alternatives	Farmers interested in novel alternatives	Improve the quality of life in terms of living conditions (e.g., food security)
Indicators:		Level of knowledge as regards new technological options, through Informal interviews (community members)	No. of varieties planted under community's conditions Level of satisfaction related to research progress	Level of well-being as perceived by local population % in assets of specific community
Look for funds	Hold raffles Hold bingos Have football games Hold festivals	Increase CIAL's funds Income and debits balance	Increase loan rates among CIAL members	
Indicators:		Monthly reports of income.	Level of satisfaction of beneficiaries (at present they are able to solve some problems).	Members of communities in Cauca will have improved their well-being in terms of education and health (need benchmark study for this). No. of communities in Cauca with self–financing.

Strategy 2. The cause-and-effect relationship of results.



Example where Strategy 2 was implemented: Esmeralda II

Overall objective

"CIAL group strengthened in order to create an agroenterprise of maize to improve income and quality of life of community members"

CIAL members

Demetrio Aranda
Esmeralda Hurtado
Diego Cifuentes
José Thomas Aranda
Martha Lucía Mera
Aura Lucía Hurtado
Diego Fernando Cifuentes

Procedure (chain questions)

Probing* questions, consequence questions, questions about activities and indicators (* in order to explore in depth the meaning of some term or saying used by farmer (Guerrero et al., 1993)

Q: ***What does*** "CIAL group strengthened" ***mean***?
(probing question)

A: That means that we have to improve the group in two ways:
(1) First we ought to increase participation, and (2) simultaneously we should search for funds.

Q: ***If you*** improve participation***, then*** what happens? ***(probing questions)***

A: ***"If*** we improve participation, ***then*** *new motivated members* will be able to increase plots of maize (the goal is at least 15-20 members).

Q: How do you hope to reach that? (**questions about activities**)

A: Well, we have to show the CIAL's results at the community level (first way), and we can also organize raffles, bingos, "tamales"; simultaneously (second way), as a support to interested people so that will allow us to increase areas and plots of maize in the Esmeralda community.

Q: How do you measure greater participation through those activities described above? (**question regards qualitative indicators**)

A: We can measure it if people have greater spirit, better knowledge about the CIAL's activities, increased levels of satisfaction and also the number of people associated (**qualitative indicators**). We have to assign responsibilities creating a commission in charge of recording all the information.

Q: How do you measure success in searching for funds? (**question regards quantitative indicator)**

A: We can measure it with our income and debits balance sheet (assessment of results).

Q: ***If you*** increase production areas of maize, ***then*** what happens?

A: As a consequence, ***we will have better production,***
then we are going to establish a process for functioning legally.

Q: What kind of action do you need to function legally

A: To find out information at the Chamber of Commerce.
To look for a consultant's office to organize the group (activities)

Q: What is the best indicator that you are working in that way?

A: (1) Increasing level of group knowledge about legal process (**qualitative indicator**), (2) license for legal functioning.

Q: When you obtain a bigger production and legal functioning, what is the next step?

A: We are going to buy a machine for threshing maize (for the maize company and its byproducts) and after that, some members of the community will be able to raise chickens, hens, and probably they will sell surplus maize to other members of the community. We need to identify different markets and potential clients (**activities**).
Probably we would like to support other maize producers, selling their production or offering services like a rotating fund and technical handling of maize crop.

Q: What are your expectations in terms of income, **if** you achieve the goals mentioned before? (**questions about impact**)

A: In the future, we are going to improve income, health and quality of life in terms of subsidies of health, home orchards, change in the nutritional diet, improvement of the house. We also could generate new jobs.

Q: How can we measure that?

- Numbers of subsidies
- Changes in the nutritional level of the diet (people sell eggs to buy rice)
- Numbers of houses improved

Q: If you had a better income, how would you spend this money?

A: I would like to invest this money in health, housing and paved roads in my community.

Synthesis of information

The challenger is to find outputs, incomes and indicators from the answers.
Following the chain results described in Table 1, it is possible to classify the answers as follows:

General objective

"CIAL group strengthened in order to create an agroenterprise of maize to improve incomes and quality of life of community members"

Outputs
Short- term results

Improved participation

Indicators: No. of people participating (15-20)

Better knowledge of the CIAL operation

Outcomes
Medium-term results and indicators

Increased areas of maize

Increased capacities of farmers in terms of maize production

Indicator: No. of hectares planted in maize

Jobs generated

Impact
Long-term results

Improve the quality of life in terms of health, housing and routes of the
Esmeralda II , located in

Conceptualization of the results chain

Correlations between time (axis X) and overall objective of communities (axis Y) across different levels of goals are presented in Figure 1. At the beginning, communities start with minimum values near the origin (X and Y) in both variables. In the first steps farmers take advantage of the CIAL's research results.

The initial step is the first component of the overall objective, where they identify potential activities in order to reach each component. It is assumed that with increasing trust and knowledge, farmers find opportunities and solutions, and can then can solve problems with new options. Finally, farmers obtain useful feedback to develop and drive development of specific goals responding to farmers' conditions and expectations. Impact assessment is possible at the end of the process. This graphic synthesizes specific objectives and indicators to select relevant moments to verify the accomplishment of the objectives.

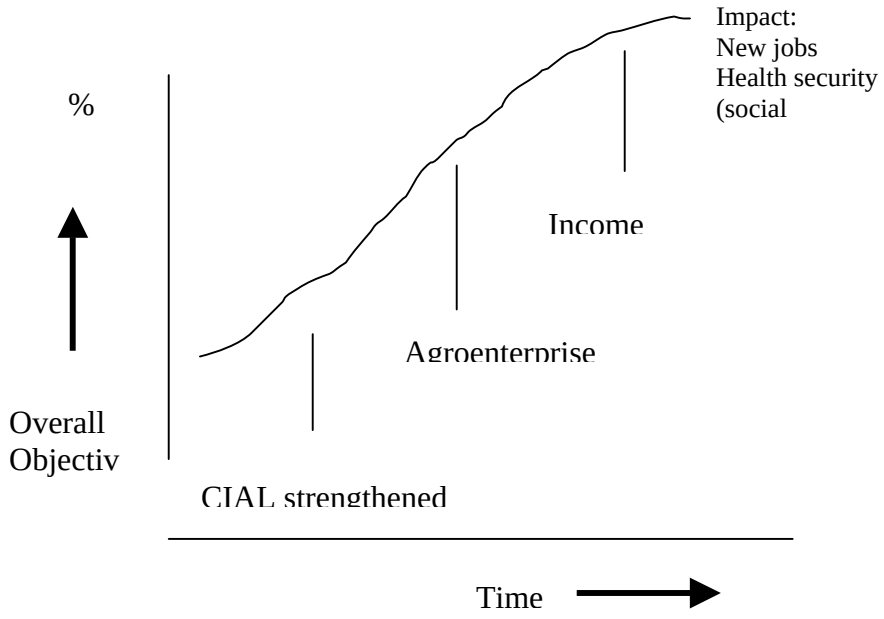


Figure 1. Levels of the overall objective (author's hypothesis)

Conclusions and lessons learned

- Farmers need to understand that PME has been found especially valuable for small farmer development. This means that PME requires the involvement of communities members in:

  - Planning the general and specific objectives at the community level and the areas to monitor and evaluate
  - Deciding the activities that permit reaching those objectives
  - Selecting indicators
  - Collating and tabulating data
  - Analyzing the results
  - Sharing information with others members of the communities
  - Using PME information for their own purposes.

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Experiences in the establishment of community-based participatory monitoring and evaluation systems (PME) with CIALs in Colombia

Researchers: *E.C. Trujillo,[3] L.A.Hernandez[4], S. Kaaria[5]*

Hightlight:

Procedure of Monitoring and Evaluation proposed to be evaluated and disseminated in some Countries

Overview

In the search for a process to empower and support rural communities in their decision-making process, IPRA has been developing mechanisms for establishing and supporting community-based participatory monitoring and evaluation systems (PME) with the Local Agricultural Research Committees (CIALs). The Participatory Research Approaches project (IPRA) of the International Center of Tropical Agriculture (CIAT) began a process of establishing community-based PME systems in Cauca in 2002 (IPRA, 2002). In 2003 IPRA extended the lessons and tested the approach with the second-order association of CIALs in Cauca Province: CORFOCIAL.

The purpose of this paper is to strengthen the knowledge and experiences with establishing and applying community-based PME systems with grassroots groups.
Lessons learned during the process of establishing PME systems in the CIALs of Cauca Province, Colombia, are reviewed.

Background and CIAT experience with PME

PME fulfills basic functions in any development effort because once established, it helps identify problems, measures the progress made toward the objectives, and evaluates the results (FAO, 1996). One of the results expected in the medium and long term is to promote people's potential through their participation in decision-making and the mobilization of this social responsibility and accountability in favor of sustainable human development and capacity building (UNDP, 1997).

PME contributes to the development of rural communities' capacities to identify and solve problems. It is oriented so that the grassroots groups can gather the information needed to evaluate the progress of their projects. In this way PME becomes an instrument to help these groups strengthen their capacity for decision-making and accomplish greater autonomy, which is translated into empowerment of their processes, self-reliance and sustainability.

[3] Research Assistant III, SN-3 Project. CIAT, Colombia
[4] Research Associate I, SN-3 Project. CIAT, Colombia.
[5] Senior Research Fellow, SN-3 Project. CIAT, Africa.

The PME approach applied by CIAT builds on the concepts and ideas developed by the Institute of Development Studies at University of Sussex (Estrella et al., 2000; Guijt & Gaventa, 1998) and the PIM concept developed by Germann et al. (1996). The PM&E system, which was developed as part of an action research process, was initiated by a student, Kirsten Probst (2002), as part of her PhD dissertation research.

Applying lessons from this earlier work, a strategy was developed in 2002 to build capacity in the CIALs in Cauca Province. They were selected as a learning ground to test this approach because of their proximity to CIAT. In addition, it was envisaged that these processes would help strengthen social cohesion, management capacity, learning and reflection, thereby empowering these groups.

Objectives

The overall goal is to establish community-based PME systems that will enable CIALs and their second-order associations to evaluate the progress of their projects and strengthen their capacity for decision-making and accomplish greater autonomy. The specific objectives are to:

- Test, evaluate and adapt the methodology for establishing community-based PME with second-order associations of CIALs
- Analyze and document lessons and experiences and then develop guidelines and principles to enable the large-scale expansion of these approaches in other second-order associations in other contexts

Research questions

This work will address the following research questions:

- What is the impact of CORFOCIAL on the sustainability and effectiveness of the CIALs?
- How will M&E contribute to enhancing the accountability of the second-order association CORFOCIAL to the CIALs?
- Can the second-order associations to develop timely solutions to their problems and make necessary adjustments to their plans and activities use the information generated by PME?
- Can PME identify quantitative and qualitative indicators of results, effects and impact?
- Does PME promote the sustainability of CIALs?

Progress in the PME process in the CIALs in the Cauca

The goal of establishing the PME systems is to cover all the CIALs that are grouped under CORFOCIAL, which currently number 39. As can be seen in Figure 1, PME systems were partially established in 12 CIALs in 2002; and this year the work was finished, with PME systems being established in another 10 CIALs, for a total of 22 CIALs in Cauca. Annex 1

shows some of the CIAL groups, where the PME systems have been established, with their objectives, activities and indicators.

In 2003 the goal was to have a higher number CIALs from CORFOCIAL with PME systems established, but there were some difficulties that made it impossible to reach that goal. Therefore, we conducted an evaluation with a few CIALs to understand the challenges in the establishment of PME systems.

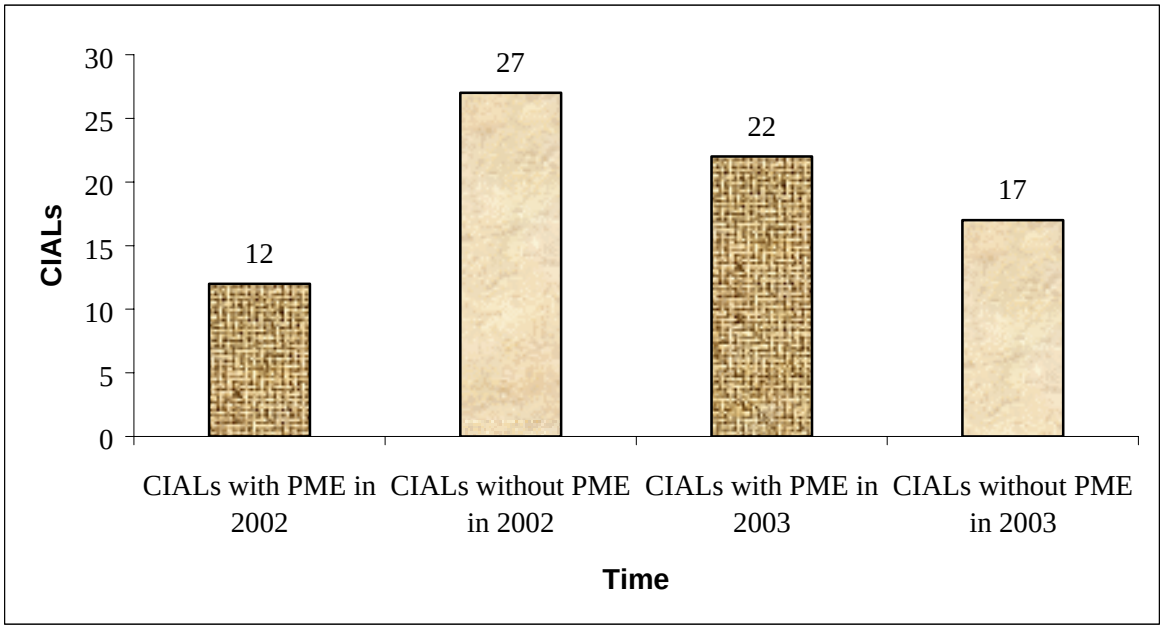

Figure 1. CIALs in Cauca with PME systems in the years 2002 and 2003.

Problems identified in the establishment of PME systems in Cauca

- ***The CIAL group feels somewhat united but weak***. Some of the CIALs feel weak as a group because there is little commitment in the execution of the activities that are programmed; and the recording of the information and the responsibility fall on a few people, not on the whole group.

- ***Lack of union between the CIAL and the community.*** In the majority of the cases, there is little communication and collaboration between the CIAL and the community. As a result of this, there is little collaboration of the community in the group's activities. This occurs because there are no programmed feedback meetings to the community about the results of the work done by the CIAL.

- ***Recording of the information.*** In the CIALs visited the people in charge of recording the information have not developed the skill sufficiently nor the habit of keeping records, which requires their being accompanied very closely by the supporting entities to ensure the recording of the information. As a result, there is little information

recorded by the groups. In some of the cases the groups record the information in notebooks or their field books, where they mix data from the PME work and the CIAL research, in addition to information on work that they are carrying out with other organizations that work in the community, which makes the organization and the analysis of said information all the more difficult.

- ***PME perceived as extra work for the CIAL***. One of the reasons why this happens is that the establishing of the PME processes was done after the CIALs were started. Thus the members of the group consider it as something additional to the work they have been doing all along.

- ***The role of the people responsible for the PME.*** Although some people were selected to be in charge of filling out the formats and motivating compliance with the activities proposed in the PME system, at the time of carrying out the activities, the people who were supposedly responsible and their specific duties in the PME process were not clear, which meant that the programmed activities were not done and the key information that this CIAL is generating was not recorded.

- ***Perception of the benefits of a PME system.*** The people of the CIAL do not perceive any immediate benefits that can be obtained from carrying out the activities and recording the indicators that measure the change towards achieving their objectives. This makes it necessary to backstop the process very closely until the people of the CIAL adopt the system, put it to work and take advantage of its benefits.

- ***Accompanying the process.*** Given that the team of facilitators establishing the PME process in the CIALs was very small, the latter were left alone for extended periods of time. The people in these groups expressed their need for more contact with the technicians (CIAT-CORFOCIAL) to explain some aspects of the activities to be done and the recording of the information that was not sufficiently clear to them. Moreover, going back to topics that had been developed previously left them out of context, and it was necessary to repeat the process of conceptualization, the formulation of the objectives, etc., in order to be able to bring the group up to date on the topics being dealt with, which meant that the work was delayed considerably.

- ***Continuity in the PME workshops.*** In some of the groups the people that attended a meeting for establishing PME did not attend the following one and sent an alternate or simply did not attend. This meant that the topic dealt with previously had to be explained again in order to place it in context for the new people that had just entered the process and this required much more time than had been programmed.

- ***Situation of social unrest***. Some CIAL groups are located in zones where there was social unrest for a time and so it was not possible to achieve the desired continuity, and for that reason, the process of establishing the PME system took longer; e.g., the CIAL El Placer in El Tambo, where it has not been possible for the team to go in order to establish the process.

- ***Institutional paternalism.*** In the zones where the CIALs are working, there are other governmental and nongovernmental institutions. In some cases there have been groups that will work only for donations or where they manage a budget to start their production projects and not in processes such as this, which are based on training people from the grassroots group to achieve sustainability and enhance their capacities.

- ***Factors external to the process.*** There are certain times of the year, such as the onset of the rains, when the farmers hire a lot of labor or they travel to other villages and even provinces in search of the "bonanza" of seasonal work as, for example, the harvesting of coffee, and so they dedicate less time to the activities programmed by the CIAL.

- ***No mechanism for obtaining qualitative indicators of effects and impacts.*** When the PME systems were established, only indicators of the results of the activities programmed by the CIAL in the short term in relation to the proposed objective were taken into account; therefore there were no indicators of intermediate or long term results, which in addition to measuring the results, also measure the effects and the impacts of the process undertaken by the CIAL in the community. Besides, there were no mechanisms for identifying indicators that were qualitative in nature. This made the later analysis difficult when it came to identifying the effects of the PME process undertaken by the CIAL in the intermediate term and the impacts in the long term.

Actions undertaken to solve problems presented in establishing the PME systems in Cauca

- ***Formation of a team of PME facilitators.*** Given that at the onset of the process of establishing PME in the CIALs there were problems because the training team was very small and could not handle the number of CIALs where these systems were being set up, it was decided to train a team of facilitators to support this process. Alfonso Truque and Bolívar Muñoz, who are the farmer-technician and the administrator of CORFOCIAL, respectively, and 6 CIAL Guides to provide continuity to the meetings and later accompany and follow up the process formed the team. It is important to note that this group of PME facilitators was trained in both the theoretical part of the workshops with the aid of exercises and tools, as well as in the practical aspects of the CIALs as a direct support to the Facilitator of the IPRA Project at CIAT. This group has the responsibility of establishing the PME systems in the CIALs that are in their charge and those that are near their zone of influence. An agreement was reached with CORFOCIAL, whereby the Guides would work in establishing the PME for 2 days per month and that they would be paid the equivalent of one day of the legal wage established for each day worked and supported by a report.

- ***Formats designed so Guides could record general results of the PME in the CIALs.*** In order to be able to obtain uniform information, to verify the work done by the Guides, and to learn the progress made in establishing PME in the CIALs, some formats were designed to gather the general information on this process, which covers all its aspects such as the exploration of knowledge on PME, the formulation of the CIAL objectives, activities programmed, indicators for measuring the progress of the

process, formats designed by the CIAL and people in charge of carrying out PME in the CIAL (Annex 3).

- ***Execution of a common PME agenda between CIAT and CORFOCIAL.*** In order to synchronize the work of establishing the PME systems in the CIALs, work schedules were prepared jointly, coordinating the remaining activities for establishing PME in the CIALs where it was incomplete and to begin establishing it in the CIALs that haven't begun the process yet.

- ***Prioritization of CIALs where PME will be established in 2003.*** In the prioritization of the CIALs where PME will be set up, it was necessary to agree upon the CORFOCIAL personnel such as the Guides and Technicians. It was also necessary to take into account factors such as the situation of security in the zones where the CIALs are located, the ease of traveling there (CORFOCIAL and CIAT teams) and the willingness of the CIAL group to participate. Given the level of the commitments, it was decided to establish the PME systems in 22 of the 39 CIALs of CORFOCIAL.

- ***Accompanying the PME process in Cauca.*** The CIAT IPRA Project is also accompanying the CORFOCIAL technicians, Guides and CIALs in order to strengthen their capacities and overcome inconveniences related to said systems.

- ***Modified methodology for establishing PME in the CIALs.*** Given the fact that in the initial stages of establishing PME systems in the CIAL groups required up to five 4-hour meetings per group, it was necessary to adapt the strategy, taking into consideration farmer's limited time. The adapted strategy of a "cascade" of questions that begin with the question, "**What are the objectives that you wish to reach as a group?"** From there, the conceptualization of what a PME system is and what it means with respect to the accomplishment of the proposed objectives are derived. Afterwards, the activities to achieve each objective are formulated, as well as what the community and the group expect to accomplish with each of these activities. To strengthen the conceptualization, graphs or drawings that reflected scenes from the farmers' daily lives are used. Figure 2 illustrates this cycle diagrammatically.

- A significant accomplishment with this methodology is that the entire process can be a completed 2 to 3 meeting per group. This means less time is required to establish it.

- ***Strategies for identifying outcome and impact indicators.*** The adjusted methodology also allows for the identification of indicators for monitoring the process (participation in group activities), outcomes (short-term effects) and impacts (long-term effects). Additionally, the methodology also helps identify both qualitative and quantitative indicators. Table 1 summarizes the information obtained in a CIAL when using this methodology. Afterwards, the formats or forms for recording the information are designed so that those responsible for the PME of the group can do this task easily and rapidly.

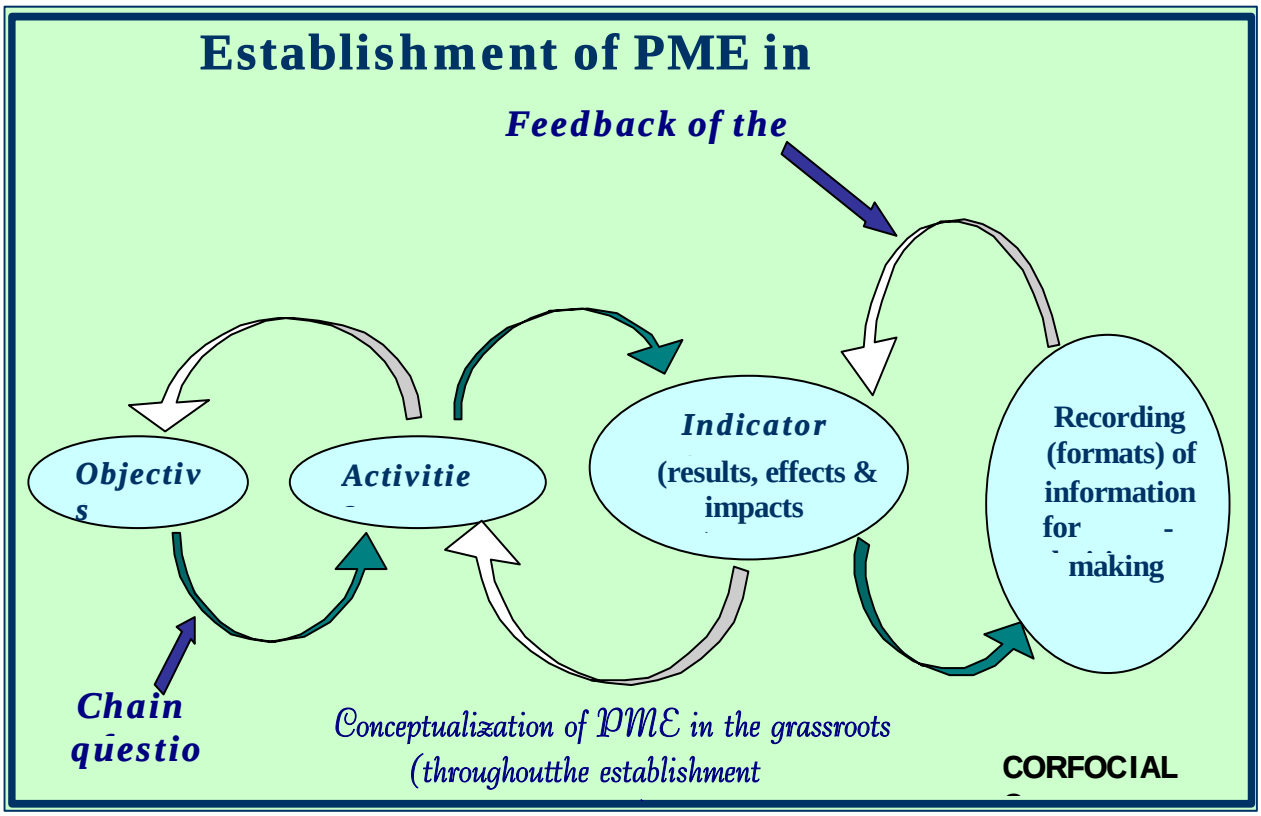

Figure 2. Revised methodology for establishing PME in grassroots groups.

Table 1. Information obtained with the modified methodology for establishing PME in the CIAL La Esmeralda 2.

General Objective	Specific Objectives	Activities	Indicators
Strengthen the CIAL group to create a business for processing maize to improve the income and the quality of life in the community	**Strengthen the group**	✓ Hold meetings with community to show benefits of working with CIAL ✓ Show CIAL trials to the community	Level of community knowledge on CIAL's work (qualitative indicator)
			No. of people who know the group and work with them (more hectares planted to maize) (quantitative indicator)
	Identify economic resources	✓ Raffles, sale of food, festivals ✓ Voluntary contributions of the members	Bookkeeping records of the CIAL entries, expenditures and balance (quantitative indicator)
	Acquire machinery for processing maize	✓ Present projects to entities to get the machinery	Projects formulated by the CIAL
			Projects implemented by the CIAL to purchase machinery
	Sell the maize	✓ Training in basic principles of marketing ✓ Identify clients ✓ Promote the product	Level of knowledge on marketing
			Level of participation in the process of marketing products
			No. of people in group working on marketing
	Generate employment		No. of people employed (indicator of effect)
			No. of person-days paid (indicator of effect)
	Improve the quality of life	✓ Organize a committee that works for health ✓ Implement home gardens	<u>Health</u> (impact) • No. of subsidies • No. of home gardens established
			<u>Nutrition</u> • Improvement in diet
			<u>Housing</u> (impact) • No. of houses in process of improvement

Lessons learned

- PME can be established in groups that have different "stages of maturity"; that is, it does not matter whether they are in the process of formation, if they have been functioning for some time, or whether it is a group that wants to reformulate its work or even in those cases where the group had fallen inactive if they are motivated to work towards their objectives.

- PME systems stimulate the grassroots groups' capacity for analysis, identifying problems, proposing and implementing possible solutions.

- The group itself decides which aspects of their work they are going to monitor and evaluate, as well as with what frequency they are going to do it.

- Groups that were discouraged have been reactivated as can be seen in the projection of their work.

- Once the PME systems are established, the CIALs should be accompanied in the process as in the majority of cases, there are questions on the part of the people who are responsible for implementing it in relation to how the system functions. Some of these questions are:
  - ✓ What is the first thing that we have to do in order to reach the objective that we set?
  - ✓ How should we fill out the formats that were designed to record the information generated by the group?
  - ✓ Who is the person responsible for gathering and recording the information on these formats?
  - ✓ How often should we fill out the formats?
  - ✓ When should the information be presented to the CIAL and the community?

- Regular backstopping is one of the factors that makes the difference between success or failure of PME, given that it can strengthen the grassroots groups in those aspects where they feel weak and it also serves to stimulate the execution of the activities oriented toward fulfilling the objectives.
- In the future it is important that at the moment of creating the structure of the CIAL, PME be included from the onset so that it be considered as a routine part of the CIAL's work and not viewed as an additional work load.
- It can be affirmed that using probing questions in a sort of chain, where all the links are the CIAL's work in function of the time and of the expected results, it is possible to obtain indicators that can measure the effects and the impacts of the process undertaken by the grassroots group.

Projection of PME work in Cauca

Given the experience accumulated over two years of work in establishing PME systems and as a response to the needs generated by the grassroots groups, the following activities are contemplated:

- ***Selection of CIAL models for PME*.** A number of CIALs are going to be selected as models in the implementation of PME in Cauca and Latin America, where much more emphasis will be placed on the accompaniment and strengthening of the PME system so that they can serve as an example and model for the other CIALs that are not so far along in the process. They will also attend tours and be motivators for PME in the CIAL groups and other community groups that have a direct or indirect relationship with them.

- ***Hold PME meetings*** among the CIALs of CORFOCIAL that have already established and implemented the PME system to share experiences and strengthen the process. Moreover, an international PME meeting among all the CIALs that have implemented PME systems in Colombia, Honduras, Bolivia, Ecuador and Nicaragua is being organized. Contacts are being made with entities such as the Foundation for Participatory Research with Farmers in Honduras – FIPAH (formerly IPCA) and the PROINPA Foundation in Bolivia.

- ***Workshops for recording Information*:** Due to the problems encountered in recording the information, some workshops will be held in the short term in order to reinforce the recording of information by the CIALs and also to strengthen the Guides in this topic so that they can support their groups better.

- ***PME in the CIAL methodology*:** The idea is to prepare a methodology where from the moment that the CIAL group is formed, the PME system is implemented in order to see the progress in their work and the fulfillment of their objectives.

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ANNEX 1. Results of some CIALs with PEM.

CIAL	General Objective	Specific Objectives	Activities	Indicators
La Unión 1	Conduct research on maize and manage projects to establish production that helps bring about food security in the zone	Integrate the CIAL with the community	✓ Visits of the community to the CIAL trials ✓ Feedback of the CIAL to the community	✓ No. of people that have visited the CIAL trials ✓ No. of people that have received feedback from the CIAL ✓ No. of people that have planted the varieties that the CIAL has studied
		Do research on common bean varieties	Planting trials	✓ No. of trials established and stage of research ✓ No. of varieties adapted to the zone
		Manage projects	✓ Small businesses in project management ✓ Write projects	✓ No. of people trained in project management ✓ No. of projects written by the community
La Unión 2	Conduct research on common beans and manage projects to establish production that helps bring about food security in the zone	Integrate the CIAL with the community	✓ Visits of the community to the CIAL trials ✓ Feedback of the CIAL to the community	✓ No. of people that have visited the CIAL trials ✓ No. of people that have received feedback from the CIAL ✓ No. of people that have planted the varieties that the CIAL has studied
		Do research on common bean varieties	Planting trials	✓ No. of trials established and stage of research ✓ No. of varieties adapted to the zone
		Manage projects	✓ Small businesses in project management ✓ Write projects	✓ No. of people trained in project management ✓ No. of projects written by the community
San Isidro – Men	Get resources to strengthen the research (cassava for fresh market and starch) with adequate soil management and manage projects to form small businesses to improve the level of income in the community	Get economic resources	✓ Organize a soccer championship with fair & dancing afterwards ✓ Hold festivals ✓ Hold raffles ✓ Hold bingos	✓ No. of activities to get resources ✓ Fund statement of cash position
		Strengthen the group and CIAL research	✓ Comply with steps of the research ladder (take the CIAL formats) (the whole project) ✓ Identify cassava varieties that are adapted and have good starch content ✓ Increase the no. of CIAL members ✓ Integrate CIAL's and community's objectives ✓ Invite the community to see the CIAL trials ✓ Present research results to the community	✓ No. of cassava varieties identified with high production and starch quality ✓ No. of people that are participating in the CIAL tasks ✓ No. of people that have visited the CIAL trials ✓ No. of visits of the CIAL promoter to the community ✓ No. of feedback meetings to the community
		Manage the soils adequately (due to deterioration produced by the cassava crop)	✓ Plant live barriers (short-term research) ✓ Establish dead barriers (short-term research) ✓ Green manure (T*itonia diversifolia*) (short-term research) ✓ Crop rotation (short-term research) ✓ Strips without plowing (short-term research) ✓ Meeting of cassava producers (leasers) with the landowners (lessee) to arrange the conditions of the lease	
		Manage projects	✓ The CIAL leads project management ✓ Small businesses formulate projects (short term because now there are good possibilities of getting resources with entities and politicians) ✓ Formulate at least one production project (medium term)	✓ No. of projects prepared by the CIAL ✓ No. of CIAL projects passed by the entities.
		Formation of small businesses	✓ Formation of small businesses (Guides who will multiply in the communities) (long term)	

CIAL	General Objective	Specific Objectives	Activities	Indicators
Carpintero	Improve the level of income by establishing maize crops, applying PR in the stages of production, transformation and marketing in the village of Carpintero	Do research on maize varieties with good production and adaptation	✓ Research on maize production (quality, type of planting) ✓ Project management ✓ Prepare a schedule of activities	✓ No. of maize varieties selected with good production and adaptation to the zone ✓ No. of research activities developed
		Planting and maintenance of crops	✓ Plant, apply manure, planting time, fertilization, control of weeds and diseases ✓ Prepare a schedule of activities	
		Project management	✓ Small businesses in project management ✓ Formulate production projects ✓ Present projects to entities	✓ No. of people trained in project management ✓ No. of projects prepared and approved
		Get resources	✓ Carry out activities (bingos, festivals, savings) ✓ Small accounting businesses ✓ Keep accounting records	✓ No. of activities held to get resources ✓ Current inventory of CIAL resources
		Formation of businesses	✓ Small businesses in marketing ✓ Marketing study ✓ Enter into trade agreements with the consumers (markets, granaries, farm supply stores, etc) ✓ Get adequate machinery ✓ Get installations for the machinery ✓ Promote the product ✓ Small businesses manage machinery (thrasher) ✓ Arrange means of transporting the product ✓ Conduct research on improving transformation	
El Pinar - Men	Conduct research on common beans and maize to increase the family income, improve the quality of their diets and create a small business (transformation and seed production)	Conduct research on common beans and maize	✓ Conduct ongoing monitoring of compliance of the steps of the CIAL research ladder ✓ Make schedule of activities ✓ Fill out formats to verify the compliance of the activities	✓ No. formats filled out for each step of the research ladder ✓ No. treatments selected ✓ No. lb harvested per treatment ✓ No. research activities carried out by the CIAL
		Get resources to strengthen the CIAL	✓ Visit entities ✓ Make requests to different entities or submit production projects to financial entities and those with a mandate to support the farmers such as the Agrarian Bank, Coffee Growers' Committee, the UMATA- Piendamó, CRC. (irrigation districts) (visit entities) ✓ Request authorization of the Communal Action Board to hold community activities (bingo, championship of typical game (*sapo*) similar to horseshoes, festival, bazaars)	✓ No. projects formulated, presented and approved ✓ No. visit made to the entities by the CIAL ✓ No. community activities held to get economic resources ✓ Profits generated by the activities to get resources (balance)
		Create small business (transformation and seed production)	✓ Increase the production of maize and common beans ✓ Select seed at end of production cycles to maintain competitiveness on the market (to prevent crosses during the cycles) ✓ Train in formation of small businesses ✓ Train in transformation of maize ✓ Train in seed production	✓ No. lb produced of the products studied (maize, common beans) ✓ No. lb of maize and common beans selected for seed ✓ No. training events on formation of small businesses (certificates, records)

CIAL	General Objective	Specific Objectives	Activities	Indicators
Santa Maria	Strengthen the group, continuing with the research, guaranteeing the seed production, and letting the community know about their activities	Strengthen the group itself	✓ Train in the crops that are being studied and on how to store seed ✓ Write up group regulations/norms ✓ Made a schedule of activities ✓ Hold group meetings more frequently (attendance)	✓ No. training events received (on the crops) ✓ No. people trained (in the crops) ✓ No. activities held of those programmed ✓ No. participants in the group's activities ✓ No. applications of the rules (stimuli and sanctions) ✓ No. applications of the training (for good of the community)
		Hold different trials (research)	✓ Follow the steps of the CIAL research ladder	No. trials conducted in the different research stages that the CIAL has
		Guarantee the seed production	✓ Get own lot (loaned, leased or own) "because the group does not have own land" ✓ Plant quality seed in good amounts and monitor crops ✓ Harvest on time	✓ No. kg seed planted by the CIAL ✓ No. of kg of seed obtained by the CIAL ✓ No. lots obtained for the research (legalized with contract)
		Let the community know about their activities	✓ Offer the CIAL's services to the community ✓ Present results of the work done to the community **(**in the meetings of other groups organized in the community Communal Action Board	✓ No. reports presented to the community ✓ No. training events held for the community ✓ No. people growing the products researched by the CIAL ✓ No. reports presented to the community
		Get economic resources to accomplish the general objective	✓ Get economic funds (raffles, present projects to entities)	✓ No. projects approved ✓ Amount of funds obtained by the group (to buy own lot) ✓ Amount of assets acquired ✓ Public deed in CIAL's name
El Uvo	Improve the organization of the group to continue with the research on common bean and maize varieties, the storage of seed and acquire their own lot to improve their level of life	Improve the organization	✓ Elect CIAL board ✓ Prepare a schedule of activities ✓ Establish commitments and responsibilities of the people that belong to the CIAL	✓ Board formed and active ✓ No. people or partners that participate in the CIAL activities ✓ No. of tasks or activities done by the CIAL
		Do research (common beans, maize)	✓ Do all the steps of the CIAL research ladder ✓ Hold a planning meeting to begin with the research on maize	✓ Formats of research trials filled out ✓ Planning meeting (format filled out)
		Get economic resources	✓ Hold bingos and raffles ✓ Train in how to present projects (INCORA and other entities) ✓ Present projects to entities	✓ Amount of funds collected (balance) ✓ No. people trained in how to present project ✓ No. projects presented to entities ✓ No. projects passed
		Acquire own lot for research and production	Get a lot and pay lease with the production	✓ Amount of funds collected ✓ Contract for leasing the lot ✓ Amount of seed sown
El Jardín	Increase the production of sugarcane for panela and maize in order to improve food security and form a small business to help improve the level of life in the community	CIAL formed and functioning	Increase the no. people in the CIAL and collaborators	✓ No. people participating in the CIAL's activities ✓ No. activities carried out to get resources
		Improve the organization of the CIAL	✓ Program visits of the community to the CIAL trials ✓ Hold field days for the CIAL to provide feedback to the community	✓ No. people that visit the CIAL trials ✓ No. people that attended the field days ✓ No. people from the community that have planted the varieties recommended by the CIAL
		Do research on sugarcane and maize varieties	✓ Identify sugarcane varieties that have good panela production and that are adapted to the zone, as well as good maize varieties ✓ Go through all the steps of the CIAL research ladder	✓ No. varieties of cane for panela and maize identified by the CIAL that have good production and are adapted to the zone
		Get economic resources	✓ Hold raffles, festivals and savings	✓ Keep an accounting book (entries, debits and balance)

Format: Record of CIAL Group's Activities

CIAL: _____ Village: _____ Municipality: _____
Province: _____

Year: _____

Date	Proposed Activity	In Charge	Date Activity Carried Out	Participants					Entities Present in Activity	Comments
				Leader	Secretary	Treasurer	Promoter	CIAL Collaborators		

Format: Statement of Cash Position for CIAL Fund - San Isidro-Men

Date	Item	Responsible	Cash Receipts	Cash Disbursements	Balance

Format: Project Management

Date	Project Title	Sponsoring Entity	Responsible for Management	Projects Approved	Ongoing Projects

Critical analysis of a participatory procedure applied to cassava breeding

Researchers:*Luis Alfredo Hernández*[6]*, Nadine Saad*[7]

Highlights

Procedure for participatory selection of cassava varieties proposed to be evaluated and disseminated

Introduction

Participatory research in cassava breeding (PCB) was developed as a procedure, first applied to the evaluation of cassava clones (*Manihot esculenta* Crantz), with low-resource farmers from the Province of Cauca and on the Atlantic Coast of Colombia from 1986-1991. It was created by CIAT (International Center of Tropical Agriculture) in collaboration with CORPOICA (Colombian Corporation for Agricultural Research), based on existing participatory methods and techniques, as well as some new components arranged sequentially (Hernández, 1993). Various national institutions in Latin America have tried and adopted it in their breeding programs for cassava (Fukuda et al., 1994, 1997; Hinostroza et al.,1988; Iglesias & Hernández, in press) as for other crops.

PCB was developed during a time in which the participatory approach was gaining ground and credibility among agricultural researchers and was beginning to be applied to the improvement of crops under the name of participatory plant breeding (PPB). Since the 1980s the number of PPB projects has multiplied, with at least 75 cases documented in Asia, Africa and Latin America (Weltzien Smithet al., 2000). These projects have used several modalities and methods of participation; together, they are a source of experiences, lessons and key elements that can be consulted by researchers who wish to implement projects or refine their procedures. The purpose of this article is to analyze critically the PCB procedure and its components in relation to what has been learned from its application, considering the lessons that can be derived from the multitude of experiences in PPB worldwide in the last 20 years.

First of all, the PCB procedure is illustrated sequentially, explaining briefly its intrinsic and contextual components. Then four topics are analyzed in relation to the outcomes and the aspects that were not considered but that the overall experience of the PPB suggests can be refined or modified. It will be shown that several of the decisions with respect to key aspects of a participatory process such as the selection of participants or the stages in which the end-users are included are taken in function of the objective of the process and to the extent that the objectives vary so can these decisions.

[6] Research Associate I, SN3 Project, CIAT, Colombia
[7] Research Fellow in Participatory Plant Breeding

Scheme of the PCB procedure

Despite the existence of several documents that deal with the PCB procedure, its application in several countries and the training that has been given on the procedure, to date, the PCB procedure per se has not been documented in sufficient detail to permit a critical analysis of its components and steps. This is partly because the PCB was elaborated during the implementation of a breeding project on the Atlantic Coast of Colombia, beginning with some modifications to the conventional method that had been used until then in both the national program and CIAT. Consequently, some of the breeding programs that have wanted to apply PCB have had to deduce practices and steps that perhaps had not been contemplated during the Colombian experience, or if they were, were not documented.

The procedure based on the available documents and materials is outlined in Figure 1. The scheme is divided into *contextual elements* – elements that we have considered as our own or unique to the Colombian context in which the procedure was developed; and *suggested steps,* essential in the implementation that should be included in the replication of the procedure, regardless of the context.

Contextual elements

These elements change according to the context in which a participatory procedure is implemented and influence the mode of implementation of the suggested steps and the end results. In the Colombian experience the most important contextual elements were the actors and the crop.

The actors

In the Colombian experience there were several different actors: agricultural research institutions (national and international), universities, cooperatives, NGOs, small processing industries of the cassava roots and small farmers. In addition, there was GRUYA (Cassava Group and Associated), a group of professionals from different institutions and specializations with experience in the cassava crop, who met periodically to share experiences, plan activities and provide mutual support on different topics related to the crop. The existence of GRUYA greatly facilitated the work and ensured that no important aspects of the crop were left out in the implementation of the project. It also facilitated the interaction with the producers and the geographic coverage that was obtained with the trials (interinstitutional agreements is one of the topics that is analyzed later on).

In addition to the relationships among the entities, the identity of the main actors, their mandates, principles, objectives and modes of work are important contextual elements. It should be mentioned that in the Colombian context, CIAT, one of the entities initiating the project, had the objective of developing a procedure for PPB and creating the capacity within their member entities for replicating the procedure. Therefore, there were activities and strategies such as the continuous training of professionals, the Interinstitutional

linkages, the hiring of a person specifically to prepare and document the procedure, the availability of a budget, the centralization of the information, and the strategy of beginning the work within the conventional scheme and with materials in advanced stages of breeding that were highly significant in the Colombian experience, but not necessarily in in other countries and with other crops.

The identity of the producers is also an important contextual element. Although the producers can be seen as an intrinsic element of the procedure as the suggested step "selection of the farmers" implies, it should be noted that their identity and their socioeconomic situation vary according to the context. As explained later, most of the farmers that live in the region where the project was established are small farmers (average of 0.5-1 ha land), male, with a great deal of experience in the production of cassava, which is grown mostly for on-farm consumption and the fresh root market. Although there are other subregions and other socioeconomic profiles within the region, these were the target of the project, given the mandate and the objectives of the executing entities.

The crop

Much can be deduced from the name of the procedure that we are analyzing. The name Participatory Research for Cassava Breeding (PCB) suggests that the procedure was developed specifically for the cassava crop, which it was for circumstantial reasons. The breeding strategy, the type of selection, the structure of the replications, the experimental design, the time, the space and the resources required in the procedure are specific to the cassava crop and will naturally vary with other crops. The sequence of steps suggested within the procedure have been and can easily be applied to other crops.

The crop is also an important element in the Colombian context because cassava is a subsistence crop, common and traditional in the project areas. This facilitated the establishment of the participatory procedure as the farmers of the Atlantic Coast have a great deal of experience and knowledge on this crop. Working with crops where the farmers have no experience (e.g., in grasses for pastures or varieties used for ground coverage in some cases) and where the benefits of the technology cannot be seen qualitatively in the short term (e.g., the conservation of soils or protein digestibility and content in forages) can present different, more difficult challenges for the researcher.

Steps suggested in the PCB procedure

The steps suggested in the PCB procedure are, sequentially, as follows:

- **Establishment of objectives**. In PCB the objectives are established by the participating entities before beginning the participatory procedure.
- **Selection of farmers and sites** (and the establishment of a network of trials) is done through participatory techniques that orient the selection of producers based on several selection criteria established by the entities.

- The **participatory diagnosis** defines, in a first instance, the problems or constraints and objectives of the participants.
- The **selection of materials** to be evaluated (technological supply) is based initially on the description of the "ideal" variety; and after the first cycle, on the producers' criteria.
- **Open-ended evaluations** (subjective information) and **agronomic evaluations** (quantitative information) are used to gather data for analysis.
- The **criteria** are determined, and the **glossary of terms** is prepared, using evaluation formats and subjective analysis of the information.
- The **field books** are formats of tables of frequencies to determine the relative importance of the criteria.
- The **information is analyzed** statistically, using regression analysis for nonparametric data.
- The **pre-release** phase is defined by the research entities.

- The **varieties** are **released** according to the regulations of each research entity.

Discussion

Four key areas within participatory research (PR) are analyzed: the selection of participants, the establishment of objectives, the analysis of information and interinstitutional agreements. The following aspects are look at: what the respective documentation existing on PCB suggests, how it was dealt with during the Colombian experience, what aspects were not considered, and finally, how can the procedure be refined in light of the experiences and the lessons learned in PPB at the international level in the last 20 years.

Selection of farmers and communities

The selection of farmers in the Colombian communities was coordinated by research institutions through staff that were familiar with the farmers' production systems. The staff selected farmer experts from communities in edaphoclimatic zones similar to those of the experiment station and where cassava is a priority crop (Iglesias & Hernández,1994).

The participatory procedure recommended selecting farmers in each location based on the following criteria:

- Recognition within their community as experts in the cassava crop
- Interest in the trials
- Availability of the necessary area
- Location with easy access to the markets in the region
- Communication skills (capacity and willingness to transmit their thoughts)
- Production systems typical of small cassava producers

It was recommended that in each evaluation cycle, the farmers responsible for the trials be changed, replacing them by others selected using the same parameters as before, involving neighbors who showed interest and had possibilities of establishing participatory trials on their farms in later cycles. The idea was to extend the coverage of experimental environments in order to ensure broad adaptation of the clones and involve members from the gamut of end-user groups involved in cassava production in the region, thereby ensuring acceptance of the clones within all the groups, not just one or two. Despite this, the group of end-users in which the selection of participants was emphasized was the group of the small farmers since this is the group to which the majority of the farmers of the region belong and also the ones that figure within the mandate of the entities that implemented the project.

In the Colombian experience more than 500 producers (all men) participated in 90 trials on 15-20 farms per cycle. Among the participants there were buyers of cassava for the drying plants (cassava chips), producers of starch and members of cooperatives. These groups were invited to the evaluations at the end of the cycle the harvest. But the largest percentage (70-80%) was a critical mass of small producers dedicated to growing cassava as subsistence crop for fresh root consumption. They participated throughout the crop cycle so the resulting information of the different groups of end-users in the evaluations was separated to prevent confounding the results.

Despite having specific objectives regarding who should participate in the process, the project on the Atlantic Coast did not systematize a strategy for selecting the participants. This was simply left to those who were interested (self-selection). Therefore it was not possible to pre-establish a balance among the different groups of end-users represented in the data collection and consequently in the decision of which clones would continue in the selection process. This did not bias the decisions much as it was discovered that the different groups had comparable objectives and similar preferences in relation to desirable varieties even though they had specific criteria in each phase of the production. Thus the same varieties were selecte by the different groups, but for different uses (fresh consumption and starch production). Nevertheless in other contexts, where the differences in varieties and preferences among end-users can be more notable, the lack of a strategy for selecting the participants and ensuring representation and a balance among different end-users could be an important constraint. In such cases the separation of the information according to the groups of end-users would be more important.

Reflecting upon the selection process of farmers on the Atlantic Coast, it is important to highlight the importance of also looking for the nonobvious end-users who may not be readily seen or who do not self-select themselves. For example, in this case the women as a group of distinct users were not considered as they have a minimum participation in getting stakes, planning and managing the crop until its sale in the market. Nevertheless, in a later work that had the specific objective of working with women, it was discovered that in this region, the women play a central role in selecting roots for making and selling *bollos*[8] (IPRA-CIAT, 2000). This market is managed exclusively by women, using the

[8] These patties are prepared with cassava flour and cheese. They are cooked wrapped in maize husks and sold in the urban zones of the region.

income to buy basic needs of the family such as clothes for the children, school utensils, medicine, and at times to pay for transportation. As the project did not have the specific objective to seek the "hidden" end-users, the researchers did not learn of this activity related to their project with cassava varieties. Sometimes the hidden end-users can be women, but other times it can be a group of farmers with a socioeconomic level lower than the majority or a group that supplies a market niche or one specific to the region. To prevent the omission of these end-users, the PCB could incorporate within its diagnosis step, a substep for identifying end-users.

In the experience of the Atlantic Coast the entities elected to work with individual farmers that had conditions and cultural practices representative of the zone. The recommendation of the PCB procedure is to work with no more than ten people at a time. This facilitates the data gathering and analysis. Nevertheless, other PPB projects have tried working with more farmers and previously established groups. In Northeast Brazil, for example, the researchers tried to work with entire communities and with cooperatives. They concluded, however, that it was too difficult to organize evaluations and handle the data coming from so many people, except in the case of the cooperatives, which greatly facilitated the work given the fact that they were already organized and used to working together (Fukuda & Saad, 2001).

The work with farmers' groups has taken different forms. For example, there is a lot of experience in Latin America with CIALs, community-based research services that conduct research in *representation* of their communities. There are also projects where the researchers have facilitated the formation of farmer groups such as the groups evaluating clones of potatoes in Ecuador or Farmer Field Schools in Bolivia. These experiences show that important accomplishments such as mutual support and motivation among farmers, the diffusion of technologies among farmers' groups, the distribution of risks and benefits, and the possibility of continuity of the work after the intervention by the research entities can be obtained by working with groups. Nevertheless, it has been seen that the formation of groups specifically for a PPB project means dedicating much more time and in some cases having personnel a background in group dynamis. This also means that the project should be situated within a broader context of rural development, not for a specific activity such as breeding.

In selecting farmers for a PPB project, it is important to consider the distribution of benefits. Generally the research entities have as their mandate to facilitate the rural development of the whole community or entire regions, not just a few selected farmers. For this reason it is necessary to select farmers who not only comply with the representative conditions, but who are also willing to share what they learn and discover in the research process. Thus the Atlantic Coast project selected farmers that not only had representative conditions and practices and good communications skills, but who also had farms that were well located and easily accessible and could thus serve as "show windows" for neighboring producers who walked by there and could see the new varieties planted. This stimulated the spontaneous or informal diffusion of the promising varieties and ensured, to a certain extent, "publicity" for the experimental clones.

The combined experiences with PPB worldwide show that the types of farmers, the number who participate and whether they participate individually or in groups depend on the project objectives and what is needed to accomplish them. For example, if a project has the objective to ensure that the benefits of the collaboration are distributed widely, it should look for participants that are recognized leaders in their communities. If the objective is to incorporate the farmers' knowledge in the varietal selection process, it should involve the local experts (PRGA, 2000). Sometimes the same people fill more than one of these profiles, but other times the local expert is not recognized as a leader in his/her community, or the community leader does not have sufficient technical knowledge. Similarly, a PPB project can often have more than one objective, which means that they must be prioritized and the participants selected accordingly.

With respect to involving women as participants, the combined PPB experience over the last years has shown that the quality of the research can generally be improved significantly as the women are usually in charge of domesticating wild species and of selecting and maintaining seeds due to their knowledge of the germplasm. Moreover, women's preferences are often different from those of the men even though they do not always participate directly in the farming activities as was the case on the Atlantic Coast.

Establishment of objectives

The objectives of the process implemented on the Atlantic Coast were established by the research entities after an initial exploration of the zone. Fully aware that there is great genetic diversity on the farms of small cassava farmers and that this is not static but changes over time, the researchers agreed to the fact that farmers have a selection process based on criteria that permits them to test new materials, observe them and eventually incorporate or reject them. They were interested in learning more about their criteria, with the idea of developing a formal procedure that would make it possible to implement this systematically in the development of technologies. This was the main objective of the project. Thus, PCB does not recommend the establishment of objectives as a suggested step within the procedure; rather it assumes that it is an activity that occurs before the farmers begin to participate.

The objectives established for a research process affect the determination of the steps and the activities to be implemented. When the objectives are established prior to the participation of the end-users, their priorities cannot be included in the initial conception and planning of the project. In the case of the Atlantic Coast, the participation of the farmers in the diagnostic phase made it possible to work with producers who identified cassava varieties as the main problem in their production areas. Nevertheless, the final objectives of the breeding itself were not discussed. Were the producers seeking varieties with specific or broad adaptation? Were they looking for one variety or several? Were they looking for varieties for on-farm consumption or multiple uses? Were they seeking to improve their cassava yields, or were they also interested in working with other crops at the same time? Were they seeking to conserve and/or improve their native varieties or did they want improved ones? The participants could not consider these and other options that breeding offers because the objectives had already been established.

In addition to the options with respect to cassava breeding, the participants could also have contributed their preferences with respect to their own participation. The combined experience of PPB worldwide shows that the stages of the research (or breeding) in which the farmers and other end-users participate varies. As mentioned, participation in the Atlantic Coast project began in the diagnostic stage. In other PPB cases, it began in the phase of setting objectives; while in others, participation is only at planting and harvesting. The PR literature and experience also indicate that there are different "degrees" of participation, ranging from a consultative to a collegial style. The documentation on the PCB procedure concludes that the preferable style of participation is the consultative one and that the initial stage recommended is the diagnosis; nevertheless, this is one way among many to implement PR.

We would suggest that the objectives of a PPB process could be established in several ways, depending on who is involved, the entities flexibility and the resources available. There are cases of PPB in which the objectives of the process were established jointly among researchers, farmers and other end-users (e.g., the CIALs working with crops such as potatoes in Ecuador). In such cases the researchers need to explain to the end-users the range of options available and what they can expect from breeding (and what not). It is also important that the researchers and their entities have the flexibility and the capacity to negotiate and modify their own objectives and assume some of the objectives of the end-users if these are different. There should also be some elasticity in the frameworks of formal research and therefore in the support of the higher levels of decision-making such as the directors of the institutions.

In the case of the Atlantic Coast project, it should be noted that given the objectives of the project, knowledge of the farmers' selection criteria was very important. To the extent that learning about their criteria has been an objective of the PPB, it has also been reported as a product of this approach, which in itself does not mean much. To have some meaning, the knowledge of farmers' selection criteria has to be incorporated in the breeding process, in the selection of parental for crosses and experimental clones. Besides, farmers' criteria are not static as appears when suggesting an objective is to establish knowledge of them. Although some criteria persist, others change from cycle to cycle and from one group of end-users to another. Numerous PPB projects have been frustrated by this fact.

Another of the principal objectives of the Atlantic Coast project was to select clones for pre-release and others for release. Although this is the objective of most PPB programs, experiences around the world show that the application of the participatory approach can have a broader range of objectives than the release of improved varieties for certain zones. Among the objectives that have been accomplished with this approach in crop breeding, the following can be mentioned: the conservation and enrichment of biodiversity, the organization of farmer groups, changes in policies for releasing varieties, multiplication of seeds, access to genetic materials, and the facilitation of learning by the farmers. When planning a PPB process, the researchers and other end-user groups could consider this approach as a very powerful tool for accomplishing multiple objectives (PRGA, 2000).

The results of the Atlantic Coast project are well known. It conformed to a participatory process that has been adopted and adapted in several Latin American countries. The farmers' selection criteria are known. Genetic diversity was expanded on their farms. In these terms, it can be said that the project was very successful. Nevertheless in the planning of the PPB experience on the Atlantic Coast, several important elements were not considered: a phase of mass multiplication of seed for the rapid diffusion of the more accepted clones, following up the process to fine tune the methodology, and study of the impact. After analyzing several projects that implemented the PCB procedure, it was discovered that these are steps ought to be included as they contribute significantly to the enrichment and impact of the work.

Quality of the information and its use

The quality of the data gathered and its use is another key issue in PR. The challenge is to obtain, combine and analyze both qualitative and quantitative data for making decisions in the research process. This is a challenge that has not yet been totally resolved in PR.

The Atlantic Coast project tested several statistical tools for facing the challenge of the quality of the information and its use. Principal components analysis (PCA) stands out because it reduces the number of variables and analyzes both quantitative and qualitative variables. The application of cluster analysis makes it possible to group varieties, criteria and regions, providing a global vision of the preferences. Nevertheless the most useful tool was logistic regression, which was adapted for analyzing preference rankings and simulating the acceptance of technology by producers. Perhaps the most important contribution of the Atlantic Coast experience with respect to information and its use is the fact of having found a way to make a technical interpretation of the subjective opinions given by the participants in the evaluations. This made it possible to establish an information link between the production systems on the Coast and the experiment stations.

The PCB procedure recommends preference ranking to compare degrees of acceptance of the different varieties in order to classify them from the most to the least acceptable. This process is based on techniques of open-ended evaluation useful for the knowledge of qualitative points of view, explanations and ideas about the reasoning processes of the producers and how they take decisions.

A sequence of the steps for analyzing the information recommended by PCB is as follows:

- Development of flowcharts to guide each activity (Ashby, 1992)
- Construction of lists of terms, local agricultural glossaries classified by region for local, regional and scientific interpretation
- Identification of criteria, differentiating them from descriptive aspects
- Integration of the reasons, rankings and criteria identified, differentiating between antonyms and synonyms
- Development of formats for systematizing the information

- Development of field books (Hernandez, 1993)
- Analysis of the information using several tools

Some of the results related to information, obtained with this process in the Atlantic Coast project, were the combination of efficient tools to obtain information (tables of relative frequencies, differentiating between synonyms and antonyms; electronic datasheets for transcribing the information directly in the field; scales for grouping ranges; matrixes with transformations of scales for the joint analysis of qualitative and quantitative information, and a matrix for classifying the preference rankings), the glossary of terms, the criteria, the reasons, the rankings, the field books, the technology profiles and the alternatives tested in the analytical process.

A method that has been adapted recently by Sall et al. (2000) in Senegal is quantification based on a quasi-arbitrary ordinal weighting system of the producers' perception of specific characteristics of a given technology. Tobit regression analysis is used, including variables that represent:

- The farmers' perceptions on the relative importance of the different characteristics that a material can have
- The presence and quality of those characteristics in the experimental material
- The characteristics of the producers and their farms

This method, the same as the one recommended by the PCB procedure, explains and predicts the adoption of improved materials.
In the data analysis it is important to consider its source and the relative weight that is given to each participant or group in deriving conclusions from the preference rankings. This can be seen as a process of voting, where each participant has the right to vote for his/her preferred clones. If the majority of the group of participants represents an interest within the community that is not necessarily the interest of the entire community, then the recommendations based on the preference ranking analysis can be very biased. Thus it is important, as mentioned previously, to select the participants of a participatory process carefully; or if this is not possible, separate the information obtained from the different interest groups so that the results reflect the community's (ies') preferences more precisely.

Another key consideration with respect to the quality of the information and its use is the amount of data gathered. Many PPB projects gather more information than they can manage, process and use. It is important in the planning of a PPB project to determine what information can be used and what not. As mentioned previously, a tool that the PCB procedure has suggested is the field book, which permits the collection of both objective and subjective data (quantitative/qualitative) and also limits the amount of information that can be noted.

Many PPB projects produce lists of the farmers' selection criteria. What happens with these at the end of the project? Until when/where are they relevant for other projects in the same areas? An interesting case of information management is the cassava breeding

project in Northeast Brazil, managed by EMBRAPA-CNPMF. Given the extensive collection of data and the magnitude of the project, the breeder Wania Fukuda had to create a database in order to store and manage the large volume of information. Although she felt that she might have collected too much information (pers. com., W. Fukuda), the database has been very useful in later phases of the project for suggesting experimental clones suitable for areas similar to the ones in the database.

Interinstitutional agreements

The project of the Atlantic Coast of Colombia was implemented in an interinstitutional framework where several entities of different types participated. As mentioned earlier, GRUYA, the group that in some ways personified these interinstitutional agreements, was important in technical, logistical and strategic aspects, given their composition, experience, coverage and participation in the decisions. In the first place, they made it possible to establish multidisciplinary discussion forums, where experiences were exchanged in each crop cycle, and the analysis and adjustment of the PPB component were facilitated. In addition the members of GRUYA had a network of trials in northern Colombia that brought together experiences of more than a thousand small cassava farmers for analysis in the forums. The interinstitutional agreements also helped the implementing entities to see different potential uses of cassava, incorporating elements/phases of the production change in the process that had not been contemplated at the onset of the project. Finally, the interinstitutional agreements provided the opportunity for the staff from the different entities to be exposed to the participatory approach. As a result of this experience, the PCB procedure recommends implementing interinstitutional projects, wherever possible.

The results of implementing the PPB project on the Atlantic Coast in an interinstitutional setting can be see in the broad geographic coverage of the work involving a large number of producers and the participation of professionals of different disciplines. Another very important result of the interinstitutional agreements (in particular, the association between ICA and CIAT) was the institutionalization of the participatory approach in ICA, which has been using the PPB as a routine procedure in cassava breeding and for some other crops such as yams (Discorea trífida L.) in the Turipaná regional office in Cordoba, Montería (pers. com., A. Lopez).

Despite the interinstitutional agreements during the implementation of the project on the Atlantic Coast, there were no joint actions. The participating institutions acted as advisors and links with the different sites where the trials were implemented; but the responsibility of implementing the project, analyzing the data and documenting the process was mostly assumed by CIAT. In this way no feedback was received in the documentation of the process and the analysis of the information from the entities, which would no doubt have enriched the work. What was not considered in designing the institutional arrangement was the distribution of resources, responsibilities and recognition of the different member institutions. This is indispensable for the motivation, active participation and the empowerment of the institutions associated in an activity and therefore in the possibilities of continuing such an arrangement. The idea of using the interinstitutional agreements to

reproduce the experience on a larger scale was not considered either. This would have required more commitment from the member institutions in a relation of belonging, where they could also expect resources.

Conclusions

With respect to the selection of farmers, it is recommended to have an explicit strategy based on the objectives of the collaboration, use specific criteria, involve members from a broad range of different groups of end-users (including women) both within the communities and in the production-marketing chain, seeking the hidden end-users and working with already established groups (if they exist in the area). The selection of farmers is a key element in the social impact of the work.

The establishment of the objectives in a PR process is perhaps the most important phase of a project as many of the decisions as to how to implement a procedure depend on the objectives. We suggest that, to the extent possible, the objectives be established together with the participants of the process and not beforehand. This can increase the relevance of the work for the end-users and therefore the impact. Besides, the participatory approach can be a vehicle for fulfilling a gamut of different objectives and does not have to be used just for developing new varieties. In the Atlantic Coast experience, it should be highlighted that two elements were not considered that have proven to be essential in later PPB projects:

- A phase of mass multiplication of seed of the clones accepted by farmers
- An impact study that includes considerations referring to the methodology per se and the process implemented.

Another key topic that is dealt with in this article is the quality and the use of the information gathered. In the Atlantic Coast experience, several alternatives useful for meeting the challenge of establishing a link between the analysis of quantitative and qualitative information were used. Logistic regression, adapted to the analysis of the preference rankings to simulate the acceptance of the experimental materials by the farmers, is recommended. The use of a field book, similar to the one developed during the Atlantic Coast project is also recommended in order to limit the amount of information gathered to what can really be used and analyzed. The incorporation of the information or of the conclusions of the analysis in making decisions about the clones to be evaluated, recommended and released is an essential step for that process to be considered participatory.

The PCB procedure was developed within an interinstitutional framework that provided several advantages to the Atlantic Coast project. Among them we can mention being able to interact with a wide range of professionals from both research and extension as well as merchants, and the availability of wider ranges of geographic coverage for the trials. Another advantage is the exposition of several institutions to a new research approach. Given that the institutional framework is a contextual element, on which the projects and their implementers do not have much influence and it is not a suggested step in the

procedure, perhaps it is out of place to make recommendations as to its form. Nevertheless, it should be mentioned that the interinstitutional collaboration can be highly advantageous for a PPB project and that in the event that there is such a collaboration, it is advisable that the members establish the objectives, the roles of each one in the collaboration and the corresponding responsibilities and obligations in a joint process.

The Colombian Atlantic Coast experience and the development of the PCB procedure were very successful. We need only to see the number of clones released and accepted among farmers and the adoption of the same procedure in several Latin American countries.

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OUTPUT 2. STRATEGIES AND ORGANIZATIONAL PROCEDURES FOR PR, DEVELOPED

Milestones

- Strategies for Enabling rural innovation developed in Africa
- FPR approaches developed in Latin America validated in Africa
- Methods for participatory agro enterprise development systematized and available for users
- Seed enterprises established at village level in two African countries.
- Areas in Kenya identified with local partners for evaluating and testing PM&E systems
- Families in a pilot site in Colomi, Bolivia identified and characterized their well-being.
- Suitable CIAL self-financing mechanisms identified and documented.
- Participatory research and validation on new alternatives for improving productions systems.
- Lulo growers identified in two zones of Cauca Province, interested taki1g part in a participatory varietal selection project (Pescador and Tierradentro).
- Five improved Lulo cultivars selected by farmers in each zone.

Developing a scaling-up strategy for "*Enabling Rural Innovation*" Project

Researchers: *Rupert Best, Colletah Chitsike, Robert Delve, Pascal Sanginga, and Susan* Kaaria[1]

Background

Growing evidence demonstrates that participatory research (PR) approaches can increase the benefits of agricultural research for resource-poor smallholders living in rural areas. These methods not only address the specific needs of poorer farmers and develop technologies that are better suited to their conditions, but they also empower farmers by giving them control over the research agenda and by building community-based organizations. Participatory approaches have often been criticized, however, because their success is only at the local level and therefore their impact is limited (e.g., on the small group of farmers participating in the project). The potential of PR approaches to impact on rural livelihoods will be realized only if promising technologies can be developed, disseminated and adopted by farmers.

During a recent retreat, the Enabling Rural Innovation (ERI) team decided it was critical to develop a scaling-up strategy to ensure that these considerations were built into the project right from the beginning. The definitions and objectives used for scaling up are

[1] All contributors are scientists at CIAT-Africa Office, PO Box 6247, Kampala, Uganda.

consistent with those developed by the CGIAR-NGO committee at a conference in the Philippines (IIRR, 2000), which defined the objective as follows: *"Scaling up leads to more quality benefits to more people over a wider geographic area, more quickly, more equitably and more lastingly."*

Consequently, it is evident that if PR approaches are to achieve scaling-up objectives, these approaches must demonstrate the ability to benefit large numbers of poor people across large areas within reasonable time frames. Developing strategies for scaling up has been the center of much recent debate within Research and Development (R&D) institutions, especially those concerned with natural resource management (NRM). Several international workshops have been carried out (Cooper & Denning, 2000; Güendel & Hancock, 2001). These workshops aimed to identify "best practice" and strategies for scaling up of NRM research (Güendel & Hancock, 2001). The workshops identified several issues critical for successful scaling-up efforts:

- Developing research partnerships and linking with other stakeholders
- New modalities for doing research; PR identified as a key area
- Capacity building to increase the pool of people with skills
- Integration of monitoring and evaluation to enhance learning, build in corrective loops, and measure progress and evaluation of impacts
- Institutionalizing scaling-up, with a focus on vertical scaling-up to ensure feedback of research results to policy and research agendas and vice-versa
- Enhancement of sharing and learning from other fields (e.g., health sector, which has a wealth of experience in developing participatory approaches and scaling-up strategies)

Why scale up the ERI framework?

- Communities applying ERI framework for better decision-making
- Institutionalization of methodology within existing partners
- New partners applying the ERI framework in their ongoing work with communities
- Policymakers within governments, NARS, universities, extension, and NGOs aware and supportive
- Adoption of technology within pilot communities and other communities
- Focus on scaling-up approaches, methods and technologies

Developing a scaling-up strategy

To achieve the foregoing objectives, it was important to develop strategies based on who the target was and at what level the impact was desired. Therefore, specific strategies were developed for scaling up at different levels: within the community, across to other communities, within the district, within the country (nationally) and across countries (internationally). Figure 1 presents the different levels of going to scale graphically: vertically and horizontally. Table 1 demonstrates specific strategies for scaling up and out at different levels.

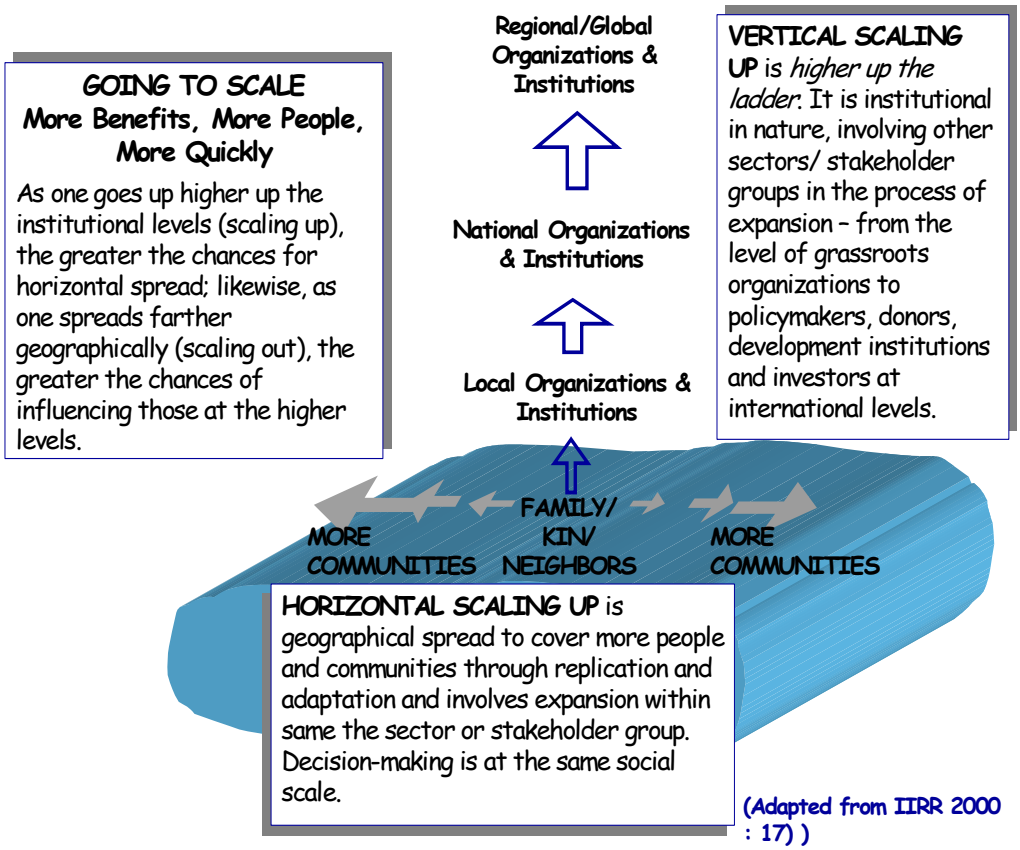

Figure 1. Scaling up as vertical and horizontal integration strategies.

Table 1. Specific strategies and activities for scaling up and out at different levels.

Levels of Scaling Up	Objective of Scaling Up/Out	Partners, Institutions & Government[2]	Specific Activities
Within the community	✓ Adoption of technology within pilot communities and to others ✓ Scaling out of ERI framework by other groups not in initial groups	✓ Africare ✓ Local government structure ✓ Agromanagement ✓ Farmers groups (initial agreement to train other groups)	✓ Feedback from research group to community ✓ Active role of champion farmer in new farmer groups ✓ Community drama; e.g., on gender ✓ Community development facilitators to train other groups ✓ Involvement of local and district government structure in all aspects
Across communities	✓ Communities applying ERI framework for better decision-making ✓ Adoption of technology within pilot communities and to others	✓ Africare ✓ Local and district government structure ✓ Champion farmers	✓ Exchange visits ✓ Awareness building and involvement of local government ✓ Identification of interested organizations and institutions or interested groups ✓ Community Development Facilitator to build capacity of new service providers ✓ Champion farmer has active role in new farmer groups
Within the district	✓ Institutionalization of methodology within existing partners ✓ New partners applying the ERI framework in their ongoing work with communities ✓ Policymakers within governments, NARS, universities,	Identification of different types of partners: Agricultural research NGOs Ministry of Agriculture ✓ Farmer associations ✓ Local government ✓ Consortium of service providers ✓ District Extension Coordinator (DEC)	**Development of scaling-up strategy and work plans with partners:** ✓ Evaluation of institutionalization of ERI approach among existing partners ✓ Analysis of partnership processes and scale up lessons ✓ Identification of capacity-building and technical backstopping needs ✓ Find out about membership in CEED ✓ Share results and if there is demand, provide training of CEED members on ERI approach

[2] Role of partners – new & old.

Levels of Scaling Up	Objective of Scaling Up/Out	Partners, Institutions & Government[2]	Specific Activities
	extension and NGOs aware and supportive		
National	✓ Institutionalization of methodology within existing partner institutions ✓ Policymakers within governments, NARS, universities, extension and NGOs are aware and supportive	✓ Agricultural research ✓ NGOs ✓ Ministry of Agriculture ✓ Farmer associations ✓ Local government ✓ Consortium of service providers ✓ DEC universities ✓ APEP–USAID project (Chemonics) ✓ International NGOs ✓ CGIAR Centers: Future Harvest Uganda ✓ Key government policymakers ✓ Parliamentary group on food security and land degradation	**Institutionalization of approaches** ✓ Participation in national agricultural shows for PR ✓ Evaluation of institutionalization of ERI approach among existing partners ✓ Analysis of partnership processes and scale-up lessons ✓ Identification of capacity-building and technical backstopping needs ✓ Build capacity of community development facilitators and assistants in facilitating scaling-up strategies **Engaging policymakers** ✓ Field visits of key government policymakers (Minister, National Agricultural Advisory Services-NAADs, National Agricultural Research Organization) ✓ Attend meetings and seminars, make presentations ✓ Posters and papers at conferences ✓ Develop simple publications and distributed widely ✓ Curriculum development with University ✓ Developing training guides
Across countries	New partners applying the ERI framework in their on-going work with communities ✓ Policymakers within governments, NARS, universities, extension, and NGOs, aware and supportive	Partnerships with organizations working across countries and regions: ✓ Participatory Ecological Land Use Management-PELUM ✓ Networks: Eastern and Central Africa Bean Research Network -CABREN ✓ AFNET ✓ International NGOs: Catholic Relief Services-CRS	✓ Participation in international meetings and conferences ✓ Posters and papers at conferences ✓ Agroecology highlights ✓ Curriculum development or testing of guide ✓ CIAT-Africa web-site ✓ Proposal writing ✓ Publishing peer review articles

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Enabling rural innovation in Africa: Integrating farmer participatory research and participatory market research

Contributors:[3] *Pascal Sanginga, Colletah Chitsike, Rupert Best, Robert Delve, Susan Kaaria, Roger Kirkby*

Collaborators: *Partners in Malawi, Uganda and Tanzania*

Introduction

Farmer participatory research (FPR) is receiving considerable recognition in both international and national agricultural R&D organizations as an important strategic research issue, vital to achieving impacts that benefit poor people in marginal, diverse and complex environments. There is now a large body of literature that demonstrates considerable advantages and the potential of involving farmers in the research process (Ashby et al., 2000; Lilja et al., 2001; Pretty and Hine, 2001; Martin and Sherrington, 1997; Okali et al., 1994). It is argued that FPR can significantly improve the functional efficiency of formal research (e.g., better technologies, more widely adopted, quicker and broader impacts) and empower marginalized people and groups to strengthen their own decision making and research capacity to make effective demands on research and extension services, thereby resulting in payoffs for both farmers and scientists.

Until recently, however, the emphasis has been on food security crops and natural resource management (NRM), with little attention to the income needs of poor farmers. This resulted in improving subsistence rather than market-oriented production systems. A major constraint to improving the livelihoods of smallholder, resource-poor farmers is their ability to access markets. Farmers' financial benefits from agriculture are often reduced by their limited opportunities and skills for identifying markets for their produce, and by low bargaining power with such rural service providers as market middlemen, agricultural extension agents and researchers. Key shortcomings for both FPR and agricultural research are failure to link farmers to markets and increasing incomes for marketing agricultural products. A key challenge today is to create an entrepreneur culture in rural communities, where farmers produce for markets rather than trying to market what they produce. Enhancing the ability of smallholder, resource-poor farmers to access market opportunities and actively engaging in them is one of the most pressing development challenges facing both governments and nongovernmental organizations (IFAD, 2001; IFPRI, 2002; Kindness and Gordon, 2002).

On the other hand, a market-oriented production system is likely to lead to land degradation and the unsustainable use of natural resources, which can eventually limit the potential for market production. Sustained growth in profitability will depend upon continued improvements in NRM technologies, which are key for increasing yields in low-external input farming systems. Sustainable improvements of rural livelihoods at the household level depend upon much more than improved access to technology and markets. It is now widely accepted that providing sustainable support to women farmers is a critical element of any rural innovation system. There is no question that integrating gender-sensitive participatory approaches in agricultural R&D projects is a win-win strategy for reducing hunger in Africa (IFAD 2001; IFPRI 2002). Because

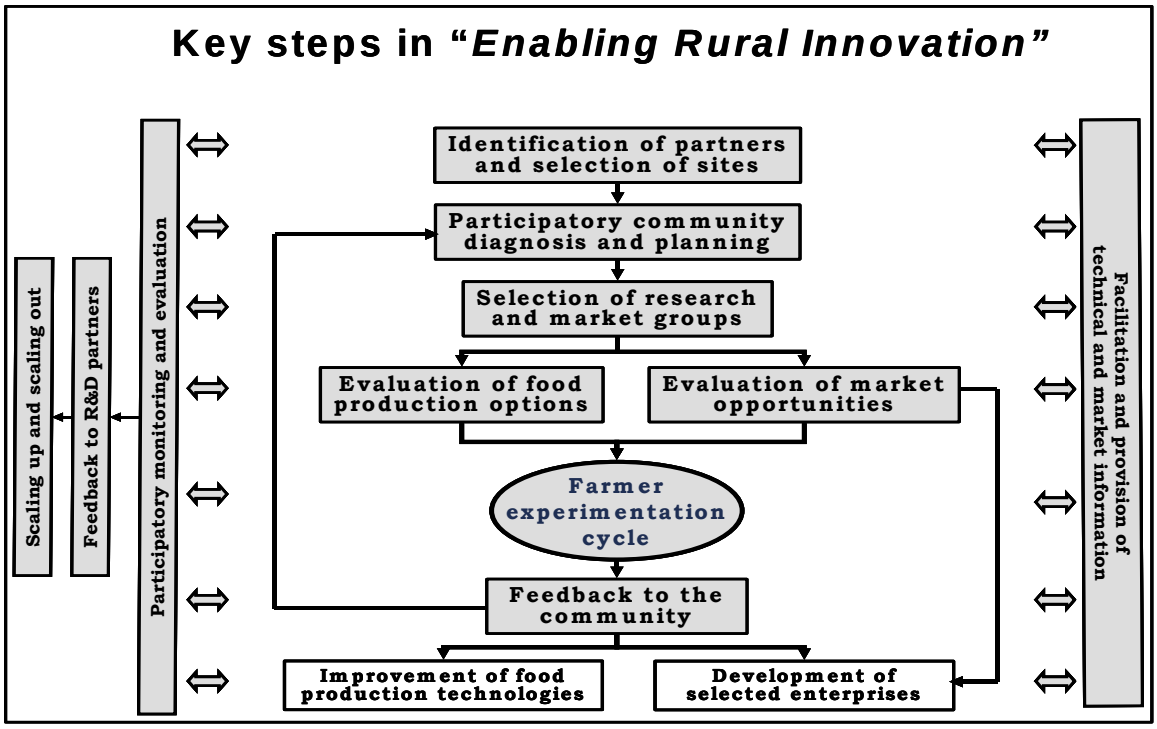
[3] All contributors are scientists at CIAT-Africa Office, PO Box 6247, Kampala, Uganda.

of their critical role in food production, processing marketing and consumption, women should be at the core of any strategies to improve rural livelihoods and build the assets of the poor. Recent research has also shown the importance of social capital foundations for successful innovations and community development. Social capital encompasses the nature and strength of existing relationships among members, their ability to organize themselves for mutual beneficial collective action around areas of common need and managing the social structures required to implement such plans; and the skills and abilities that community members can contribute to the development process (Uphoff and Mijayaratna, 2000; Woolock and Narayan, 2000). Social capital is an important asset that can be called on in a crisis, to the extent that communities endowed with a diverse stock of social capital are in a stronger position, not only to confront poverty and vulnerability but also to take advantages of new opportunities (Grootaert, 2001; Narayan and Prittchet, 1999). Consequently, measures to strengthen the social capital of local communities will lead to the improved adoption of sustainable NRM practices.

This report summarizes a novel approach to participatory research (PR) being applied in eastern and southern Africa: "Enabling Rural Innovation" (ERI), a partnership between R&D organizations that links small-scale farmers to markets to improve food security, income and NRM. ERI is a mutual learning process approach for empowering rural communities and facilitating an enabling environment to access and generate technical and market information for improving decision-making and capacity to innovate, experiment, access market opportunities and better manage their resources in a more sustainable manner. More specifically, it links farmer PR, market-opportunity identification and development of technologies for integrated soil and nutrient management, with a focus on women and the poor. This report describe lessons and challenges in implementing this participatory learning and action research through a learning alliance between R&D partners and farmers' groups in pilot sites in Uganda, Malawi and Tanzania.

Methods

CIAT defines rural innovation is defined as "the process by which various stakeholders generate, adapt or adopt novel ideas, approaches, technologies or ways of organizing, to improve on- and off-farm activities, so that the rural sector becomes more competitive in a sustainable manner". In Africa this definition was made operational through the participatory action research project, "Enabling Rural Innovation," which integrates farmer PR and participatory market research (PMR) to improve rural livelihoods. The key steps in implementing ERI are shown in Figure 1. The details of the conceptual framework for ERI are described in greater detail in the paper, "Strategy Document: The Resource-to-Consumption Framework as a Strategy for "Enabling Rural Innovation (ERI)," also in Output 2 of this report.



Results and discussion

This section highlights the results of applying the ERI framework, and discusses the implications for R&D, which include building and managing partnerships, selecting communities and farmer groups, participatory diagnosis (PD) and community visioning; market opportunity identification and community agroenterprise selection; farmer experimentation; promoting gender equity and building social capital, strengthening human capital and scaling up.

Building and managing partnerships

Tim Smith, who conceived the Eden Project (Cornwall, UK), argues that " Innovation is not about hiring an Einstein or creating a slogan. Everybody is capable of it, and the first sign that it is happening is ***when people work together***, excited because they want to be there, focused on finding a solution to a challenge they all understand." (emphasis added)

Table 1. ERI sites and partners in eastern and southern Africa

Countries	Sites	Partners
Malawi	Dedza Ukwe Kasungu	Dept. of Agricultural Research Services (DARS) Lilongwe Agricultural Development Division (LADD) Plan International
Uganda	Kabale Masindi-Hoima Tororo	National Agricultural Research Organization (NARO) Africare Africa2000 Network CashFarm ActionAid Vision for Rural Development Initiatives (VIRUDI) African Highlands Initiative (AHI)
Tanzania	Lushoto Hai	Traditional Irrigation and Environmental Development Programme (TIP) Africa Highlands Initiative (AHI) Hai District Council (District Agricultural and Livestock Development Office) Sanya Agricultural Development Programme
Total	**8**	**14**

Partnerships, a key principle of ERI, are becoming increasingly important for R&D organizations to deliver services to the rural poor and achieve sustainable rural livelihoods. Traditionally the NARS have been CIAT's key partners. With the ERI approach, CIAT has begun to strengthen its partnerships with national agricultural research and extension systems (NARES) in eastern and southern Africa while finding new partners in the NGO sector who have a more development-oriented mandate (Table 1).

Research has shown that investments in building a strong foundation for partnerships can yield significant benefits. It is important to note, however, that partnerships can be challenging and difficult to sustain and manage. A recent literature review indicates that a high proportion of partnerships or alliances either fail or have to be restructured (Gormley,2001). Table 2 shows some of the obstacles to effective partnerships and the steps we are taking to manage them.

Table 2. Obstacles to effective partnerships.

Obstacles	**Steps to Take**
Lack of attention to the process of building partnerships and trust	✓ Discuss potential barriers to partnership openly and establish norms for working together ✓ Be transparent, putting all issues on the table, including the budget, expectations and deliverables) ✓ Avoid even the appearance of withholding information ✓ Decide together how decisions will be made and how resources will be allocated ✓ Ask for input from all partners, listen, don't dominate ✓ Be patient, flexible and willing to do things in different ways ✓ Confront conflicts quickly and directly

Obstacles	Steps to Take
	✓ Clarify roles and responsibilities ✓ Spend time in building social capital
Communication challenges	✓ Have project call meetings at which all partners are present and work together on planning ✓ Hold progress meetings at regular intervals ✓ Agree on communication channels and protocols ✓ Find motivating ways to share information ✓ Communicate successes ✓ If communication weakens, do something positive about it; don't just let it happen ✓ Budget for communication expenses
Overcommitted partner; uncompleted work or missed deadlines	✓ Make extra efforts to achieve realistic resource planning and budgeting ✓ Discuss work plans with key staff to help them determine if they can realistically do the extra work. ✓ Avoid applying pressure to get them to make promises they can't keep ✓ Give reasonable time for the work to be done so that staff can fit it into their work schedules; avoid unrealistic deadlines ✓ Keep in touch with the people doing the work regularly; stay connected with them ✓ Don't over commit yourself! ✓ Build a sense of teamwork and mutual accountability by having periodic meetings
Not enough support for partnership	✓ Involve a senior manager in the formation of the partnership ✓ Report progress faithfully ✓ Keep senior managers informed ✓ Be cautious about making commitments to partnerships that senior managers do not support
Lack of partnership competencies	✓ Build your capacities in partnership ✓ Stay open to learning ✓ Ask for feedback ✓ Invite others to help with more experience on partnerships

Source: Adapted from Gormley, 2001.

To sustain effective partnerships, we maintain regular interactions with partners at different levels, including personal face-to-face contacts, and regular joint visits to field activities. These have included:

- Visit to CIAT HQ for NARES Directors to become familiar with our work
- Needs assessment and planning workshop
- Development of a joint proposal on ERI with the key partners. The proposal received financial support from the Canadian International Development Agency (CIDA) and the Belgian Department of International Cooperation in 2002.
- Project inception seminars and workshops with high-level directors and heads of institutions. In Malawi, for example, the seminar involved the principal secretary of the Ministry of Agriculture, directors of research and extension, and heads of departments. A similar meeting was held in Uganda with the Director General of NARO, Center Managers of agricultural R&D centers, and the senior adviser to the Minister.

- Meetings with heads of department and staff to clarify expectations, discuss roles and responsibilities and implementation strategies
- Regional and national training workshops and capacity-building activities with field-level staff to build necessary skills, understanding of the ERI approach and develop action plans
- Negotiation and signing of partnership agreements and memoranda of understanding, clarifying roles and responsibilities of each partner
- Regular meetings and field visits to develop operational work plans, activity schedules and milestones
- Annual review and planning meetings with field staff, heads of departments and institutions
- Regular communication, sharing of documents and reports, field visits, face-to-face contacts
- Credit sharing and recognition: CIAT has an institutional culture that gives due credit and recognition to national partners and collaborators. The ERI partnership won the GFAR 2003 merit award, presented by the Global Forum for Agricultural Research (GFAR) for the best poster on successful partnership in agricultural research for development. Similarly, TIP, on behalf of other partners, is presenting a poster at the Innovative Market Place at the CGIAR Annual General Meeting (AGM03) in Nairobi, Kenya.

It is important to note that this interactive and iterative process was instrumental in getting buy-in and support from high-level management and ensuring ownership of the process by the field staff at the onset of the project. Because of the different types and nature of partnerships involved in ERI, understanding and strengthening effective partnership between research and development organizations and other rural service providers have become an important project output and research area.

Selecting pilot communities and farmers' groups

ERI is being implemented with 19 farmers' groups and communities in 8 pilot countries (Table 3), with close to 1000 farmers. The selection of these sites was a result of discussions with partners, field visits and community meetings in potential sites. In selecting pilot sites, the following questions were addressed:

- Is there a real potential for working in this community? (agroecological and socioeconomic conditions, accessibility)
- Are there issues that the majority of farmers consider important enough to commit their time and resources?
- Is there a good potential for scaling out to nearby villages?
- Are there active groups, local social organizations or farmers working together to try and find solutions to problems?
- Are there other development organizations working in the community or willing to work in the community and that can commit resources (human, financial, physical)?
- Is there an active extension or development worker with sufficient motivation and skills (or willing to learn) to be a community development facilitator?
- Is there potential for empowering women and promoting gender equity?
- What is the potential for adding value in current production activities? What are the research issues?

- Is the partner willing to commit resources to meet some of the expenses within the project?

Table 3. ERI sites and groups.

Countries	Communities/Groups	No. Farmers
Uganda		
Kabale	Muguli B	47
	Karambo	57
	Nyabyumba	25
	Nyakibande	32
Tororo	Katamata	25
	Awanya	30
Masindi	Katwemukye	21
	Wekambe	25
Tanzania		
Mtae	Dindira Water User Group	50
	Tema-Kelenge	210
Hai	Kware	24
	Sanya Juu Village	12
Lushoto, Shashui	Mzungu A	23
	Kilindi	27
	Kwemashai	23
Malawi		
Dedza	Yazini	37
	Mthala	135
Ukwe	Katundulu	40
	Gwile	57

There was no blueprint for selecting communities or groups. In some pilot sites, we are working with the whole community in a more inclusive process; while in others, we made an effort to build on existing groups or organizations rather than creating and forming new ones. The main features of the selected groups include:

- Regular meetings
- Record keeping. Records are very important monitoring and evaluation tools for the group
- Constitution and by laws (rules and regulations). This helps the group manage internal conflicts and make the responsibilities of each member clear.
- Leadership. Leaders should be committed members who are chosen carefully and who have essential leadership characteristics with a sense of altruism.
- Resource mobilization. Regular group savings and contributions are essential for group performance. Members' contributions to their group activities help build a sense of group ownership and solidarity.
- Effective horizontal linkages within the community and vertical linkages with service providers
- Diversification of activities (implementation of production-oriented activities)
- Self-initiated activities
- Group size (not too large groups)

- Social capital (relations of trust, cooperation, norms, sanctions, social interactions, group dynamics and collective action)

Not all of the communities meet the established criteria, but show good potential for strengthening group development. In some cases, we intentionally select "weak groups" or "weak communities" in order to strengthen them so that they can become more active and successful. Strengthening the organizational capacity of groups and communities is a key ERI objective, which requires commitment and skills in managing social processes and group dynamics.

Participatory diagnosis building on community assets and opportunities

ERI uses PD as a highly interactive process for establishing dialogue and engaging with farmers to stimulate collective analysis and better understanding of community livelihood assets, opportunities and strategies as a basis for developing community action plans to improve livelihoods. The process has a strong element of connecting with participating communities to create a process for learning and empowering rural people to be agents of their own change. An important principle of this approach is that it starts with an analysis of strengths or opportunities, rather than needs, problems or constraints. It implies recognition of the community's inherent potential and ability to use these opportunities to achieve better livelihoods.

PD focuses on facilitating community visioning to help people think in terms of long-term vision, beyond the immediacy of daily problems. A typical visioning question asks: *What changes would you like to see in the next five years? What would you like to achieve in the next 5 years?* The different visions expressed by the different groups are then matched with the ERI objectives and strategies to find common ground and develop action plans with rural communities. In facilitating action plan development, force field analysis tools provide ways of generating a shared vision of a future livelihood outcomes and an agreed strategy for achieving the livelihood outcomes. Development of the action plan uses the change formula below:

$$SCE = D \times V \times S_{fs} \times B$$

Where **SCE =** success of a change effort; **D** = dissatisfaction with current condition; **V** = vision of desired future condition; **S** = steps and **fs** = first steps and **B** = belief in the success of the effort.

All the pilot communities have developed action plans based on their vision of future conditions, specifying activities and first steps in relation to the key components of the ERI approach: community enterprise development, farmer experimentation, gender and group dynamics. Effective proactive facilitation skills are used to ensure that concerns and priorities of marginalized groups such as women and the poor are not neglected. The action plans developed during the PD process are regularly revisited and refined at a later period after farmers have gone through the PMR**.**

Identifying market opportunities and selecting community agroenterprises

Over the past two years, ERI has been implemented in eastern and southern Africa to test, adapt and disseminate a territorial approach for identifying market opportunities and building profitable agroenterprises (Best, 2000; Ostertag, 1999). The selection of options for generating income requires collecting information that will help the farmer make decisions appropriate to his/her situation.

These enterprises were selected after market and enterprise visits where the income group or market committee is facilitated to conduct PMR to find out information on varieties and types of products that are in high demand and which they think they could introduce to their area, either now or in the future. The final selection of options is undertaken in the presence of the whole community when the market research group presents the results of the market and enterprise visits, production costs and the prices they can expect when they sell. An evaluation of the different options, including cost-benefit analysis and other benefits that the option can bring to different groups, is made for farmers to select the enterprise options with which to start.

Table 4 summarizes the different enterprises and food security options selected by different groups. It can be seen that farmers tend to select existing crops (beans, peanuts, potatoes) and small livestock (goats, pigs, poultry and rabbits) for market-oriented production. After PMR, however, farmers are beginning to select relatively new enterprises as well. For **example, in** Lushoto farmers selected zucchini, a new crop in their communities; while the groups in Kabale decided to develop their enterprise around pyrethrum **(*Chrysanthemum cinerariaefolium*).**

Pyrethrum is a perennial crop whose flowers are used to extract pyrethrin, used to make a natural insecticide for household insect pests. The demand has continued to grow in the world market as a more environmentally friendly insecticide for household use. Pyrethrum is a relatively new cash crop in Kabale district with a good potential for providing regular income to resource-poor farmers, especially women. In most cases the area occupied by pyrethrum averages 0.06 to 0.25 ha, and the crop is often grown without additional inputs. Agro Management, a private company, began processing pyrethrum in Uganda in 1993. The pyrethrin-extraction factory now draws on harvests from about 525 ha of local farmland, providing work for 10,000 people. Yet this corresponds to only about one-third of the plant's operating capacity. Thus there is a good opportunity to develop pyrethrum as a profitable, income-generating enterprise.

Although some farmers had heard about it, the crop was not grown in the pilot communities so they did not have information on its agronomy and marketing. During the PD process, pyrethrum was selected as a potential new income-generating crop. During the PMR process farmers visited Agro Management and pyrethrum farmers in other communities to collect market information. Pyrethrum was evaluated against other options such as coffee, potatoes, pigs, chickens and beans, and was finally selected because of its low investment cost, guaranteed market and regular income. In addition, because pyrethrum is typically grown in high altitudes, farmers saw an opportunity to use their hilltops, which are usually abandoned land. There were also some other criteria such as an opportunity for bringing back more men into agricultural production by providing them with an income generating crop with the hope that they will also contribute to other agricultural activities. However, the market of pyrethrum was limited to only

one buyer, Agro Management, which purchases pyrethrum flowers from registered farmers on a monthly basis.

Farmers in the two communities were well aware of the financial risks of dealing with a single local firm that currently has only one large client. It was not long before Agro Management experienced serious financial and marketing problems, leaving the company unable to pay farmers for the flowers. Despite this case of market failure, farmers' decisions and reaction on whether to stop or to continue with the enterprise are mixed, as expressed by farmers in the two pilot communities:

"There is no business without risk. We'll try something else if there is no market for pyrethrum." We are happy to have started with research before going into mass production. This has saved many farmers from losing a lot of money, land and labour. We have learnt that it is better to start on small scale before expanding." "We know that development and income generation are processes that don't happen overnight. Despite the hardships and risks, we're all ready to forge ahead and make a go of it."

These local distortions and market failures were dealt with through farmer experimentation on a collective learning plot that helped minimize risks to individual farmers. The farmers are now looking for alternative enterprises and have acquired sufficient capacity to evaluate market opportunities, select enterprises and conduct experiments before expanding to larger areas.

Table 4. Community agro enterprises and food security options selected by farmers' groups in the pilot communities.

Country and Site	Enterprises Selected	Food Security
Uganda		
Kabale,	pyrethrum, eggs	common beans
	potatoes, goats	beans
Tororo	beans, peanuts	beans, maize
		beans maize peanuts
Hoima	onions, mangoes, pigs	beans sweet potatoes
Tanzania		
Hai	Beans sunflower garlic tomatoes	beans maize
Lushoto, Shashui	tomatoes, beans, zucchini, red peppers	beans
Malawi		
Dedza	goats, beans, rabbits, pigs	potatoes

Country and Site	Enterprises Selected	Food Security
		beans
Ukwe	pigs, goats, beans	Cassava potatoes

A new phase in the process of developing integrated agroenterprises around potatoes started in Kabale, where farmers were linked to a major fast food firm in the capital city. This phase required a much more detailed analysis of the chain of actions and actors involved from production through marketing. The process of designing integrated agroenterprise projects is being expanded in a market facilitator manual which is being developed on the basis of the collective experience of all project partners and stakeholders.

Among the lessons learned, it is essential to build a clear sense of ownership of the process by farmers and build local capacity to identify, evaluate and select market opportunities. Farmers' experimentation proved to be critical in minimizing risks against market failures, even for existing crops and markets. Farmer experimentation also provides a balance between enterprise options and food security.

Farmer experimentation/Farmer Participatory Research

Enhancing farmers' technical skills and research capabilities and involving them as decision-makers in the technology-development process are cornerstones of ERI. Farmers' experimentation results in innovations that are more responsive to their priorities, constraints and needs. Farmer experimentation is linked to the PMR process described above. After the PMR process and selection of enterprise options, farmers are helped in the process of identifying potential constraints that research or experimentation can address for improving the profitability of the selected enterprise option. This process leads to the design and planning of experiments that farmers decide to implement, manage and evaluate.

One of the key constraints to crop productivity and to increasing profitability across sites was identified as declining soil fertility. In addition to varietal evaluation and selection, farmers' experimentation focuses on integrated soil fertility management practices such as:

- Management options better suited to different soil conditions (poor soils, acid soils, different locations within the landscape
- Crop requirements, where on the slope can it be grown
- Pests and diseases
- Appropriate use of organic/inorganic materials for soil fertility improvement
- Management options aiming at optimal use of legumes in combination with strategic applications of mineral fertilizers to maximize nutrient cycling and soil organic matter replenishment
- Appropriate niches for legume for soil fertility improvement and erosion control
- Testing and evaluation of forage legumes

The experiments are usually established on a group plot for collective learning. The treatments are selected through a negotiation process between farmers and researchers, with researchers providing technical information and suggesting additional treatments. In Kabale, for example, the community selected 12 treatments [farmyard manure, legumes, soil erosion control measures, *marc* compost (pyrethrum residue), agricultural lime, wood ash and organic and inorganic fertilizers], which were established in each village. At the end of this season, participatory evaluations of technologies were conducted with farmers in Muguri B and Karambo.

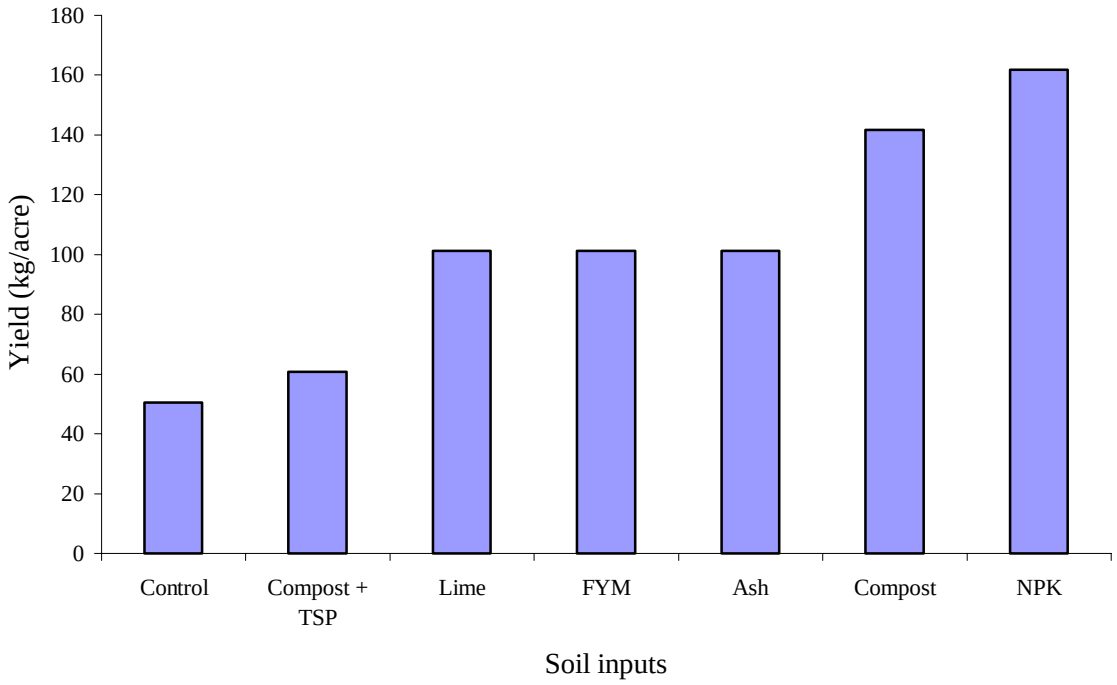


Figure 2. Effect of soil input to pyrethrum flower yields

Although agronomic results showed that the NPK treatment gave the highest yields compared to the other soil inputs (Fig. 2), farmers ranked compost manure highly because of inaccessibility (cost and availability) of fertilizers and agricultural lime. However, transporting manure up the hill is labor intensive and expensive. Farmers argued that with proper management practices (weeding, pruning, timely harvesting), pyrethrum could do as well with no soil inputs in fertile soils. In addition to the pyrethrum experiment, farmers are also testing different legumes and grass species for controlling soil erosion through stabilizing the trench bunds (embankments).

These are being evaluated at specific intervals.

Promoting gender equity and empowerment of women

Gender and equity are of central concern in all the stages of the ERI process from selecting communities and groups, forming committees, conducting PD and community planning, identifying and selecting market opportunities, farmer experimentation and capacity building. The PD process specifically uses gender-sensitive participatory tools to bring gender issues to the forefront and to create awareness on gender issues in a more systematic manner. These tools include gender-sensitive resource mapping, seasonal and activity calendar, daily activity routine, and various preference ranking methods. Proactive strategies and gender-sensitive facilitation skills are used to encourage women's participation in community meetings (including separate groups of men and women), and to generate a collective analysis of gender relations and dynamics within the community or groups. As a result, in several communities, gender goes beyond division of roles and responsibilities between men and women or encouraging women's participation to develop specific action plans to deal with gender awareness education, group dynamics, nutritional education, HIV/AIDS awareness and education, and supporting women-specific initiatives.

The project has a strong focus on supporting women to identify specific agroenterprises that enable them to use available agricultural technology to their own advantage. Both men and women are encouraged to identify options that can benefit everyone. In Kabale, both men and women selected pyrethrum as an enterprise option. A survey of pyrethrum growers showed that more than 40% of the farmers are women, and many female pyrethrum producers are organized into groups. In addition to pyrethrum, the women also selected poultry (local hens for egg production), which is in their domain. Similarly, in Tororo beans and peanuts, both women's crops, were selected for enterprise development. In Malawi, communities have selected beans and small livestock, which are traditionally managed by women. On the other hand, in Lushoto, the majority of farmers involved in zucchini production are men. There are concerns that women's labor may be used to produce the crop, while men will take over when marketing to control the income. Experience and previous studies on intrahousehold gender dynamics elsewhere in Africa have shown that when a crop enters the market economy, men are likely to take over from women, and that women do not benefit from market-oriented production (Quisumbing et al., 1998; Kaaria and Ashby, 2001) .We are closely monitoring intrahousehold gender dynamics as the project progresses as this will be a key aspect of our research areas. Proactive strategies are an integral part of the ERI process for promoting gender and equity, and empowering farmers. The activities included:

- Increasing gender awareness through community drama and community meetings
- Training workshops for scientists to enhance their ability to integrate gender analysis in agricultural research
- Enabling both men and women farmers to evaluate a diverse range of crop and soil fertility management technologies
- Participatory approaches to support women's empowerment and leadership at the community level are integrated as part of the strategy, creating and facilitating forums where women can discuss their livelihood concerns.
- In addition to including women in all project activities, proactive strategies are used to help women identify specific agroenterprises and enable them to use available agricultural

technology to their own advantage. Farmer experimentation maintains the balance between enterprise options and food security.
- Assisting men and women farmers to build assets, particularly small livestock (poultry, goats, rabbits), which are usually managed by men.

Some of the gender outcomes include:

- Women have gained confidence as expressed in the following statement: *"We women participate in the work just as the men do. Although I was a little shy at first, I am now supremely confident in my ability to accurately document the work of our group."*
- Women constitute the majority of community and group members. At all the sites, representation and participation of both men and women in the committee are clearly important criteria when selecting farmers. They are equally well represented on all the committees and some in leadership positions. For example in Ukwe, about 50% of all the committee members are women.
- In Uganda, it was reported that male members of the group are actively taking part in farming activities, compared to nongroup members. Similar observations were made in Malawi.
- We are finding that farmer research groups proved to be a more effective mechanism to involve women and resource-poor farmers in research.
- There is a strong and growing sense of community spirit, cooperation, trust and mutually beneficial collective action in the pilot communities and groups. Farmers have also acquired increasing confidence.

Although considerable progress is being made in promoting gender equity and women's empowerment, it is important to recognize that addressing gender relations is a long process that requires commitment and effective facilitation skills. There is still a need for a better understanding of the likely implications of market-oriented production to assess the distributional effects and equity of benefits, especially gender dynamics, which we need to consider in developing enterprises and to determine when farmers will actually capture significant market opportunities.

Strengthening human and social capital

Creating a critical mass of scientists and development partners is crucial for both enabling rural innovation and scaling up the ERI process. Over the last 2 years, we have conducted over 10 workshops, reaching more than 200 R&D partners to enhance their skills of our partners to implement an ERI process effectively. Our capacity-building strategy is based on five main approaches:

- Introductory training. A typical introductory workshop lasts for 12 days, which is kept flexible for contextual adaptation. The workshop covers facilitation skills, ERI principles and concepts, PDs and community visioning, PMR, building and managing partnerships, gender analysis, farmer experimentation, participatory evaluation of technologies and strategies for scaling up.

- Follow-up workshops review, refine and develop feasible action plans and activities as well as come up with refreshing concepts, approaches, process, tools and skills.
- Action learning. A stepwise process of learning (implementation in the field – analysis – learning – implementation) is adopted, with feedback from the analysis of each stage, enabling modifications to be made. Systematic feedback and analysis are undertaken on the appropriateness of the methods and tools in different situations.
- Mentoring. Field mentoring and coaching are also powerful tools for building capacity of partners in FPR/PMR.
- Training manuals. Because the demand for training and expertise in ERI is increasing in the region, we are developing a series of training guides and facilitators' manuals for integrating FPR and PMR in sub-Saharan Africa.

We anticipate considerable expansion in the demand for training of partners and other NGO staff in ERI process (several requests have been already received and are increasing). Identifying other agencies working with communities and that have an interest in stimulating community innovation and in learning from their experiences will help create a critical mass of agencies. We are pursuing a learning-alliance type of partnership with Participatory Ecological Land Use Management (PELUM), a consortium of over 150 NGOs in eastern and southern Africa to build the capacity of some selected members who can then take on training responsibilities of other NGO members in the region.

At the community level, we are strengthening the organizational capacity and social capital of local communities through training and facilitation of leadership skills, group dynamics, consensus building and negotiation skills for managing conflicts, with attention to NRM. ERI also facilitates horizontal and vertical linkages among communities, and between pilot communities and rural service providers. Farmers in pilot communities have improved their analytical skills and participation in mutually beneficial collective action as well as in local policy formulation and implementation. They have been instrumental in initiating community bylaws for soil and water conservation, and have established strong links between farmer research and market groups and the rest of the community. Nevertheless, it is possible that with the new market orientation, conflicts may emerge between farmer market groups and the rest of the community over distribution of benefits and participation in research or market groups.

To scale up its impact, we are developing a strategy at different levels from local communities to national and regional levels. This strategy defines the different levels for scaling out and scaling up, the objectives and targets at each level, the strategic partners to be involved, and the specific activities that are needed to achieve the set objectives. For greater details on this strategy, see "Developing a scaling-up strategy for "*Enabling Rural Innovation*," also under Output 2 of this report.

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Developing a collaborative PME research project with the Kenya Agriculture Research Institute: Summary report

Research: *Susan Kaaria*[4]

This meeting aimed to identify potential areas for developing collaborative research activities focusing on strengthening participatory monitoring and evaluation (PME) processes to support adaptive/participatory research programs. It was expected that the results of the workshop would lay the groundwork for developing concrete activities and future plans.

The specific objectives of the workshop were to:

- Discuss the scope of monitoring and evaluations (M&E) systems in supporting learning within R&D institutions
- Share experiences and lessons learned from existing Participatory Monitoring & Evaluation (PME) systems
- Identify opportunities and challenges of establishing and supporting PME systems and identify critical issues in the development of a comprehensive PME system
- Discuss potential strategic areas for M&E technical backstopping and support to strengthen existing systems
- Share and discuss a proposed regional (Kenya and Uganda) project that aims to support and strengthen both participatory and formal M&E systems within R&D institutions

Participants

The participants were from Kenya Agricultural Research Institute (both from KARI HQ and from the Regional Research Centers (RRCs) – Kisii, Kitale, Kakamega, Embu and Mtwapa) and two NGOs (Environmental Action Team, EAT; and Community Mobilization Against Desertification, CMAD).

Issues covered during the meeting

- Scope of both participatory and formal M&E systems in supporting the institutional change processes
- Role of an M&E System in supporting adaptive/participatory research programs from a KARI perspective
- Sharing experiences and identifying opportunities and challenges of implementing PME systems
  - ✓ The case of the FFS PME system
  - ✓ African Highlands Initiative (AHI) example
  - ✓ Community-based PME systems
  - ✓ Presentation of proposed project objectives and output
  - ✓ Identification of opportunities and challenges of establishing and supporting PME systems
  - ✓ Discussions on future collaborative activities

[4] Senior Research Fellow, Rural Innovation Institute, CIAT-Africa, PO Box 6247, Kampala, Uganda.

Results: Common areas for collaborative research activities

There was agreement within the group that this project was opportune and was going to strengthen and add value to new and ongoing activities within adaptive research projects in KARI. The results of these discussions were systematized to develop some specific outputs and activities for the project. These ideas were developed during discussions throughout the day as the group tried to identify ways in which to make the proposed project build on and benefit ongoing activities and processes.

During the discussions it was clear that PME would have to be developed at different levels (Fig. 1). Additionally, there was a lot of discussion as to the importance of developing mechanisms to harmonize M&E systems at these different levels and to systematize the information.

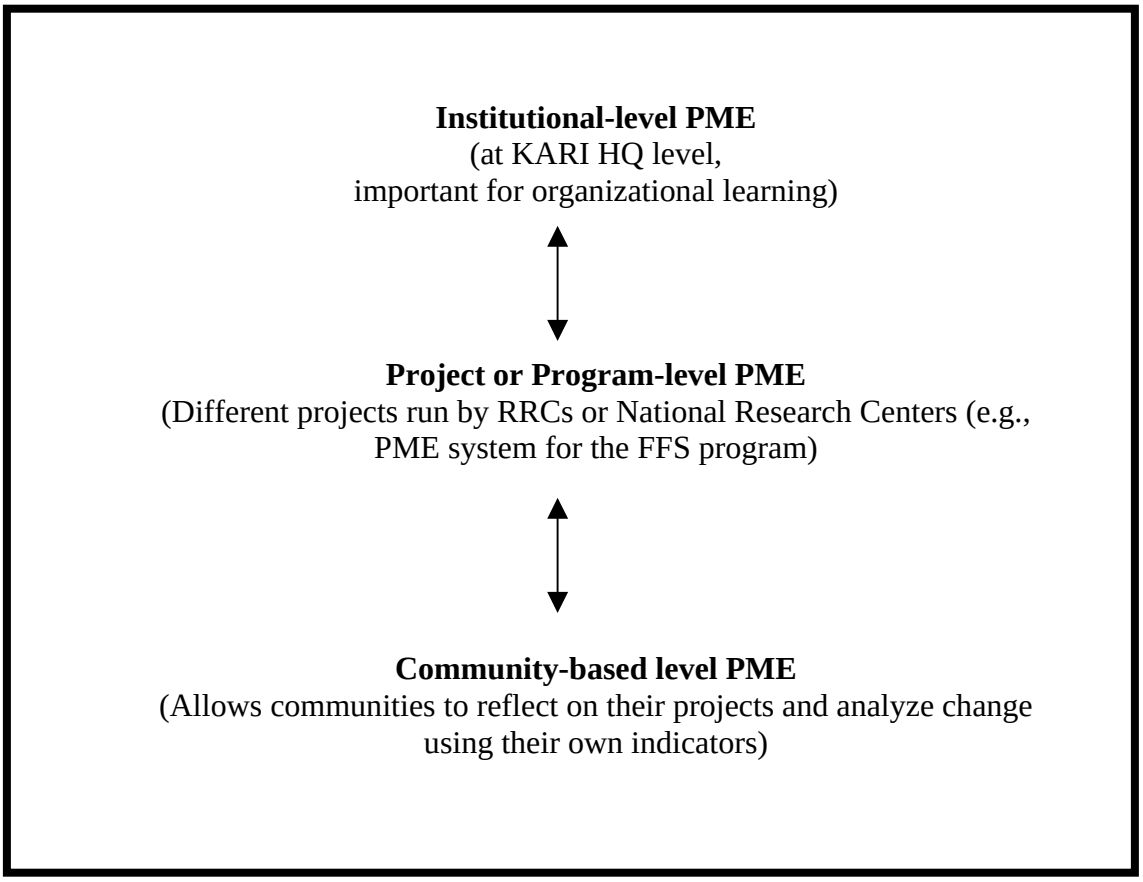

Figure 1: Different Levels of M&E Systems

Establishing and supporting PME systems in adaptive research projects and at community-based level

This component of the project would be mostly targeted at project and community levels and would work directly with the RRCs, NGOs and community-based organizations (CBOs). This component will be implemented immediately.

- ***Lessons from existing PME systems, analyzed and systematized***

  - Conduct an inventory of M&E methods being applied by different organizations and within the RRCs
  - Conduct a SWOT analysis of existing approaches
  - Participate in forthcoming M&E workshop being organized to share experiences in June 2003 to understand ongoing processes
  - Identify critical issues, opportunities and gaps in existing PME systems
  - Document lessons and experiences in PME "best practices"
  - Conduct a workshop to share results

- ***Potential sites for initial pilot cases, identified and selected***

  - Initial sites will include RRCs with a good history of FPR (5 RRCs and NGOs)
  - Embu, Kitale, Kisii, Mtwapa and Kakamega; EAT and CMAD
  - Conduct sensitization meetings at each RRC to evaluate interest and identify projects that will be involved in the PME
  - Select the different case studies based on several criteria:
    - ✓ Case studies where PME can be integrated as part of an existing R&D project
    - ✓ Cases that offer a diversity of experiences: a new project, an existing one, or one with an existing PME project
    - ✓ Identify ongoing projects where PME is needed
    - ✓ Identify projects with an existing PME system already incorporated into the project
    - ✓ Identify new projects where PME can be integrated from the onset
  - Conduct a larger stakeholder meeting that would start creating awareness of PME within R&D organizations (link with the June meeting on PME)

- ***Capacity of partners to establish and support PME systems, strengthened***

  - Conduct series of training and follow-up workshops to build capacity of scientists in establishing and supporting PME systems at two levels: (a) community and (b) adaptive research projects. Capacity building should include the following topics:
    - ✓ Identification of different stakeholders and their roles in the PME process (including farmers and other community members).
    - ✓ Strategies for developing appropriate qualitative and quantitative indicators
    - ✓ Integration of both qualitative and quantitative aspects (land size, yields, different measures)
    - ✓ Capacity building for data analysis in PME at different levels

- ✓ Synthesis of PME data to facilitate its use for decision-making at different levels and to provide feedback and learning
- ✓ Development of simple tools that can be easily applied in the field with communities and by project staff

➢ ***Development of an applicable PME system at project and community levels***

- Develop PME guidelines and key principles
- Develop general frameworks that can be adapted across projects/ technologies
- Establish mechanisms to ensure that frameworks and guidelines are applied
- Develop framework for integrating PME systems at different levels
- Develop strategies to harmonize different PME approaches within KARI
- Build in process for continuous evaluation and adaptation of the PME systems
- Build process of continuous reflection into the PME process to identify challenges and opportunities
- Design a database system to organize and systematize the microdata collected by PME processes

➢ ***Scaling up to other projects within the centers***

- Conduct biannual workshops to share and systematize experiences
- Develop mechanism for establishing effective linkages among the different PME systems to allow the agile flow of information and feedback between rural communities and R&D systems
- Develop mechanisms to systematize PME data and to put data/information into a form where it can be communicated
- Develop a core team of scientists within NARS that can train trainers in PME systems.

Local perceptions of poverty: The case of the communities of Kanko, Tabla Mayu and Primera Candelaria in the municipality of Colomi, Bolivia

Researchers: *Edson Gandarillas Ch.*[5], *Juan Almanza*[6]

Background

The Bolivian System of Agricultural and Livestock Technology (SIBTA) is in the process of being implemented through four Foundations for the Development of Agricultural and Livestock Technology (FDTA), distributed in function of macroregions: the Highlands, Valleys, Chaco and Humid Tropics.

During the last year, the market of technological innovation in Bolivia has been dynamized through the FDTAs. They have begun to put out tenders for the Applied Innovation Technological Projects (PITA), the demands created by these entities are beginning to be responded to, and the suppliers of technology are beginning to work in them.

On the other hand, there are initiatives aimed at improving the process of identifying technological demands (through ATICA, INNOVA, etc.), by incorporating the farmers in agricultural research processes (through the CIALs), improving the strategies of agricultural training (through the Farmers Field Schools), and implementing pro-poor processes. All these efforts are being implemented with the purpose of improving the current innovation system in Bolivia.

In this sense, the project for "¨Promoting Changes (FoCam) is contributing to the adjustments of SIBTA, carrying out a series of investigations that incorporate mechanisms of Participatory Monitoring and Evaluation (PME) within the setting of the Applied Technological Innovation Projects (PITA), suppliers of technology, but primarily at the level of the demandants of technology (developing their capacities, especially of the poorest).

Objectives
In this context, research is being implemented to pursue the following objectives:

- Evaluate the effects and impacts (social, economic, methodological and technological) of the application of participatory research methodologies (CIALs) within the communal context and their interactions with the local social organization (sindicatos and centrales campesinas) and the local government (municipalities)
- Determine and analyze the effect and impact (social, economic, methodological and technological) of the application of a PME system within the context of interactions among the demandants, suppliers and FDTA (PITAs).

[5] Coordinator, Project IPRA - FoCam, Bolivia.
[6] Technician, PROINPA Foundation, Bolivia.

This document presents one of the first tasks that was carried out to develop the first objective of the research. It provides details on the local perceptions of three communities from the municipality of Colomi in Cochabamba, Bolivia. The objective of the document is to identify the perceptions on poverty of farmers from the communities of Kanko, Tabla Mayu and Primera Candelaria.

Methodology

Diverse authors (Grandin, 1988; IIED, 1992; Scoones, 1988) have reported different ways of classifying well-being, such as the classification of cards, group discussions and the making of maps that indicate the social condition.

The methodology used in this work was proposed by Ravnborg (1999), based on the identification of levels of well-being through the local perceptions of the farmers using the following ten methodological steps

- Definition of the communities to be studied, based on the requirements of the research
- Definition of the classification units in accordance with the research objectives
- Make a list of the families in the community (in the case of Bolivia, the list of the affiliates of the sindicatos of the communities
- Identification of key informants based on previous interviews with the local authorities in order to identify the people who know the families in the community best
- Identify local terms of well-being, through informal interviews in order not to bias the information from the farmers
- Explanation of the purpose of classification of the families based on well-being (to be done in work with key informants; the objective of the work should be made quite clear so that the data provided are valid)
- Classification of the cards, separately, for each of the key informants
- Description of the piles of cards at the end of this process)
- Record the classification (office work)
- Identification of the average categories of levels of well-being

Results and Discussion

Communities studied

The communities of Kanko, Tabla Mayu and Primera Candelaria, belonging to the municipality of Colomi, Province of Chapare in the Department of Cochabamba, Bolivia, were selected. The criteria for identifying the communities were as follows:

- Existence of CIALs
- Members of the subcentral campesina of Candelaria
- Target communities of the FoCam project

Classification of levels of well-being

- ***Community Kanko***. Table 1 gives details of the levels of well-being identified with three key informants from the community. Four levels were established: wealthy, less wealthy, poor and very poor. The community has 66 families, of which 12% belong to the "wealthy" category, 53% to the "less wealthy," 27% to the "poor" stratum and 8% to the "very poor."

Table 1. Levels of well-being in the community of Kanko.

Levels	Criteria
Wealthy	5-6 ha of land Land in Corani Houses in Colomi House made of brick House in Sacaba Land in Chapare Nissan Cóndor truck and taxi 10-15 cows 15-30 sheep 3 pigs 1-2 horses Chickens Ducks
Less wealthy	2-3 ha of land House in Colomi House of adobe Pick-up trucks 5-8 cows 10-20 sheep 1-2 pigs
Poor	2 ha of land House of adobe 2 cows 5-8 sheep
Very poor	0.5-1 ha of land House of adobe 1-3 cows 1-3 sheep 1 pig a few chickens day laborer

The perceptions that determine the levels of well-being in the community are owning land, availability of vehicles, owning a house, owning cattle (cows), owning minor species of animals (sheep, pigs, poultry).

The levels “poor” and “very poor” are also characterized by living in the community, while the other levels usually have houses in the nearest town (Colomi) or in the city of Cochabamba. The poor levels have agriculture as their main source of income; whereas the other levels have other income that is not necessarily agricultural in nature. It should be noted that the poorest stratum work as laborers in the community.

Community Tabla Mayu. Table 2 provides information on the levels of well-being identified with three key informants from the community. Three levels were established: rich, fairly rich and poor. The community has 38 families, of which 13% belong to the “rich” level, 32% to the “fairly rich”, and 55% to the “poor.”

The perceptions that determine the levels of well-being in the community are owning land, availability of vehicles, owning a house and owning cattle (major and minor species).

The level “poor” is characterized by living in the community, which is different from the other levels that usually have housing in the nearest town (Candelaria) and in the capital of the province, Colomi (fairly rich) or the capital of the Department in the case of the rich. The poor have as their main source of income, agriculture; while the other levels have other sources of income that are not necessarily agricultural in nature. It should be noted that the lowest stratum work as day laborers in the activities of the community and as cargador at the Colomi fair.

Table 2. Levels of well-being in the community of Tabla Mayu.

Level	Criteria
Rich	3-4 ha of land Land in Corani House in Sacaba House in Colomi Houses of good material (brick, calamine, cement, tiles, stucco, glass windows) Mobility (Nissan Cóndor truck, pick-up truck and taxi) 5-10 cows **8-15 sheep** 2 pigs Chickens
Fairly rich	2 ha of land Houses of adobe (Candelaria and Tabla Mayu) 2-5 cows 5-10 sheep 1 pig

Level	Criteria
Poor	0.5-1 ha of land Small house of straw and stone 2 cows 2-5 sheep No pigs or chickens Works as day laborer or cargador at the Colomi fair

Community Primera Candelaria

Table 3 gives the levels of well-being identified with three key informants from the community of Primera Candelaria. Three levels were established, grouped as "those who have the most", "those who have" and "those who don't have." The community has 62 families, of which 48% belong to the level "those who have the most," 24% to those who "have" and 27% to the stratum "do not have."

Table 3. Levels of well-being identified in the community of Primera Candelaria.

Level	Criteria
Those who have the most	10-15 ha of land Land in Corani Land in Chapare House in Colomi House in Sacaba Mobility (Nissan Cóndor truck, pick-up truck and taxi) 8-10 cows 10-15 sheep 5 pigs 2 horses Poultry (chickens and ducks)
Those who have	8-10 ha of land House in Colomi 4-7 cows. 5-10 sheep 2 pigs 1 horse
Those who don't have	Fewer than 4 ha of land 1-3 cows 1-4 sheep Live on small plots inherited from their parents Do not have pigs, chickens or ducks

The perceptions that determine the levels of well-being in the community are ownership of land, availability of vehicles, ownership of houses, ownership of major and minor animal species.

The "does not have level" is characterized by those people who have inherited small lots of land on which they live. Their income comes from farming. The families in the "have" level are characterized by having major and minor animal species, and two houses—one ***in*** Primera Candelaria and the other in Colomi. Finally, "those who have the most" own the largest surface of land, three houses (one in the town, another in Colomi and one third in Cochabamba), cattle and minor species, and vehicles.

Conclusions

The criteria of well-being in the three communities are repeated. Basically, the criteria that define the levels are: amount of farming land, land ownership number of houses, owned and number of cattle and minor species owned and model and vehicle and the definition of income by labor force.

The source of income also defines the level of well-being. If farming is the principal source of income in the family, the level of well-being will be in the lower levels of well-being in the community. On the other hand, if the main family income is not farming, for example, transportation, the family has a greater probability of being in the higher levels of well-being of the community.

Of the three communities, Tabla Mayu and Kanko have the largest percentages of families considered to be poor. This is posibly due to their greater distance from the town (Colomi) and therefore a lower possibility of nonfarming activities.

The results of the well-being levels will constitute another criterion for identifying case studies that try to assess the effects and impacts of the CIALs work on the poor members of the communities.

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Mechanisms for self-financing in community-based research services (CIALs)

Researcher: *Juan Camilo Cock*[7]
Collaborators: *José Jiménez*[8]*, Juan Almanza, Fausto Merino*

Abstract

The CIALs are groups of farmers elected by the community to do research and try to solve certain local problems. This article synthesizes the results of extensive research on mechanisms for self-financing that the CIALs are promoting. The mechanisms with which the CIALs finance some of the costs of their research and other production and social activities are documented, as well as how they function. One conclusion is that all CIALs finance their trials partially in kind, through their contributions in labor and land for the trials. Some groups have developed more complex mechanisms for generating and administering resources. These are important steps toward reaching self-sufficiency; however, the CIALs are far from being able to finance all their current costs if the costs of training and technical assistance are included. Finally, some recommendations are made for continuing with the study and promoting self-financing mechanisms in the CIALs.

Introduction

The CIALs are formed by groups of farmers elected by the community to conduct research on local problems related to farming. The CIAL methodology was developed in Colombia by a team of facilitators from the International Center for Tropical Agriculture (CIAT). It has now been disseminated throughout Latin America (Ashby et al., 2001), with groups of farmers doing research in Bolivia, Ecuador, Honduras and Nicaragua and Venezuela. This has been possible because the methodology has been favorably received in various projects and entities in these countries in search of ways to include the farmers in the formal research processes. However, the projects have set time limits, and the entities have changing priorities. Even those who have a long-term commitment with the CIAL methodology have to diminish their support to the oldest groups in order to form new ones. This means that the CIALs will gradually and in some cases, suddenly, lose the support of the entities and projects. Thus, if these groups are to have continuity, it is necessary to identify mechanisms that permit them to become independent from the entities and projects that helped form them. This does not imply cutting the relations with them; but at that time, the entities should not accompany the CIALs to see whether they have the capacity to continue functioning and doing research on their own. To accomplish this the groups need to achieve independence or self-sufficiency in several fields. On the one hand, they have to have the capacity to design and carry out experiments in such a way that they can identify solutions adequate for their needs. Knowing how to conduct experiments is not sufficient. The group needs a leader and the willpower to keep on with the experiments once there is no technician or agronomist motivating the group. Perhaps one of the most critical points is that the CIALs also have to be able to generate the resources required to finance their trials.

[7] Consultant, SN3 Project, CIAT, Colombia
[8]Researchers asistant, FIPAH, Honduras; PROINPA Foundation, Bolivia, INIAP, Ecuador

There is a general need for local organizations to seek alternatives to the external financing of projects to obtain the resources necessary for their functioning. At present there are diverse ways in which the local organizations can gain access to resources. The transition toward some of these options is important if they are to become more sustainable and more firmly anchored in the local community (Wheatley, 2003). One of the options for obtaining resources is that the organizations themselves generate them through different activities. In Latin America there are many documented cases of local organizations that have very effective mechanisms for generating resources (Cock, 2003a; FIDAMERICA 1996, 1999, 2000; Wheatley, 2003). Among those cases there are small businesses, cooperatives, microcredit institutions and NGOs.

Given that their primary objective is research, the CIALs have not been oriented toward this type of activity. To ensure their sustainability, however, it is necessary that these groups begin to generate the resources necessary for their functioning. Despite the fact that they have not focused on generating resources, some CIALs and their second-order organizations have taken the initiative to create mechanisms for generating some of their own income to finance their activities.

At present there are several mechanisms that the CIALs use to finance their trials and other activities. Their application, however, varies a lot. There are groups that have several mechanisms operating, while others have none. In general the mechanisms have been developed by the groups themselves, either alone or with the help of the institutions that support them. As a step towards the search for economic self-sufficiency of the CIALs, research was conducted to document the mechanisms with which the groups finance some of the costs of their research and other activities related to their objectives. The purpose of this inventory is to determine existing mechanisms and then share them with other groups so that they can use them as models, guides or simply as in inspiration to adopt and adapt their own mechanisms. This article synthesizes the mechanisms found in the research; they are documented in much greater detail in the final report of the work (Cock, 2003b).

What is a mechanism for self-financing?

In this work, the term “mechanism for self-financing” refers to those actions and the norms; that is, the process and the structure, whereby a CIAL covers the costs of its activities and operations.

With the prefix *self-* we want to emphasize the fact that we are interested in those mechanisms whereby the groups generate their own resources or other activities, whereby they themselves are in a position to assume the costs of their activities. This naturally excludes any external contributions of resources such as donations and project resources. In the case of the CIALs there are mechanisms that generate monetary resources with which they can pay certain costs with cash, as well as others that function with contributions in kind, thereby reducing the need for cash to pay those costs. That is frequently the case of financing the land and labor for the trials. The projects, activities, businesses, funds, contributions or any other mechanism whereby these groups get resources constantly to

finance their operations and projects and to comply with their objectives are monetary mechanisms. The profits produced by these mechanisms can be distributed in various ways, but part of them should be used to finance the CIAL's activities.

Finally, being a process, a mechanism, involves several stages: the way in which it contributes the elements that the mechanism itself requires to function, the way in which the mechanism generates resources or reduces the need for them; that is, the operation of the mechanism itself and the way in which the resources generated are invested in the projects and activities.

Methodology

The research that made this work possible was done in three stages:

- A search was done on Internet to identify cases of self-financing in local organizations in Latin America. This search served to contextualize the CIALs in the environment of local or grassroots organizations in Latin America; to provide access to a source of ideas on the possibilities of the self-financing mechanisms already being used; and to serve as an inspiration for finding new ones (Cock, 2003a).
- A survey on the topic was designed and sent to all the institutions that have implemented the CIAL methodology in order to get a general idea of what self-financing mechanisms there are at present. Those cases that merited a more detailed, in-depth study were selected (Cock, 2003c).
- Visits were then made to Bolivia, Ecuador and Honduras to document these cases with the inputs of the farmers themselves. Field visits were made and in-depth interviews were held with the members of the CIALs and the staff of the institutions that support them.

The discussion of the results is by mechanism, analyzing each one separately. However, one of the most important elements of the self-financing mechanisms is the fact that they rarely function in an isolated manner. In practice, the groups generate their resources by combining the different mechanisms in diverse forms and with varied norms. From an analytical standpoint, however, it is better to separate them in order to analyze them in general; that is, independently of the particular combinations that each group has come up with. Thus other interested groups can adopt and combine them as they wish.

Results

In the research the following self-financing mechanisms are being used by the CIALs at present:

Contributions

All the CIALs contribute the research costs related to the land and the labor, generally through nonmonetary mechanisms. In most cases the farmers contribute land and their own labor, assuming the opportunity costs of not using the land and their work for other commercial purposes. For each of these aspects there are several ways to finance them.

Land. **The land is financed in four ways:**

- A member of the CIAL loans the land where the trial is being conducted. In compensation, they help the owner clear the land in fallow and prepare it. Thus the owner of the land does not have to clear the land for the following planting. Sometimes the owner also receives a part of the production as compensation.
- Several members of the CIAL contribute land. A replication of the trial is planted on each lot. The owner of each lot keeps part or all the production from that replication.
- The land is leased and paid in several ways. Sometimes a quota is collected among the members of the CIAL to pay for it; other groups pay it with a percentage of the production.
- The community contributes the land. In the Andean countries the community frequently loans part of their communal land to plant the trial.

Labor**. There are three ways in which the labor for the trials is financed:**

- The entire group works together. All the members contribute their labor in each stage and throughout the trial. Sometimes their work is compensated with part of the production.
- A member is in charge of a replication. When each farmer has a replication of the trial in his/her plot, he/she assumes responsibility for the work in it. The other members of the CIAL participate in the activities that are important for the trial, such as the evaluations. Generally the farmers receive part or all the production from the replication of which they are in charge.
- The community assumes the cost of the work. In the Andean countries where the communities work in *mingas*[9], the community permits the members of the CIAL to work in their trials on the days of the minga. As this is a day that the members of the CIAL should work for the community, it is the community that assumes the opportunity costs.

Informal activities

Informal activities such as raffles, bazaars and sale of food are very common for raising funds. In many cases they are carried out to finance some immediate need; in others the idea is to save the funds and use them later. There are groups that have gathered resources as a result of these activities to build up the initial capital necessary for other mechanisms such as loans or planting a production lot. In general these activities are not related to the CIAL's research activities.

[9] Compulsory community service.

Production lots

Although the purpose of the CIALs is not to generate resources but to test and/or validate technologies, some trials do generate profits, especially in the more advanced phases of production trials and commercial lots. Some groups use the profits from these activities to capitalize the group and be able to finance subsequent stages of the research and other activities of the CIAL. Thus some CIALs have planted production lots parallel to their trials in order to generate resources. In Honduras the second-order associations of CIALs, known as ASOCIALs, have funds to make loans to the CIALs to support production projects. The profits from these production projects serve to capitalize the fund of each CIAL.

Quotas

A very simple mechanism for generating resources is the setting of quotas or special fees. There are several types of quotas: extraordinary, membership and periodic.

- *Extraordinary*. Members are asked to make an extraordinary contribution at a given moment to finance some immediate need for which there is no money. Many CIALs ask their members to pay a quota when it is necessary to pay a cost in a trial such as some input and the group does not have savings to cover it.

- *Affiliation*. This is a one-time membership fee that a person or group should pay to belong to some organization. The income from this type of quota depends on the number of new members entering a group. In the case of some ASOCIALs, this type of quota has permitted them to procure an initial working fund when they get started. Besides, they have continued to receive contributions from other groups when they become members.

- *Periodic.* This is a payment that each CIAL member makes to his or her group or that each CIAL makes to the ASOCIAL every certain amount of time. This quota provides the most constant and reliable flow of resources. With this mechanism an organization can count on a set amount of money every so often (the membership fee, on the other hand, depends on new members) and their members know that they have that obligation and can therefore include it in their routines as a permanent responsibility (the extraordinary quota, in contrast, is occasional and so it is not generally included in the plans of those who pay it). In general the periodic quota is a mechanism useful for financing the administrative expenses of an organization, given its regularity; however, it is not a mechanism that has the capacity to generate sufficient resources for projects. Their use in groups such as the ASOCIALs can be important for financing some of their administrative expenses.

Savings and loans system

In Honduras the ASOCIAL Yorito provides a series of services to their CIAL members, which at the same time serve to generate some income to help cover their administrative

expenses:

- *Savings*. Each CIAL has a savings account in which they have to save a minimum amount yearly and beyond that, the amount they want. A low interest rate is paid.
- *Production loans*. The second service is the provision of loans for production projects. The CIAL can take out loans for twice the value they have saved, paying an interest rate of 29% monthly.
- *Loans for storing maize and common beans*. The third service is loans exclusively for purchasing maize and common beans for their storage and later sale during periods of scarcity. The profits from the sale are divided equally between the ASOCIAL and the CIAL that took out the loan.

CIAL petty cash funds

Some CIALs have their own petty cash funds in which they manage the savings of their members and make loans. Interest is charged for these loans, which generates some resources. The norms that each CIAL has with respect to the contributions to the petty cash fund, the amount and the duration of the loans, the interest that is charged, the way in which the interest paid is distributed, the loan to outsiders and the solidarity funds differ from one group to another.

Storage of maize and common beans

This mechanism functions in Honduras although it could be applied in other countries. The CIAL purchases maize and common beans at harvest time when the supply is abundant and prices are low, and then they store them in metal silos. In the months prior to the next harvest, these products generally become scarce, and the price goes up. Then the CIAL sells the stored maize and common beans at a much higher price than they paid for them. With this mechanism the CIAL offers a service to their community, increasing the local availability of these products and offering better prices, while generating resources for the group.

Contract planting

An agreement is made between the producer and the buyer as to the conditions under which the production will be sold. Buyers who need farm products with special characteristics seek farmers who are organized and have experience in contracting their production. The producer group has the advantage that they can ensure a minimum for their production, thereby assuring the profitability of their investment. There are CIALs that are planting under this mode, contracting with municipal and second-order organizations to generate resources as groups.

Small agroenterprises

A problem that many farmers face is the low price that the market pays for the products they grow; when these products are processed, however, they bring high prices. To improve

the farmers' income and generate some extra income for the CIALs, the generation of aggregate value is being promoted in several countries. A part of the profits that the small agroenterprises of the CIALs generate can be used to capitalize the group's fund and finance some of their activities. In Ecuador and in Bolivia there are experiences with small agroenterprises that add value to potatoes. In Ecuador they are producing potato chips locally; prior to that, they were brought from the city at a much higher price. In Bolivia native potatoes are being selected and packed for a specialized urban market (natural foods). Both are cases that respond to a market (one local, the other, external), process a product that the CIAL produces, and the initial investment is not high.

Conclusions

Self-financing is, to a certain extent, found in *all* CIALs. For their experiments, the CIALs normally seek a way to finance the land for planting the trials and the labor that they need. As was seen, there are several mechanisms to accomplish this; they vary from one place to another and are linked to the different local practices of the zones where there are CIALs. In many cases cash is not required to finance these costs as the CIAL members contribute their own land and labor or resort to diverse nonmonetary mechanisms for financing them, ranging from payment in kind to traditional mechanisms of reciprocity.

All CIALs also receive support from the facilitating entities to finance the costs of the trials, especially in the form of seed, inputs and outside technical knowledge. This help is either given in kind or cash so that the group itself purchases the inputs that are not available locally. In some cases this investment is needed only for the first trial given that the production gives seed and some resources for the following trials. However, some groups also assume some of the costs of the inputs.

To finance costs for which they require cash, the CIALs look to mechanisms that generate resources for them. The simplest mechanisms for obtaining some resources are using the sale of the production of a trial to finance the following one, collect extraordinary quotas among the members of the group, and organize informal activities such as the sale of food or raffles.

Some CIALs have more elaborate mechanisms for generating resources. These mechanisms have clear operational norms, are independent of the immediate need for resources (i.e., they are more structural than opportunistic), are more constant and frequently bring other benefits apart from generating resources. Some examples of these mechanisms are the systems of savings and loans, the CIAL petty cash funds, small agroenterprises, storage and commercialization, and production contracts. With these mechanisms some CIALs are financing some costs of their trials. Others use them to finance production projects independent from the CIAL trials. Besides generating resources for self-financing, many provide a service for the community.

The only information available on the costs that a CIAL has for an entity is from 1995 and was calculated from CORFOCIAL's budget for supporting their CIALs in Colombia. At that time, it was estimated that each CIAL cost the CORFOCIAL US$500 a year. This figure serves as a reference for calculating the income that the CIALs need to generate to

cover the expenses they require. At present there are no mechanisms that generate this amount. The self-financing mechanisms available at present generate resources to cover administrative expenses and some or even all the costs of the trials. If the costs of technical assistance and training that includes salaries of technicians and agronomists and logistical expenditures such as transportation—the resources generated by the mechanisms available at present are insufficient.

Self-financing should be seen as a process in which it is necessary to advance step by step. A first step is that the groups pay their trials and their administrative expenses. It should be noted that one of the principal obstacles to self-financing is the paternalism of the entities. Many of the research costs are either given to the groups or they have to pay back less than the entity's original contribution. This is done even in trials that have a high projected profitability. Even when production projects are supported, the amount that should be returned by the CIAL is, in many cases, less than what they were given. In this sense some ASOCIALs in Honduras have advanced considerably and serve as an example of granting loans for production projects that should be paid back fully plus interest. The loans with interest are an important financing mechanism as they stimulate the execution of profit-oriented projects while generating resources for the group that makes the loan (a CIAL or an ASOCIAL).

The CIAL petty cash funds are another important mechanism in this process as they permit the members of the CIAL to save as individuals and as a group. In the concept of self-financing, it is important to have clear ideas as to what the capital of a CIAL is.

The success of the small agroenterprises as self-financing mechanisms depends on multiple factors inherent in the difficulties of agroindustry, which should be analyzed at the time of undertaking a business of this type, but that goes beyond the scope of this work. It suffices to highlight that there are small agroenterprises that generate profits in a short time, while others take a long time in doing so and cannot therefore be considered as mechanisms for financing in the short term.

In addition, there are other commercial opportunities that can be important sources of resources such as the cases of storing grain and contract farming in Honduras.

In all these cases the support of second-order organizations is important, and this can be one of the fundamental roles of this type of organizations: support the CIALs in their efforts to become self-sufficient. It is no accident that in Honduras, where there are some solid ASOCIALs, some of the most interesting mechanisms are found. ASOCIAL support has been important for promoting savings in the CIALs and access to loans for production and commercial projects. Also in Honduras the production contracts were possible through a second-order organization although it was not an ASOCIAL. In Bolivia, the small business of native potatoes grew and was converted into an association that includes farmers outside the CIAL to take better advantage of their potential.

Some CIALs, whose cases have been documented in this research (Cock 2003b), have taken important steps toward their economic independence through self-financing. This inventory of mechanisms should serve to help promote the process of transition toward

self-sufficiency in these and in the rest of the CIALs by sharing the successful experiences in this field with all the groups.

Some final suggestions

Some ideas that have arisen from this work for progressing in the process of self-financing of the CIALs are as follows:

- Know how much a CIAL costs. To achieve self-financing it is important to know the exact amount of resources necessary to generate. At present this information does not exist or it is not easy to access. There are cost studies of a CIAL trial, which is an important element for knowing exactly what needs to be financed.
- Many CIALs already generate resources through production projects or even in some of their trials. It is important to seek mechanisms to ensure that the CIALs reinvest those resources in their own activities.
- It is imperative that the CIALs have clear accounts: how much they spend and how much they produce. Although the groups should be doing this, it does not always happen.
- The CIAL petty cash funds help to have clear accounts besides providing other important services such as loans.
- Stop giving things away (seeds, inputs, tools, etc.). Other strategies can be used to support the CIALs, including loans with facilities, especially when there is a production focus.
- Convert production and commercial lots in mechanisms for institutionalized financing, have rules so that some of their profits can be used for self-financing (of future activities or for paying previous support).
- Promote the installation of new mechanisms, especially when there are innovative ideas that require initial capital. An initial fund is needed, one that preferably should be granted as a loan to generate commitment and responsibility in the group.
- It is necessary to seek the way in which the generated resources can be reinvested and not be distributed among the beneficiaries. This requires clear rules at the moment of providing the support; e.g., now that they are moving toward small businesses.
- Initiate the transition toward paid assistance. If the CIALs are to pay all their costs eventually, including the technical assistance provided by the entities that support them, there should be a gradual transition. They could pay a small quota for this service as a way to measure their willingness to pay for/finance this support.
- Be careful of mechanisms that distract from the main objectives; i.e., research. The mechanisms for self-financing should generate resources without demanding too much dedication by the farmers so that they do not take time that they would normally dedicate to their trials.
- The need for resources promotes the adoption of mechanisms. Having to pay loans, etc., the groups will surely begin to adopt and generate mechanisms for self-financing in order to be able to comply with those payments.

- It is important to generate basic norms to control the mechanisms for self-financing that are established. These regulations will facilitate the group's process of changing and adjusting according to their needs.

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Integration of the CIALs in the management and conservation of natural resources in San Dionisio, Nicaragua

Responsible: *Thomas Keller*[10]*, Clark Davis*[11]*, Jorge A. Beltrán*[12]*, Pedro Pablo Orozco*[13]*, Carlos A. Quirós*[14]
Collaborators: *Eduardo Hernández, Berta Jarquín, Sinforiano Hernández*[15]

Highlights

Two protocols have been established for doing research on NRM
Participation of the municipality and the local organization Associations Campos Verdes in methodological process

Objectives

- Test the proposed methodology for integrating the CIALs in natural resource management (NRM) and conservation
- Take advantage of the CIALs organizational capacity and convening power in their communities
- Generate collective action to improve the level of well-being of the communities that have the CIALs in their own watershed.

Justification

The CIALs are community-based research services, whose members are elected by the community with the purpose of adapting or generating new agricultural technologies. Most Committees are located in the hillside zones, where they are faced with serious problems of erosion, deforestation and scarcity of water, above all in the summer. These problems lead to others such as scarcity of firewood for cooking, lack of drinking water and the loss of soil fertility, which in turn results in lower crop yields.

Therefore it is important to involve the CIALs in the topic of NRM and conservation, parallel to their research on crops for food security, in order to improve their level of well-being.

Taking advantage of autochthonous knowledge and the participatory methods and tools that the CIALs already have, the groups can work in a watershed to execute actions and do research on the conservation and improvement of their natural resources.

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[10] Swiss College of Agriculture
[11] Research Assistant, PE-3, CIAT, Nicaragua
[12] Liaison officer, PE-3
[13] Research Assistant, PE-3, CIAT, Nicaragua
[14] Acting Project Manager, SN-3 PROJECT, CIAT, Colombia
[15] Technician, Nicaragua

Methodology

- **Sector workshops**
  - ✓ Identify the partners in NRM in their watershed
  - ✓ Identify and prioritize the general issues in NRM (farmers)

- **Workshops of reflection**
  - ✓ Analyze problems and local alternatives/solutions
  - ✓ Establish mechanisms so that the CIALs and their partners work closely together in order to develop the NRM strategy
  - ✓ Create working groups among the members of the CIAL responsible for working in NRM

- **Exchange of experiences**
  - ✓ Sharing experiences, both locally and externally (Supermarket of Options for Hillsides - SOL, visits) and training in selected topics

- **Preparation of action plans**
  - ✓ Establishment of research protocols

- **Implementation of NRM activities in the short and medium term**

- **Monitoring and evaluation**

Results

The process of integrating the CIALs in NRM was begun in the months of April-May 2003 in the micro watershed of the Calico River, municipality of San Dionisio, Matagalpa Province. Three sectors were selected, each one with three CIALs and a paratechnician in charge (Table 1).

Table 1. Sectors identified for developing the NRM process.

El Zapote Stream: Communities: Zapote-Chile CIALs: El Jardín, Los Girasoles (women), Nueva Vida (El Chile)	Cálico River Communities: Carrizal, Zarzal and Corozo CIALs: Santa Fé, Linda Vista, Manos Que Ayudan	La Calera Stream Communities: Las Mesas, Wibuse, El Jicaro CIALs: Productores Unidos, El Porvenir, Mujeres Experimentadas, San José

Tables 2 and 3 present the results in relation to assistance, identification of problems in NRM, identification of the social capital and general problems so that the producers become involved in NRM issues. The principal topics are loss of soil fertility, scarcity of firewood, low quantity and quality of water, and burning fields

Table 2. Preliminary results of the sector workshops, San Dionisio, Matagalpa.

	Sector Zapote /Chile	**Sector Carrizal/Zarzal/Corozo**	**Sector Mesas/Wibuse/Jicaro**
Attendance (no. people)	33 (43% women)	37 (54% women)	34 (35% women)
Identification of topics	✓ Low quantity and quality of water ✓ Low soil fertility ✓ Scarcity of firewood	✓ Loss of soil fertility ✓ Scarcity of firewood ✓ Low quantity and quality water ✓ Burning fields	✓ Low quantity and quality of water ✓ Loss of soil fertility ✓ Regular supply of firewood
Social capital	The CIALs are advanced and experienced. People able to lead the work in NRM: Mariano López, José Luis Ochoa, Reyna Ochoa	CIALs are advanced and work well testing crops. People able to lead the work in NRM: José Luis Orozco, Salome Zeledón, Presentación Pérez	People able to lead the work in NRM: Franciso Martínez, Dionisio Blandino, Haydee Blandón, Bruno Salmerón
Problems for NRM	Producers mention the increase in population (about 4.2% yearly) and lack of land	Producers mention the increase in the population (about 4.2% yearly)	Lack of own plots; rapid changes in leased plots

Table 3. Preliminary results of the reflection workshop, San Dionisio, Matagalpa.

	Sector Zapote /Chile	**sector Carrizal/Zarzal/Corozo**	**Sector Mesas/Wibuse/Jicaro**
Attendance (no. people)	36 (31% women)	44 (55% women)	36 (44% women)
Prioritization of topics	Men: water (12), firewood (7), soils (6) Women: water (4), firewood (4), soils (3) ✓ Low quantity and quality of water ✓ Scarcity of firewood ✓ Low soil fertility	Men: soil (16), firewood (2), water (0) Women: Soil (11), firewood (9), water (0) ✓ Loss of soil fertility ✓ Scarcity firewood ✓ Low quantity and quality water ✓ Burning fields	Men: water (20), firewood (0), soil (0) Women: Water (14), firewood (2), soil (0) ✓ Low quantity and quality of water. ✓ Regular availability of firewood ✓ Loss of soil fertility

	Sector Zapote /Chile	**sector Carrizal/Zarzal/Corozo**	**Sector Mesas/Wibuse/Jicaro**
Problems for NRM	Improvement in water not visible in short term; lack of local incentives for this area.	Long-term results; communities unwilling to implement recommendations.	The sources of water are located on the property of a large landholder.
Planning	✓ Plant Calliandra (*C. calothyrsus*) to improve the supply of firewood. ✓ Construct micro-dams to improve access to water.	✓ Establish live and dead barriers to improve soil fertility. ✓ Establish legume *Canavalia brasiliensis* in plots during the summer.	Plant Calliandra (*C. calothyrsus*) to improve supply of firewood. Construct micro-dams to improve access to water.

At present, two research protocols have been developed and will be discussed with the different groups to begin work the second semester of 2003.

Conclusions and recommendations

This methodological process, which seeks to integrate the CIAL groups more actively in activities of NRM research, presents the following reflections:

- Hold the workshops in summer to permit better participation of farmers.
- The NRM workshops should held separately for men and women as the interests of the latter are primarily related to water and firewood.
- Working in smaller groups (12-15 people) results in more active participation.
- The prioritization and voting should not be public to prevent biases and dependency on other people.
- Carry out previous selection of people who have been identified to have interest in the topic.
- The meetings should be held with shorter spaces between them to ensure greater continuity.

Lulo project

Researchers: *Fernando Hincapie[16], Juan Jairo Ruiz[17] , Luis A. Hernández[18], Zaida Lentini[19], James Cock[20], Carlos Quiros[21]*

Collaborators*: CORPOICA: Freddy Parra, Hidelbrando Achipri. Pescador: Pedro Nel Herrera, Hermes Vitelio Menza, Alejandro Murillo, Diomar Patiño, Wilson Moriones, Nelson Orozco, Leoncio Sanabria. Tierradentro: Humberto Inseca, Saul Salazar, Orlando Valverde, Jose Valverde, Eduard Salazar, Samir Salazar, Miguel Astudillo, Jison Salazar, Jose Honda, Félix Cuello*

Introduction

The Biotech team working on fruits, particularly with lulo (*Solanum quitoense*), also known as naranjilla or Quito orange, has been doing work on clonal multiplication with materials from the Andean Fruit Growing Center. The work began in 2001; and although the origin of the material was not known, the Center collected it from the farmers.

The Biotechnology Unit is interested in the conservation of materials (in vitro germplasm) and the regeneration of new plants. One year ago the first materials that maintained good characteristics after in vitro storage were taken to the field. The field results with the materials from the Andean Fruit Growing Center have been good in terms of production, early harvesting (2-3 months earlier than normal). Now the purpose of the participatory component is to identify a group of lulo producers interested in validating this method of clonal multiplication with their own varieties. They select their improved materials, give them to the Biotechnology Unit, and then evaluate the materials in the field, comparing them with their traditional method of planting seeds.

Actors involved

The lulo project involves producers with experience in the crop, buyers (Pescador and Tierradentro, Cauca, Colombia) and specialists in biotechnology and participatory research from CIAT.

Justification

The availability of seed of promising materials for the growers' production systems is one of the bottlenecks that prevents the better use of resources by the small farmers. All farmers are interested in obtaining improved varieties or clones for planting. For many years the producers have selected promising materials in their production areas,

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[16] Research Assistant, SN-3 Project, CIAT, Colombia
[17] Research Assistant, SB-2 Project, CIAT, Colombia
[18] Research Associate I, SN-3 Project, CIAT, Colombia
[19] Senior Staff, SB-2 Project, CIAT, Colombia
[20] Project Manager, IP-06 Project, CIAT, Colombia
[21] Acting Project Manager SN-3 Project, CIAT, Colombia

collecting seeds of the best plants. In crops such as lulo, however, where the progenies differ substantially from each other and their progenitors, the process of obtaining varieties with the desired characteristics is slow and frequently does not work out. The strategy of joining forces between participatory research and biotechnology seeks to give the producers the necessary tools so that they select the improved materials and multiply them, obtaining progenies the same as the mother plants. Thus their selections pass rapidly to the multiplication stage and can be disseminated more quickly.

Objectives

- Obtain materials of lulo apt for the region according to the criteria of the producers themselves and buyers from Cauca

- Prove that clonal propagation[22] is viable for obtaining improved material

- Offer the producers the service of clonal multiplication for the regional materials selected by CIAT (work in Dapa) and by the farmers and buyers themselves

- Determine possible selection criteria of the producers and buyers in the selection of lulo cultivars through participatory techniques

- Develop mechanisms for establishing viable commercial systems for multiplying the selected materials

- Design procedures that combine clonal reproduction and participatory research for their application as a model in lulo and other fruits.

Methodology

- Motivate potential groups interested in the topic (informal presentation of the project, explaining the benefits and risks for producers and scientists involved in the project)

- Characterize the interest groups with whom the work would be done through a survey (a fundamental criterion in selecting the interest groups is their experience with the lulo crop)

- Explain the process of multiplying materials through meristem techniques (visit to Dapa, experimental fields and lab by the interested groups); and depending on the interest of the groups, they could evaluate some of the lulo materials that have been multiplied with these techniques.

[22] The system of clonal multiplication reproduces the same gene material as the mother plant selected and minimizes the transmission of systemic diseases.

- Select promising materials from the regional germplasm of lulo (application of participatory techniques such as open-ended evaluations, definition of criteria, grading and reasons for same, preference ranking, etc.).

- Multiply materials selected through biotech techniques (meristem technique).

- Plant promising materials coming from clonal multiplication according to the producers and buyers

- Conduct participatory evaluation of the selected materials at two locations in Cauca (Tierradentro and Pescador; at this stage establish linkages with institutions such as CORPOICA-Cauca)

- Develop mechanisms to establish viable commercial systems for the multiplication of the selected materials (nurseries interested in the multiplication of materials or the possibility of establishing systems of propagation at the local level identified)

Procedure

Criteria for selecting interest groups

- Experience with the lulo crop (local experts)
- Detailed level of observation from the experienced producers
- Producers known their community as innovators or experimenters (perception of probabilities of change in the local practices)
- Skills for communicating with the researchers (ease of expression)
- Socioeconomic resources
  - Land tenure
  - Farm size
- Objectives of the producers
  - Commercial vs. subsistence
  - Improve crop
- Localization
  - Distance to the market
  - Agro ecological zone (upper zone, lower zone, etc.)

Participatory diagnosis limited to the lulo crop

Meeting to speak about the lulo crop, problems, causes and possible solutions.

Open-ended evaluations

Method for probing and recording the spontaneous reactions of the producers to the technology (varieties of lulo) without using direct questions.

Techniques used by the interviewer to stimulate the communication of ideas from the producer in open-ended evaluations.

Describe what would be an variety ideal for you.
What do you think of this variety?

- Could you explain that to me?
- Tell me more about that.
- Is that an advantage or disadvantage for you?
- Could you group some of these? How would you classify them?
  - Why do you put these in a group and those no?

Preliminary results

Results of the lulo growers visit to CIAT and the experimental trial of lulos in Dapa (June 3).

- *Exploration of expectations of lulo producers from Pescador and Tierradentro*. The expectations of the lulo producers can be grouped into two areas: (1) pests and diseases and (2) seed quality. The expectations of the producers were compared with those foreseen in the project in order to clarify them and integrate goals. In terms of the expectations designed into the project, the possibility of obtaining "clean" (strong) seeds using the technology being tested was explained, as well as how this could be used at the field level so that the producers learn how to apply it and manage it in the future. The possibility of the producers themselves looking for potentially good materials of lulo in terms of pest resistance and/or diseases and to multiply them using the technology being tested was also explored. With the adaptation and adoption of the technology in case of being successful, they could be applied to other crops of interest to the producers. The result of this exercise indicated a good correlation between the expectations of the producers and those in the project.

- *Results of the survey about experiences with lulo*. Based on the questions (1) how many years have you worked with the lulo crop?, (2) about how many lulo plants do you have?, (3) why are you planting lulo?, (4) if their objective in planting lulo is commercial, at what distance are they from the market?, twenty people involved in the crop responded as follows:

  - ✓ Some have experience of only 1 year; others up to 15 years. Of the 20 growers, 50% have experimented for periods of 2-3 years.
  - ✓ The producers have from 80-5500 plants; 50% grow from 1200-3000 plants.
  - ✓ The majority of the producers sell their fruit for the fresh markets, far from their production areas; they do it through middlemen.

- *Criteria of producers expressed about a lulo crop (13 months after planting, Dapa, 1600 m alt.)*. For this part of the experience, the technique of "open interview" was used, in which the producers express their opinions about two lulo cultivars, freely and spontaneously. The possible criteria are the result of the exposure of the farmers

to the characteristics of these two varieties. For the exercise, the group was divided into the producers coming from Tierradentro and Pescador, assuming there would be differences of opinion according to different agroclimatic and marketing conditions.

Table 1 shows the possible selection criteria that were mentioned by the two groups. In some cases the criteria differed between the two groups (letters in bold case), possibly due to agroclimatic conditions (e.g., leaf size) and types of market (e.g.,, size of the fruit).

Table 1. Possible selection criteria mentioned by two groups of producers (Tierradentro and Pescador, Cauca).

Possible selection criteria

- ***"Size" referred to as:***

  - ⇨ The leaf
  - ✓ The bigger the leaf area, the better the lulo plant (**producers from Tierradentro**)
  - ✓ A small leaf area favors circulation of the air, there are fewer diseases, and better advantage is taken of the space available for planting (**producers from Pescador**)

  - ⇨ The fruit
  - ✓ Large fruits are better accepted (**producers from Tierradentro)**.
  - ✓ Small fruits can be sold in the marketplace, but through middlemen. The large fruit can be sold in chain stores, but they require fixed production quotas (**producers from Pescador)**.

- **"Color" referred to as:**

  - ⇨ The leaf: Should be dark green and shiny.
  - ⇨ Fruit: When fully ripe, it should have a deep orange color.
  - ⇨ Pulp from the fruit: Consumers prefer the green color (in the juice).

- **"Thickness" referred to as:**

  - ⇨ Stalk: The thickness of the stalk is directly related to good fruit setting.

- ***"Fruit setting" or production***

  - ⇨ Fruits: 300-400 lulos/plant, 6-7 lulos= 1 kg, 50 kg = one plant.

- **"Thorns"**
  Plants with thorns are preferred for their production and fruits that tolerate postharvest management

Definition of an ideal plant (producers from Tierradentro)

- Healthy plants (free of diseases and pests)
- Large fruits, deep orange in color when they are ripe
- Good production (300-400 lulos per plant, 6-7 lulos per kg).

Visit to lulo farmers

Taking into account the field day in DAPA with lulo farmers from Pescador and Tierradentro and the last meeting (01-07-03, Annex 1), where it was agreed to begin the process of selecting the farmers who showed interest in participating in the project (initially Pescador), some points of reference for beginning the fieldwork were established.

The purpose of the first visit to the field (Pescador, 22 August) was to identify from among the group of 4 farmers selected from the survey, who are currently growing lulo (Annex 2), those who are still interested in participating in the project and try to find at least 6 farmers more in order to have a group of 10 farmers.

Those who participated in the field visit were Fernando Hincapié, Leonel Rosero and Juan Jairo Ruiz from CIAT, and the farmers Pedro Nel Herrera, Hermes Vitelio Menza and Diomar Patiño.

The 4 farmers that were selected for their experience in the crop were visited, and their interest in participating in the project was reaffirmed. A survey was also conducted in order to obtain more detailed information of each farm and some of the activities that they carry out (Annex 3). During this visit, a visit was made to the crop of Diomar Patiño, which has many problems (principally diseases such as sclerotinia and anthracnose).

Finally, the farmers were asked to get together other farmers from the region who also grow lulo and that have shown interest in participating, to attend a meeting programmed for 25-07, where all the farmers will be informed about the objective of the project, share experiences with respect to crop management and look at the current importance of lulo in the region.

Second visit to field (Pescador, 25 August)

The purpose was to identify new farmers to expand the group working on the selection of new clones, learn of the experiences of each with respect to crop management and evaluate the current situation of the crop in the region.

Those who participated in the field visit were Fernando Hincapié and Juan Jairo Ruiz from CIAT, and the farmers Pedro Nel Herrera, Hermes Vitelio Menza, Diomar Patiño, Wilson and Manuel Moriones, Nelson Orozco, Leoncio and Urbano Sanabrio, and Nacho Herrera.

Four new farmers interested in participating in the project were identified, the management criteria of each of the farmers were unified based on the survey (Annex 3), and the person with the most knowledge and good crop management was detected: Pedro Nel Herrera (crop in excellent health conditions).

The rest of the farmers have many problems (primarily diseases) and are not familiar with the management practices being used by Pedro Nel. Pedro is open to transmitting his knowledge to the rest of the farmers, and we consider his farm to be a good place for the observation plots.

Then the work plan was developed with the group. The first thing to be done is to begin the selection of the improved materials from each farm. For this purpose, a field visit was programmed (07-08). In the upper zone, the tour will cover each of the where the farmers have previously identified their improved materials. Then each of them will present before the whole group the criteria he used to select these outstanding clones.

A brief diagnosis of the current state of lulo in the region and the importance that it has for each farmer, classifying the crops that they have in the high zone of Pescador as well as in the lower zone, and their priority with respect to income generated.

The farmers' interest in lulo is due to the fact that it is a crop in high demand and a very good market; besides it can be said that it guarantees a return on the investment.

In the lower zone (Crucero de Pescador) the main cash crops are coffee, common beans (*Phaseolus vulgaris*) and cassava. Very few producers are cultivating lulo, partly because they believe that the conditions are not the best for the crop and partly because they do not know about the crop. Lulo is seen as a cash-crop option.

In the upper zone (Buena Vista), the main cash crops are beans and blackberries, just as in the lower zone, lulo is seen as a good cash-crop option.

The interest of lulo growers is mostly related to the good price it brings on the market, the production is sold easily, and it is a "generous" plant with respect to fruit setting and production.

Some of the problems encountered are that the lulo producers are very far from the markets, which affects the price they get for the fruit, and transportation to the markets is costly and difficult.

Third visit to field (Pescador, 07 August)

- Each of the farms was visited, and the two best lulo plants were selected (taking into account the farmers' priorities).
- The 5 best materials of the whole zone were selected, taking into account the farmers' observations and criteria, recording the characteristics of each material (health, productivity, plant habit, quality of fruit, etc.).

- Two observation zones (one in the lower zone at 1650 m alt. and the other in the higher zone at 1900 m alt.) were selected, where the plots for evaluating the plants will be located.
- Each observation lot will have 3 treatments: plants propagated from seeds, from clones done by the farmers and micro propagated.
- Each treatment will have about 20 plants, for a total of 60 plants. If 5 clones are selected in the zone of Pescador, there should be 300 plants. As there are 2 zones, this means 600 plants for all the treatments and clones.
- Considering the introduction of the farmers' clones to CIAT, close attention will be paid to the methodologies of clonal propagation that some of the farmers like Pedro Nel Herrera use on their farms. The purpose of this is to estimate the time required to collect the materials in the field, how long they need in the glasshouse and later in vitro.
- Establish the planting dates in relation to the delivery of the in vitro materials.

Fourth visit to field (Tierradentro 9-12 September)

Visit to the lulo producers who went to Dapa in order to see their crops, identify those interested in participating in the project, and select materials for delivery to CIAT for the process of clonal multiplication. The principal crops of the region are coffee and beans, given their importance as cash crops, the same as for the zone of Pescador. Lulo is attractive because of its good price on the market, and the production is sold easily. As for the problems faced by the producers, they are similar to the zone of Pescador, the markets are far away from the farms, they do not have much experience in crop management, and they do not know how to control some diseases and pests.

Despite the fact that lulo is an attractive crop because the fruit has a good demand on the market and brings a good price, the number of lulo producers in the regions visited is low. Many farmers begin working with this crop; but when they face a problem such as a disease or pest, they abandon it. This can be explained in terms of the little knowledge and technical help available with respect to the management of this crop. Another reason that should be borne in mind is that the producers generally have other well-established crops that generate incomes and that have to be taken care of as they are the basis of their economies. Thus they do not dedicate sufficient time to lulo, which in the first days needs a certain amount of dedication. Another factor that was observed and that can have incidence on the deterioration of the lulo crop is that the production plots are generally located far from the farms and are of difficult access, making it problematical to guarantee the appropriate care of the crop.

It was also observed that there are some producers with very good management and knowledge of the lulo crop, only a few kilometers from very deteriorated crops, whose owners do not have the knowledge or the technical assistance to make their crops prosper. Consequently, a compilation of the best practices for managing the lulo crop at the local level was proposed so that the producers who want to work with lulo can benefit from the experience of the producers who have the local knowledge for growing a successful crop.

Commitments acquired

With the producers from Pescador, the following commitments were acquired, once the materials to be multiplied have been identified:

- Planting of cuttings or shoots of the plant selected for clonal multiplication in the week from 11-15 August
- Delivery of at least 10 plants, daughters of the plant selected for multiplication in the week from 6-10 October
- Delivery of cloned material for establishing observation plots from February and March 2004
- Work of observation, monitoring and evaluation of clonal and traditional materials for the next two years

With the producers from Tierradentro, similar commitments were established:

- Planting of cuttings or shoots of the plant selected for clonal multiplication in the week from 15-19 September
- Delivery of at least 10 plants, daughters of the plant selected for multiplication in the week from 17-21 November
- Delivery of cloned material for establishing observation plots from March-April 2004
- Work of observation, monitoring and evaluation of clonal and traditional materials for the next two years

Annex 1
Zone: Pescador
No. of farmers: *8*

Experience: 4 without experience in lulo; the other 4 with experience ranging from 2-9 years
No. of plants*: 200-1000*

- Based on these results, it was decided to eliminate the 4 farmers that no have experience in lulo and have not planted lulo.
- Juan Jairo Ruíz will prepare a list by zone of the farmers that participated in the survey, tabulating the results of the survey, their selection for the study and confirming their interest in participating in the project.
- Fernando Hincapié will contact ASOBESURCA, to communicate the Project's interest in continuing the follow-up from the project and request their help in identifying other farmers in the zone of Pescador, given that half the farmers who attended the workshop at CIAT did not have experience in lulo.
- Fernando Hincapié and Juan Jairo Ruíz, will make a preliminary visit next week to the 4 farmers selected in Pescador according the survey to confirm their interest in participating in the project and begin gathering the preliminary data on productivity, pests and diseases, know the farm and obtain a better idea of the crops, and request information about other possible farmers with experience in lulo that could be candidates for including in the project.
- Fernando Hincapié will contact Freddy Parra (CORPOICA, Popayán), give him the list of farmers from Tierradentro and see whether he can collaborate by consulting the farmers about their interest in participating in the project and then plan a visit to the interested farmers, and begin a process similar to that of Pescador.
- A survey will also be developed for use in a group meeting by zone, where the group of farmers involved in the project participate; should be designed for the follow-up of the project.

It was suggested that instead of asking each farmer to select his best clone to be multiplied in vitro, they should form two work teams (one per zone), and that each team select the best 4-5 clones available among the group of participating farmers. Thus, there would be the best 4-5 clones by zone. These clones would be the ones to be multiplied in vitro. Each team would select 3-4 locations in each zone (replications) for the comparative trial of the in vitro material vs seed from each clone. This would facilitate the standardization of the management of the trial in the different replications, the costs of maintaining the trials would be less, and the risk would be shared among the farmers. This pre-trial could be the beginning of the procedure to be used for establishing the observation lots for when they are going to introduce the new germplasm. Of course, in order to establish this scheme, the farmers would have to be willing to share their germplasm. This could be explored in the preliminary visits.

Annex 2
List for classifying and selecting lulo growers
Zone: Pescador

Name	Experience (yr)	No. Plants	Selection Based on Survey	Interested in Participating
Pedro Nel Herrera	15	1000	X	**yes**
Hermes Vitelio Menza	15	900	X	**yes**
Alejandro Murillo C.	2	700	X	**yes**
Diomar Patiño	9	260	X	**yes**
Genit Almendra	0	0		
David R. Trochez	0	0		
James Bastos	0	0		
Angel Daniel Paz	0	0		
New farmers				
Wilson Moriones			No	**yes**
Manuel Moriones			No	**yes**
Nelson Orozco			No	**yes**
Leoncio Sanabria			No	**yes**
Urbano Sanabria			No	**yes**
Nacho Herrera			No	**yes**

Annex 3
Criteria for conducting survey of lulo farmers (3 July)

- What is the fruit setting or production of your lulo plantation?
- What is the planting distance that they use?
- Describe your main cultural practices (e.g., fertilization, fumigation).
- What are the principal pests? (pests and diseases that limit the productivity and the crop management)
- What other factors limit the lulo production on your farm?
- What is the average and maximum height that these plants reach?
- How many harvests of lulo do you get a year?
- With what frequency do you plant new lulo plants and how many?
- Are your new plants from seeds or cuttings of the best clones?
- Do you plant other plants in association with lulo?

OUTPUT 3. PROFESSIONALS AND OTHERS TRAINED AS FACILITATORS OF THE PARTICIPATORY RESEARCH APPROACH

Milestones

- ✴ Professionals trained in the use of PR tools and methods
- ✴ PME training strategy tested in potato production systems in Toralapa, Bolivia
- ✴ Capacity of Bolivian national partners for implementing and supporting PME Systems within their communities, strengthened
- ✴ PME training strategy strengthened by the exchange of experiences in the training workshops
- ✴ Farmers' groups-experimenters initiating agroenterprise activities based on the technology generated in their experiments
- ✴ Technicians of partner institutions in the Andean zone applying and promoting an agribusiness orientation in farmers' groups

Professionals trained in the use of PR tools and methods

Table 1. **Participation in training events related to PR.**

Dates	City & Country	Event	Participating Institutions	No. Participants
Feb.	Kabale, Uganda: Tanzania, Kenya, Malawi	FPR & PMR workshop	NARO	15
Feb. 10-11	Lilongwe, Malawi	Stakeholder project inception workshop & consultations	✓ Ministry of Agriculture, Dept. of Agricultural Research & Technical Services, Dept. of Agricultural Extension ✓ CARE Malawi ✓ World Vision ✓ Plan International Malawi ✓ Lilongwe Agricultural Development Division	12 9
Feb. 17-18	Lushoto, Tanzania	Project inception workshop	✓ Africa Highlands Initiative ✓ Traditional Irrigation &	8

Dates	City & Country	Event	Participating Institutions	No. Participants
			Environment Protection Programme ✓ District Dept. of Agricultural & Livestock Development ✓ Lishe Trust ✓ SECAP	
Feb. 24-27	Jinja, Uganda	Follow-up & action plans development workshop	✓ NARO ✓ Agricultural Research Development Centres ✓ District Extension Coordinators ✓ National Agricultural Advisory Services ✓ Action Aid ✓ Africa 2000 Network ✓ Africare	24
Mar. 3-8	Honduras	Training workshop on management of CIAL database	✓ FIPAH ✓ EAP Zamorano	8
Mar. 24-28	Lushoto, Tanzania	Market facilitators workshop	✓ TIP ✓ Africare ✓ Lilongwe ADD ✓ DARS, Malawi ✓ Africa Highlands Initiative ✓ Lishe Trust ✓ NARO-ARDC	20
Mar. 24-Apr. 4	Toralapa, Bolivia	CIAL methodology & PME System	✓ ACDI-VOCA ✓ Tarija Prefecture ✓ PROMETA-INNOVA ✓ GNTP-NUR ✓ PRODII ✓ JAINA ✓ CAD ✓ CIAT-SC-INNOVA ✓ QHANA Community Education Center ✓ FCAP-UMSS ✓ PROSUCO ✓ ASAR ✓ Mayor's Office, Llallagua ✓ FDTA Valles	29

Dates	City & Country	Event	Participating Institutions	No. Participants
			✓ APG ✓ AGAVAT FOCAM ✓ UTA-CEDAG-Tarija Pref. ✓ PROINPA ✓ PROMACEL-UMSS ✓ NIAP-Ecuador	
Mar. 31 Apr. 11	Salima, Malawi	Integrating FPR & PMR	✓ DARS ✓ LADD ✓ CARE ✓ Plan International ✓ TIP-Tanzania ✓ NARO-Uganda ✓ CIAT	22
Mar. 24	Nairobi, Kenya	Stakeholder consultative meeting on "Strengthening institutional change process by enhancing participation of farmers in R&D process"	✓ KARI ✓ CMAD ✓ EAT	12
May 7	Cali, Colombia	Workshop on PR	✓ Fundation CIPAV ✓ INTEP ✓ Institute of Education Technical Professional ✓ Communities & Watersheds, CIAT	10
May 26-31	Kabale, Uganda	Integrated agroenterprise development of potatoes	✓ Africare ✓ Uganda National Potato Seed Production Association	20
Various	Kabale, Uganda; Lushoto, Tanzania; Dedza, Malawi	Community workshop on leadership skills & gender	✓ Farmers from pilot communities in ERI sites ✓ NGO partners	45

Dates	City & Country	Event	Participating Institutions	No. Participants
July 1- 3	Popayán (Cauca), Colombia	Training for rural agroenterprise development, with emphasis on financial management, Gloria Liliana Lasso Buitrago	10 CIALs from CORFOCIAL with the participation of 15 farmers & 2 technicians	17
July 28- Aug. 2	Jinja, Uganda	Integrating gender analysis	✓ NARO ✓ ARDC	22
Aug. 11-16	Tororo, Uganda	Market opportunity identification & enterprise selection	✓ Africa 2000 network ✓ Cash farm ✓ NAADS ✓ Tororo district ✓ Katamata Farmers' Group	23
Sept. 28-Oct. 11	Arusha, Tanzania	PR approaches & scaling-up strategies for soil-fertility management	TSBF-Africa soil fertility network	32
Oct. 27- Oct. 31	Tororo, Uganda	PME	✓ Africare ✓ Africa 2000 Network ✓ NARO ✓ DARS ✓ LADD ✓ TIP ✓ DALDO ✓ KARI ✓ EAT ✓ ILRI	24
TOTAL		**17**	**75**	**352**

Participatory monitoring and evaluation workshop, Toralapa, Bolivia

Facilitators*: Luis Alfredo Hernandez R*[1]*, Elias Claros Trujillo*[2]

Background

The strategy of capacity building in the "Promoting Changes" project determined that the Bolivian system of agricultural and livestock innovation would be strengthened if those who provide the services of research and technical assistance were experts in participatory methodologies. It also states that to build a critical mass of experts in these methodologies, it is necessary to build these capacities in the institutions and organizations to support the target groups to incorporate those methodologies in the technological innovation processes.
Based on the aforementioned strategy, the "Promoting Changes" project has been promoting training workshops in participatory monitoring and evaluation (PME) to share experiences with this approach, identify groups of people or organizations interested in collaborative activities in the future, and develop appropriate PME systems in Bolivia.

This PME workshop describes the methodology that is being used to train groups of technicians, professionals and farmers in PME. At the end an analysis of the experience was done, and commitments to implement the systems by the trainees were established.

Objectives

The following objectives were proposed for the workshop:

- Strengthen the knowledge about PME
- Promote the establishment of PME systems
- Exchange knowledge and experiences about the establishment of PME systems
- Provide tools and methods to promote the establishment of PME systems
- Suggest some steps for establishing PME systems

Methodology

Participants' expectations and their relation to the workshop objectives

Table 1 gives the predetermined objectives of the workshop and the participants' expectations prior to beginning the event.

[1] Research Associate I, SN-3 Project, CIAT, Colombia
[2] Research Assistant III, SN-3 Project, CIAT, Colombia

Table 1. The participants' expectations and their relation to the workshop objectives.

PME Workshop Objectives	Participants' Expectations
Strengthen the knowledge on PME	✓ Increase knowledge on PME to apply it to the institution's activities and projects ✓ Know and learn new knowledge to be able to carry out PME in the CIALs
Promote the establishment of PME systems	✓ Learn about PME ✓ Form a good conceptualization of PME methodologies ✓ Increase the knowledge on PME techniques ✓ Improve knowledge through participation ✓ Acquire knowledge and skills on PME ✓ Learn more about PME, as well as learn new strategies related to it
Exchange knowledge and experiences about establishing PME systems	✓ Strengthen capacities through the exchange of experiences ✓ Exchange experiences in PME
Provide tools and methods for promoting the establishment of PME systems	✓ Learn methodological tools to strengthen CIALs ✓ Expand knowledge, instruments, methods for PME
Suggest some steps for establishing PME systems	
Agree upon action plans with the entities participating in the workshop to establish PME systems	✓ Establish relations with all participants to establish joint work in PME
	✓ Establish solid relationships with participants

The first column of Table 1 relates the predetermined workshop objectives in relation to the participants' expectations. In general the expectations and the objectives are correlated. Some of the participants' expectations have an indirect relation to the objectives. For example, the establishment of solid relationships with the participants is related to the exchange of experiences, just as the steps in the methodology are related to methods for establishing PME systems. Thus it was not necessary to adjust the content of the workshop considering the correlation between the expectations and the objectives.

Analysis of experiences in PME processes (participants' presentations)

The analysis of the presentations indicated that the PME systems have a project focus and logframe. Thus the participation of the users is relative in terms of the definition of indicators, formats, use of the information, etc. The most outstanding aspects of the presentations are highlighted here:

- *Project focus for PME*. The presentations indicated that the systems they are going to monitor have pre established work plans where the producers have not participated in their design (consultative participation).

- *Logframe approach*. The presentations showed that the activities in the PME systems are based on logframes. This implies predetermined activities, measurable indicators that can be verified, etc.; which confirms a project focus determined mainly by the interests of the entities or donors and, of course, with very low producer participation.

- *Negotiated indicators*. In the presentations it was observed that the predetermined indicators enter in a process of concertation (negotiation) with the producers. In this way the users of the PME systems do not intervene in the design itself.

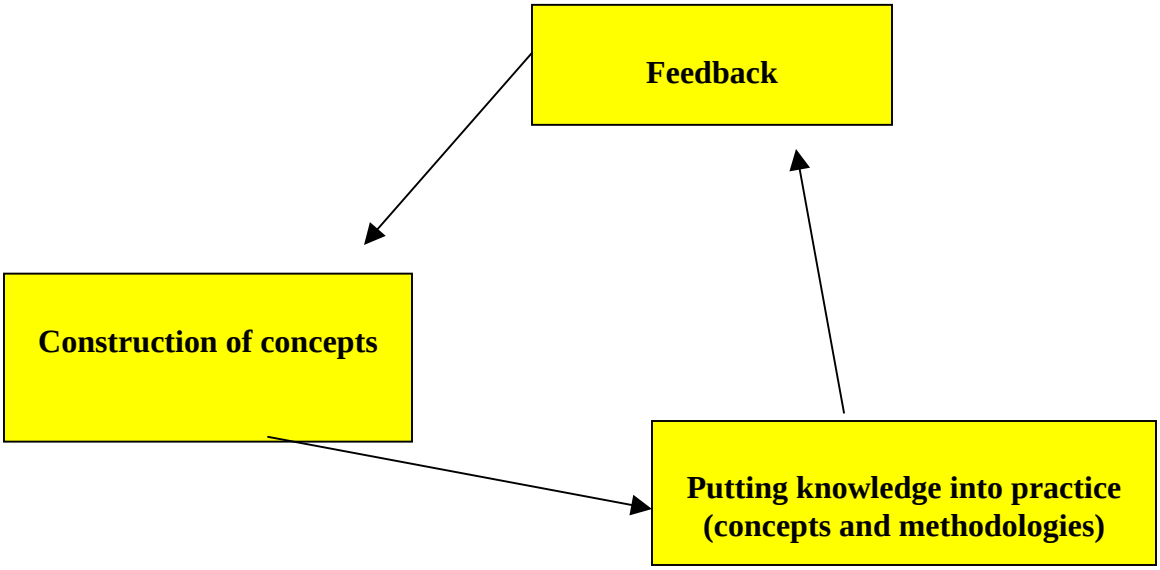
- *Other presentations*. Some participants related research experiences in which communities intervened in a consultative fashion, without having true PME systems.

In conclusion we can affirm that the PME experiences presented by the participants have a project focus characterized by low levels of user participation, different from the PME system offered in the workshop, in which the users should be involved throughout the process. Nevertheless, there is a great opportunity for establishing PME within the new approach of the Bolivian system of agricultural and livestock technology (SIBTA), given that it starts with the demand of the beneficiary interest groups.

Strategy for training as part of the PME process

The facilitators promote discussions on the different topics referring to the PME, then they construct concepts and finally there is feedback from experiences in other contexts. Having finished this process, the participants can apply the knowledge acquired with interest groups and then discuss the results of the practice in plenary session.

Strategy of learning by doing



Conceptualization (Training Module 1)

First the participants' knowledge on the different concepts is determined and then it is reinforced with the presentation of drawings that represent the concepts in the daily activities of the interest groups. For this purpose, cards are used and each participant writes down what he/she knows about them. Then the related concepts are grouped in an exercise in a plenary session. Finally, an agreement is reached on the concepts.

After doing this exercise the following results were obtained (Table 2).

Table 2. Knowledge on the PME concepts.

Concept	Participants' Results
Monitoring	• Verification • Accompanying the activities
Evaluation	• Assessment of results • Grade something • Assign value to something
Participation	• Joint decision-making (all actors of the process)
Indicator	• Sign • Something that orients us • Something that tells us where we are going and where we have to go

Analysis of the exercise at the level of the workshop participants

The process of conceptualization is easy, and there is good congruence with results in other contexts.

The following distinction was made between monitoring and evaluation: accompanying and verifying activities that are developed in a process (monitoring); and assign a value to the results obtained at given times to ensure that the decision-making process leads to the completion of the proposed objectives (evaluation).

Conceptualization exercise at the level of the interest groups

- *General description of the interest groups (farmers)*: The practice was implemented with farmers from the town of Candelaria in the Municipality of Colomi, which has 18 communities and 8 CIALs established. It is a microcenter of biodiversity with 70 varieties of Andean potatoes and 16 varieties of smooth-skinned tubers (*Ullucus tuberosus*). The CIAL in Candelaria has worked with these native potatoes with good results. Of 38 varieties evaluated for adaptation, they have selected 5. They are seed producers and want to give added value to their production with good selection and packing.

  The workshop participants decided to define the terms based on the description of the

potato crop. They asked the interest group to describe the cycle of the crop and then tried to link them to the terms Monitoring (M), Evaluation (E), Participation (P) and Indicators (I).

- *Analysis of the exercise at the level of the interest group in Candelaria*. It was easy to describe the crop cycle for the participants in the workshop, but very difficult to relate them to the concepts (M,E,P, I). On occasions, for lack of mechanisms to accomplish the objective of the practice, the facilitators had to lead the participants.

  Based on experiences in other contexts, it is preferable to conceptualize using activities known by the groups, before using an activity without preparing mechanisms that reflect the relations that are sought. In any case, the PME methodology was presented as a flexible format to be enriched in case of success.

Use of illustrations

Nowadays drawings are used to facilitate the training of producers with any level of schooling. However, the participants at this PME workshop do not yet manage open-ended evaluations, probing questions, etc.; which ensure that the process is based on the free expression of the producers.

It would probably be very useful to think about how to link the processes or activities that are traditionally done in the interest groups (crops, animal management, etc.) with the conceptualization of monitoring, evaluation, participation, objectives, activities and indicators, developing new strategies to facilitate the process. It would be more interesting if they started with illustrations developed by their own interest groups. It is it possible to induce the groups when we use an activity specific to the group as an example? This question is a reflection that we should do in order to avoid having to lead the process.

Use of flow charts

The participants did not use flow charts. However, in the discussion and analysis of the practice, Fausto Merino (Research Assistant from Ecuador) emphasized the importance of their use and the difference that should be made with the "agenda for a meeting." This participatory tool is very useful in these training processes at the level of the interest groups. Displayed in visible places, the flow charts make it possible to orient the groups, discuss the process with them, orient the methodology that is going to be used, etc.; and the reason why its use is recommended in processes of establishing PME.

Conclusions on Training Module 1

In the process of inquiring into the participants' knowledge of terms such as M, E, P and I, the PME methodology proposes exploring their knowledge first and then establishing a relation between these terms and routine activities such as the management of a crop

and/or use illustrations. In the former case, the new facilitators have to develop a strategy for constructing concepts.

It is also recommended to:

- Revise the conceptualization of the flow chart and distinguish it from other tools such as the agenda for a meeting
- Study and use flow charts, distinguishing them from other tools such as the agenda
- Practice the technique of open-ended evaluation to obtain greater spontaneity of the interest groups.

Formulation of the overall objective, current and future situation, activities, indicators and formats (Training Module 2)

Table 3 gives the definition of each term from Module 2. In the definition of the objectives, the relations with the concept "goals" and their characteristics such as "reachable," "verifiable," "concrete," "clear," etc. are highlighted. Moreover, the participants understand the importance of having objectives.

Table 3. Knowledge on objectives, their characteristics and importance.

Questions	**Participants' Responses**
What is an objective?	✓ It is a goal drawn up ✓ It is what you propose to reach at the end of a process ✓ It is a dream proposed
What characteristics should an objective have?	✓ Reachable ✓ Measurable ✓ Clear ✓ Concrete ✓ Verifiable
Why is it important to have a good objective?	✓ To have the future clearer ✓ To know what we have to do ahead of time ✓ To know where you want to go and structure a good work plan

To understand the current and future situation, predesigned illustrations were used that showed, through a time line, the activities that needed to be done chronologically in order to reach the proposed goals.

With the objectives of each entity, an exercise was done that made it possible to build the overall objective and the current and future situation of the same. Then the components of this objective were analyzed, and one was selected. Based on the one selected, the activities indispensable for reaching the objective were analyzed, and for some of them the indicators were defined. The participants defined the components of the formats in terms of "indicators," "time," "person responsible," etc.

- ***Analysis of the exercise at the level of the interest group.*** The field practice of was done with 24 farmers belonging to the association of producers of seed potatoes. Four subgroups of 6 people each were formed.

  Table 4 indicates that the subgroups, working simultaneously (independently), managed to define objectives, indicators and activities (they were also able to design formats). An interesting result reflected in this table is the fact that constructing the objective "better organization," they prioritized the same activity, "meetings" and thus obtained similar indicators such as "number of meetings" in all the subgroups. This could indicate the efficiency and efficacy of the proposed PME process (Table 4).

Table 4. Objectives, activities and indicators of the subgroups.

Working Group	Objective	Activities	Indicators
1	Strengthen our organization	Attend meetings	# of meetings
2	Grow as an organization	Meetings	Records of partners
3	Want to be organized	Look for interested people (meetings)	# of visits to communities
4	Produce and multiply seed in an organized way	Training	# of training events dedicated to seed multiplication

General conclusions

- A capacity in the process of establishing PME was created.
- Institutional commitments were established through the work plans presented.
- The proposed PME process was well accepted by the participants, who generated diverse ideas on its application.
- The facilitation of the PME processes should consider people who are able to speak Quechua because it is the language most frequently spoken in the communities.
- It seems that the conceptualization of the diagnosis in the CIAL course caused confusion in the definition of the objectives of an interest group; nevertheless, the proposed PME system helped distinguish between the two concepts.

Promoting a business and market orientation in CIALs from Colombia, Ecuador and Bolivia: Report of follow-up activities to the Second Workshop on "Design of Integrated Agroenterprise Development Projects." Part 1: Cauca (Colombia) and Ecuador

Research: *Carlos F. Ostertag*[3]

Background

This collaborative project between IPRA and the Rural Agroenterprise Development Project (RAeD, SN-1) at CIAT has focused on promoting a more businesslike perspective among some CIALs in Colombia, Ecuador and Bolivia. For this purpose, two 3-day workshops were held in Conocoto (Ecuador) in 2002, with the participation of technicians from NGOs that support the CIALs and their members. The first workshop focused on presenting basic business concepts and the methodology for identifying market opportunities for small rural producers, while the second workshop centered on the process of analyzing a production chain and the design of an integrated agroenterprise development project (IAP). The IAP consists in developing an action plan to strengthen the production chain under consideration.

This report[4] corresponds to the follow-up activities to the second workshop, consisting in the analysis and development of an action plan to strengthen the selected production chain. Reference is made to visits to Cauca and Ecuador to follow up the activities of a CIAL in Cauca, dedicated to maize production, and to three Ecuadorian CIALs located in the provinces of Chimborazo, Pichincha and Carchi.

CIAL in Morales (Cauca), 8 July

Activities carried out

This CIAL is located in Carpinteros, a village in the municipality of Morales in the Province of Cauca. There is a maize growers' asociation with 34 members. CORFOCIAL, the second-order organization, provides support through its technician, Bolívar Muñoz.

This CIAL is working on maize, sugarcane for making *panela*, a noncentrifuged sugar in block form, and guinea pigs. After prioritizing, they decided to focus on yellow and white maize. With the collaboration of the CIAL leader, they conducted a rapid market study to identify potential buyers of maize in Piendamó and Popayán. They proceeded to identify the different actors in the chain. They studied the support system for maize (Office of the Mayor, CORFOCIAL. SENA, etc.). The organization of maize growers was evaluated, which revealed a deficiency in outcomes and in the level of commitment of several members. Based on this analysis, the organization has undergone an overhaul. They proceeded with the analysis of the critical points in the production, processing and

[3] MSIM – RAeD Project, CIAT.

[4] In this report recommendations are presented for each case separately; thus some of them are repeated.

marketing links. Then they prepared the problem trees to identify the causes and effects of the diverse limiting factors in the chain. They then converted the problem tree into an objectives tree, ending up with the action plan or the design of the IAP. They plan to write and present a project to the Office of the Mayor of Morales. They are very interested in lowering production costs and in initiating activities to generate aggregate value.

In the process of analyzing the chain, the CIAL had problems in bringing together the middlemen and merchants in a meeting; thus they had to limit their meetings to the producers. The commercial information was obtained from traveling and interviews in the work place.

Recommendations

- First of all, the Maize Growers' Association should strengthen their leadership and administration in order to have well-founded objectives and strategies. The members should also know what their specific responsibilities are and be committed to reaching the objectives they have set. The Association should also adopt an organizational chart with well-defined functions in order to develop their business activities more efficiently and effectively. This point is in addition to the fact that the Association needs to execute the action plan it has proposed to strengthen its position in the maize chain.
- The leaders of the Association or the CIAL with an aptitude for business should receive training and technical support in business, including business and market orientation, foundations of business management, strategic planning and preparation of business plans. It is not sufficient to give a short training course on the topic to the technician of the supporting entity.
- For this purpose it is recommended that the Association carry out processes of strategic planning and develop business plans for the production activity and business selected. Although these topics were presented in the first workshop in Conocoto (Mar. 2002), the importance of organizing a workshop for technical advisors of the CIALs and producers on the topic of the business plan was communicated to IPRA.
- This CIAL should examine in greater depth the market study on maize in Colombia, including the diverse segments (grain, processed and transformed) and trends in domestic production and imports.
- They should also review the cost structure that they are using at present in order to become competitive. It is recommended that they use the RAeD software, RentAgro. The CIAL's agricultural research should support this point.
- In their analysis there was no figure illustrating the links and actors of the chain, including importers of maize and the diverse market segments.
- One of the CIAL leaders expressed his interest in business-oriented training and technical support. This and credit are the main needs of the CIAL in its efforts to strengthen its business. This point is related to compliance with the recommendations made in the first point.

***CIAL Flor Naciente, near Riobamba (Chimborazo*), 12 August**

Activities carried out

This CIAL, which is a half hour from Riobamba, consists mostly of indigenous women. It is located in the parish of San Juan, alt. 3300 m. The community works on 38 ha of an old hacienda that they have been buying with the fruit of their hard work, farming. They have the support of the FORTIPAPA project, through their technician Julián Pucha, to study new potato varieties including Papa-pan, Fripapa, Rosita and Santa Isabela, using their traditional variety Rábida as a check. They are also doing research on upland rice, which did not do well and quinoa, of which they already have 6 lines approved.

Their work can be divided into two types: preparation of the proposal for the IAP on potatoes (FORTIPAPA) and business development for transforming the production (CIAL and FORTIPAPA).

Development of IAP

The technician Julián Pucha applied the methodology of identifying market opportunities (topic of the first workshop), consisting in the preparation of a biophysical and socioeconomic profile of the region of the CIAL in question and the execution of a rapid appraisal of markets in Riobamba. The following market opportunities were detected: potatoes, *chochos*, peas, *taxo* and "*mortiño*".

The potato chain in Ecuador was analyzed, working from the national level down to the CIAL community, using the IAP methodology presented in the second workshop in Conocoto (Aug. 2002). The technician based the exercise partially on work done by FORTIPAPA, focusing on three products: potato chips, potatoes cut in thin strips for french fries, and whole potatoes, washed and selected. An evaluation of the CIAL Nuevo Amanecer was also included.

It should be noted that FORTIPAPA is in the process of entering into an alliance with several institutions including the Project Emprender, implemented by the Swiss NGO InterCooperation, in order to execute an IAP at the level of Ecuador, with emphasis on the market development of new potato-based products, targeted to supermarkets and agroindustries. FORTIPAPA also plans to conduct a more complete market study for the diverse products derived from potatoes, with the support of local universities.

Business development

It is important to highlight this joint work between FORTIPAPA and the CIAL, given that with the CIAL's own resources and the enthusiasm of the promoter Hilaria, they were able to do research on processes for making potatoes for french fries as well as potato chips. After some technological explorations with the potatoes cut in thin strips, they reached the conclusion that they needed to perfect the process by adding antioxidants to keep the potatoes from darkening in color. They finally decided to work with the other product: potato chips in bags.

The CIAL Nuevo Amanecer has worked out a process to make this product, for which they tested several varieties of potatoes and several types of oil. They had technical support from a FORTIPAPA foods engineer for the frying tests. They have begun local sales on a small scale in schools and at fairs, with a volume of about 300 bags (100 g each) weekly. They have rustic equipment such as plastic recipients, large frying pans, stove and slicers, bought by them and by FORTIPAPA; and they seal the bags by heat, using a candle and a knife.

The process of making the potato chips is as follows:

- They wash the unpeeled potatoes manually.
- They select the potatoes manually, preferring those that are healthy and have a uniform shape
- They peel the potatoes manually, trying to remove only the peel.
- The peeled potatoes are re-washed.
- The potatoes are cut into thin slices.
- If the variety used is Fripapa, it is fried directly; if it is another one such as Papa-pan, the chips have to be cooked 3 min. before frying.
- The chips are removed from the pan, and the oil is left to run off.
- The chips are placed in a polyethylene bag, sprinkled with salt and sealed with a knife, heated with the candle.

The CIAL has also calculated the cost structure for processing 25 kg of potatoes, and they know what their gross profit margin is. In their structure they have included the cost of their labor.

Recommendations

- All actors (IPRA, the local support institution and the CIAL itself) should bear in mind where the CIAL ends as a research body and where the rural agroenterprise begins. It is important to define whether the members of the CIAL and the agroenterprise are the same individuals or whether it is necessary to involve others. The rural agroenterprise should adopt an organizational chart with well-defined functions in order to carry out their business activities more efficiently and effectively.
- The leaders of the Association or the CIAL who have an aptitude for business should receive training and technical support on business. It is not enough for the technician of the supporting entity to have received a short training course on business because he/she will most likely not be present in the day-to-day running of the business.
- The head of the young agroenterprise should implement processes of strategic planning and develop a business plan for the selected production activity and business. Although these topics were presented at the first workshop in Conocoto (Mar. 2002), the importance of organizing a workshop for the technical advisors of the CIALs and producers on the topic of the business plan was communicated to IPRA.
- IPRA should promote the creation of complementary funds to support the transformation of the CIAL into a rural agroenterprise. Just as there are limited funds

for agricultural research (US$50-100 per CIAL), there could be a larger, rotating fund or a system of reimbursement to finance technical and business consultancies and minor investments (equipment and tools) for the CIALs to become rural agroenterprises. This model is being promoted by the NGO Randi Randi for the CIALs in El Carchi in northern Ecuador.

- The CIAL Nuevo Amanecer should improve the quality of their product because the chips turn soft by the second day. Normally, potato chips can last more than 2 months without losing their crispness. According to experts in Colombia, this quality issue has to do with the following aspects, which could be new research topics for this CIAL:
  - ✓ The variety of the potato
  - ✓ The type of material used in the bag; explore changing from polyethylene to polypropylene
  - ✓ The frying temperature; the higher the temperature, the better (≅200°C)
  - ✓ The peeled potatoes should have the starch removed by soaking them in water for several hours before frying.

- In this sense, FORTIPAPA could support the CIAL by identifying an expert in the production of potato chips to offer a rapid solution to the problem of the product losing its crispness.

CIAL Nuevo Amanecer, San Agustín Parish, Quito (Pichincha); **14 August**

Activities carried out

This CIAL has nine members (six stable), mostly mestizo women who have done research on guinea pigs, tomatoes, rabbits, chickens and laying hens. One of its members, Antonio, is a young man who already has a rural agroenterprise that breeds and sells live guinea pigs, and who has participated in both workshops. This CIAL has the support of the NGO IIRR.

Two activities were held: A market study for yellow-footed, country-raised chickens in the capital city, Quito, followed by the analysis of the chain of country-raised chickens and the development of the action plan (IAP) for strengthening this chain. A good demand for these country-raised chickens was identified in Quito.

The second activity was to begin a rural agroenterprise for producing country-raised chickens to be sold alive. The CIAL selected this line of production because (1) they already had the knowledge, (2) the demand was identified in the rapid market appraisal, and (3) there is a more rapid return on the investment than with guinea pigs. With the community's own investment and contributions (mingas), they constructed a chicken coop with a capacity for 50 chickens. The rations consisted of a commercial concentrate, supplemented with coarsely milled maize. The chicks were given the first vaccine. The CIAL managed to raise and sell locally two broods, but in the third, the chickens died, probably because they changed the supplier of chicks, which suffered from being transported such a long distance. They also had to face a period of low prices because of the importation of chickens from Colombia and Peru. At present the price of chicken has begun to rise again.

The chicks are bought at 2-3 weeks, and after 5 weeks they reach commercial weight. Despite the failure of the third brood, the group plans to continue with the business, but they are now aware that they should improve their technology, especially with respect to the purchase of the chicks (chicks 1 wk old purchased from a reliable supplier nearby) and to improve the infrastructure (coop and cages). Their target market is the city of Quito, and not the local community, due to the better purchase price.

Recommendations

- It is important that IPRA, IIRR and the CIAL itself have a clear idea of where the CIAL as a research body ends and where the rural agroenterprise begins. It is important to define whether the members of the CIAL and the members of the agroenterprise are the same people or whether it is necessary to involve other people. They should adopt an organizational chart with well-defined functions so as to develop their business activities more efficiently and effectively.
- The head of the chicken agroenterprise should implement processes of strategic planning and develop a business plan for the production activity and business selected. Although these topics were presented in the first workshop in Conocoto (Mar. 2002), the importance of organizing a workshop for technical advisors of the CIALs and producers on the topic of the business plan was communicated to IPRA.
- It is important that IPRA promote the creation of complementary funds to support the transformation of the CIAL into a rural agroenterprise. Similar to the funds available for agricultural research (US $50-100 per CIAL), there could be a larger rotating fund or system of reimbursement to finance technical and business consultancies and minor investments (equipment and tools) for the CIALs in the process of becoming rural agroenterprises. This model is being promoted by the NGO Randi Randi for the CIALs of El Carchi in northern Ecuador.
- The IIRR should offer more technical support, to the extent that their resources permit. If this is not possible, IPRA should support this CIAL with resources so that they can obtain the advice of an expert in raising broiler chickens on topics such as minimum infrastructure, biological control of pests and diseases, and nutrition.

***CIALs in El Ángel (Carchi),* 13 August**

According to the technician Patricio Ponce of Manrecur, the activities of the CIALs in this zone in northern Ecuador have been suspended for lack of funds. Manrecur did not implement the design of the IAP. The CIALs in the upper zone have been working on fodder beets, blackberries and native plants; while those of the lower zone have been working on raising animals such as guinea pigs, pigs, chickens and sheep.

The new Project Manrecur 3 has a more business-oriented approach and will continue with the CIALs, but they intend to decrease the dependency of the CIAL on the technician. There will be two funds to support the CIALs: the conventional one of US$1000 to support the research activities for 10-15 CIALs, which will be rotating in nature, and the other, an investment fund of US$10,000. In this way the CIAL has the opportunity to pass from the

Research Fund to the Investment Fund. An alliance among Manrecur, EcoPark and Manrena is also being explored in order to develop a process of Training of Trainers on the topic of the CIAL methodology.

Recommendations

- Workshop on business concepts and preparation of the business plan to train producers. This workshop can be held in November of this year or leave it for the first quarter of 2004. It would be convenient for CIAL producers interested in the business and whose educational level is not too low to participate. The agenda should include a review of basic business concepts (business and market orientation, foundations of business management, strategic planning and preparation of business plans), before proceeding to the topic of business plans. The topic of business plans can be approached first with the theory, then an example and finally develop a business plan in groups of two or three people.

- Organizational charts for the business. For each case the decision as to whether the CIAL and the rural agroenterprises should involve the same people or not, should be taken very rationally. The agroenterprise requires positions and functions that are certainly different from those of a CIAL, given that their objectives are different although there is some overlapping.

OUTPUT 4. MATERIALS AND INFORMATION ON PARTICIPATORY RESEARCH APPROACHES, ANALYTICAL TOOLS, INDIGENOUS KNOWLEDGE AND ORGANIZATIONAL PRINCIPLES, DEVELOPED

Extension through farmer research: Local Agricultural Research Committees (CIALS) in Latin America

Researchers: *Carlos Arturo Quiró[5]s, Boru Douthwaite,[6] Jose Ignacio Roa,[7] Jacqueline Ashby[8]*

Highlights

Book chapter written for a World Bank book entitled "Extension through Farmer Research: Local Agricultural Research Committees (CIALS) in Latin America"

Identification of the case

A CIAL is a committee of people who volunteer to carry out experiments in rural areas on behalf of their clients. The client group from which the committee comes may be a rural community, an agroenterprise, an interest group such as a women's group, or a producer organization. CIALs help foster equitable rural innovation by sharing the knowledge, experience and benefits that comes from experimentation, while at the same time sharing the inherent risks and costs.

The first step in forming a CIAL is when a group becomes motivated to do so through contact with a CIAL facilitator or hearing about the method from other farmers. The group then meets to elect a committee and to identify problems and opportunities, prioritize them and then mandate the committee to experiment on their behalf. The committee then designs experiments to meet this mandate. The CIAL method reduces the risk of financial loss if their experiments fail by stipulating that the trial plots should start small. In addition, the method reduces the risk of the committee recommending an inappropriate technology by stipulating that each trial should be replicated, and the promising trials be repeated for three seasons on larger and larger plots. All the steps in the CIAL process are shown in Figure 1.

[5] Acting Project Manager, SN-3 Project, CIAT, Colombia
[6] Senior Research Fellow, Rural Innovation Institute, SN-3 Project, CIAT, Colombia
[7] Specialist professional, SN-3 Project
[8] Director of Research, Institute of Rural Innovation

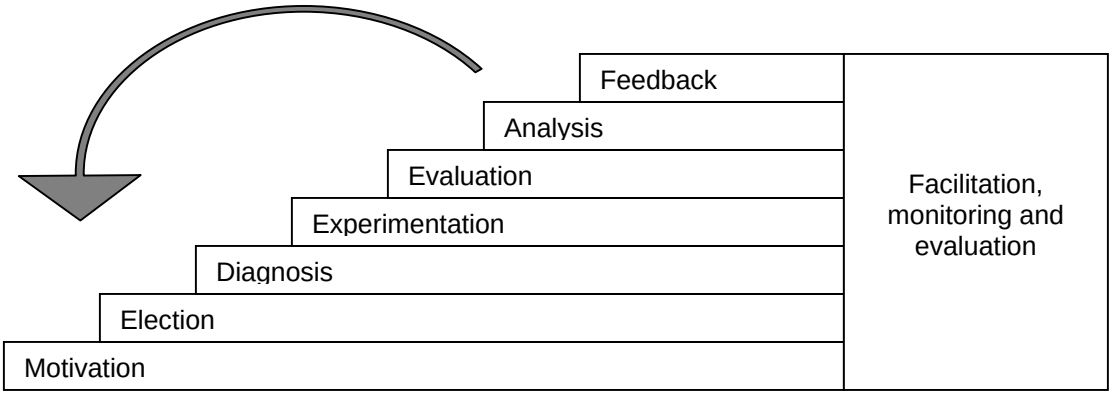


Figure 1: The CIAL process (Ashby et al.,2000)**.**

A team at the International Center for Tropical Agriculture (CIAT) developed the CIAL method in the early 1990s. The team had worked for more than five years to understand why resource-poor farmers in particular were not adopting technologies produced by formal-sector research. They concluded that if adoption rates were to increase, then farmers must be included earlier in the design, testing and local adaptation of new technologies. However, they recognized that to do this in the complex and risk-prone environments on which millions of farmers depend would be extremely costly and slow unless farming communities themselves took much of the initiative. Hence the team developed the CIAL method as a way of enabling farming communities to carry out their own on-farm evaluation and adaptation. One of the features of the CIAL method is that farmers should learn about and use the concept of experimental replication so that formal sector R&D can use their results and thus become more sensitive to the needs of poor rural communities.

Although CIALs were designed to be a cheap way for a research and extension service to expand their reach, CIALs do have costs associated with them. The main costs are training the facilitators who support the process, and providing the CIALs with a small research fund (Ashby et al. 2000). The costs of setting up a CIAL for the period 1990-1998 were estimated to be US$670 for the first year and US$325 per year for the next 5 years. The return on investment was estimated conservatively at 78%. This is likely to be much higher now, however, because costs of setting up and sustaining CIALs have been greatly reduced through "learning by doing." For example, it has been found that experienced farmers can adequately train facilitators much more cheaply than salaried professionals, and under the right conditions one facilitator can support up to 50 CIALs. First year start-up costs now range from US $25-$500 per CIAL, in cash or kind (Ashby, 2003).

Impact

CIAT began by establishing five CIALs in Cauca Province in Colombia in 1990, with funding from the Kellogg Foundation. By late 1991 the CIAT team had established a total of 18 CIALs, and this number grew to 55 by 1994. CIAT has also trained trainers from other countries and other organizations, including the International Institute of Rural Reconstruction (IIRR), National Autonomous Institute of Agricultural and Livestock Research (INIAP) in Ecuador, Potato Research Program (PROINPA) in Bolivia,

Corporation, Colombian Institute of Agricultural and Livestock Research (CORPOICA) in Colombia and Participatory Research in Central America (IPCA). These organizations then went on to set up their own CIALS, and as a result there are now more than 250 active CIALS in 8 Latin American countries (Figure 2) and an unknown number of adaptations of the approach in sub-Saharan Africa and Asia, including China. As of 2002, 57% of the known CIALs were supported by non-government organizations and a third by government organizations. The others were facilitated by consortia of two or more cooperating organizations.

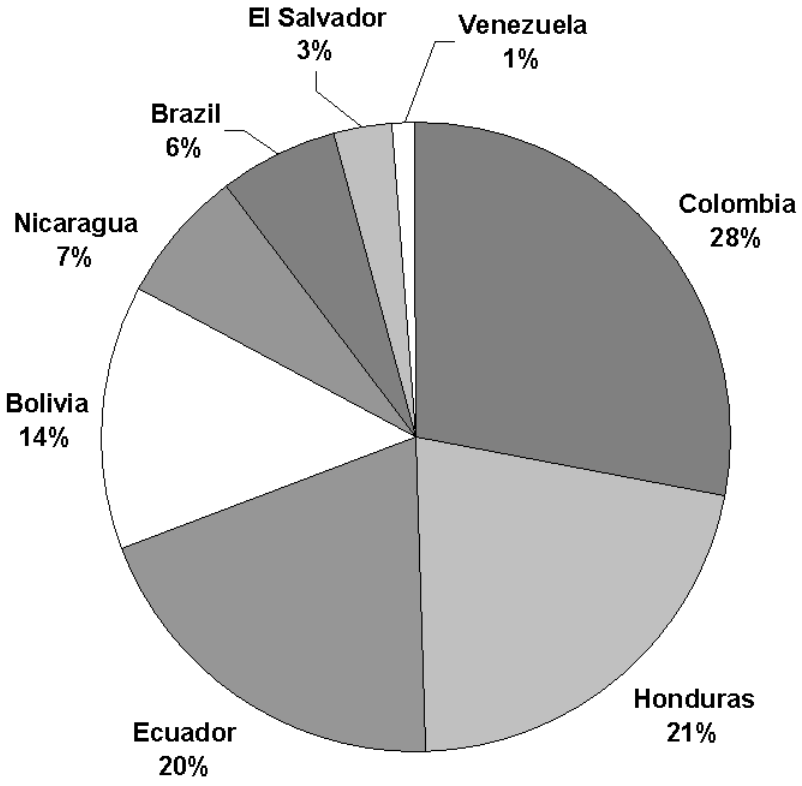


Figure 2: The countries that are hosting CIALs in Latin America.

During the CIAL diagnostic process, most communities assign first priority to research on their major food crops (Figure 3). Thus in Honduras most CIALs are working on common beans and maize—the two most important ingredients of the local diet; while in the Andean regions of Ecuador and Bolivia, communities prioritize potatoes and broad (faba) beans. In the few areas with good food security, CIAL research covers a broader range of themes (Figure 4). Under these conditions committees seek to raise incomes by taking up new crops or adding value to traditional ones through improved processing.

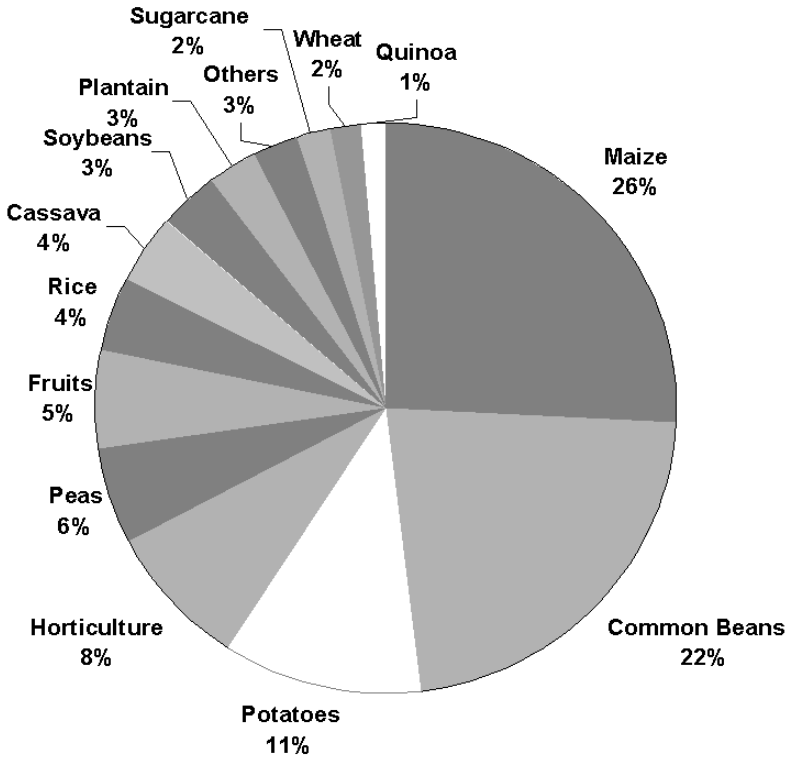


Figure 3: Crops researched by 250 CIAL communities in Latin America.

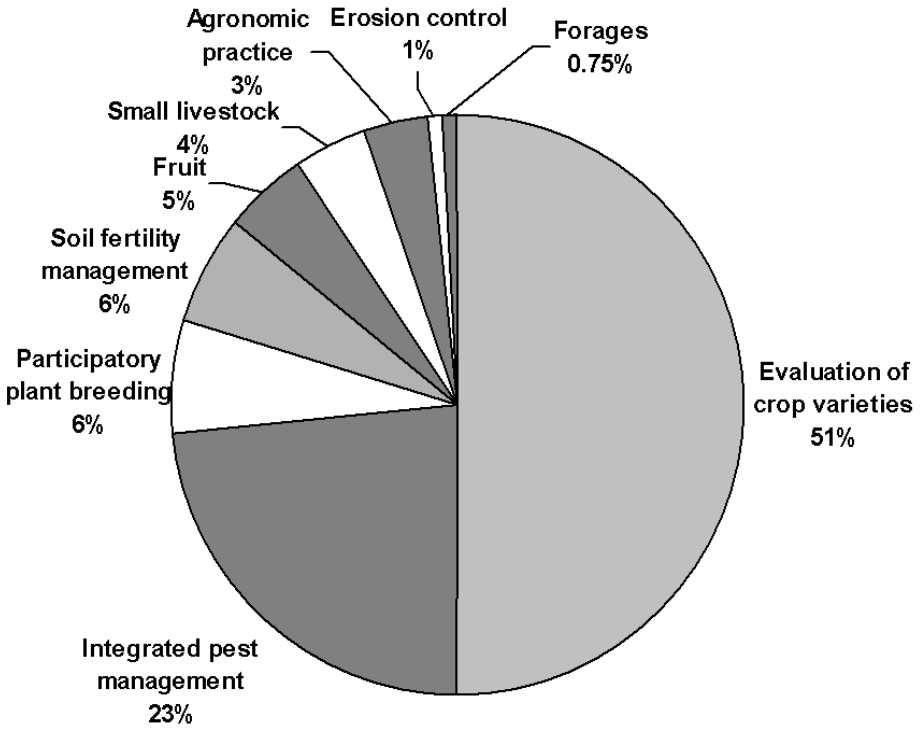


Figure 4: Research themes chosen by 250 CIAL communities in Latin America.

CIAT carried out an impact assessment of the 68 Colombian CIALs in 1998. The study found that: (1) CIALs directly resulted in more rapid technology adoption; (2) the CIAL process itself has led to people's learning useful skills and forming valuable social linkages; and (3) CIAL communities had experienced improvements in welfare. These welfare improvements came about partly by people starting agroenterprises based on the results of the experiments and the new skills and linkages they had developed. For example, some CIALs have started to produce commercially the seed of the best crops identified in their trials. Another source of welfare improvement has been that people in CIAL communities have been encouraged by the experimentation to try more new crops, and as a result have more crops and more varieties in their fields than farmers in similar villages without CIALS. This diversity enables villages with CIALs to cope better with risk. Moreover, the speed of technology adoption was faster in villages with CIALs, and the poorest strata of farmers were just as likely to adopt as the richer strata. Hence CIALs help communities benefit more quickly from improved varieties, whether developed by the formal research sector or the farmers themselves. The study also suggests that CIALs may improve food security because farmers in villages with CIALs reported fewer "hungry months" of seasonal food shortage.

An important impact of CIALs has been the inclusion of women in local research. As of 2003, nearly 60% of the committees have women members, and their participation has meant that factors critical to whether a community accepts a new technology such as cooking time and taste are included in farmers' evaluations. Women have been able to set up their own CIALS—one eighth of the CIALs are women only—and carry out research on topics of concern to women such as family nutrition. Women have also been able to benefit financially from CIAL research and in this way boost family incomes.

Another impact of CIALs has been on formal-sector research agendas. In Ecuador, for example, the national research and extension agency INIAP has worked with CIALs since 1996 and is now supporting 19 CIALs in one of its five regions. INIAP staff has learned that resource-poor farmers want to diversify their crops, and as a result INIAP is now putting less emphasis on potatoes and more on the crops that farmers are interested in such as the indigenous quinoa (*Chenopodium quinoa*), beans and *chocho*, a fodder legume (*Lupinus mutabilis*). Another effect is that the staff working with the CIALs is motivated by the good relationships they have developed with the communities through the CIAL process.

Although CIALs are influencing the research agenda of INIAP in Ecuador, this is the exception rather than the rule. In general, CIALs are not as well linked to formal-sector research as originally hoped for, and more work needs to be done in understanding why this is and how linkages can be strengthened.

The general lack of formal linkages to research and extension organizations has meant that the financial sustainability of CIALs is an issue. In part this is simply the challenge faced by all community-based organizations as state support for agricultural research and extension withers away. CIALs have developed a large range of mechanisms for replenishing their operating fund; however, these local initiatives probably need to be matched by a larger scale source of financial investment if they are to be sustained.

Twelve years of experience working with CIALs has shown that the main success factor is that the CIALs themselves and their host communities stick to the following basic principles:

- Relationships between the CIAL, the community and external actors are founded on mutual respect and accountability and shared decision-making.
- Partners in the research process share the risks of research.
- Research is conducted by comparing alternatives systematically.
- Knowledge is based on building experience and learning by doing.
- Research products belong to the community.

Another key success factor is adequate training of CIAL members in the participatory research process. In addition, Humphries et al. (2000) found that CIALs have been found to be more successful in communities where social capital is already high.

Sustainability and replicability

CIALs are not static entities. When the first research cycle is finished some CIALs will begin another cycle to investigate a new problem or opportunity, while others will cease research and may start to commercialize some aspect of the new technologies they have tested. For example, one CIAL in Cauca, Colombia, identified a high-yielding common bean variety, then in the following seven years produced 230 t of seed before the variety became susceptible to anthracnose (a fungus). The CIAL has now begun a second research cycle to look for new varieties of beans, including, for the first time, climbing types. Whether CIALs continue or not, the process permanently improves the capacity within that community to search for new solutions and to experiment. Actively seeking out solutions, experimenting and setting up agroenterprises are all key for the sustainability of rural communities in the current global context of climate change and more open markets.

One of the ideas when the CIALs were originally founded was that the committees would act as a feedback mechanism to National Agricultural Research and Extension systems (NARES). Since then, funding cuts has seriously weakened the NARES in Latin America. Nevertheless, the pendulum may well be swinging back as a new awareness has occurred of the role of the public sector in funding, but not necessarily delivering, non formal agricultural extension (Rivera, 2003). Experience with mature CIALs has shown that they can expand the reach of research and extension services to poor, remote client groups at a low cost. CIALs may be well placed to benefit from more public-sector funding to NARES. Indeed, evidence from Bolivia, Ecuador and Colombia shows that "mainstreaming" of CIALs is happening. Bolivia has recently reorganized its NARES. Rural municipalities are required by law to include farmers' perspectives in municipal development plans, and the CIALs are proving a useful mechanism to bring this about. In Ecuador INIAP has recently reorganized to work on organic agriculture using participatory methods. INIAP has realized that research and extension that does not take farmers' needs and experiences into account can be "like throwing money in the river";[9] and participatory

[9] A direct quote from a senior INIAP staff member.

approaches, in particular CIALs, are necessary to maximize impact with the limited resources at INIAP's disposal.

In Colombia CORPOICA, the national research program, started working with the methodology in 1996. CORPOICA has set up 46 CIALs in 7 provinces in Colombia, and as of 2001 was working with 30. A case study that looked at the institutionalization processes found that while the methodology receives official support within CORPOICA, the institutionalization process is being hampered by a widely held view that the CIAL methodology is an extension tool and not useful to scientific research (Mentor, 2002). Nevertheless, CIAL methodology has gained ground in CORPOICA among the scientists who have been involved firsthand.

Another mechanism for ensuring CIAL sustainability has been the setting up of so-called "second-order organizations." In Colombia, the CIALs in Cauca formed CORFOCIAL in 1995 as an umbrella association to protect and promote their interests. CORFOCIAL is funded from the interest on an endowment provided by an anonymous benefactor and has a staff of three paraprofessionals. It supports the CIAL process by providing training, helping in the formulation of funding proposals, facilitating visits to research organizations or to other CIALS, promoting the exchange of seeds and other products among CIALs, and organizing an annual meeting of its members. In Honduras the IPCA project[10] supported the formation of a federation of CIALs in 1998. The organization is called ASOCIAL and like CORFOCIAL is financed by an endowment fund. ASOCIAL carries out functions similar to CORFOCIAL. In addition, however, both individual CIALs and ASOCIAL provide savings and microcredit schemes to their members. Another difference in Honduras is that the annual CIAL meeting is regularly attended by researchers from the national agricultural programs making it likely that CIAL and formal-sector research in Honduras will become better integrated in the future (Humphries et al., 2000).

Lessons learned

One of the strengths of both CORFOCIAL and ASOCIAL is that that they are independent and thus able to put the interests of their members first. The CIAL members of these two organizations have played an invaluable role in showing the potential of the methodology. However, in order to mainstream the approach further, more CIALs will have to be established in existing organizations, groups or agroenterprises, with the associated risk that the CIAL methodology be compromised. Experience shows that if CIALs are established as part of a NARES, then the NARES staff must commit to the principle that a CIAL primarily serves the community it belongs to and not the NARES adaptive research or extension interest. NARES staff must also commit to regular contact, respect farmer research, be accountable and share decision-making.

Based on the CORPOICA case study, Mentor (2001) came up with the following recommendations for successful institutionalization of the CIAL approach:

- Identify natural allies—build a support base before attempting to convince skeptics.

[10] Funded by the International Development Research Centre (IRDC), Ottawa, Canada.

- Use existing information on successes to create a demand for training.
- Use appropriate media for different audiences to build awareness of results.
- Give key stakeholders a role in deciding how to work with CIALs.
- Implement report-back and participatory evaluation at all levels to enhance institutional learning.
- Focus on learning from the process of working with CIALs as well as on the results.
- Gradually reduce the amount of time researchers dedicate to working with any one group of CIALs.
- Network experienced people and those who are just beginning CIALs to support expansion of the process and exchange ideas about adaptations of the approach.

Another key lesson learned is that while it is important to stick to the basic CIAL principles, which are listed in the next section, it is also important to encourage local adaptations. Some of the adaptations that have proved successful are listed below.

- Where short-term food security is a priority, begin by evaluating treatments in researchers' trials and subsequently share risk in more uncertain forms of farmer-run experimentation (Ecuador, East Africa).
- Run a collective production plot using proven technologies, testing risky technologies in the CIALs small experimental plots. The collective production helps compensate committee members for their time and helps increase the petty cash fund (Honduras, Colombia).
- Test and monitor innovations on farms without establishing formal experiments, especially useful with livestock or natural resource management practices (East Africa, Southeast Asia).
- Elect a large committee: in Northeast Brazil large committees sustained CIALs through periods of seasonal migration as those returning or remaining replaced migrant members. In Honduras, large committees made the human capital benefits accessible to a broader cross-section of the client group.
- Create a petty cash fund by providing the CIAL with experimental inputs in kind and then use profits from trials to fund the committee's activities. This enabled CIALs in Bolivia and Colombia to increase their petty cash fund.
- Form a CIAL to provide R&D on new products or processes for new or existing small agroenterprises.
- Run the petty cash fund as a revolving credit fund or as a small venture capital fund that makes loans for equipment that is rented out to the client group.

Experiences have shown that CIALs develop along one of two paths: they either continue to work as a volunteer research service on behalf of their communities or privatize the results of their research in an agroenterprise. Regular meetings in which the CIAL reports back to their community are important to ensure that they remain in contact with the community and follow along the first path. Nevertheless, if the CIAL does set up an agroenterprise then this can also bring benefits to the community and beyond through, for example, providing seed of new and proven varieties or crops. Indeed, one of the findings has been that the CIAL method is actually a very good way of initiating agroenterprise

development, and CIAT is currently including market surveys in the CIAL method as a way of facilitating the process.

Finally, CIALs have proven themselves to be complementary to farmer field schools (FFS). FFS can build agroecological knowledge to make CIAL research more meaningful; e.g., when a community wants to experiment on different control methods of the white grub (*Diloboderus abderus*), a pest of potatoes. CIALs can generate locally adapted technology options to strengthen FFS (Braun et al., 2001).

Guidelines for replicating CIALs

Many features of the CIAL process such as the sponsoring organization, who facilitates, the size of the committee, the type of experimentation and the size of the petty cash fund can vary greatly, provided that sponsors, trainers, client groups, committee members and facilitators understand and adhere to these basic principles:

- Support CIALs to help poor farmers manage risky agricultural innovations, building on local experience. This means avoiding paternalistic protectiveness and supporting farmers in learning how to innovate over and above demonstrating technological "fixes."
- Ensure that the client group monitors and evaluates their committee and the facilitator through regular feedback. CIALs must share knowledge about their process and its results to ensure that research products belong to the wider community, not just to the committee members or the sponsor.
- Expand and rotate committee membership over time.
- Nest experimentation in social projects with short-term returns to sustain commitment in very poor, risk-adverse client groups.
- Encourage neighboring CIALs to visit or get together to reduce the costs of visiting geographically dispersed CIALs.
- Minimize costs of visiting CIALs by planning locations for their establishment; e.g., in Kenya and Colombia the national programs have located committees in target agroecological zones, easily reachable from an experiment station or municipal extension office.
- Train experienced farmers with prior experience in a CIAL as facilitators to reduce costs of facilitation, especially in the case of large-scale implementation.
- Develop capacity of CIALs to organize their own regional meetings and exchange results.
- Promote attendance of scientists and key R&D decision-makers at CIAL meetings to ensure their support for CIALs.
- Ensure that CIALs are making decisions about what is acceptable by ensuring that both they and their client group own and are responsible for experimental inputs (i.e., the CIAL petty cash fund).

People interested in learning more about CIALs should visit the IPRA website (http://www.ciat.cgiar.org/ipra/ing/index.htm), where it is possible to download a book on CIALs (Investing in Farmers as Researchers) and 13 handbooks that deal with the different

stages involved in establishing CIALs (http://www.ciat.cgiar.org/ipra/ing/cial_primers.htm). Details of a training of trainers module, available on CD, is given in the Appendix. Further information on CIALs, including a training of trainers module on CD, is available from Carlos Arturo Quirós (c.quiros@cgiar.org).

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A participatory procedure applied to selecting and developing forages with farmers (PPSF)

Researchers: *Hernández R., L.H*[11]*, Peters, Michael*[12]

Highlight

A participatory procedure applied to selecting and developing forages with farmers (PPSF), developed

Abstract

Although forages play an important role in smallholder production systems, conventional approaches to technology development for forages particularly legumes have not generally resulted in significant levels of adoption in Latin America and the Caribbean, Asia and Africa. Various factors have been identified that impede forage adoption directly or indirectly: (a) the unavailability of locally produced seed, (b) the lack of credit facilities for purchasing inputs such as seed, fertilizer and fencing, (c) distorted pricing policies, which do not guarantee economic returns to farmers, (d) poor infrastructure, which disrupts delivery of inputs and removal of outputs, (e) lack of adequate markets for livestock products, and (f) low levels of farmer participation in forage development. The need for developing participatory procedures that actively involve farmers in the research and scaling-up processes is evident. According to them, there is no doubt that the participatory procedure for selecting forages (PPSF) was successful in selecting and developing with farmers, forages suitable for smallholder production systems in Honduras, Nicaragua and Costa Rica. Technicians and scientists in similar biophysical and socioeconomic environments can use the methodology and information generated to design and select novel forage technologies. Moreover, it was possible to strengthen linkages among farming communities and technicians, development workers and researchers in the aforementioned countries, increasing mutual knowledge and benefits. The PPSF gave a sounder understanding of farmers' perceptions of their problems and opportunities, contributing toward building a stronger bridge between farmers' communities and national research institutes.

Introduction

Farmers usually employ more than one technology to address constraints and opportunities on their farms and in the market environment. These components are observed, compared and evaluated before being accepted or rejected. Farmers' decisions are based on criteria obtained from their own experience; in other words, this process can be described as farmers' research at the field level. Criteria can be defined as a basis for judging and making decisions on technology options (Guerrero et al., 1993).

[11] Research Associate I, SN-3 Project, CIAT, Colombia
[12] Senior Research Fellow, IP5 Project Tropical Grasses and Legumes, CIAT, Colombia

The research process carried out in experiment stations is also based on criteria, but the emphasis is on institutional and scientific objectives. Although this process has objectives such as improving the level of farmers' well-being and poverty alleviation, the technological components generated are not generally adopted by farmers because the technologies do not function in their fields (i.e., failure of technology) or do not respond to opportunities and constraints under farmers' conditions (i.e., not adapted) (Quirós et al., 1991). On the other hand, there have been cases where technological components rejected by scientists have given good results in the farmers' fields (Ashby, 1990). These observations reflect the fact that farmers' and scientists' criteria for selecting technology options are frequently different.

Despite the fact that forages play an important role in smallholder production systems, conventional approaches to technology development for forages— particularly legumes have not generally resulted in significant levels of adoption in Latin America and the Caribbean, Asia and Africa (Horne et al., 1999, Peters et al., 2001). Various factors have been identified that impede forage adoption directly or indirectly: (a) the unavailability of locally produced seed (seed in general available to farmers), (b) the lack of credit facilities for purchasing inputs such as seed, fertilizer and fencing, (c) distorted pricing policies, which do not guarantee economic returns to farmers, (d) poor infrastructure, which disrupts delivery of inputs and removal of outputs, (e) lack of adequate markets for livestock products, and (f) low levels of farmer participation in forage development (Thomas and Sumberg, 1995; Peters et al., 2001, 2003; Sumberg, 2002). Sumberg (2002) emphasizes the fact that agroclimatic, economic, socioeconomic and cultural conditions define the context of technology design and development and should, therefore, be fully integrated into the process of design specification.

The need for developing participatory procedures that actively involve farmers in the research and scaling-up processes is evident (Braun et al., 1999). This paper addresses this constraint by developing a participatory procedure applied to forage selection (PPSF), developed for conditions in Latin America and the Caribbean.

Understanding farmers' perceptions (criteria) about technological components has been successful in terms of attaining better opportunities for adaptation and adoption of forage technologies. Moreover, it has been possible to strengthen the linkages between farming communities and scientists using this strategy (Horne, et al., 1999).

Better understanding will emerge as to how each partner can take the initiative at different stages of the forage selection and adoption process according to their respective skills, experience and available resources. Utilizing these experiences, PPSF builds on the farmers' unique capacity to articulate precise preferences and to match varietal traits with specific environmental and socioeconomic niches. Finally, iterative feedback loops among all the actors will lead to mutual benefits.

Objectives

This paper describes a sequential procedure for implementing the participatory development and selection of forages, which is widely applicable and allows the analysis of quantitative data. The aim is to identify ideotypes requested by farmers as a basis for efforts to make these available to them, as well as to other farmers. The latter process of scaling up will be described elsewhere. The final goal is to identify and scale forage technologies, offering solutions to farmers' constraints and opportunities, integrating on-station and on-farm research with farmer participation.

This work capitalizes on earlier work with cassava, maize and beans, which resulted in a procedure to analyze data obtained in participatory evaluations and serve as an initial framework for developing a technology specific to forages (Hernández, 2000). Forages differ considerably from other crops as germplasm ranges from annual to perennial materials and forages have other multiple functions in the system (Humphreys 1994; Schultze-Kraft and Peters, 1997; Peters et al., 2001).

This paper describes this procedure and identifies strengths and limitations of the same.

Methods

The following research questions will be addressed in this study:

- Is it possible to develop a participatory procedure in order to identify farmers' selection criteria to be applied in forage technologies?
- Can information derived from this participatory procedure be analyzed and incorporated into the traditional research process?

Participatory procedures

Figure 1 summarizes the suggested sequential participatory procedure, focusing on the identification, analysis and synthesis of criteria and explanations obtained in interactions with farmers. The procedure was developed in an iterative process of training, validation and feedback among farmers, technicians and scientists working with NARIs, NGOs, development projects, ARIs and CIAT in Honduras, Nicaragua and Costa Rica. The forage options used were selected on the basis of earlier on-station and on-farm work carried out by CIAT and its collaborators in Latin America and the Caribbean.

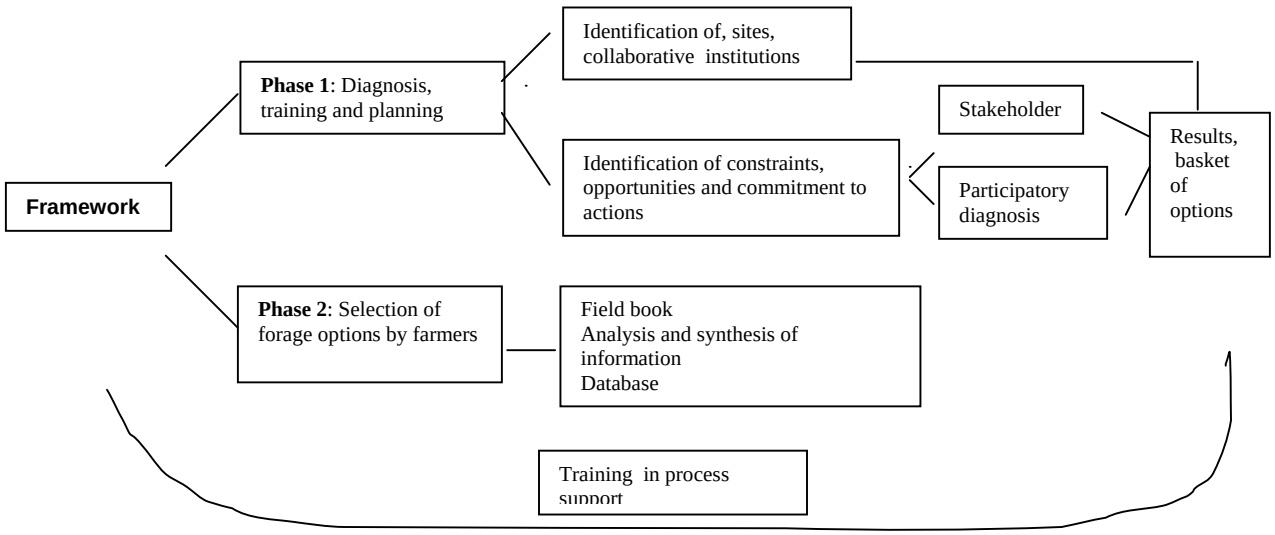

Figure 1. Description of the procedure and results.

The procedure consists of two phases thus far:

1. *Diagnosis, training and planning.* Identification of institutional collaborators and sites and exposing farmers (and technicians) to a range of forage options. This phase focuses on diagnosis, planning and training and the supply side of technologies; work with farmers is mostly consultative
2. *Selection of forage solutions by farmers and development of a field book.* In this phase forage options are selected; and descriptors, criteria, reasons, explanations and ideotypes obtained. Results are analyzed, systematized and generalized conclusions, drawn. Work with farmers is consultative and collaborative.

1. Phase 1

- Identification of institutional collaborators and sites. When selecting institutional collaborators, emphasis is placed on including diverse R&D institutions, working at different scales, from locally to nationally and internationally. Such diversity will not only allow the inclusion of different experiences and views, but also capitalize on the strength of each partner. An essential guiding principle and selection criterion is the interest in doing participatory work. Once collaborators are identified, experiences in PPSF and PME are assessed, and a corresponding training strategy, including training courses and follow-up workshops, is developed. The training process is an integral part of procedure development, particularly in the follow-up workshops, where approaches and methods employed and developed are validated and revised.

- Identification of constraints, opportunities and commitment to actions

- ⇨ Stakeholder analysis. Identifies interest groups at the watershed and community levels, differentiating age, gender, and experience (Ravnborg et al., 1997). Although in our case the initial focus was on livestock producers, the use of forages for soil fertility maintenance and soil conservation was included. Livestock, crop and mixed farmers participated. Focus groups included small- and medium-sized farmers although larger farmers sometimes benefited through contacts with these groups. It was also made clear to farmers and collaborators that there were no monetary benefits as part of the collaboration and that the immediate benefit was the access to improved technological options selected by farmers (most not yet available commercially). It was also pointed out to the farmers that success would depend on their active participation.
- ⇨ Participatory diagnosis. Restricted to agriculture, to complement the stakeholder analysis. The community identifies and prioritizes the main problems and opportunities for agriculture in their environment. Farmers look for research actions in order to find technologies to solve their field problems. Participatory diagnosis is a dynamic process done by groups of farmers in order to identify problems and possibilities of solutions. Farmers take decisions and actions as a commitment for them in a participatory diagnosis process (Ashby et, 1992).

- Selection of forage options. Different tools are used to evaluate forage options with farmers. Which tool to use initially depends on the stage in the participatory process, farmers' risk averseness in response to available resources and culture, and their experience with forages. Some approaches can be handled simultaneously.

  A range of forage options including grasses, herbaceous and shrub legumes were used as a basket of options. While introduced options are common across sites, in each location the currently used forager were included as controls.

- In later stages complementary options (e.g., Brachiaria hybrids and cowpeas), identified on the basis of farmers' preferences, constraints and opportunities were included in the evaluation.

- Nursery plots. This tool can be used for first exposure of farmers to new forage options. Nursery plots are small areas with a multitude of forage options where farmers are exposed to a breadth of potential technologies addressing constraints and opportunities. Farmers give feedback on the utility and deficiencies of forage technologies and can select the most promising options for their production environment. There is limited risk as plots are small and the farmers' input of resources is minor. The process is mostly consultative, with the farmers providing land for the nursery plots and investment of time in participatory evaluations.

  To assess the forage options, preference ranking in an open-evaluation environment is employed (Guerrero et al., 1993). Farmers rank technology options according to their objectives and give feedback, defining specific reasons for selection. The

information provided by farmers in the ranking/open evaluation interviews is based on (a) criteria, (b) reasons and (c) scoring the criteria. Farmers' comments give insights into what they "see," what is significant and what is not, from his/her viewpoint. Wherever possible, links between farmers' explanations and technological characteristics will be explored. Participatory evaluations used in Latin America frequently use scales from good to poor. Probabilities of accepting or refusing technologies can be drawn from their scores/rankings (Hernandez, 2000). When starting in a new environment, the set of criteria, reasons and explanations is relatively ample; moreover, terminology varies among farmer groups and individuals. The development of a glossary of terminologies with technical explanations, analysis and stratification of results leads to a reduced set of descriptors for scaling up the approach in similar conditions (see below). Hence the process of obtaining a reduced set of wider applicable descriptors is crucial in reaching a maximum number of farmers under conditions of limited capital and human resources, biophysical and socioeconomic environments and cultural preferences.

Information at this stage is fed back to the scientists to focus and orient the development of novel forage options.

- Demonstration plots. To assist the process of farmer selection, it is often beneficial to combine the nursery plots with larger scale demonstration plots of "best-bet forage options" (i.e., with a high technological confidence level) to observe their potential use at the farm level (e.g., soil conservation and animal production evaluation). While farmers give feedback and can select technologies from such demonstration plots, farmers can adapt the technologies according to their own demands. Given that this scale involves a relatively high risk, scientists and technicians assume this risk, managing the trials during the phase of introducing technologies that have not been tested previously in the area.

- Expansion plots. Once farmers have identified the suitability of technology options, they are likely to expand the area dedicated to these new options. Such plots can then become additional demonstration plots, which may offer a "real life" comparison for other farmers in similar biophysical and socioeconomic environments . The management of such plots is farmer led. Cross visits to and farmer-to-farmer interaction at such demonstration plots are facilitated.

2. Phase 2

- ***Selection of forage solutions by farmers***

  ⇨ Test plots. Utilizing their own criteria, farmers select one or a limited number of technologies for testing on their farms in bigger areas. In Central America an area of 200-400 m2 has been found useful for this testing, but the size may vary according to specific production environments in other locations. Large livestock production is not yet possible to measure in such plots: however the

effect of livestock on plants and the acceptance of animals can be assessed. Initial seed/planting material is provided to farmers, but with the clear indication that for further expansion, they need to produce or purchase their own planting materials. Hence this is also the stage where linkages to seed producers and formation of artisan seed production are facilitated. The test plots can serve as an initial basis for multiplication of planting material. The management and risk of the test plots is the responsibility of farmers; however they receive support from technicians and researchers.

Based on their experiences, farmers will or will not expand and adapt forage options on their farms. As part of monitoring and evaluation criteria, reasons and explanations will be further refined. Feed back and analysis on these processes is crucial for directing future on-farm and on-station research.

- Field book. This is used to analyze, systematize, stratify and validate results from the participatory and complementary agronomic evaluations. It includes the glossary of the terminology and a multivariate analysis of preference ranking, criteria, reasons, explanations and rating. The product is a further refinement and prioritization of descriptors and a definition of ideotypes for farmers in similar environments. Such information is highly useful to direct further on-station germplasm/breeding research as well as to enhance scaling into other areas.

Process support: Training

The incorporation of training in the participatory procedure is essential for the success of the approach. There are training components specific to institutional collaborators and to farmer collaborators. The first step is training institutional collaborators in participatory research tools and philosophy, forage technologies and monitoring and evaluation tools (which comprise both participatory and 'traditional' methods). This training commences once the collaborators have been identified and a work program has been agreed upon. In general training includes an initial, mostly theoretical training course, followed up by accompanied learning-by-doing during the research and diffusion process, with the greatest intensity during the first two years. The follow-up concentrates on the practical utilization of the tools based on a learning-by-doing approach, which also feeds back to improve the participatory procedure. Other training needs among institutional collaborators are identified during the research process and are addressed by the best qualified of the R&D partners or, if necessary, sourced outside. Training materials include manuals such as an instructional unit on the participatory procedure (Hernandez et al., in prep.), forage technology (Argel et al., 2002 a,b; Peters et al., 2003), monitoring and evaluation database tools (Franco et al., in prep.), and methods for facilitating artisan seed production (Cruz et al.., 2003). The aim of this training is not only to facilitate the R&D process per se but also to emphasize the empowerment of farmers and strengthening of all institutional research collaborators involved. It is important to acknowledge that the learning process is multidirectional (i.e., everybody learns from everybody) as well as iterative.

Results – Phase 1

Identification of institutional collaborators and sites

Identification of constraints, opportunities and commitment to actions

- Stakeholder analysis and participatory diagnosis. Stakeholder analysis and participatory diagnoses were carried out in the communities of Yorito, Sulaco and Victoria in Honduras; San Dionisio in Nicaragua; and El Puriscal in Costa Rica (CIAT 2000, 2001) .

- Livestock farmers as well as crop and mixed farmers were included although the focus is on smallholder livestock farmers. Although women and a wide age range (from approx 18 to 80 yr) participated in the original diagnoses, future work showed that in terms of livestock owners they formed a minority, not statistically significant for separate analysis.

- Participatory diagnosis. In the context of participatory development and selection of forages, the diagnosis was employed, not only to define demands and niches for forages and availability of potential options, but also to identify highly interested farmer groups and individuals with a high likelihood of benefiting from and hence maintaining the collaboration. The selected group was then given the responsibility of defining sites for the initial nursery plots, offering a basket of forage options.

Selection of forages by farmers

Combined analysis including all forage technologies offered to farmers

- Frequency analysis. Based on data from Honduras, a cross tabulation of frequencies with all forage technologies included (i.e., grasses, shrubs, herbaceous legumes and green manures) was computed. Results indicate that plant color was the most important criterion in the farmers' assessment. Across seasons this parameter was given more importance in the dry season as an indicator of the ability of the plants to stay green and retain their leaves. Plant growth was the next most important criterion, followed by cover, leafiness, competitiveness and production. In contrast to color, all these parameters had a greater importance in the wet season.

  Color was the most important criterion in all forage technologies. However, growth, especially in the establishment phase, was a more important criterion in grasses and shrub legumes; while cover was more important for herbaceous legumes and cover crops. Equally important for herbaceous legumes and cover crops were competitiveness, growth, leafiness and ability to function as green manure. For shrub legumes, possible use as firewood was another important criterion.

In conclusion, farmers selected forages based mainly on drought tolerance, ease/success of establishment and yield. Drought tolerance was the most important criterion, indicating the demand and potential for adoption of dry season forage species.

- Principal components analysis. Criteria were also analyzed using Principal Components Analysis (PCA). In the global analysis across technologies for the wet season, the first 3 PCs (principal components) explained 64% of the variation, which is a high percentage when analyzing participatory work.

  The wet season is defined by criteria for establishment and stability/ persistence:

  The analysis of dry season data across forage technologies shows a similar level of confidence, with the first three PCs explaining 66% of the variation:

  In the dry season fewer criteria are related to the selection of forage technologies by farmers, possibly as a reflection of the major importance of few parameters, responding to particular constraints for farmers at that time of the year.

Conclusions

There is no doubt that the PPSF was successful in selecting and developing with farmers, forages suitable to smallholder production systems in Honduras, Nicaragua and Costa Rica. Technicians and scientists in similar biophysical and socioeconomic environments can use the methodology and information generated to design and select novel forage technologies. Moreover, it was possible to strengthen linkages among farming communities and technicians, development workers and researchers in the aforementioned countries, increasing mutual knowledge and benefits. The participatory procedure developed gave a sounder understanding of farmers' perceptions of their problems and opportunities, contributing to building a stronger bridge between farmers' communities and national research institutes.

All participants-farmers, technicians and researchers-through the implementation of the participatory procedure gained increasing trust and knowledge. Farmers gained knowledge on superior forage germplasm and adapted and adopted selected options, technicians/scientists obtained useful insights to develop and drive design of new technologies design responding to farmers' conditions and expectations. Farmers adopting forages increased the capacity to take more risk by harvesting the benefits of technology adoption. More confidence was gained as forage based options adapted to their farming systems were identified and through the open interaction with technicians and /researchers. Many farmers are increasing areas of selected forages options. This environment of trust is anticipated to facilitate future research on more complex technologies as for example soil fertility improvement and evaluation of value added forages (i.e. hays, silages, leaf meals, forage-based concentrates).

The participatory procedure involved a series of steps that could be easily followed with anticipated outcomes. Thus, it was easy for technicians and scientists to adopt the participatory procedure, and they could obtain outcomes such as criteria, qualifications and reasons from farmers relatively rapid. The participatory procedure included careful research planning and the definition and supply of forage options appropriate to the vulnerable environments of the Central American hillsides. Diverse social actors such as technicians, researchers and interest groups were identified and their roles defined in a collaborative and integrative approach. The inclusion of producers in all processes as the design of research, diagnosis and the evaluation of forage options (supply) led to the selection of appropriate forages by farmers in a broad range of farming systems. Moreover, an understanding of farmers' perceptions (criteria) about forages options was acquired, focusing further research needs and allowing a higher likelihood of adaptation and adoption of forage technologies.

The coupling of a rapid participatory diagnosis with selection of farmers and farmer groups and complemented by secondary background information was efficient in focusing and initiating the research and development interaction and rapidly identifying interested farmer collaborators, leading to a high probability of technology adoption. The rapid procedure focuses initially on technologies where a good understanding of suitability of technology options exists but is limited when addressing highly complex technologies and an in-depth understanding of learning processes is needed. However the technologies supplied combined with the procedure may prove a good entry point for other, often more complex technologies as the rapid intervention with tangible results maintains interest and builds trust. The procedure is widely applicable, scalable and in this respect has advantages over many other methods in directing strategic research on identification of germplasm options. The procedure is well structured and can be used to analyze quantitative data with multivariate methods. As a result ideotypes based on criteria, reasons and explanations were defined. In fact, the participatory procedure developed in forages can be a suitable complement to other experiences of researches that are using participatory approach for developing forages technologies on farms. This participatory procedure offers a sequence procedure and some ways to analyze the information.

The participatory procedure is complemented by training strategies to establish a capacity on how to apply the procedure to forage technology development and selection, facilitating scaling-up of institutional capacity through the formation of strategic alliances.

Recommendations

The procedure needs further validation to define limitations for specific types of technologies and socioeconomic and biophysical environments. It is already acknowledging that the procedure needs to include small plot selection with animals at an earlier stage. This procedure could prove to be useful, not only for forage selection in Central America, but also for other contexts and technology options after appropriate validation and adaptation.

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Acknowledgments

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OUTPUT 5. IMPACT OF SN-3 PROJECT ACTIVITIES DOCUMENTED

Milestones

- ✳ Methodology for conducting impact assessment of PR methods on livelihoods
- ✳ Impact of CIAL methodology on rural livelihoods in 4 communities with CIALs in Cauca Province
- ✳ Project approved
- ✳ Selection of Agro entrepreneurial CIALs accomplished
- ✳ Secondary information recovery and primary information accessed

Impact Assessment of Local Agricultural Research Committees (CIALs) in Colombia

Researchers: *Susan Kaaria,[1] Nina Lilja,[2] Fernando Hincapié,[3] James Garcia,[4] Viviana Sandoval,[5]*

Collaborators: *F. Escobar, L. Sandoval, J. Rincón, A. Truque, E. Garzón, S. Valencia C. Prieto, C. Usma, J. Sandoval, B. Muñoz, M. Cerón*

Abstract

For the last 13 years the IPRA Project at CIAT has promoted the formation of community-based research services called Local Agricultural Research Committees (CIALs). With this study the IPRA Project seeks to evaluate the changes in the livelihoods of the farmers and their communities attributable to the CIAL methodology. The CIAL methodology was developed at CIAT with the goal of increasing the efficiency of the agricultural research and technology development system by integrating farmers better into the process. The study will assess the effectiveness of the CIAL methodology, the extent to which the problems addressed by the CIAL are relevant to the community, the costs and benefits of the CIAL to its members as well as to the community in terms of the development of appropriate technologies and who benefits from the innovations. The extent to which CIALs affect the rate and level of adoption of agricultural technologies among socially differentiated user groups and the costs associated with forming and supporting a CIAL will also be studied. It will also examine how farmer participation in the agricultural research process affects the process itself, as well as the specific communities and individuals involved. Particular attention will be paid to how CIALs as institutional innovations affect the human, social and other capital assets available to

[1] Senior Research Fellow, SN-3 Project, CIAT, Colombia.
[2] Senior Scientist, PRGA Program, CIAT, Colombia.
[3] Research Assistant, SN-3Project, CIAT, Colombia.
[4] Associate Researcher, Impact Project, CIAT, Colombia.
[5] Research Assistant, SN-3 Project, CIAT, Colombia.

individuals and communities, and what implications these impacts have for livelihood outcomes. This study involved 13 CIALs: focus group discussions were held in all of them, and in 6 formal interviews were conducted. In addition, four rural communities without CIALs (counterfactual communities) were also surveyed.

Introduction

Over the past decades, agricultural research has contributed to significant increases in world food production. Maintaining this productivity increases, as well as making progress on additional goals of alleviating poverty and protecting the environment, presents a major challenge to the agricultural research system. In order to maintain and extend the benefits of agricultural research, new ways of doing research may be necessary. One such method, participatory research (PR), seeks to involve the intended beneficiaries of research in the research process itself, based on the idea that user participation will lead to more efficient and effective design and targeting of technologies, thereby reducing diffusion time and helping ensure that the intended beneficiaries are reached with technologies suited to their needs.

In principle, the concept of PR has been widely accepted. Few scientists would consider doing adaptive research on agricultural or natural resource management technology development without at least some input from users. There are many types and degrees of participation, however, with very different implications for the benefits and costs of research. For example, asking farmers opinions or inviting them to visit field trials is a type of participation; however it is very different from letting farmers make decisions about what kinds of technologies will be developed or training them to carry out research themselves. Because PR methods incorporate user perspectives in the research process, it is often claimed that they orient research more towards the needs of the poor and thus result in a greater impact on poverty alleviation than conventional research. It cannot be said a priori that participatory methods make research more pro-poor because this would depend on the extent to which the needs and priorities of the poor differ from those of the non-poor, and whether or not the poor are specifically targeted in the research process.

Whether PR makes research more pro-poor is essentially an empirical question. Therefore, in order to understand the relationship between PR and poverty alleviation better, empirical evidence is needed on what impacts participatory methods have had on poverty in the context of specific projects and participatory methodologies. This project seeks to begin to fill this gap. The study builds on results from an earlier study (Hincapié, 2003) and a survey done by the IPRA Project in 1998 (Ashby & García, 2000).

Methodology

This study examines the impact of one particular method of incorporating farmer participation, which is based on the establishment of local agricultural research committees (CIALs) in rural communities. This method was developed at CIAT in the 1990s and is currently used in approximately 250 communities of several Latin American countries. The CIAL methodology is based on the establishment of a research committee

with elected members. Each CIAL is supported by an agronomist or extension agent who trains the committee members in the research design (controls, replicates, systematic evaluation of results) and who visits their trials regularly to provide technical support. Support for the agronomist comes from the institution supporting the CIAL, usually an NGO, the national research or extension service, or some other institution involved in technology development and transfer. Costs of experimentation are covered by outside funds; however farmers are not paid for their participation or time. Research problems and priorities are set at the level of the community (by vote), but the experimentation is done by the CIAL on behalf of the community. Community members are able to visit the trials all along, and results of experiments are disseminated at the level of the community. If a series of experiments identifies a promising technology or practice, the CIAL will officially recommend it. In Cauca Province, men and women farmers have formed 39 CIALs over the last 13 years. A second-order association Corporation for the Development of the CIALs (CORFOCIAL) —While the IPRA Project at CIAT provides technical backstopping.

Study objectives

- Assess the effectiveness of the CIAL methodology
- Assess the costs and benefits of the CIAL to its members as well as the members of the community
- Use the results of this impact study actively for institutional learning and change.

Research questions

- How effective is the CIAL methodology?
- What are the benefits of being a CIAL member?
- How have the CIALs benefited their communities?
- What are the costs associated with CIALs?
- How can the results of this impact study be used for institutional learning and change?

Sampling frame

Table 1 presents the sampling frame for the entire study, which involved data collection using both individual household interviews and focus group discussions (FGDs) with 13 CIALs.

Table 1: Sampling frame for the study.

	CIAL Level		**Community Level**	
	Active CIALs	**Inactive CIALs**	**With CIALs**	**Without CIALs (Counterfactual)**
Focus group discussions	13 CIALs	4 CIALs		
Individual	Four CIAL		Household-level	Household level

household questionnaires	members from each of 13 CIALs		interviews conducted in 6 communities	interviews conducted in 4 communities

CIAL level

The sample was selected from all existing CIALs in Cauca that are more than 5 years old and where it is considered "safe" to travel. To ensure a representative sample, CIALs were also stratified by age and gender of membership. Thirteen CIALs in 12 communities in Cauca were selected (Table 2). At the CIAL level, individual household interviews were conducted, and FGDs were conducted at the CIAL group level. FGDs will be conducted with 13 CIALs in Cauca Province. The FGD will collect the CIAL-specific data needed for the analysis.

Table 2: CIALs included in the study: Individual surveys and FGDs.

Name of CIAL	**Location**	**Age of CIAL**	**Households in community**	**No. of Members**		**Sample Size for Survey**
				Men	**Women**	
Asopanela	Rosas	12	30	3	1	
Betania 1	Piendamó	12	33	6	2	
La Esperanza	Caldono	7	45	4	1	
El Turco	Santander	9	25	3	1	
Carpintero	Morales	8	181	20	10	46
El Jardín	Caldono	10	38	3	1	10
Las Cruces	Silvia	6	57	3	3	15
Pescador	Caldono	13	66	5		17
San Bosco (Female)	Santander de Quilichao	5	58		9	15
San Bosco (Male)	Santander de Quilichao	12	58	3		
San Isidro (Male)	Santander de Quilichao	7	66	5		
Cinco Días (Female)	Timbio	11	205	2	13	52
El Diviso	Rosas	12	83	4	2	

Community level

In order to understand the impact of CIALs on individual members as well as on other community members, individual household interviews will be conducted in six CIAL communities and 4 communities without CIALs. In each of these communities both CIAL and non-CIAL members will be interviewed. In addition, both the male and female heads of household will be interviewed.

CIAL communities. Four of them (El Jardín, San Bosco, Tres Cruces and Cinco Días) were selected because they formed part of the study documenting the impact of the CIAL methodology (Hincapié, 2003), while the other two (Crucero de Pescador and Carpintero) had been in the impact study conducted in 1998. The information from these earlier studies formed the basis for the design of the surveys for this study.

To define the sample for individual household interviews, a 10% margin of error and a 95% level of confidence were used in a randomly stratified design, in which the rural communities constituted the subpopulations that form the strata. The distribution of the selected sample is presented in Table 3. The size of the sample for the rural communities without CIALs will be determined as was done for the rural communities with CIALs.

Non-CIAL communities. In order to control for changes in the communities attributable to the presence of CIALs, 4 counterfactual communities were also selected on the basis of not being neighbors and similarity in various characteristics (Table 4):

Table 3. Distribution of the sample selected.

CIAL Communities	No. of Households	Sample Size
El Jardín	38	8
Carpintero	182	37
Tres Cruces	57	12
Crucero de Pescador	66	14
San Bosco	58	12
Cinco Días	205	41
Total	606	124

Table 4. CIAL communities and their corresponding non-CIAL communities.

Communities with CIALs	Counterfactual Communities (without CIALs)	Location	No of Families	Sample Size
El Jardín and San Bosco	La Conception	Santander de Quilichao	87	17
Carpintero and Cinco Días	San José	Caldono	169	31
Tres Cruces	Santiago	Silvia	108	21
Crucero de Pescador	La Chapa	Santander de Quilichao	37	7

- Sociocultural characteristics: ethnicity, level of schooling and access to public services (energy, access to aqueduct, telephone and health services)
- Interaction with institutions
- Distance to large markets
- Agroecological zone
- Farming system

Research questions/hypotheses, indicators, data needs and data collection method

In order to develop a data collection strategy, we took each of the research questions and developed variables to measured and identified specific indicator to measure the variable. Table 5 presents details about each of the broad research questions, as well as indicators used to measure the impacts, and data sources. This served as the basis developing data collection and analysis methodology.

Table 5: Impact study questions/hypotheses, indicators, data needs and data collection method.

Hypothesis/Research Questions	Indicators	Data Needed	Data Collection Method		
			Survey	Focus Group	Case Study
~~1.~~ How effective is the CIAL methodology?					
Who are the members? (Are they poor, rich, educated, innovators)	✓ Distribution of participation in CIALs across the different gender and wealth groups	✓ Characteristics of members: (well-being levels, educational level, gender ✓ Community criteria for selecting members	X		
Are the farmers "effective" researchers? (productivity of research outputs, responding to community needs)	✓ Problems addressed relevant to the community (CIAL is responsive to community priorities and needs.)	✓ Farmers ranking of appropriateness of research themes to address community problems ✓ Community diagnosis results vs. topics of CIAL experimentation	X		
	✓ Appropriate technologies are developed	✓ Rate of output of research (no. of research topics covered by CIAL experimentation)	X		
"Scientific rigor"; are research results improving yields, environmental issues?	✓ "Improved" or better technologies are recommended	✓ Characterization of recommended technologies using scientist-defined criteria (yield, resistance, soil fertility management, biodiversity, etc.)			X
Integrating local and scientific knowledge	✓ Increased research in indigenous/local technologies	✓ Research outputs based on indigenous/local knowledge			X
Do CIALs improve the flow of information between farmers and R&D organizations?	✓ Enhanced capacity to demand technology and related support services	✓ No. of visits from other communities to CIAL experiments or no. of visits by CIAL members to other communities to explain their technologies	X		
What is the role of second-order organization CORFOCIAL?		✓ Assessment of services provided by CORFOCIAL to CIALs (from perspectives of both)		X	
What are some of the key actors in a CIAL failure?		✓ No. of inactive CIALs and reasons		X	

Hypothesis/Research Questions	Indicators	Data Needed	Data Collection Method		
			Survey	Focus Group	Case Study
2. What are the benefits of being a CIAL member?					
What are the benefits of being a member? (human and social capital)	✓ Enhanced leadership skills	✓ Degree of participation/leadership in other community events	X		
	✓ Enhanced capacity for experimentation	✓ No. and types of new non-CIAL related experimentation other ✓ New knowledge acquired and its application to new problems	X		
	✓ Capacity to convene and organize community meetings	✓ No. of meetings organized or capacity to initiate and organize farmer-to-farmer exchange	X		
	✓ Become agricultural experts in community (innovators)	✓ Representation of the community in agricultural events. ✓ Community members' opinion about who are the agriculture leaders in village	X	X	
	✓ Improved financial management skills	✓ Capacity to increase CIAL fund/capacity for raising funds	X		
Do improved skills lead to benefits? What is the impact of the increased human and social capital among the members and communities?	✓ Able to support community in addressing new challenges	✓ Member involvement in other community development activities	X		
	✓ Ability to formulate and present own projects based on community demand	✓ New projects started because of CIALs		X	
	✓ Acts as entry point for other R&D	✓ Same as above			X
	✓ Enhanced capacity for collective problem solving	✓ Major community problems solved in the past 5 years and how they were solved		X	

Hypothesis/Research Questions	Indicators	Data Needed	Data Collection Method		
			Survey	Focus Group	Case Study
3. How have CIAL research outputs benefited members of their communities?					
How have their research outputs benefited their communities?	✓ CIAL communities benefit from research outputs	✓ Assessment of benefits of CIAL to the community at large.		X	
	✓ Communities benefit from adoption: concrete results/changes/effects of these technologies	✓ Increased/stabilized yields ✓ Increased food security at household level ✓ Increased income (and how it is used) ✓ Better management of farm resources	X		
Who benefits in different social groups, especially across gender and the poor?	✓ Access of benefits to different households categories (women and the poorest)	✓ Characterization of households adopting and benefiting from technology	X		
Spillover benefits to other communities?	✓ Adoption of CIAL technologies in neighboring communities (spillover)	Same as above	X		
How do their marketing projects benefit the community?	✓ Benefits from CIALs marketing projects	✓ Types of marketing projects			X
Who has access to these benefits from marketing?	✓ Enhanced access of benefits to different categories of households (women and the poorest)	✓ Benefits and who has access: analysis of above broken down			X
Has methodology contributed to poverty alleviation? Who has access?	✓ Enhanced access to benefits by women, children and the poorest households	Same as above			
4. What are the costs associated with CIALs	✓ Effectiveness increases with maturity ✓ Reduction in the operational budget over time	✓ Cost of creating and supporting a CIAL ✓ How much time members spend on CIAL-related activities and the value of that time (similarly other resources and their value)			

Progress to date

From June to September, 2003, the surveys were administered to a sample of 124 households heads and to a second person in each respective household (wife/husband, son/daughter), for a total population of 606 household heads from six rural communities with CIALs in Cauca Province: Crucero de Pescador, Cinco Días, Carpintero, San Bosco, El Jardín and Tres Cruces.

Implementing the study

Ten enumerators were selected and trained (5 university students and 5 people from the study region) to conduct the household interviews. The training focused on developing communication skills and techniques for conducting the surveys and to create a local capacity for gathering information and for identifying the regional problems.

Selection and application of surveys in communities with CIALs

- All surveys were conducted with the selected CIALs in the six rural communities: 124 surveys to household heads and 106 to the second person.
- A format in the OMNIFORM program was developed to input the data from the surveys and the statistical analyses.
- All the data from the surveys were typed into the OMNIFORM program and are ready to be analyzed.

Figure 1. Interviewing the wife of a farmer in Cauca.

Selection and application of surveys in communities without CIALs

The four non-CIAL communities were selected by grouping four CIAL communities with similar characteristics. For example, El Jardín and San Bosco; or Carpintero and Cinco Días were grouped together as they have similar characteristics with respect to sociocultural characteristics: ethnicity, level of schooling and access to public services (energy, aqueduct, telephone and health services), interaction with institutions, distance to large markets, agroecological zone and system of agriculture. In this instance, one

counterfactual community was selected for each pair. In the case of Tres Cruces and Crucero de Pescador, a counterfactual community was identified for each one because the communities were very different from each other.

The selection of counterfactual communities involved visiting the community and conducting interviews with key informants (teachers, presidents of the JACs or Communal Action Boards and the health promoters). In each community information was gathered on general characteristics and compared to communities with CIALs.

La Chapa and San José were surveyed, and the information was entered in the OMNIFORM program.

Challenges of implementing the study and solutions

The main difficulties encountered in the development of the study were related to the data gathering:

- Some farmers are distrustful and do not answer the surveys honestly; thus there was incongruence in the data. Explaining the objective of the study very clearly and explaining that the data would be treated confidentially and would not be used for any other purposes except for the study addressed this problem.

- Some farmers selected for the survey did not want to answer the questions unless they were given some economic remuneration. In this case, other farmers were selected at random to replace them.

- The indigenous communities are reserved about their information and do not permit their members to give out information without permission from the Governing Council to which they belong. This difficulty was encountered mostly in those communities located near a reservation. In the native communities surveyed, it was necessary to speak first with the local leaders and the Governing Council to explain the purposes of the survey and request their approval for the study.

Lessons learned

Thus far the following lessons have been identified, which contribute experiences for future studies:

- The training of the interviewers has resulted in good-quality information.

- The revision of the surveys by each interviewer before turning them in to the coordinator meant that they had fewer errors, and the process of final revision was much quicker.

- The rapid feedback by the coordinator of the group to the interviewers minimized the errors in gathering the data and made the work more efficient.

- The support of the local interviewers generated more trust in the farmers, facilitating their response to the surveys.

- A key factor for obtaining information on the rural communities was talking to the presidents of the JACs, the health promoters and the teachers.

- To be able to interact with indigenous communities, it is necessary to approach the local authorities previously in order to facilitate the execution of the work.

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Impact study of CIALs El Jardín, Las Cruces, San Bosco (men and women), Cinco Días

Researchers: *Susan Kaaria*[6]*, Fernando Hincapié*[7]
Collaborators: *N. Zambrano, A. Truque, E. Claros, J. Rincon, F. Escobar*
CIALs: *El Jardín, San Bosco, Tres Cruces, Cinco Días*

Highlights

Impact of CIAL methodology on rural livelihoods in five communities in Cauca Province
Identification of impact indicators from the perspective of rural communities

Abstract

This study examined the impact of a particular method of incorporating farmer participation, based on the establishment of local agricultural research committees (CIALs), in rural communities. The methodology used is based on the Sustainable Livelihood Approach. The aim of a livelihoods impact assessment is to gain an understanding of the significance of the project to the livelihoods of project participants and other local residents. The study found four major topics of impact: technology, which includes better planning and organization of farms, new technology and its diffusion; food security which looks at nutrition; income generation from the standpoint of agroenterprises and production projects; and social and human capital which takes a look at leadership, empowerment and gender. Some of the major challenges involve better communication channels to facilitate the flow of information from farmers' communities to second-order organization and to research centers.

Background

Over the past decades, agricultural research has contributed to significant increases in world food production. Maintaining these productivity increases, while making progress on additional goals of alleviating poverty and protecting the environment, presents a major challenge to the agricultural research system. In order to maintain and extend the benefits of agricultural research, new ways of doing research may be necessary. One such method, participatory research, seeks to involve the intended beneficiaries of research in the research process itself. The idea is that user participation will lead to more efficient and effective design and targeting of technologies, thereby reducing diffusion time, increasing adoption and helping to ensure that the intended beneficiaries are reached with technologies that are appropriate to their particular circumstances, needs and priorities.

This study examines the impact of one particular method of incorporating farmer participation, which is based on the establishment of local agricultural research

[6] Senior Research Fellow, SN-3 Project, CIAT, Colombia
[7] Research Assistant, SN-3 Project, CIAT, Colombia

committees (CIALs) in rural communities. This method, which was developed at CIAT in the 1990s, is currently in use in more than 250 communities in 8 Latin American countries. The CIAL methodology involves the establishment of a research committee with elected members. Each committee is supported by an agronomist/extension agent who trains the committee members in the research design issue (controls, replicates, systematic evaluation of results) and who visits their trials regularly to provide technical support. Support for the agronomist comes from the institution supporting the CIAL, usually an NGO, national extension service, or some other institution involved in technology development and transfer. Costs of inputs not available locally are covered by outside funds, and members are not paid for their participation or time. Research problems and priorities are set at the level of the community (by vote), however the selected members do experiments. Community members are able to visit the trials all along, and results of experiments are disseminated at the level of the community. If a series of experiments identifies a promising technology or practice, the CIAL will officially recommend it.

Objectives

The objective of this study is to evaluate the impact of the CIALs on poverty in rural communities. The CIAL methodology was developed at CIAT with the goal of increasing the efficiency of the agricultural research and technology development system by integrating farmers into the process. The study assesses the extent to which CIALs affect the rate and level of adoption of agricultural technologies among socially differentiated user groups. It also examines how farmer participation in the agricultural research process affects the process itself, as well as the specific communities and individuals involved. Particular attention is paid to how CIALs as institutional innovations affect the human, social and other capital assets available to individuals and communities, and the implications these impacts have for livelihood outcomes.

Methodology

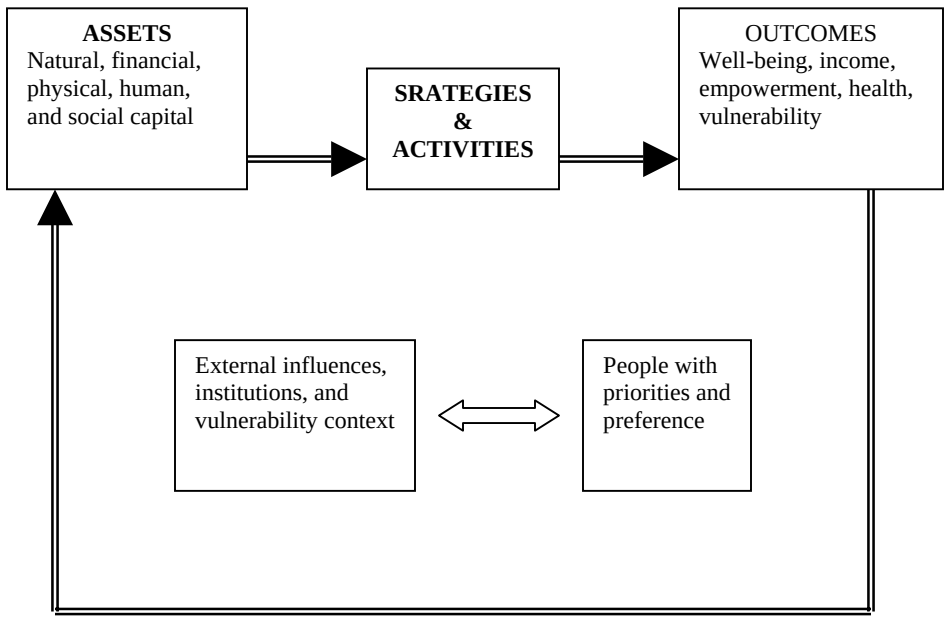
Conceptual framework

The impact of research outputs such as technologies and methodologies goes beyond the production process and to the well-being of the people involved directly and indirectly in the project carried out in a given community; therefore, an alternative methodology to conventional impact assessment is required. The methodology is based on the Sustainable Livelihood Approach. Figure 1 diagrammatically presents the components and linkages within this Approach. The aim of a livelihoods impact assessment is to gain an understanding of the significance of the project with respect to the livelihoods of project participants and other local residents. Such an assessment is based on the premise that the project and project participants share a core aim: the enhancement of local people's livelihoods.

It is important to note that a benefit inherent in this methodology is that as it is the community that identifies problems and needs, they are in a better position to make

decisions and act upon the major issues affecting them. Thus research-action becomes a motivation tool for the future development of projects by communities.

Box 1. Livelihoods framework



Source: Ashley & Hussein (2000)

Study area

Five CIALs were selected: El Jardín, San Bosco (men and women CIALs), Tres Cruces, Cinco Días. Table 1 lists the CIALs, their research topics and years of experience.

Table 1. CIALs studied, their research topics and years of experience.

CIAL	Initial Diagnosis	Research Topic	Experience/ Starting Date
San Bosco (men)	Maize Potatoes	Experimentation on varietal adaptation to area	12 years 1990
San Bosco (women)	Soya Rice Barriers Beans Cassava Maize Organic fertilizer Soil conservation	Experimentation on varietal adaptation to area Soil improvement	4 years 1998
Tres Cruces (indigenous)	Maize Beans Quinoa Wheat	Experimentation on varietal adaptation to area	5 years 1997
El Jardín	Onions Beans	Experimentation on varietal adaptation to area	6 years 1996
Cinco Días (women)	Blackberries Soybeans	Experimentation on varietal adaptation to area	10 years 1992

Participatory Rural Appraisal (PRA) Tools

PRA is used here to refer to a more extended process that involves not only the collection of information but also its eventual use by the community as it plans further activities. The emphasis of PRA is often not so much on the information as it is on the process and seeking ways to involve the community in planning and decision-making.

Table 2: PRA tools and type of Information that can be collected.

Diagnostic Tool Used	Type of Information Obtained	Types of Indicator for Measuring Change
Participatory mapping	✓ Village landmark, infrastructure and social structure ✓ Spatial land use patterns ✓ Settlement patterns ✓ Information on livelihoods and places important to livelihoods ✓ Markets ✓ Relations with other villages	✓ Adoption of technology across village and neighbors ✓ Access to markets ✓ Change in production systems techniques ✓ Change in farm planning and organization
Vern Diagram	✓ Existing organizations in the community and their linkages within and externally ✓ Role of external forces in the community: government and NGOs ✓ Relationship with other villages	✓ Role of CIAL in local organizational systems
Calendars	✓ Patterns within the community: Income, labor and consumption ✓ Seasonal agricultural calendar ✓ Forest product availability ✓ Migration patterns ✓ Livestock management	✓ Change in food availability ✓ Change in migration patterns ✓ Change in labor intensity ✓ Gender-labor intensity ✓ Change in production ✓ Empowerment
Wealth Ranking	✓ Levels of well-being; ✓ Access to services and assets ✓ Leadership/wealth correlation	✓ Well-being and participation in activities ✓ Distribution of project benefits ✓ Change in access to assets ✓ Change in assets ✓ Changing composition of wealth

Results

The study found four major topics of impact: technology, food security, income generation and social and human capital.

Technology

Better planning and organization of the farm: As a result of new knowledge on the crop production management, as in the case of San Bosco, new techniques for hillside land and crop management resulted in increased production of maize, beans and cassava.

New technology and its diffusion: The recovery of an ancient crop, quinoa, in CIAL Tres Cruces has resulted in a program led by the indigenous Council to include this crop in all gardens.

Food security

The main impact in food security is the reduction in the scarcity periods of grains, beans and maize, which are the staples of most communities' diets.

When comparing the production of the four communities over time, beans and maize showed a remarkable improvement and also show a potential for further increment in production due to the research carried out by the CIALs. Production figures and the food-availability calendar support this claim. Food scarcity was reduced from 6 month to 3-4 months in the case of beans and maize in the villages of El Jardín and San Bosco. The only reason why they have not been able to close the gap is because of grain storage problems.

Beans, being one of the commonest research topic of CIALs, has come a long way from production for consumption to its present level, which allows for seed production and, to a lesser extent, income generation. The CIAL El Jardín works with beans and its production figures have gone from consumption only 5 years ago to 2500 kg/ha at present. Research on new varieties and training on crop management and seed production account for the success this CIALs research.

Maize has also shown an increment in production, and its behavior has been similar to that of beans. Most of the grain was kept to feed the family, but this increase in production also allows for seed production and to feed minor species on the farm. The CIAL San Bosco has been working with maize for around 10 years. Their production has doubled in the last five years, going from 2500 kg/ha to 5000 kg at present. Similar to El Jardín, the CIAL San Bosco has also gained knowledge on new management practices and seed production, which is a source of income generation for this group. Another source of income and a major impact for this CIAL was the acquisition of a maize milling machine, which is used by village farmers and neighbors, representing not only a source of income but also savings in time and money.

Greater maize production has also allowed producers to keep as many as 200 chickens on their farms some for their meat and others as egg producers as an alternative source of food and income.

Income generation

Most CIALs generate income from their production of beans and maize seed; however, CIAL Cinco Días has acquired bakery equipment to produce soy bread (soybeans are the topic of research of this CIAL). A new group of soybean producers will supply the raw material for the bakery; soybeans are also sold to feed small animals.

Social and human capital

Another major impact the CIAL has had on its members is the development of leaders and empowerment of the communities where they are located. Appendix 1 shows clear areas of impact or indicators such as understanding of experimentation, social organization, leadership, empowerment, land, crop and farm management, decision-making, better planning and organization of farm, new knowledge, new technology, diffusion and income generation.

It also shows that although a CIAL may have only one research topic, impact is also produced by other technologies introduced by the CIAL. This technology may come from the technician, farmer-to-farmer, tours, the yearly CIAL meeting. It is then tried by the CIAL and is eventually adopted in the village and neighboring communities. Results from these technologies should also be included in the CIAL research records and reported to CORFOCIAL and the research entity.

Impact on livelihood goes beyond production and income generation, which are only some of the components of well-being; leadership, organization, communication, empowerment and decision-making complete the picture.

Research on maize and beans has not only had a real impact on food availability in the communities through increased production and a better knowledge of land, crop and pest management; but it has also helped improve nutrition levels in villages such as San Bosco, El Jardín and Tres Cruces, helping get closer to their objective of food security.

Other technologies introduced by the CIAL to villages (e.g., forages in El Jardín) represent an extra income for the farm in terms of cash when sold for cattle feed or in kind when exchanged for milk.

In the case of Tres Cruces, quinoa has put the CIAL at the front of a major project by the local indigenous Council to incorporate quinoa plants in their gardens. Already 80 out of 175 families have included quinoa in their diets and are also learning about its medicinal uses.

As the result of its research on soybeans, the CIAL Cinco Días has established a small bakery based on soy flour, generating income not only for the families of the members of the small business but also for a group of farmers who see the opportunity of supplying soybeans to the bakery. Training in small business management will also improve and have an impact on the livelihoods of the village by opening up new opportunities and generating employment for the village.

San Bosco is also looking at the establishment of a small business in the form of a collection centralized facility for collecting and marketing local products which would not only benefit the village but also its neighbors, and would generate employment.

The development in some communities of a do-it-yourself mentality has had a major impact on its own, considering that not long ago their conditions and self-esteem were at a very low point. One of the commonest discussions in the five CIALs visited was the preparation of proposals for local projects, which shows a vision, a plan or strategy for improving the well-being of the village.

Human capital is also another major area of impact. The CIAL is also a school for leaders, and its members often work with other organizations in the communities such as the indigenous Councils, the Communal Action Boards (JAC), water boards, etc. The community often consults CIAL members on farming issues; and the CIALs also have the responsibility of reporting research and feedback to the community, not only on their findings but also on the accounts.

Gender is an area that needs more attention. CIAL research represents extra work for women who have to carry on with their day-to-day numerous activities and find time to do CIAL work. A common attitude towards women working in CIAL is that they have nothing better to do or that it is a waste of time. This attitude means that in order to spend time away from home in the CIAL, women must work harder at home. This attitude changes as the CIAL begins to show positive results, particularly in their families. Good feedback of results to the community will improve the attitude towards women groups

Another barrier women encounter is that their husbands oppose their spending a long time away from home, and this produces conflict at home. This is less noticeable in villages where there is a CIAL already established or where there is knowledge of the CIAL work and results.

Wealth ranking

Table 3. Summary of wealth ranking characteristics by group.

	El Jardín	San Bosco	Tres Cruces	Cinco Días
Top level	✓ Income from employ-ment ✓ Small families ✓ Employ-ment generation ✓ Large farm	✓ Large farm ✓ Income from employ-ment ✓ Better diet	✓ Cattle ✓ Income from employ-ment ✓ High academic level ✓ Own transport ✓ Leadership	✓ Income from employment ✓ Large farms ✓ Inheritance ✓ Family help ✓ Very active
Intermediate level	✓ Extra income from goods or services ✓ Seasonal labor ✓ Farm products	✓ Own home ✓ Seasonal labor ✓ Large family ✓ Little land ✓ Farm products	✓ Large families ✓ Single men ✓ Seasonal labor ✓ Farm products	✓ Self-sufficient farm ✓ Single head of house-hold ✓ Seasonal labor
Low level	✓ Illness ✓ Old age ✓ No help	✓ Do not own home ✓ Large family ✓ No water or electri-city	✓ Large families ✓ Single mothers ✓ Illness ✓ Widows ✓ Old age ✓ No help	✓ No land ✓ Old age ✓ Illness ✓ No help ✓ No water or electricity

Wealth ranking in the four communities shows some characteristics common to the different levels studied: At the top level are fixed income from full-time employment by members of the family in addition to farm products, larger and already established productive farms which in some cases generate income for members of the communities. At the intermediate level, farm products, supplemented by seasonal labor, are the common characteristics that identify this group. The lower level is characterized by Illness, old age, no collaboration from family relatives and lack of water and energy.

When asking the question what is necessary to move from one group to another, better management of assets and access to credit for investment are the commonest answers, followed by participation in-group activities.

Better management of assets and teamwork are areas where CIAL methodology can contribute to the progress of communities. In the future, it may be possible that second-order organizations of CIALs can facilitate access to credit for its members.

Challenges

Some of the major challenges ahead are to improve reporting of results to research centers and other organizations, the quality and relevance of research, and feedback to communities.

Better communication among CIALs, CORFOCIAL, CIAT and other R&D organizations is essential for improving the quality and relevance of research and also for validating CIAL research before these organizations. In order to obtain funding for research, it should not be done only on the basis of interest in the communities alone but also reflect the interest of donors and R&D centers.

To a certain extent, that is what this impact evaluation methodology offers an understanding of community needs and interests in order to match donor and organization requirements. As CIAL Tres Cruces put it, “we are tired of organizations bringing in projects that solve none of our problems, and when they are gone, we are worse off than when we began…we have lots of product no one wants…”

References

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Appendix 1

Table 4. Summary of impacts by CIAL

Impact	El Jardín	San Bosco (men)	San Bosco (women)	Tres Cruces	Cinco Días
Technology					
Better planning and organization of farm	New knowledge of cassava management has improved crop production.	New techniques of hillsides land and crop management has permitted increased production of maize, beans and cassava.	Research on organic fertilizer has solved problem of lack of funds to fertilize land.	✓ Reduction in maize harvest cycle from 12 to 7 mo ✓ Recovery of ancient crop (quinoa)	✓ Diversification of crops ✓ New knowledge on crop management and preparation
New technology and diffusion	✓ Forages used as live barriers to control erosion and exchanged for milk ✓ Increased maize production permits production of chickens. ✓ Greater bean production permits seed production. ✓ Neighboring villages adopting technology researched by CIAL	✓ Increased maize production permits seed production. ✓ New knowledge of pest management has led to better production.	Greater maize production allows CIAL to work with laying hens (egg production)	✓ Quinoa research led to the local indigenous Council's implementing a program of quinoa in gardens ✓ CIAL members and collaborators live in neighboring villages, facilitating adoption and diffusion of technologies.	Training of community in over 40 recipes prepared with soybeans, including milk and meat alternatives

Food security	**El Jardín**	**San Bosco (men)**	**San Bosco (women)**	**Tres Cruces**	**Cinco Días**
Nutrition	✓ Improved quality of crops, particularly beans, shift from local variety to an improved variety ✓ Better bean and maize production has reduced food-scarcity period	Better bean and maize production reduced food-security period	Better bean and maize production reduced food-security period	Research on nutrition and medicinal benefits of quinoa	Soybeans are an alternative to many products including milk and meat, which represents a savings in the purchase of these products.
Income generation					
Agro-enterprises	CIAL and community will present project for cane mill to increase panela production and generate savings in its processing.	Maize seed production	Production of feed concentrate for minor species		✓ Bakery ✓ New group formed to supply soybeans to bakery, generating income for producers
Production projects	Bean hulling machine used by local residents, neighbors and local indigenous Council	Maize milling machine used by local residents and neighbors represents savings to farmers as they can process harvest in village.	✓ Use maize milling machine to prepare feed concentrate for animals ✓ Generate savings by producing fertilizer in village	Production of organic fertilizers to improve soil	✓ Bakery equipment to initiate small business and purchase soybeans from local producers ✓ Soybean production also sold to feed smaller animals

Social & human capital	**El Jardín**	**San Bosco (men)**	**San Bosco (women)**	**Tres Cruces**	**Cinco Días**
Leadership & empower-ment	CIAL members role as agricultural experts in village	Local indigenous Council delegated management of farm to CIAL leader	Local indigenous Council allocated 15 ha for research and work led by CIAL	Local indigenous Council quinoa program led by CIAL	Small business will generate extra income for the community.
Gender	Gender awareness promoted by local indigenous Council motivated formation of women's group to work with soybeans.	Gender awareness, collaboration and motivation to women's CIAL	✓ Gender awareness to change stereotype role of women ✓ Community attitude to CIAL has changed a little as they see results.	Change in family attitude regarding sharing of activities at home	Change in family attitude regarding collaboration at home when women are working with CIAL

CIAL experiences with agro enterprises: Linking research to development in Cauca – Project progress report

Researcher: *Fanory Cobo P.*[8]

Abstract

Many actors in the rural context offer a large cadre of training opportunities to local communities. Nevertheless, such training is not always enough to promote development due to the fact that knowledge application is not possible due to scarcity of financial resources. Local groups are in search of economic resources to carry out their projects. Some have been successful in accomplish this task. Thus it was considered important to learn from the experiences of the process of forming rural agro enterprises in 5 CIALs. The objective was to identify and analyze what aspects promote the formation of these organizations within the context of the CIAL methodology and groups, providing a vision specific to farmers interested in incorporating an entrepreneurial focus to production activities.

Problem Identification

The experience of forming rural agro enterprises (RAEs) in some community-based research services (CIALs) that have been conducting research for several years has not been assessed. This study proposed to identify and analyze the organizational and production principles and practices of five CIALs with RAEs in Cauca - Colombia. This study covers (a) the analysis of their formation, from the initial research period to the creation of the RAE, (b) the diagnosis of the organizational and production characteristics that contributes to their maintenance and (c) the identification of the possible effects of a socio-economic nature, generated in the Committees and in their communities. The study will not only report back to the communities on these experiences, but will also generate information to orient other organizations in the national and/or international setting that wish to form other RAEs in the field.

Background

Since the seventies, the methodology of participatory research has not only influenced the methods of social inquiry, but also allowed rural communities to establish priority criteria based on an informal analysis of their context. Until 1998 the CIAL methodology had contributed to the formation of 249 Committees in 8 countries of Central and South America (Ashby, 2001)

In Cauca Province, Colombia, the CIAL methodology was first developed in 1990 as a result of the direct intervention of the community and facilitators from the Participatory Research Project with Farmers (IPRA) at CIAT. The CIAL, which is created at the instigation of the community, is an organization directed by and for farmers. This

[8] Thesis student National University of Colombia, SN-3 Project, CIAT, Colombia

structure is designed to meet the needs of the community (mostly related to food security), which are then prioritised through a participatory diagnosis that leads to the planning of the research process. Basically, farming methods and technologies that are not known locally and have not been tested in the region are compared with the traditional practice, but sometimes this is not sufficient to accomplish the desired results (Ashby, 2001). Their relative success affects the strengthening and development of the community at the local and regional levels.

The influence or impact generated within the communities can be determined by evaluating the participatory processes of the individuals, the distribution of the benefits generated by the research, and the consolidation of the RAEs. Then the advantages, successes or failures are identified, and recommendations are made accordingly in order to enrich both the functioning of each Committee and the CIAL methodology.

Independent of the impact that the research may generate in the community, some CIALs have interacted as a result of training or experiences in neighboring communities or in the village itself with alternative production systems that give an aggregate value to the agricultural product. Thus the idea arose of forming a small-scale agro entrepreneurial system, which is influenced by the way in which the farmers are associated and organized.

In 1998 the Rural Agro enterprise Development Project at CIAT identified key factors for success based on eight RAEs in Colombia, Ecuador, Bolivia, Peru and Chile, oriented toward promoting the exportation of agricultural products. The analysis was based on the physical, social and economic environment, the business organization, analysis of the product and competitive capacity. Among the key factors identified were business-oriented leadership, a drive toward self-management, availability of support services, links to the alternative market, development of marketing strategies and business schemes with vertical integration (Lasso & Ostertag, 1998).

In 2000, part of the small business experiences of 11 CIALs (Cinco Días Mujeres, ASOPANELA, El Placer, San Bosco Hombres, San Isidro Mujeres, El Diviso, Carpintero, Pescador, El Jardín, Santa Barbara and Betania) in Cauca was documented. Analysis of the results of that study, centered on the conceptualization of successful RAEs, and on recommendations or strategies for achieving them (Roa & Lundy, 2000). At present there are 10 groups (except for the last two and including the CIAL Santa Isabel) dedicated initially to research and then to the small-scale production of maize seed, common beans and peas, organic by-products from sugarcane, and bakery products from soy products.

Research questions

Based on the foregoing issues, the study centers on the experiences of 5 CIALs with RAEs. The following framework of questions is used to determine the information requirements:

- What factors motivated the formation of the RAE within the CIAL? ¿How did this process evolve? ¿What are the organizational aspects that have favored that formation?
- What production and marketing factors have contributed to the permanence of these RAEs?
- What have been the main constraints to the normal functioning of the RAE?
- What are the effects of this process on the CIALs with RAEs, on their members and the community?

The information gathered during the study will be important for the farmers involved in CIALs, both with and without RAEs, in the planning, analysis of the production work and in the formulation of projects.

Methodology

In this research, which is explanatory in nature (i.e., why and how), social research strategies such as surveys, analysis of files, histories and case studies will be used (Yin, 1994) The research will not include experimental or quasi-experimental designs (rigid in their methodological structure), because the emphasis is on exploring the specific perspectives of the participants with respect to the CIAL experience, which are important for constructing the meaning and implications of the Committee for the community. Information related to production and marketing data of the Committee will also be gathered.

Both primary and secondary data are being gathered. The design is based on an approach that integrates qualitative, participatory and quantitative methods: The process of forming an RAE in a CIAL will be described through formal, semi-structured individual interviews, group analysis and time-line. Then the organizational and production aspects of the 5 CIALs under study will be characterized (Gottret et al., 2000) (description of producers, the production process, the product and its marketing, among others), using participatory techniques (flowchart of activities) and formal surveys and semi structured interviews.

The analysis of the information will not only be done in the final stage of the study. It will also be a key factor during the execution of the study, for which successive activities of ranking, analysis and recording of information will be done to revise the results, identify gaps and check the reliability of the same.

Results

Selection of CIALs with RAEs

The research hypothesis is that there are organizational and production principles and practices that are key to success in the processes of forming RAEs in the CIALs and their sustainability over time. To test this hypothesis, the study sought to document the

participatory and interactive experiences of farmer members of 5 CIALs that decided to form an RAE.

Rural agroindustry is an "activity that permits increasing the value of the production of the rural economies through the execution of post harvest processes (e.g., selection, washing, classification, storage, conservation, transformation, packing, transportation and marketing) in products from agro-silvo-pastoral systems, fisheries and fish ponds" (Riveros, 1998). This concept makes it possible to differentiate those nonagricultural production activities from others that could easily be confused. Therefore, the following CIALs situated in Cauca were identified according to their RAE experience relative for some.

Table 1. CIAL with RAE in Cauca Province, Colombia[1]

CIAL with RAEs	Founded/ Municipality
San Bosco Hombres: Small-scale production of maize seed	Feb 1 1991 Santander de Quilichao
Pescador: Small-scale production of common bean seed	March 1 1991 Caldono
El Diviso: Small-scale production of maize seed	Sept. 24 1991 Rosas
Cinco Días Mujeres: Production of bakery products from soybeans	March 12 1992 Timbío
ASOPANELA: Production of panela[2]	April 28 1992 Rosas
El Jardín: Small-scale production of common bean seed	Sept. 15 1993 Caldono
Carpintero: Small-scale production of common bean seed	Oct. 6 1995 Morales
El Placer: Small-scale production of maize seed	Aug. 22 1996 El Tambo
San Isidro Mujeres: Production of food from soy products	Oct. 1 1996 Santander de Quilichao
Santa Isabel: Small-scale production of pea seed	Oct. 1 1997 Totoró

[1] From IPRA Project database.
[2] Uncentrifuged brown sugar patty.

As there was insufficient information on the existing types of RAE, it was assumed that they could be subsistence agro enterprises or in the initial stages of development, which do not generate sufficient economic surpluses to be capitalized and that differ in the use of family labor.

Prior to the selection, excluding criteria were identified: armed conflict (CIALs El Placer and Santa Isabel) and the amount of documentation (CIAL El Diviso). A rapid poll was

conducted in the remaining 7 CIALs with RAEs, using a semi-structured interview, designed according to criteria that integrate organizational and production factors, without becoming isolated from the context of the process of forming the RAE in the CIAL and its implications on the lives of the farmers and on the community. The criteria were conditions of poverty in the zone, gender, type of product and its influence in the diet, organization, complexity of the operations and research. San Bosco Hombres, Carpintero, San Isidro Mujeres and ASOPANELA were selected. Upon discussing the information from the poll of the selected CIALs, it was decided to include the CIAL Cinco Días Mujeres because studying the organizational problems that they are facing was considered to be illustrative (Table 2).

In addition, two groups of committees differentiated as to the continuity of their research (e.g., the second group in addition to the RAE carries out farming activities that are not related to the research):

CIALs with RAEs:	Carpintero and ASOPANELA
CIALs that are RAEs:	San Isidro Mujeres, San Bosco Hombres and Cinco Días Mujeres

The CIALs San Bosco Hombres, San Isidro Mujeres, Carpintero and Cinco Días Mujeres are located in different parts of the county seat and have basic services, primary schools, health centers and unpaved access roads. The CIAL ASOPANELA also has the basic services but is located along the Pan American highway, which has facilitated the effective marketing of their product.

The final selection of CIALs also makes it possible to relate the contrasting conditions of poverty in the zones and their influence on the functioning of the RAEs. The research was distributed in the North (San Isidro Mujeres, and San Bosco Hombres in Santander de Quilichao), Center (Carpintero in Morales) and South (Cinco Días Mujeres in Timbio and ASOPANELA in Rosas) of Cauca Province.

Table 2. CIALs with AERs selected.

San Bosco Hombres	San Isidro Mujeres	Carpintero	Cinco Días Mujeres	ASOPANELA
RAE Founded				
1996	2001	1997	2002	1983
Municipality –Cauca Province				
Santander de Quilichao	Santander de Quilichao	Morales	Timbío	Rosas
				
Production Characteristics				
Small-scale production of maize seed. They process surplus grain in threshed maize, bran and meal, adding value to the “fresh” product at two levels: the selection of the grain for seed and its physical transformation.	Small-scale production of common bean seed. They do not carry out complex operations or have much infrastructure, but they dedicate a good part of their time to the production.	They make bread from wheat flour, supplemented with soy flour. They have a production site and the equipment required for the production.	They produce bakery products from wheat flour. They have a production site and the equipment required for baking bread.	They produce panela in several forms. The level of complexity of their activities has been increasing as they advance in the process. Their marketing is successful, given the closeness of the production site to the Pan American highway.

San Bosco Hombres	San Isidro Mujeres	Carpintero	Cinco Días Mujeres	ASOPANELA
Organization				
The organizational structure of the CIAL does not function (constituted by 3 people) although they do work as a group. In addition to the time dedicated to the RAE, they also do other farm work (crops) that contributes to the functioning of the RAE.	The organizational structure of the CIAL does function (5 people), and they work as a group during the production and marketing of the product.	The organizational structure is the CIALs (5 people); at present they work as a team. They combine the time dedicated to the RAE, with farm work that contributes to the purchase of ingredients. They are in the process of getting a tax no, and resources through the UMATA.	They have the organizational structure of a CIAL (5 people). They form part of the group that makes bread.	They work in a group, but the organizational structure of the CIAL is incomplete (3 people - relatives and another who does extension work). They are also trying to obtain resources for modifying the area where they produce the cane juice.
Research				
At present they are not doing any research, but are motivated to begin on upland rice.	They are doing research to improve maize production.	At present they are not doing any research for fear of losing the investment in the trials (as has occurred be-fore). In the future they want to do research on green beans.	They are in the stage of evaluating trials with the soybean crop.	They are doing research on two cane varieties and on alternatives for fertilization.
Constraints				
At present the generation of income is not better because they have not been able to meet the clients'	The long dry season and the high cost of inputs are affecting the volume of production. At the same time,	Marketing and standardization of production.	At present it shows organizational problems due to lack of commitment among participants. This	At present they have problems marketing their products in North Cauca because FEDEPANELA

San Bosco Hombres	San Isidro Mujeres	Carpintero	Cinco Días Mujeres	ASOPANELA
orders, caused mainly by the climate, which has been unfavorable for production.	marketing is affected by the low frequency and high cost of the transportation and by their low supply capacity.		generates fights for leadership, which in turn affect production activities.	requires a sanitary register that certifies good manufacturing practices.
Future				
In the future they want to have their own site (bigger) for the RAE activities, as well as a shop for selling inputs and a warehouse for storing products. They want the RAE to provide services to the community and generate employment.	Improve the quantity and quality of common bean and maize seed.	Adapt the production site and contribute to improving the nutrition of the children in schools and family welfare homes; generate income.	Improve income and product quality.	Adapt the panela processing area to provide milling services to the community.

In addition to the foregoing selection process, another alternative of analysis was considered: statistical. Logistic regression (Hernández, 2000) establishes the relationship between the criteria and the degree of adjustment for each CIAL.

To obtain the 10x10quadratic matrix required for this tool, it was necessary to include additional information from three CIALs: El Diviso, Santa Isabel and El Placer (Table 3). This matrix is a step prior to graphic analysis.

Table 3. Data matrix: Criteria against CIAL with RAE.

Data Matrix											
Distribution of Frequencies of Acceptance											
CIAL with RAE	**Criteria**										Total
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	
1. ASOPANELA	3	2	2	2	2	3	2	3	3	3	25
2. San Isidro Mujeres	3	3	3	3	2	3	2	1	1	1	22
3. Santa Isabel	3	2	3	2	2	1	3	2	2	1	21
4. San Bosco	3	3	2	2	3	2	2	2	1	1	21
5. Pescador	3	2	1	1	2	2	2	2	3	3	21
6. Cinco Días Mujeres	2	2	2	3	2	3	2	1	2	2	21
7. Carpintero	3	2	3	2	2	1	2	2	1	1	19
8. El Diviso	2	3	1	2	2	2	2	2	2	1	19
9. El Placer	1	2	3	2	2	1	1	2	1	1	16
10. El Jardín	2	2	2	1	2	1	1	1	1	1	14
Total	25	23	22	20	21	19	19	18	17	15	185

Selection Criteria:
1. Time dedicated to the RAE
2. Contribution to food security
3. Organization of the RAE
4. Capacity for self-management of the RAE members
5. RAE-community interactions
6. RAE production conditions
7. Reaching RAE objectives
8. Age of the RAE
9. Marketing
10.Conditions of the zone

In the regression analysis, the criteria for selecting the CIALs were predetermined (Table 4). The criteria were assigned values on a scale of 1-3. A 1 indicates that the CIAL has little relation to that criterion vs. 3 for a high relation. In this way, each CIAL was graded for each criterion, generating a matrix, which was then analyzed using logistic regression.

In Figure 1 the CIALs are represented by curves. The most related to the criteria have the highest percentages on the Y axis; the contrary corresponds to the lowest percentages.

The results of the matrix express cumulative percentages of the criteria used in selecting the CIALs. Three probability zones (high, intermediate, low) were distinguished, depending on the concave, convex and approximate line of each curve, respectively. CIALs with RAEs in each zone were selected. In the zone of greatest concordance, were the CIALs San Isidro Mujeres, Carpintero and San Bosco Hombres; from the zone of lowest concordance, ASOPANELA; and from the zone of intermediate concordance, the CIAL Cinco Días Mujeres.

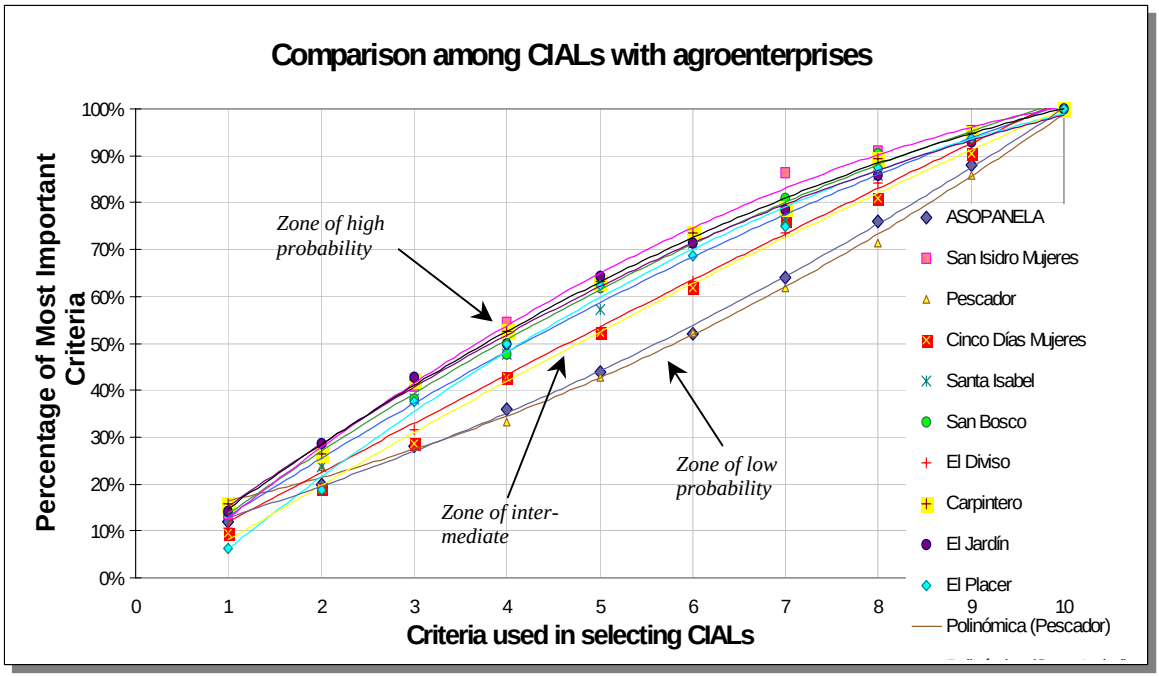

Figure 1. Comparison among CIALs with RAEs.

Upon comparing the results of the selection by qualitative and quantitative methods, a great similarity was found in the results although the sample of CIALs with RAEs was not large.

Executing the research

Progress made

Progress has been made in obtaining primary information on the background, through the application of semi-structured interviews in the CIALs Carpintero, Cinco Días Women and San Isidro Women. In San Isidro Women and Carpintero, group interviews were held in order to characterize the RAE.

Difficulties

Although there were delays in executing the study because of the coffee harvest, the people were willing to collaborate. As of the second semester, both the men and women farmers had more time to dedicate to activities outside their routine work.

The initial Log Frame for the research proposal did not consider the assumption of other parallel research such as a study of evaluation of impact, which is being developed in three CIALs. It was proposed to make an effort to decrease the time of fieldwork so that the methods used had to be as efficient as possible in gathering the required information.

The farmers do not keep records or secondary information to provide details on important situations in their development process as agro enterprises. Thus it was necessary to rely on participants' memory, delaying the fieldwork and perhaps introducing imprecision due to the passing of time.

Lessons learned

The dialogue and group interviews are tools that have allowed the recording of information to evaluate priority aspects considered in the semi-structured interview and in the formats.

It is necessary to adapt the proposed methods to studying each CIAL, given the fact that they operate in totally different contexts. Apparent similarities do not necessarily give way to generalizations.

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Poverty and rural livelihoods in Uganda, Malawi and Tanzania: A baseline study of BAPPA project sites

Researcher: *Soniia David*[9]

Introduction

In 2001 the International Center for Tropical Agriculture (CIAT) embarked on a new project entitled, "Beyond Agricultural Productivity to Poverty Alleviation" (BAPPA). CIAT, one of the Future Harvest Centers of the CGIAR (Consultative Group on International Agricultural Research), has worked in eastern and southern Africa since the early 1980s, primarily focusing on increasing bean productivity among small-scale farmers in partnership with national R&D partners. CIAT's mission is to reduce hunger and poverty in the tropics through collaborative research that improves agricultural productivity and natural resource management. To achieve this goal, CIAT must go beyond improving food supply to address the underlying causes of poverty. The BAPPA project represents a greater emphasis on CIAT's work on integrated community development, building on gains in bean productivity but going beyond productivity issues.

While increasing food supply is often a necessary condition for improving food security, increases in food supply and rural incomes do not guarantee improved rural livelihoods and food security at the household level. Farmers' financial benefits from agriculture are often reduced by their limited opportunities for adding value to their agricultural produce, poor marketing information and low bargaining power with middlemen. Unless resolved at the household level, factors such as chronic disease, lack of clean drinking water, gender bias, poor knowledge of nutrition and sociocultural practices may undermine the adequate utilization of available food.

The BAPPA project aims to address the bottlenecks that hinder farmers from benefiting fully from research-generated agricultural technologies. Recognizing that none of this is new territory to many NGOs, the project's strategy to achieve this objective by forming strong, holistic, interdisciplinary partnerships with development organizations. The project has 5 outputs:

- Catalyze improved organizational capacity in pilot communities
- Support farmers' experimentation and application of technical skills
- Develop an approach to strengthen community capacity to invest their potentially higher income in alleviating poverty
- Assist farming communities to protect their environmental resources
- Senior Scientist, CIAT-Africa, P.O. Box 6247, Kampala, Uganda
- Support women's empowerment and leadership at the community level

[9] Senior Scientist, CIAT-Africa, P.O. Box 6247, Kampala, Uganda

The BAPPA project works in 3 pilot sites in eastern and southern Africa: Kabale District in southwestern Uganda, Dedza District in central Malawi and Lushoto District in northern Tanzania. These sites were selected on the basis of two main criteria: impact achieved from bean technologies and presence of a willing NGO collaborator. In Kabale the project operates in 2 villages in Rubaya Subcounty and is implemented in collaboration with Africare, a US-based NGO. The project began work in May 2001. Concern Universal, a UK-based NGO implemented the project in two villages in Linthipe EPA for one year starting in July 2001, but pulled out in 2002. In Lushoto District, the project has been operating in a village in Soni Ward since January 2002and is implemented by TIP (Traditional Irrigation Project), a local NGO. Project activities were initiated.

To monitor the impact of the project and assess change, a baseline study was carried out during the first year of the BAPPA project. This report presents the results of that study, which was loosely based on the sustainable livelihoods framework (Carney, 1998) which focuses on a comprehensive view of the livelihood circumstances of the poor including ownership of assets, livelihood activities, factors contributing to their vulnerability and the relationship between relevant factors at micro, intermediate and macro levels.

This paper explores the following dimensions of rural livelihoods in relation to the five project outputs (Table 1 lists indicators used to measure key variables related to major project outputs):

- Household resources
- Poverty and vulnerability
- Social capital, participation and conflict
- Agricultural production and food security
- Land use and management
- Gender relations

Methodology

Both participatory rural appraisals (PRAs) and formal surveys were used to collect baseline data in the three study sites. PRAs were conducted over 1-2 days and involved activities such as visioning and group discussions on the gender division of labor, wealth ranking, prices and crop calendar. Formal surveys took place during the first season of project activities: November 2001 in Rubaya, November-December 2001 in Linthipe, and June 2002 in Soni. Key informants from each study village were involved in wealth ranking, and the results were used to assign surveyed households to wealth groups. As wealth categories identified in the three sites are not necessary comparable (i.e., wealthy in Soni is not the same as in Linthipe), descriptions of each wealth are provided in the appendix.

Table 1: Indicators used to measure livelihood variables.

Variable	Indicators	Comments
Livelihood assets	Sex and age of head of household, household size, educational and literacy level of the head of household and partner, no. of school age children out of school, household labor, dependency ratio, annual agricultural income, sources and importance of nonfarm income, ownership of livestock	Successful asset accumulation "often involves trading-up assets in sequence"; e.g., chickens to goats to cattle to land (Ellis et al., 2002); no information was collected on overall household income
Social capital	Group membership, technology/knowledge diffusion pathways, participation in NGO activities	The existence of indigenous groups and technology and information diffusion pathways are indicators of the bonds of social trust and social networks; participation in NGO activities is a measure of linking social capital
Poverty and vulnerability	Household wealth status, borrowing and saving behavior, investment priorities, coping strategies in emergencies	Rising prosperity depends on having multiple opportunities for asset accumulation. Respondents were asked what they would invest in if their income were to double.
Agricultural production	Crops produced and purpose, multiplication rate of major crops, adoption of modern crop varieties, use of inputs, seed sources, proportion of crops sold, marketing constraints	
Food security	Food shortages and reasons for them, how long the harvest lasts, no. of meals eaten during the hunger period	
Land use and management	Location of farm land, erosion control measures, measures for improving soil fertility, tree planting behavior	
Participation and conflict	Optimism about the ability to bring about positive change locally, participation in collective action, social divisions and conflict, changes in the level of theft, willingness for children to become small-scale farmers	The extent to which people are willing to act collectively to solve social problems is a good indication of the level of social cohesion
Gender relations	Areas of conflict between married couples and decision-making patterns and differences in perceptions by husbands and wives, school attendance by boys and girls	

The formal survey covered a random sample of households from project villages plus a third nearby nonproject village. Table 2 shows the sample size and breakdown by location. Interviews were divided into two parts: the first general section addressed the farm couples, where applicable; the second part was conducted individually with male and female farmers. The interview schedule covered the following topics: household characteristics and resources, agricultural enterprises, use of inputs, marketing, environmental issues, tree planting, household well- being, savings and credit behavior, group membership, intrahousehold decision making and conflict, social participation and conflict. All quantitative information related to income, savings, borrowing and crops yields were based on farmer recall. Due to the unreliability of income data collected through recall, farmers were only asked to report on agricultural income.

The first part of the interviewed covered household-related topics, while the second part was conducted separately with husbands and wives. In Rubaya, 52% of the first part of the interview was conducted with women, 40% with farm couples and 8% with men alone. In Linthipe, 43% of the interviews were held with couples, 37% with women alone and 20% with men alone. In Soni, 78% of the interviews were conducted with couples, 19% with women alone and 2% with men alone.

Table 2. Sample size (no. of households).

	Rubaya, Uganda		**Linthipe, Malawi**		**Soni, Tanzania**	
	Sample	**Population**	**Sample**	**Population**	**Sample**	**Population**
Project villages	Muguli B: 32 Kalambo: 30	63 53	Mnthala: 49 Yazini: 31	160 36	Shashui	107
Nonproject village	Rukole: 30	53	Chikonde: 41	79	Vuga:	469
Total sample size	92	169	121	275	83	576

Data analysis relied on descriptive statistics; namely, frequencies, means, t test and ANOVA to compare means. To assess and compare men's and women's investment priorities, frequencies and ranked data were converted to scores for more accurate comparison. Variation within study communities was analyzed along three dimensions: wealth, gender and location (village and country) with the objective of exploring how social differentiation affects people's experience of poverty.

Results and discussion: Cross-site comparison and recommendations

When poverty is measured by factors such as income, ownership of assets and access to resources such as credit, land etc. and vulnerability, the picture that emerges from the three sites is one of varying levels of poverty across and within them. Of the three sites, farmers in Soni (Tanzania) were relatively better off, enjoying the highest annual agricultural income ($149). Poverty was most acute in Linthipe (Malawi), while Rubaya (Uganda) represented a situation of moderate poverty. The following section analyzes

poverty within and across the three communities in the context of four dimensions: agricultural production, livelihood activities, ownership of assets and vulnerability.

Agricultural production and livelihood activities

In all three sites agriculture was the predominant economic activity. Farmers in Soni had the most diverse portfolio of crops, including at least 7 cash crops. In contrast, farmers in Rubaya and Linthipe grew some crops mainly for subsistence, many for both consumption and sale, and relied on only one or two crops exclusively for cash. There was, however, in these two sites, evidence of diversification of cash crops: Soybeans, potatoes and paprika in Linthipe and coffee, wheat and pyrethrum in Rubaya. Additionally, in Linthipe there was evidence of food crop diversification, away from the traditional dependence on maize to increased production of cassava and sweet potatoes. As this and other studies (David, 1999) show, the absence of traditional cash crops contributes to food insecurity, with farmers falling into a cycle of selling large parts of their food crop harvests when prices are low and buying those same foods when prices are high. Significantly, although farmers in Soni bought maize and beans when they experienced food shortages, unlike farmers in the other two sites, they did not attribute shortages to food crop sales.

This study investigated the uptake of crop varieties and land management technologies. On the whole, the adoption of introduced crop varieties at the study sites was moderate to high, but yield estimates for some crops such as potatoes and maize suggest that farmers had not benefited fully from the yield advantages of introduced varieties because of their failure or inability to carry out good agronomic practices (e.g., fertilizers or use of "clean" seed in the case of potatoes). In addition, in areas where NGOs were involved in seed dissemination, the low adoption of some bean varieties (climbing beans in Rubaya, Bush beans in Linthipe) was unexpected. One possible explanation may be related to the practice of one-time seed dissemination by NGOs and farmers' difficulties in retaining seed of new varieties (David & Sperling, 1999), especially in communities where informal social networks are weak, which is not conducive to rapid seed diffusion.

Uptake of land management technologies provides insight into the types of support farmers and communities need to facilitate adoption. As the Linthipe data suggest, Concern Universal's input in terms of training and follow-up was largely responsible for the high adoption of land management technologies. The significant increase in the digging of trenches in Rubaya at the start of the BAPPA project highlights two basic ingredients needed for effective NRM and community development generally. Prior to 2001, few households in Rubaya had dug trenches to control erosion and reclaim gullies despite farmers' awareness of the technology. The BAPPA project organized farmers into groups to dig trenches across plots belonging to several households and provided digging tools. This intervention subsequently led village leaders to establish bylaws requiring all households to dig trenches.

At all sites the combination of low agricultural productivity and limited market opportunities has increased household dependence on nonfarm activities. The high

proportion of Linthipe farmers involved in nonfarm activities, for example, is a reflection of poor agricultural performance and chronic food insecurity in Malawi due to drought, low soil fertility and the inability of most households to achieve self-sufficiency in maize. Farmers' attempts to minimize risk by opting for a dualistic strategy of intensifying agricultural production while seeking off-farm employment as a short-term survival strategy are clearly evident in their investment priorities. Farmers in Linthipe and Soni attached a high premium to purchasing chemical fertilizer, while farmers at all three sites showed a strong interest in business.

While nonfarm activities offer a potential pathway out of poverty for rural African households (Ellis et al., 2002: 17), the types of opportunities available to farmers are limited; and some may even contribute to low agricultural performance. Four areas of off-farm income-generating activities were common to the three sites: casual labor, petty trade, brewing and salaried employment. A recent study in Malawi (McDonagh, 2002) shows that, while casual labor is an effective survival strategy, it forces many farmers—the poor in particular—to neglect their own fields at key periods during the farming season. The study concludes that the overall effect of casual labor on farm-based livelihoods is negative. Due to high start-up costs and limited credit opportunities, relatively few farmers in the three communities were involved in remunerative off-farm self-employment activities such as maize milling, carpentry and poultry, which could serve as pathways out of poverty. Indeed, farmers' investment aspirations highlight the need to expose farmers to new business ideas. Across sites, men were more likely than women to engage in off-farm income-generating activities and had a more diverse portfolio of activities, including more skilled activities such as salaried employment. Male migration for casual employment was found only in Rubaya, an area of low male involvement in agriculture. Aside from petty trade, women tended to engage in relatively low-paying activities such as casual labor, brewing and handicraft production.

Asset ownership

The key assets of rural African households are land, livestock, labor, education, implements and tools, networks that increase trust, ability to work together, access to opportunities and informal safety nets. Access to enough productive land for crop cultivation and livestock is crucial for the rural households to generate a viable living. In Rubaya there was evidence that the poorest households had least access to land in the wetlands, the most suitable land for potato and vegetable production. In Linthipe better-off farmers cultivated significantly larger land holdings in both the uplands and *dambos (river beds).*

Ownership of agricultural tools and use of agricultural inputs are also associated with improved well-being as they enhance agricultural productivity and the latter in turn permits further investment in inputs. Farmers' inability to dig trenches in Rubaya for lack of appropriate tools illustrates the association between ownership of agricultural tools and poverty. A key reason why farmers in Rubaya did not dig trenches to control soil erosion was lack of tools. At all sites wealth was strongly correlated with livestock ownership; however, the importance of livestock lies in substituting lower value livestock (e.g.,

chickens, small ruminants) for higher value livestock (cattle, pigs, donkeys), the type and number of livestock owned is key to achieving rising assets over time. While most households surveyed owned chickens, only the wealthiest households owned cattle, pigs or donkeys. In Soni a third or more of the livestock owners kept cattle and small ruminants, whereas in Rubaya and Linthipe few households owned cattle. In those two sites, aside from chickens, most households had an average of 2-3 goats or sheep, not enough to make a significant contribution to poverty alleviation. Not surprisingly, farmers in Rubaya and Soni attached high importance to livestock as an investment priority. Livestock received lower priority in Linthipe because of the high risk associated with theft.

Survey data confirm that the amount of available household labor contributes to household well-being. Households in Soni had the highest number of productive workers; and notably in Rubaya and Soni, but not Linthipe, wealthier households had a significantly higher number of productive workers. Rubaya had the lowest number of productive workers due to the high number of men and women engaged part time in agriculture and the resulting high dependency ratio. The lack of correlation between wealth and household labor in Linthipe may be related to the observations by a recent study that except for livestock holding, there were few significant differences in the assets profiles (defined as household size, education, ownership of tools, land and livestock) of different income groups in Malawi (Ellis et al., 2002).

At the community level, Soni had the highest proportion of formally educated farmers, both male and female; while farmers in Linthipe were the least educated. At the household level, however, there was a correlation between wealth and educational level only among men in Linthipe. Education contributes to poverty alleviation through various direct and indirect mechanisms—an area not explored in this study.

Significant differences existed among the communities in terms of membership in indigenous groups, with Rubaya having the highest number of groups and proportion of households belonging to groups. Soni had the next highest number of local groups and number of households belonging to groups, while there were few indigenous groups in Linthipe. Local groups played various functions including providing informal safety nets for burial assistance, transportation to hospital and obtaining credit, facilitating savings and the exchange of new technologies and information, providing services such as labor exchange and generally strengthening social cohesion among kin-based groups. Wealthier households in Rubaya and Soni had more members involved in groups, presumably because of their larger size and better access to resources (e.g., time, money, skills). Surprisingly, there was no difference in the number of men and women belonging to groups. In Linthipe and Soni, government and NGO- created groups were carrying out development activities. The basis on which these groups were formed and the subsequent implications for their sustainability after development projects end, are issues of concern and require further research.

Vulnerability and gender considerations

Rural households in the three study sites and throughout Africa are subject to calamity trends, external shocks (such as drought) and seasonality in health, prices, agricultural production, employment opportunities and resource availability—factors that are outside their control. Ill health, particularly malaria and HIV/AIDS, was an important shock not investigated here. As noted by a recent study in Malawi and Tanzania, rural households are unable to plan ahead and therefore cope with illnesses with short-term survival strategies, resulting in net welfare, cash and capacity loss, which weakens the capacity of households to generate work (Koestle, 2002). Across sites, drought, crop failure, food shortages, insufficient capital, low prices and lack of markets were common shocks. In a number of instances, farmers showed great innovation, often without external assistance, in tackling major shocks. For example, in Rubaya, farmers responded to the devastating effects of bean root rots by spontaneously adopting more tolerant climbing beans. In line with government policy to combat the effects of drought, farmers in Linthipe had diversified their food crops and were growing more drought-tolerant crops such as cassava. Crop diversification was a general response to vulnerability observed at all three sites, but was most successful in Soni due to several factors including favorable climatic conditions, proximity to urban markets and strong institutional support for horticultural production dating back to the late 1960s (pers. comm., R. Kirkby).

Coping strategies were similar across sites, with most households reducing the number of meals eaten during the "hungry season," borrowing money from friends and relatives, working for food or money, and borrowing or buying food. To cover educational and health expenses, farmers were often forced to sell crops, land or livestock, contributing to the poverty cycle. Local groups played an important safety net role by providing credit in Rubaya, but farmers everywhere tended to seek assistance from friends. Vulnerability may be exacerbated at community level by a high level of social division that prevents communities from engaging in collective action to address common problems. The major social divisions identified in the study communities were asset related (access to land, including wetlands, wealth, ownership of livestock, education). Interestingly, a high proportion of farmers in the poorest communities (Linthipe and Rubaya) perceived an increase in the level of theft, suggesting an association between poverty, theft and social divisions.

Although Rubaya was the only site where survey respondents highlighted poor relationships between men and women as a social problem, the study consistently documented women's disadvantaged position and greater poverty in the three communities. Generally, women were less educated, saved and borrowed smaller amounts of money compared to men, had less decision-making power than men, and owned fewer productive assets (livestock, land). While analysis of conjugal decision-making data was problematic, the findings across sites suggest that women rarely make agricultural or personal-level decisions on their own. Cultivation on personal plots, which allows married women more economic freedom, was only found in Soni, the most market-oriented location. Typically, women had greater control over smaller amounts of

income. At all sites, the dominant male decision-making pattern gives rise to marital conflict.

Women had higher workloads compared to men, largely due to their domestic responsibilities; but in the case of Rubaya, also as a result of male migration and men's lower input in agriculture over all. The proportion of female-headed households was high across sites, particularly in Rubaya; and everywhere those households formed a disproportional number of the poorest group. Surprisingly, the study did not reveal strong educational discrimination against girls, possibly because most children in surveyed households were at the primary level, where girls face less discrimination. Still, this finding represents an important advance in the education of girls. Across sites, women complained of similar marital problems: conflicts over money and decision-making, failure of men to work and provide for their families, drinking and domestic violence. Marital problems shared by men in the three communities included conflict over money and decision-making and wives' disobedience.

Conclusions

Although this study presents a rather dismal snapshot view of the three communities, farmers at all sites—but especially in Soni, where living standards were better—were relatively optimistic about the future, with half or more wanting their children to become small-scale farmers. Growing evidence indicates that the key to developing pathways out of poverty in rural Africa "is a cumulative process that requires the ability to build assets and diversity across farm and non-farm activities" (Ellis et al., 2002). Farmers in the BAPPA project sites, in conjunction with development partners, have started this process. The BAPPA project, a unique partnership between an agricultural R&D institution and NGOs, can build on progress made and make unique contributions to poverty alleviation.

Recommendations

Based on the study's findings, some specific recommendations for project interventions that complement on-going activities include:

- Developing creative, workable mechanisms for credit provision and identifying strategic partners who can develop credit programs that cater to the needs of both men and women of different wealth categories
- Helping men and women farmers build assets, particularly livestock holdings
- Training farmers to identify market opportunities and working with them to carry out diverse nonfarm economic activities
- Improving farmer access to agricultural inputs through credit and more creative programs
- Strengthening farmers' capacity to form and manage both social and entrepreneurial groups based on a sound understanding of social ties and existing groups
- Identify partners that can improve farmers' literacy levels
- Develop sustainable technology-dissemination mechanisms

- Redress gender inequalities in workload, decision-making and income levels by raising awareness among adults and especially children, introducing labor- saving technologies for women and diversifying women's nonfarm economic activities.

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Visitors attended by staff from the SN-3 FPR team, Oct. 2002 - Sept. 2003

Date	Name/Position	Institution	Country	In Charge
2002				
Oct 24/02	Efraín Rodríguez	Director Fundación Amazónica Los Churumbelos	Colombia, Putumayo.	José Ignacio Roa
Oct 31/02	Otoniel Villegas y Elizabeth Muñoz.	Universidad Autónoma Centro de Información	Colombia, Cali.	José Ignacio Roa
Oct 31/02	German Bashemheimer	Universidad Autónoma, comunicación.	Colombia, Cali.	José Ignacio Roa
Oct 31/02	Andres Perafán	Universidad Javeriana, Macroproyectos	Colombia, Cali.	José Ignacio Roa
Oct 31/02	Leonardo Duque	Universidad Javeriana, Director Postgrados	Colombia, Cali.	José Ignacio Roa
Nov 12/02	Edson Gandarillas	Fundación PROINPA	Bolivia.	Susan Kaaria, Carlos A. Quirós
Nov 12/02	Pilar Lizarraga y Carlos Vacaflorez	Fundación JAINA, Coordinadores	Bolivia	Susan Kaaria, Carlos A. Quirós
Nov. 22/2002	Mr. And Mrs. Jean Marc Duval Mr. Andre Hoovert Mr. Luis Vargas Mrs. Anne Sophie Berche	Canadian Ambassador and Wife Aggregate Humanitarian Issues. Embassy of Switzerland Advisor, Embassy of Japan Policy, Culture and Cooperation Advisor. Embassy of Belgium	CIAT, Cali	Susan Kaaria Anna Knox Rupert Best
Dic 9/02	Marino Valderrama profesor del Instituto técnico de Roldanillo y 8 ganaderos de la región..	Profesor del instituto e integrantes de un proyecto con la Universidad Nacional. Se hizo una gira a la estación del CIAT en Quilichao.	Colombia,Valle.	Carlos A. Quirós José I. Roa
Dic 19/02	Wessel Eyman	Director RED CAPA	Chile	Susan Kaaria
Dic 19/02	Nora Presno	Coordinadora RED CAPA	Chile.	Susan Kaaria
2003				
Enero 24/03	Reinaldo Vélez	Coordinador Medio Ambiente y Territorio del CRIVA.	Colombia, Vaupés.	José Ignacio Roa
March 10, 2003	Edgar Guardia	Director Ejecutivo FDTA-Valles	Cochabamba, Bolivia	Carlos Arturo Quirós Vicente Zapata Luis A. Hernández Elías Claros Fernando Hincapié
May 19, 2003	Dr. Hari Har Ram	Professor Vegetable Breeding and Head, Vegetable Science and Nodal Officer, Pantnagar Centre for Plant Genetic Resources	India	Susan Kaaria

Date 2002	Name/Position	Institution	Country	In Charge
	Dr. R. K. Pant	Technical Coordinator, Diversified Agriculture Support Project, Uttaranchal, Dehradun, Vasant Vihar	India	
May 30/03	Nic Hogenboom Jeffery Bentley	Consultores PREDUZA	Ecuador	Carlos A. Quirós
June 11, 2003	Dr. Gary Toenniessen	Director, Food Security Division, The Rockefeller Foundation, New York	USA	Susan Kaaria
July 7/03	Jesús Antonio Tumiña/Responsable de los Recursos Naturales	Cabildo indígena de Silvia.	Colombia, Cauca	José Ignacio Roa
Julio 14/03	Patricio Ponce y Jimena Tapia.	Fundación MANRECUR	Ecuador, El Ángel Carchi	José Ignacio Roa
July 14-15/03	Cecilia Cabascango Teresa Carlosama Ximena Tapia Aldemar Nejer Luis Ponce, Mauricio Lara Patricio Ponce Edwin Revelo	Técnicos de MANRECUR	ECUADOR.	José I. Roa
July 29/03	Juan Pablo Higuera	CORPOICA, Medellín	Colombia	Elías Claros T. Jorge L. Cabrera Fernando Hincapié
Agosto 6/03	Bernardo Rivera / director maestría Sistemas de Producción	Universidad de Caldas	Colombia, Caldas	José Ignacio Roa
August 26/03	Erika Eliana Mosquera	AGROEMPRESAS RURALES, SIDER, Cali	Colombia	Jorge Luis Cabrera
August 29/03	Mariela Quintero	Innovación Rural, Cali	Colombia	Jorge Luis Cabrera
Sept 25/03	Fabio Trujillo Benavides Fabio Gomez	Secretario de agricultura Director Ejecutivo, FAS	Nariño, Colombia Valle, Colombia	Carlos A. Quirós
Sep 28/03	Efraín Rodríguez	Fundación OIKOS	Colombia, Mocoa	José Ignacio Roa

OUTPUT 6. INTERNAL PROJECTS AND OTHER INSTITUTIONS SUPPORTED AND STRENGTHENED IN CONDUCTING PR

Milestones

- School-age children acquire basic concepts of PR in theory and practice.

"Sharing learning experiences" - Workshops among organizations that have begun joint work in Central America, CIAT, CIPASLA and community groups in Cauca Province, Colombia"

Researchers:*José I. Roa*[1]*, Lucy Figueroa,*[2] *Carlos A. Quirós,*[3] *Rodrigo Vivas,*[4] *Alfonso Truque*[5]

Highlights

Central American organizations of young people reorient their attitude and execution of their projects as a result of interacting with the farmers' organizations constructed on the basis of participatory methodologies

Abstract

The purpose of these workshops is to promote interactions among networks of young people supported by the Kellogg Foundation and farmers' organizations based on participatory models and to get to know firsthand the different participatory processes of the models that the Participatory Research Project (IPRA) at CIAT has been investigating in the communities in Cauca Province, Colombia. The strategy consisted in organizing field visits so that the visitors could learn about the processes of CIPASLA (Institutional Consortium for Sustainable Agriculture on Hillsides) and the different projects that support CORFOCIAL (Corporation for Promoting CIALs) and the research activities of the CIALs (Local Agricultural Research Committees). The community projects analyzed have components of adaptive research, production, transformation, marketing, communication, education, gender and natural resource management. The most outstanding outcomes mentioned by the participants were the importance of the participatory methodology, where the projects should arise from a need felt by the community itself; the importance of transmitting basic values that should be passed on to the new generations; respect for the land and the environment; and a feeling of loyalty, commitment to the process and to joint work. They also understood the importance of

[1] Research Specialist, SN-3 Project, CIAT, Colombia
[2] Consultant, WK Kellogg Foundation.
[3] Research Associate I, SN-3 Project, CIAT, Colombia
[4] Technical Coordinator, CIPASLA.
[5] Administrator, CORFOCIAL.

good project administration, clear rules, equity and technical support committed to the process of participatory research, which underlies the whole process.

Identification of the problem

The need to deal with situations that are more complex each day, such as the ever-increasing hunger and deterioration of natural resources, leads us to think about the need to involve the local actors in a broader R&D agenda, in which all those involved should participate. Participatory methods are an alternative tool for facilitating these processes and enable each actor to be heard and take part in the decision-making. Without these conditions, many projects have had negligible impact despite years of work and high investments. For this reason the active participation of the project beneficiaries is becoming more important so that they are able to take part in the development of their future. The role of the outside actors is to facilitate the processes in integrated teamwork and identify technological alternatives that respond to the local demands.

Background

With the spirit of integrating the projects financed by the Kellogg Foundation (WKK), the IPRA project was invited to participate in "The Second Meeting of Projects in the Initiative of Human Nutrition in the Latin American and Caribbean Region," held in San Salvador from 3-9 December 2000. At this event the CIAL methodology was made known. It was seen as an alternative that could possibly be applied in other areas such as health and education.

Later we received the visit of the Directors of Programs of Latin America and the Caribbean, Drs. Jana Arriagada and Heliodoro Días, who had the opportunity to talk personally with members of some CIALs in Cauca, and they were also able to learn about the interinstitutional model, CIPASLA. This experience—being able to converse with the actors of local organizations, visualize their accomplishments, their capacity to manage their organization and their projections—showed the importance of having other Foundation-supported projects or farmers' organizations interact and learn about these experiences.

Given the foregoing, the IPRA Project at CIAT proposed to develop a milieu, where the organizations involved in the CIALs and CIPASLA and organizations from four interinstitutional projects in Central America could interact. The projects selected were part of the Youngsters Networks of Nicaragua, El Salvador and Guatemala. In each case a group of ten or more institutions form a network, a consortium or an association that has received financial support to strengthen a style of joint work, where they lead the local development of a selected geographic area, with participation of the community, especially the younger people.

Methodology

The methodology consisted in conducting a sensitization exercise, prior to the field visits to CIPASLA, CORFOCIAL and the CIALs, on theoretical aspects and the way in which the participatory models have been implemented, as well as some of the results obtained. For two days days they visited the different projects that form part of CIPASLA ,ASOBESURCA, accompanied by the Director of CIPASLA, Rodrigo Vivas ,and These projects have components of adaptive research, production, transformation, marketing, communication, education, gender and natural resource management, among others. At these sites they had the opportunity to interact directly with the actors of the process and explore different aspects of interest to the visitors in much greater depth.

On the third day the participants had the opportunity to visit some CIALs, where they could see methodological steps being applied and the adaptive research trials that they carry out. They were able to interact, with the farmers and the administrator of CORFOCIAL, Alfonso Truque

At the end of each day, discussions were held among the participants, with the aim of extracting the lessons learned (positive and/or negative) from each of the experiences.

The last day of the workshop, a summary was made of what had been observed, the workshop was evaluated, and a list of tasks was made, including commitments on the part of the participants with respect to what they would do when they returned to their countries in order to strengthen their networks, taking into account their respective conditions.

Activities

Basically fiveactivities were undertaken:

- Presentations on the theoretical framework and results obtained with the participatory research methodologies in Cauca
- Tours and workshops to exchange information with the community organizations from Cauca and the networks of young Central Americans
- Discussion and analysis of the experiences by the visitors
- Establishment of commitments
- Follow up to the commitments made in Colombia

Results

Following the discussions and analyses of their experiences, it was expected that the different institutions and their networks would begin a process of adapting the lessons learned. To each network coordinator, a questionnaire was sent out to facilitate their reflections on the relevant aspects, adaptations or adjustments of the participatory methods that they had implemented in their projects after their visit to Colombia.

The following questionnaire and responses are a compendium of what was expressed by the members of the different networks.

- *What elements or aspects of the methodology and experiences of the visit have been put into practice in your local projects?*

One of the aspects that the participants highlighted most was believing more in the capacities of the local people. The visit permitted them to see and analyze directly how the beneficiaries trained and strengthened in their principles, were capable of executing actions just as any outside professional. With this local capacity, the project was more sustainable, and solid bases for the future were created.

This increased capacity permits the community to take decisions with greater confidence, which is essential for participatory processes. They also prepared profiles of projects based on community priorities, where the execution of these projects will be much more active and participative in those interest groups.

- ⇨ The management group from the Valle de San Andrés is adapting the CIAL methodology for their decision-making, preparing project profiles and executing agricultural projects.
- ⇨ Working with young people who are given the basics of the local and national reality so that they can program relevant activities that strengthen the participatory structure of women in community actions as an indispensable factor in their capacity for self-reliance.
- ⇨ Agricultural and livestock diversification to promote rational management of their natural renewable resources, protection of water sources, maintenance the ecological balance of the ecosystems in order to contribute to improving their quality of life and food security.

- ***How did you share the knowledge and the material you received in the workshop once you returned to your country?***

- ⇨ They have held meetings at the level of the action communities from the Consortium of San Pedro Carcha-San Juan Chamelco Alliance for the socialization of CIAL and CIPASLA activities.
- ⇨ The experience has been socialized with the Community Development Councils (COCODE) in Guatemala with emphasis on the community organizational structure of the CIALs, CORFOCIAL and CIPASLA.
- ⇨ A workshop was prepared to disseminate the methodologies with the technical team from the area of Local Development of Salvadorian Foundation for basic support (FUSAI for its Spanish acronym)
- ⇨ The materials were photocopied and given to other organizations and institutions.
- ⇨ In Guatemala, the Universidad Rafael Landívar has plans to translate the CIAL hanbooks to the native language to be used in the formation of future CIALs.

- ***How did they adapt the methodology to the local situation?***

  The methodologies have not been adopted as such; however, they are implementing the participatory principles, which is fundamental in these processes. They are also applying principles of equity, permitting the communities to take their own decisions and share the risks.

  In the case of Guatemala, the legislation has apparently undergone important changes in compliance with the peace agreements, including the officialization of the Mayan languages, a new Municipal Law and the Law of the Urban and Rural Development Councils. These have strengthened the actions undertaken jointly with the consortium. In the case of the Municipality of San Juan Chamelco, activities to sensitize the community leaders are being carried out in order to achieve the outcomes outlined in the Annual Operating Plan.

  ⇨ In the Alliance of Young People of León and Chinandega in Nicaragua, a replica has been made of CIPASLA's coordination system, naming a coordinator who can be neutral at the moment of the decision-making and who does not belong to any other entity.

  ⇨ The work that FUSAI does in the field of agriculture is not specific to research; rather it is the dissemination of appropriate technologies that have been tested, and the CIAL methodologies could be easily adapted. Support is being given to the management group from the Valle de San Andrés, which is one of the commitments acquired.

- ***What difficulties have arisen and how have they been overcome?***

  ⇨ Most of the community authorities are adults who have filled these positions consecutively for some time, but an effort is being made to make them aware of the importance of incorporating young people with new ideas. The experience of the adults combined with their different perceptions can contribute more efficiently to processes of change in their community for the collective benefit.

  ⇨ The active participation of the actors in the rural area is very limited so that it is difficult to know the concerns of the majority, which makes community work very slow; but the financing and execution of the projects march at a much more accelerated pace because it is necessary to see results in the short term. Rural innovations with this type of participatory techniques contribute to accelerating the processes and increasing the participants' interest.

  ⇨ There is a lack of coordination among the different components due to the intent to avoid duplicating efforts in the execution of some activities. Nevertheless, each one in his/her component has planned the activities to be carried out and revised them with the rest of the members.

- ⇨ In the Nicaragua network, some activities have not been fulfilled in accordance with the plan drawn up in Colombia. It is expected that with the naming of the executive secretary, the follow-up should improve.

- ***What was the impact from the workshop and the evaluation of CIPASLA and the CIAL visited?***

According to the participants the IPRA Project/CIAT experience of working to strengthen community organizations is enriching. They also mentioned that the topics are easily replicable in the different countries.

- ⇨ Re-orient their thinking based on local experiences.
- ⇨ Motivated to strengthen community structures and channel efforts toward a similar experience
- ⇨ Makes one reflect on our reality and the one visited in the field
- ⇨ Makes one ponder on the role of IPRA/CIAT in the process
- ⇨ The workshop made it possible to see clearly the work being done by the two types of organizations and the methodology used. It was clear that the success of these organizations lies in their training and initial backstopping by the institutions to facilitate these processes. It is also evident that this is the result of a process that require stages or phases in order to reach the goals; that is, projects in the longer term.
- ⇨ With respect to CIPASLA, what most called their attention was that the participants in the process are convinced that they are positive agents of change at the level of their communities and that this process is highly beneficial as it gives them the opportunity to carry out technical activities that contribute to preventing the degradation of natural resources and the conception and utilization of organic farming.
- ⇨ In relation to the CIALs, what impacted them most was the degree of commitment and responsibility that the beneficiaries have acquired with respect to controlling their farms. They themselves are the ones who decide what to cultivate; but not only that—they also disseminate the results obtained, which are considered public assets.
- ⇨ In general this experience generated a great deal of enthusiasm in the different network participants, as well as knowing that an organized community can break with the cycle of poverty when they are organized and open to other circumstances and are capable of becoming sustainable.
- ⇨ In Nicaragua. the Colombian experience generated a great deal of enthusiasm in the different participants, especially knowing that when a community is organized, it can break the poverty cycle and be capable of becoming sustainable. This has led them to want to work more closely and develop different programs in network form.
- ⇨ In the Nicaragua network , they are obtaining legal status: the Consortium Network for Local Sustainable Development in alliance with young people.

Summary of achievements

What do you consider the principal achievements?

- Diffusion of participatory methodologies to strengthen the community organizations, which have been successful, as can be seen from their results. The methodologies presented to the participants of the Central American networks were implemented several years ago, and today they are being applied to various production projects that continue, although with some difficulties, and are managed directly by their own members. These projects in which the users participate in their development have a high degree of empowerment and are probably of easier sustainability in the future. Sharing experiences with the technicians of institutions from three Central American countries was also meaningful for them.

- All the technicians had the opportunity to know and interact directly with the executors and beneficiaries of the projects that are being executed with the communities in Cauca. They also had the opportunity of learning about the different methods and tools that have been used to facilitate participation and execution; and the different participatory processes on which the research and/or production projects are based.

- *Permit the members of the community organizations in Cauca to present their projects themselves.* Despite the fact that this has been done many times in the national context and occasionally during the visits of people from institutions or representatives of donors, this was the first time that the directors or representatives of the community organizations participated in the whole process in an event of this nature. For them it has been a highly enriching experience and has let them see other visions and have direct contact with representatives of institutions from other countries.

- *Sharing results among different projects that are or have been supported by the WKK*. On many opportunities meetings have been held among the diverse projects that the Foundation supports, and we have been surprised to find similarities, differences or ignorance of achievements of other projects. On this occasion, there was more time to share and discuss results or methods that can be easily be adapted and/or applied in other related projects. There is also the opportunity to maintain contact and continue to share results or concerns about the future.

- *According to a survey done with the participants after their visit to Colombia the achievements that they highlight are as follows:*

    - ⇨ Learning more about these participatory methodologies and applying them leads to greater acceptance at the community level.
    - ⇨ There is more good will among the community organizations (COCODE)
    - ⇨ The participation of young people in training in arts and crafts is stimulated.

- ⇨ It has been possible to train more young people in the methodologies of Healthy Schools.
- ⇨ It has been possible to train more and strengthen the community organizations.
- ⇨ More participation in structures with gender equity
- ⇨ Developing topics of self-esteem
- ⇨ Developing environmental topics
- ⇨ Learning how to manage the methodology, which is a tool applicable in any development institution.
- ⇨ Learning how to be able to work more closely with FUSAI in conciliating circumstances, such as the management group from the Valle de San Andrés and other types of alliances (e.g., the counterpart funds of Nejapa and Soyapango)
- ⇨ Having learned about a noteworthy and successful experience.
- ⇨ Having conceptualized our experience in light of the experience
- ⇨ Internalizing the CIAL methodology and the CORFOCIAL and CIPASLA experience in organizations and institutions.
- ⇨ Obtaining legal status
- ⇨ In Guatemala (FUNDEMI,) the achievement within the community organization component for strengthening technology, has been the creation of "Community Centers of Technology," which are in charge of replicating the training in their respective work groups with the support of the technician-facilitators.
- ⇨ Manage resources
- ⇨ Sign agreements

- *In accordance with your experience thus far, would you say that the original expectations for achieving these results were realistic? If not, why? How should unrealistic expectations be addressed? If you have modified the expected outcomes, indicate the changes.*

  ⇨ Yes, the central idea of this project was very realistic in the sense that the Foundation already knew a great deal of the methods that our IPRA Project has developed, and they even financed these processes at the onset. These processes have gradually been passed on to the farmers themselves, and today they are the ones who direct and lead them for the benefit of the participating communities.

  ⇨ With the previous results, what we were looking for was to share both the successes and failures of these methodologies. We also wanted the participants to be able to question and discuss their concerns about the participatory methods with the producers themselves and learn what these have meant in the execution of their projects so that each person could get what he/she wanted from that experience and then put into practice adaptations or apply principles to improve their performance.

Factors or circumstances (positive and/or negative) in the surroundings that affected advancing toward the accomplishment of the objectives.

- ***Positive:***

    - ⇨ The willingness of the producers and other participants in the processes from Cauca to participate actively in all the tours
    - ⇨ The willingness that the participants had to work hard in order to fulfill the objectives of the workshop
    - ⇨ The access to abundant and diverse cases or examples of applying the methods
    - ⇨ The majority of the visiting technicians had experience in field work with farmers

- ***Negative:***

    - ⇨ The difficulties in communication especially after the workshops
    - ⇨ Establishing agreements among the parties to agree upon dates for the workshops
    - ⇨ Some personal problems among the participants caused difficulties in the application or adaptation of some of the participatory experiences
    - ⇨ because participatory methodologies were not included in the institution's annual plan.

Lessons learned

The main lessons learned were as follows:

- Exchanging ideas and knowledge among the men and women farmers, the participants and project executors and technicians just beginning the participatory processes facilitated their sensitization.

- When holding this type of workshop, it is essential to establish specific commitments well ahead of time in order to facilitate the application and/or adaptation of the knowledge acquired

- When facilitating these processes of knowledge of new alternatives, it is necessary to check with the participants regarding training needs that arise in order to complement the information received.

- By letting the farmers themselves participate as facilitators, showing and teaching their experiences, their knowledge is being valued and their self-esteem is strengthened.

- The conceptual and/or personal difficulties or differences among the technician-facilitators within the networks can seriously limit the results in participatory development projects.

- For the participatory development of the communities and the strengthening of their organization, it is very important to have among the institutions, entities from both the development and technological sector in order to support or promote the offering of this knowledge through them.

- Counting on the power of information and the dissemination of results is a critical factor in community development.

Future plans

What structure has been established to continue this project?

The idea was not really to continue Implementing specific actions in the execution of the project, such as these workshops for sharing information among members of institutions from Central American countries to Colombia. What we hope is that successful experiences such as these or others that occur in other places and possibly in the participants' projects, will also be supported in their diffusion and replication. This type of event is stimulating and permits the participants to learn firsthand about situations different from those that they face daily. They let us explore in greater depth experiences that perhaps in similar conditions or even under more difficult conditions can also obtain good results. The key is to be able to know firsthand the executors and the results and difficulties lived in the field in order to extract the experiences and apply them to ongoing or future projects.

In the future it would be helpful to have an initial survey to be filled out by the participants beforehand in order to determine their expectations. If the survey contains information on the organizations to be visited, their objectives and achievements, the visitors can be much more explicit about specific topics and their needs.

Along these same lines, it is important to come to an agreement with the participants ahead of time, with respect to the commitments and mechanisms that may keep them from applying the adaptations, principles or lessons that they consider relevant in the improvement of their projects.

Recommendations

What recommendations would you make to the other project directors who work in this area or in the Foundation?

- *New workshops:*

    - ⇨ There is a need to establish prior commitments more clearly among the participants with respect to what they will do or the proposals for which this type of event is being held.
    - ⇨ After the workshops it would be constructive to carry out some type of survey or poll to determine training needs that the group has in order to be able to explore

in greater depth the experience lived and apply the methods that could prove useful in their work with communities, improving relevance for they have firsthand opportunity to hear farmers' needs. The incorrect application of a tool or a method can be harmful for both the technician an/or the community.

- *Communication channels*

  ⇨ Define the regional coordinators and their specific commitments to the project to facilitate the process

  ⇨ The lack of habit or nonexistence of communications limits and delays the processes. It is very difficult to communicate via email. On the other hand, the technicians' and professionals lack of a writing habit makes the promotion and diffusion of results complicated.

- *Support for participatory projects*

  ⇨ When beginning participatory processes with rural communities, it is necessary to have technicians with an attitude for and knowledge of participatory methods; otherwise they must be trained. It is important to have prepared and committed persons with community interests that help obtain the desired outcomes. Another important element is the facility for transmitting their knowledge to the key people in the community and for gradually strengthening local capacity and leadership skills in order to empower their project.

  ⇨ The rural development and extension projects should have counterparts in research institutions that have a comparative advantage in the development of technologies, as is the case of computer mediated information centers (usually called "tele-centers"). In this way they can access information of use and interest to the producers, that can help them open doors toward the broadening of their alternatives of production and development; i.e., forming strategic alliances that benefit their clients the farmers.

A methodology designed to promote sustainability of a second-order organization

Facilitator: *Alfonso Truque Díaz*[6]

Highlights

38 CIALs generating alternatives to resolve agricultural and livestock problems in their communities

Abstract

The purpose of creating the CORFOCIAL organization was to bring together all the committee-based research services (CIALs) in the Cauca Province in a second-order nongovernmental organization so that the farmers would have the opportunity of improving their livelihood and economic sustainability in a more organized and efficient manner. The application of participatory methodologies permits the farmers to present demands for research technologies and be the ones to evaluate them in search of better adaptation and greater adoption to their local production systems. CORFOCIAL has a team of farmers trained in the CIAL methodology participatory monitoring and evaluation, where it is proposed to form leadership at the local level so that small farmers can participate more fully in the decision-making and planning in research projects, production and training. Among the more outstanding results are the discovery of new leaders, the recovery of indigenous experimentation, the diversity of crops and the appropriation of the methodology by the communities involved.

Identification of the problem

Most of the time, both the male and female farmers in our country are not considered in the process of generating and transferring technologies. For that reason many small farmers do not follow the technical recommendations, but modify them according to their needs and resources. Thus the methodology of participatory research in the CIAL model is an alternative that permits the farmer to become a main actor in adaptive research.

Background

The menu offering new and innovative technologies is quite large and diverse; nevertheless, the small farmers do not use these technologies in the way in which the scientists expect. There are numerous experiences regarding ignored agronomic recommendations, equipment that was not adopted, varieties that were rejected, etc. On the other hand, other new practices not recommended by scientists pass from farmer to farmer.

Frequently, these initiatives of the farmers have not been foreseen by technicians nor by the professionals trained in traditional approaches to research. Today, however, many

[6] Administrator of CORFOCIAL

professionals believe in the importance of having the active participation of farmers in the different phases of applied research.

Methodology

The methodology used is the application of the eight steps of the research ladder that is used in the CIALs. Each of these steps is carried out with the community: motivation, election of the committee, diagnosis and feedback; with just the Committee: the planning and setting up of the trial, evaluation of the technologies and analysis of the results.

Activities

In addition to the research activities, the committee should carry out with their community:

- Meetings
- Tours
- Field days
- Training of farmers

Results

- Food security in the CIAL and its community
- Capacity for validating technologies
- Integration of the community
- Awareness of research as a tool
- Strengthened as individuals as a result of training
- Capacity for managing external resources
- CIAL that are recognized for their work in the region
- Creation of new CIALs
- Training businesses (accounting, preparation of projects and products)
- New leaders in the community

Table 1. Descriptive aspects of the CIALs in Cauca Province and their research topics.

Name of CIAL	Village or Community	Municipality	Date Formed	CIAL		No. Families/ Community	Research Topic	Research Stage
				M	F			
Asomuripik	La Peña	Totoró	05/2001	13	3	60	Aromatics	Planning
Betania	Betania	Piendamó	07/91	6	8	33	Sugarcane varieties	Planning
Buenavista	Buenavista	Caldono	06/93			30	Cape gooseberry or *uchuva* (*Physalis peruviana*.)	Trial
Campo Alegre	Campo Alegre	Caldono	02/92	6		30	Maize varieties	Commercial
Carpintero	Carpintero	Morales	10/95	20	10	55	Maize varieties	Trial
Chambimbe	Chambimbe	B. Aires	02/96			35	Upland rice varieties	Confirmation
El Jardín	El Jardín	Caldono	09/93			40	Common bean (*Phaseolus vulgaris*) varieties	Confirmation
El Pinar Hombres	El Pinar	Piendamó	03-00			80	Potato varieties	Trial
El Turco	El Turco	Santander	09/94	5	1	25	Plantain varieties	Confirmation
Esmeralda 1	Esmeralda	Piendamó	11-2001			50	Maize varieties	Production
Esmeralda 2	Esmeralda	Piendamó	11-2001			50	Staking in peas	Production
La Esperanza	Esperanza	Caldono	01-2001	14	6	20	Potato varieties	Production
La María	La María	Piendamó	07/96			60	Maize varieties	Confirmation
La Palma	Esmeralda	B. Aires	04-2001	4	4	35	Soybean varieties	Planning
La Unión 1	La Unión	Piendamó	05-2001	4		53	Maize varieties	Confirmation
La Unión 2	La Unión	Piendamó	05-2001	8		53	Bean varieties	Confirmation
Las Cruces	Las Cruces	Silvia	01/97			50	Bean varieties	Trial
Las Lajas	Las Lajas	Santander	01/2001	7		56	Potato varieties	Confirmation
Pescador	Pescador	Caldono	05/90	5		300	Bean varieties	Trial
San Bosco Muj.	San Bosco	Santander	01-2001		9	60	Potato varieties	Trial
San Bosco Hom.	San Bosco	Santander	02-1991			60	Maize seed prod.	Commercial
San Isidro Muj.	San Isidro	Santander	10/96		7	30	Soy flour bread	Production
San Isidro H	San Isidro	Santander	09/96	5		30	Cassava varieties	Production

Name of CIAL	Village or Community	Municipality	Date Formed	CIAL		No. Families/ Community	Research Topic	Research Stage
				M	F			
Santa Isabel	Santa Isabel	Totoró	10/97			15	Staking in peas	Commercial
La Independ.	La Independ.	Piendamó	2002			45	Diets for guinea pigs	Confirmation
Asopanela	Portachuelo	Rosas	04/92	5		20	Fertilization in sugarcane	Trial
Camposano	Camposano	Timbío	12- 2001	9	5	80	Upland Rice varieties	Confirmation
Cinco Días Muj.	Cinco Días	Timbío	03/92	2	13	120	Soybean varieties, Industrialization	Commercial production
El Diviso	El Diviso	Rosas	09/91	4	2	83	Maize varieties, seed	Commercial lots
El Placer	El Placer	El Tambo	08/96	5	5	85	Maize varieties, seed	Commercial lots
Santa María	Santa María	Timbío	03-201	4	3	85	Staking in peas	Production lots
Portachuelo Alto	Portachuelo	Rosas	09-2001	5	1	20	Green bean varieties	Production
El Uvo	El Uvo	Timbío	04-2001	10	6	35	Bean varieties	Production lots
Alto de San José	Alto de San José	Timbío	10-2001	10	2	80	Upland rice varieties	Confirmation
Parraga	Parraga	Rosas	04-2001	4	8	25	Upland rice varieties	Confirmation
Pinar Mujeres	El Pinar	Piendamó	08-2002	5	8	90	Horticulture	Confirmation
San José	San José	Silvia	23-04-2003	6	5	50	Wheat varieties	Trial
La Fortaleza	Carpintero	Morales	08-2002		30	55	Diets for broilers	Production

Lessons learned

- The farmers are indigenous researchers.
- After training, the farmers become the facilitators, and the degree of responsibility is high.
- The CIALs are gradually working towards self-reliance.
- The farmers' degree of appropriation of the trials facilitates their independence.
- Sharing experiences at the annual meeting strengthens the CIALs.
- Delegating functions in the work team (technicians and Guides) creates self-esteem.
- CORFOCIAL does not do research in agriculture but extends other services (e.g., writing letters, credit for the CIALs, training).

Recommendations

- Strengthen the revolving fund of the CIAL to promote the production and marketing of the products that have been researched by the CIAL.
- Strengthen the organization with communication channels for searching for sustainable alternatives
- Modify the organic structure for introducing programs, such as that of the rural enterprises and rural development.

Future Plans

- CORFOCIAL will have the necessary human, logistical and financial resources to continue and improve research, organization, management, and agricultural and livestock development of the CIALs, within a framework of sustainability and respect for natural resources.
- It is very important to expand the number of CIALs.
- Prepare a portfolio of services in order to expand training services
- Offer a farmers' field school on different topics

Indigenous women process potatoes

Researcher: *Fausto Merino*[7]

Highlight

Groups organized to do participatory research generate mechanisms of self-financing in search of additional sources of income that guarantee the continuity of the participatory process.

Definition of the problem

Among the principal limitations for the small and intermediate potato producers in the Province of Chimborazo is commercialization. The factors that contribute to this situation are, on the one hand, that the farmers do not manage criteria related to quality; that is, they take their product to the market without any type of selection, the potatoes are physically damaged from incidence of pests and pathogens, sizes are nonuniform, varieties are mixed, the tubers are dirty, packing is inadequate, etc. On the other hand, the lack of knowledge of alternate markets for their product and their incapacity to face commercialization individually, added to their incapacity to negotiate, has resulted in their getting low prices for the sale of their product.

Traditionally the objectives of the agricultural research institutions, as is the case of INIAP, have been to increase yields and reduce production costs. However at present other objectives should be added, such as the management of information on markets, improvement of product quality and aggregate value of the production, and better interpretation of the market, its demands and agroindustrial production processes.

In the case of potatoes, the use that is given to processed potatoes is constantly growing, the industry demands fairly stable volumes, the raw material needs to meet certain specifications and future demands also need to be known.

Objectives

The general objective is to implement a rural agroenterprise that processes and offers a permanent supply of potatoes suitable for french fries to restaurants and fast food establishments in the city of Riobamba, to benefit the group of women organized in the CIAL "Flor Naciente." The specific objectives are as follows:

- Determine the volume of demand for potatoes for french fries in restaurants and fast food establishments in the city of Riobamba
- Establish criteria for quality and purchasing habits (varieties used, quality, size, likes and preferences, other purchasing alternatives)
- Identify the current supply system to find possibilities of doing business between the small producers and the restaurants and fast food establishments in the city of Riobamba
- Implement and position a rural agroenterprise on the market to offer potatoes for french fries continually

[7] Coordinator, UVTT-Chimborazo, INIAP.

Background

The potato is a basic staple in the family basket of the Ecuadorians. Consumption was 38 kg/yr per capita for the period between 1986 and 1993. The price for potatoes on the Ecuadorian market is highly unstable, which causes insecurity for the producers dedicated to this crop and frequently leads the consumers to decrease their consumption. The Ecuadorian society is becoming more urban every year. The data show that while in 1974 the urban population in Ecuador was only 38.4%, in 2002 it had reached 55.4%. At the same time, women have an ever-increasing production role outside the home, which has generated changes in the dietary habits of the Ecuadorian society.

The quality of fresh potatoes in wholesale provisioning markets, shops or supermarkets is in most cases poor due to different types of primary and secondary lesions, lack of uniform size and dirtiness in handling the product, resulting in numerous impurities. The habits of potato consumption have expanded, however, and industries offer diverse processed or semiprocessed products that increase the ways in which to consume this tuber.

Of the total volume used by the industry 89% is used for potato chips (smooth or crinkled). The supermarkets also offer peeled, cut, precooked and frozen potatoes, as well as flour for preparing mashed potatoes. This last product is imported from Chile for sale by the supermarkets; however the volume is insignificant, which is the reason why no domestic processor is interested in producing it at the local level. To the extent that the volume of consumption increases, some firm will become interested in this type of processing.

In the Province of Chimborazo the potato continues to be one of the main crops, being both a basic staple and a source of work and income for the population. The tubers are mostly used fresh; in recent years, however, there has been more consumption of processed potatoes; fundamentally fried potatoes (chips and french fries) and, to a lesser extent, other types of products.

In the city of Riobamba the fast food business has been growing so there is an ample market for consuming french-fried potatoes, which are offered by certain places where roasted chicken is sold (more than 380 restaurants). Basically they work on a small scale, serving french-fried potatoes as a side dish for chicken, sausages, meat, etc.

After processing the data compiled on the restaurants and related businesses, it was concluded that the greatest use given to potatoes is in the form of french fries. The second way in which potatoes are used in the restaurants and related businesses is in the form of soups. The third way of offering potatoes to the public is mashed; and in the case of restaurants and related businesses, other important forms of consumption are in salads and tortillas.

In the Guabug community located at an altitude of 3400 m in the parish of San Juan Province of Chimborazo, Ecuador a group of women constituted a CIAL (Local Agricultural Research Committee), which they called “Flor Naciente.” In 1996, they were trained in the participatory research methodology to investigate potato varieties that would adapt at the local level (Table 1). After four years the women selected two varieties (INIAP Rosita and INIAP Fripapa) through participatory evaluations. They

improved their harvests, but not their income due to the very low price that the middlemen paid them. On holidays the women farmers take the potatoes to the wholesale market. Despite their good quality, the price received does not compensate their investment and effort.

Table 1. Training activities developed with the CIAL.

Events Held	Topic	Objective
Course	Integrated crop management for potatoes	Improve product quality
Observation tour	Visit to share experiences with the IIRR CIALs	Promote self-reliance
Observation tour	Visit to rural agroenterprises in the Province of Bolívar	Motivate the creation of a rural agroenterprise
Meetings	Reflection-action-reflection	Promote and motivate a business-oriented organization in the zone
Participation in agricultural and livestock fairs	Byproducts from potatoes	Promote and motivate business management
Course on processing potatoes	Cutting trials, antioxidants and packaging potatoes	Learn about optimal cutting sizes of potatoes and adequate rates of antioxidants
Short course on processing potatoes	Frying trials with different varieties of potatoes	Identify the best variety and frying times needed to obtain potato chips of better quality
Short course	Learning about tools used to determine supply and demand	Conduct rapid market appraisal

Research questions to be addressed

- Does the implementation of a rural agroenterprise for processing and commercializing potatoes responds to the consumption needs of the inhabitants in the city of Riobamba and to the socioeconomic requirements of the CIAL "Flor Naciente"?
- How has consumption of potatoes (volumes and varieties) evolved in recent years in the city of Riobamba?
- What characteristics should be considered concerning the supply of potatoes to restaurants and fast food establishments in the canton Riobamba?

Methods

Marketing study

The overall objective of the marketing study was to know the new trends of the market for potatoes by applying surveys to restaurants, roast chicken places and fast food establishments in the city of Riobamba. The specific objectives were to:

- Ascertain the current and projected competition of the market for potatoes in the Riobamba canton
- Determine the distribution channels of the product that the project offers
- Find out the prices of the inputs for potato production
- Measure the market potential of potatoes for french fries
- Analyze the potential participation in the market
- Analyze the prices for commercializing the potatoes
- Analyze the competition

Instruments for gathering data. To support the research methods selected, the following research techniques will be used.

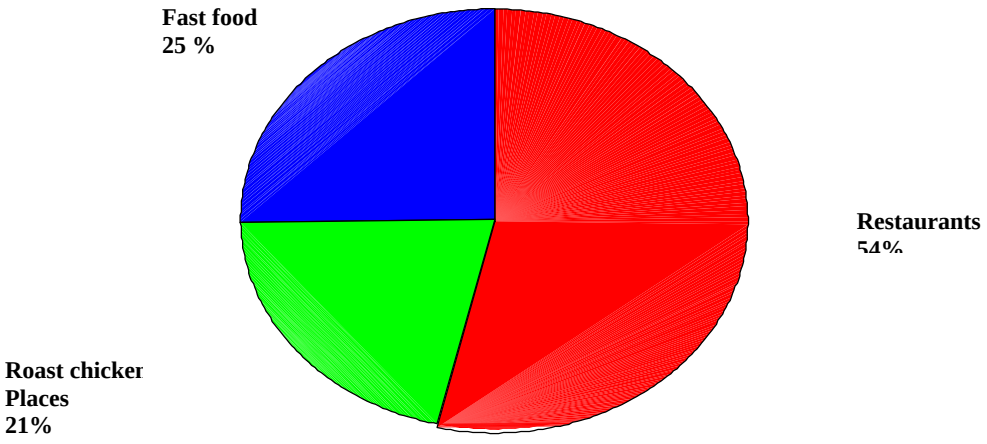
- Field observations to study the behavior of the market for potatoes in Riobamba
- Surveys to be processed with the owners of restaurants and fast food establishments, this technique will help identify the viewpoints of those who are actually involved in the business.

Field work

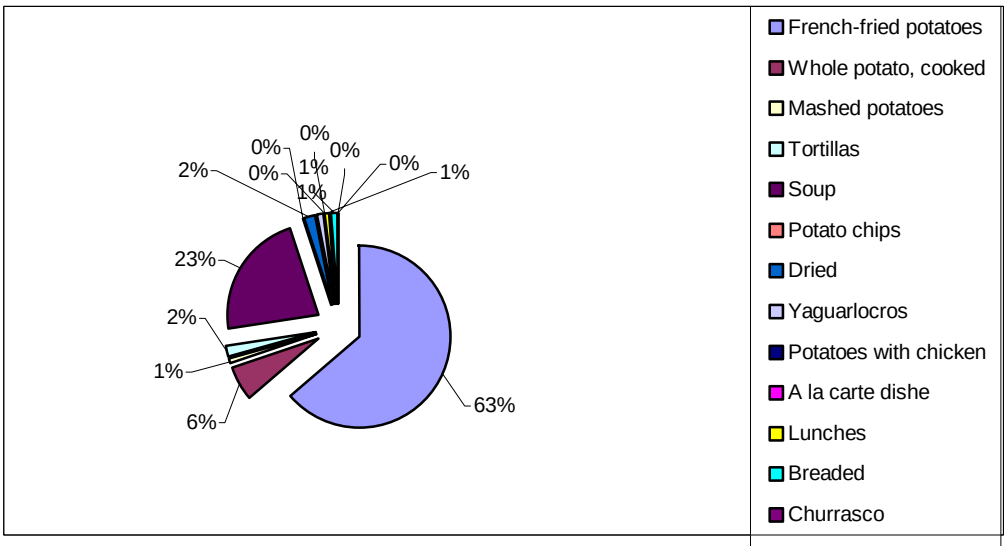
The surveys will be applied to 100 places where food is sold in the city of Riobamba in accordance with the established census.

Processing and interpretation of results

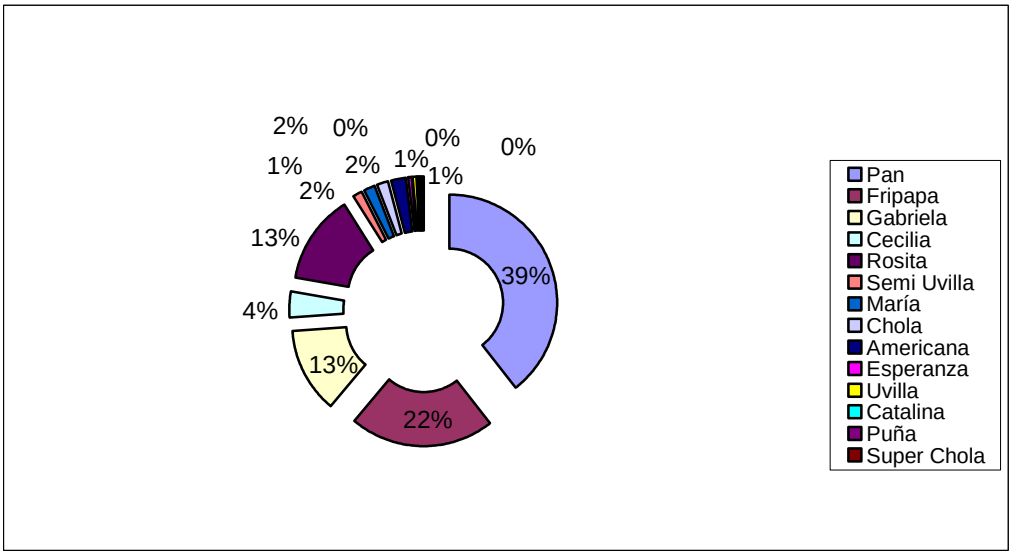
- *Types of businesses surveyed.* With the results of the total sample (100), 54 restaurants, 21 roast chicken places and 25 fast food establishments were surveyed. These correspond to businesses that are commercially active, as there are very small businesses that use or sell very few foods in which potatoes are used.



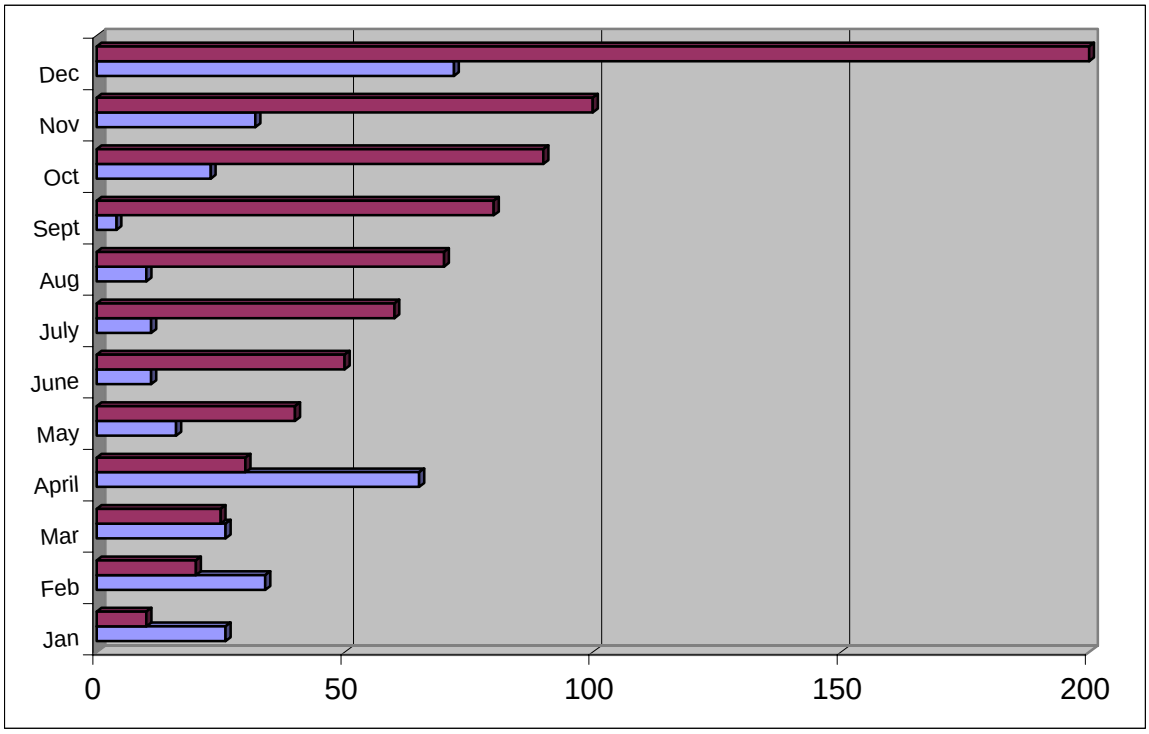
- *Main products made of potatoes that are offered in the businesses.* The businesses offer french-fried potatoes (63%) and in soups (23%), while other points of consumption utilize the whole potato (6%), cooked. Thus there is an opportunity to offer processed products for these businesses throughout the year.



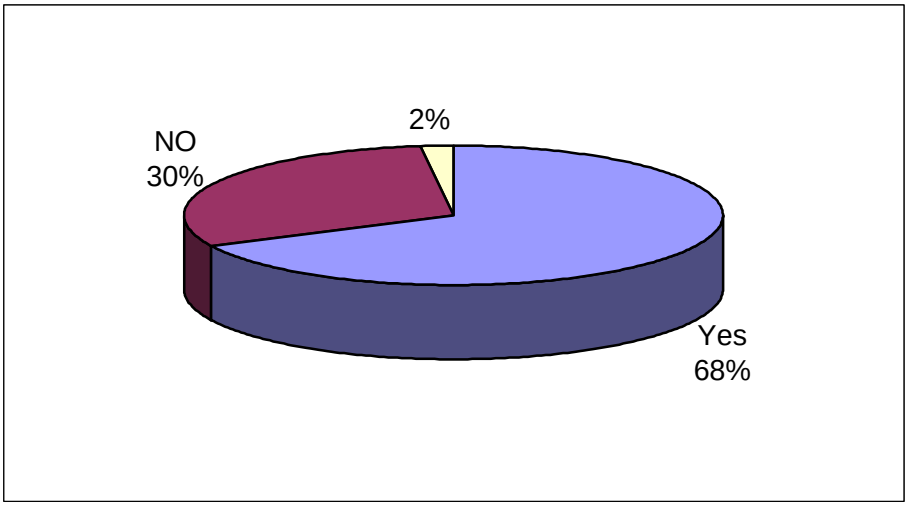
- *Main varieties of potatoes that they purchase.* Among the varieties of potatoes that the businesses buy the most important are Pan (39%) because they do not fall apart when fried; Fripapa (22%), Rosita (13%), Gabriela (12%) and Cecilia (4%). We should highlight that the varieties in greatest demand were selected as the most promising in the CIAL Flor Naciente.



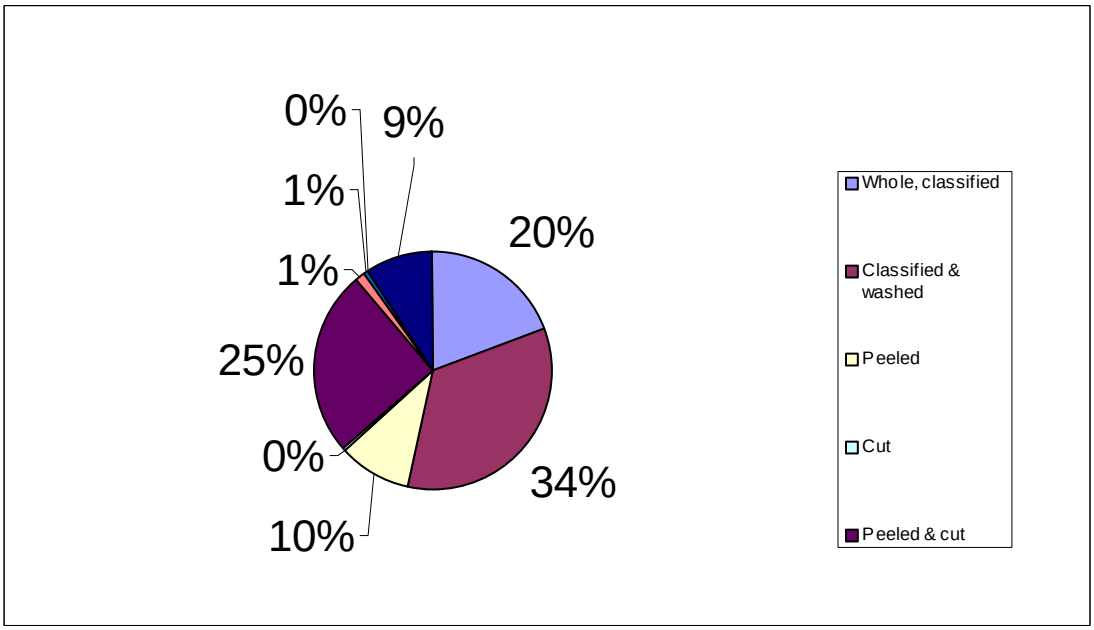
- *Months of highest sales and percent increase*. The months of greatest sale in the year are April (an increase of 30%) and December (100% increase). In the other months, stable growth was maintained without major impact on the normal pattern of behavior of the businesses. This will permit planning the time of planting to have greater production during the months of highest sales.



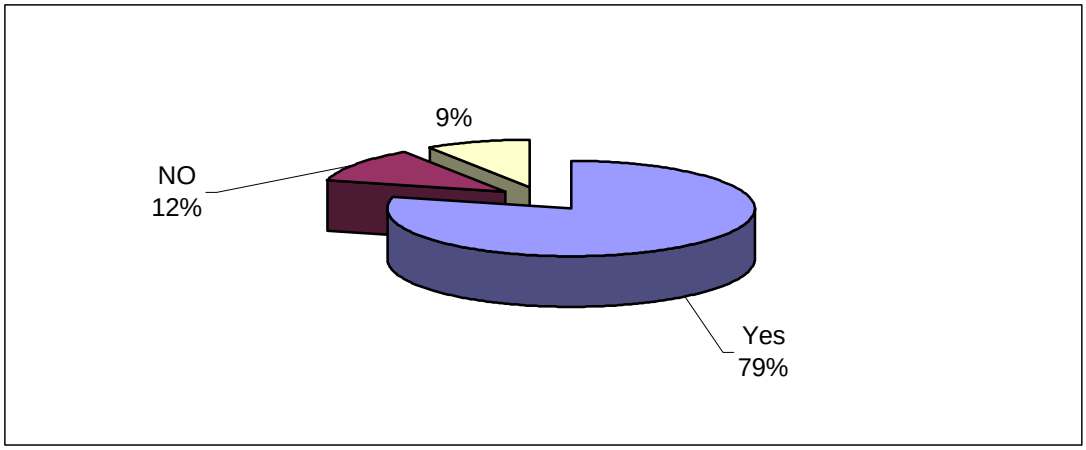
- *Preference for purchasing the potatoes in other presentations.* Among those surveyed, 68% were open to the idea of purchasing potatoes in other presentations such as classified, peeled, washed, thin strips and cubes, 30% preferred the traditional presentation, while 2% of the owners of food stands had no preferences.



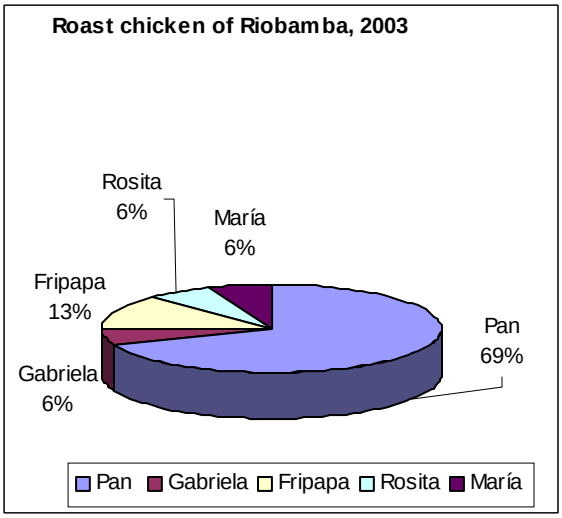
- *Processing*. The type of presentation that the owners of roast chicken places and establishments of fast food would prefer are classified and washed (34%), peeled and cut (25%), whole and classified (20%), peeled (10%), while 9% are indifferent to the type of presentation of the product. Thus there is the possibility of incorporating aggregate value to the product in different presentations.

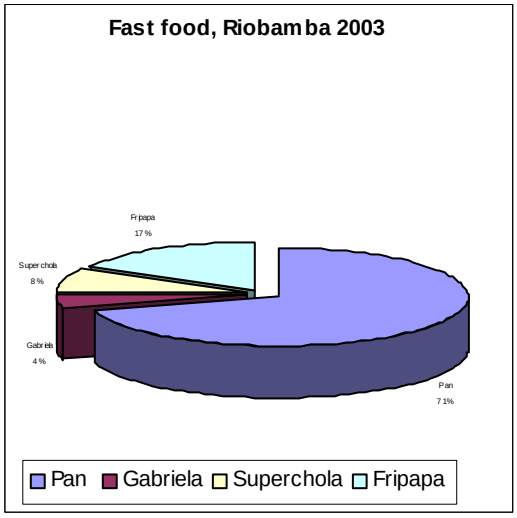


- *Willingness to do business with the CIAL Flor Naciente*. Of those surveyed, 79% would be willing to do business with the producers who work on the production, processing and commercialization of potatoes; while12% would stay with their current suppliers, and 9% simply commented on the question. This is an opportunity that would have to be exploited by the CIAL to establish its business.



Processing of the demands





No. of qq of potatoes for french fries/wk in roast chicken places and fast food establishments, Riobamba.

- In the roast chicken places potatoes for french fries are consumed weekly in the following amounts for five varieties: Pan (69%), Fripapa (13%) and Rosita, Gabriela and María (6% each). The fast food establishments use two varieties: Fripapa (17%) and Pan (71%). The group of producers will be able to offer the varieties they are currently planting and that have suitable characteristics for this type of industry.
- To improve their income, the CIAL "Flor Naciente" has decided to incorporate aggregate value to the potatoes by offering potatoes peeled and cut in thin strips (french fries) to the roast chicken places and fast food establishments in the city of Riobamba.
- The aggregate value is a new activity, as no there are similar local experiences; thus it was necessary to investigate new techniques for processing the product, using small-scale tools and equipment. After calculating production costs, the women could obtain a price of $18.00 for the quintal of potatoes, as shown in Table 2.

Table 2. Rough estimate of the cost of producing 1 kg of potatoes for french fries, CIAL Flor Naciente, Chimborazo.

Line Item	Costs ($/kg)
1. Production costs	
Raw material	0.16
Antioxidant	0.03
Packaging	0.03
Transportation	0.01
Labor	0.02
Tools	0.02
Subtotal	0.27
2. Income	
Sale of 1 kg of potatoes for french fries	0.40
3. Profits	
Production costs	0.27
Gross profit	0.40
Net profit	0.13

Production of potato chips

The CIAL found that when the potatoes are peeled and cut into thin strips for french fries, 30% of the potato is discarded. This could be given another use, transforming the waste product into potato chips, packed in polyethylene bags for commercializing them at the community level and in the educational centers in the sector as a complementary activity to processing potatoes for french fries and to make efficient use of the raw material.

This activity is also new for the CIAL members. They had to conduct some trials using cottage-scale equipment in order to determine if the activity was profitable. They were able to obtain US$19.00/qq of potatoes, as shown in Table 3.

Table 3. **Approximate costs of small-scale processing of potato chips based on 1 kg of raw material, CIAL Flor Naciente, Chimborazo.**

Line Item	Cost $/kg	
1. Production costs		
Raw material	0.114	
Day's wages	0.205	
Oil	0.057	
Gas	0.014	
Seasoning (salt)	0.003	
Packaging	0.029	
Sealer	0.004	
Tools	0.018	
Subtotal	0.442	
2. Income		
Amount of bags from 1 kg of fresh potatoes		5.5 units
Unit cost of sale ($/unit)	0.10	
Total revenue from sale	0.55	
3. Profits		
Production costs	0.442	
Gross profit	0.55	
Net profit	0.103	

In this way small farmers organized in CIALs can create small rural agroenterprises, generating sources of employment at the local level, improving their income and the livelihood of their families.

Conclusions

The marketing study has been a basic tool for determining the demands and other parameters that are needed to plan strategically the processing and commercialization activities that the CIAL Flor Naciente is undertaking.

To determine the demands, it was necessary to conduct a marketing study, with the support of the IPRA Project at the CIAT through the INIAP-UVTT Chimborazo, the CIAL Flor Naciente and the National University of Chimborazo. It was determined that the potatoes, peeled and cut in the form of french fries to be offered to the roast chicken places and fast food establishments in the city of Riobamba.

The CIAL-Flor Naciente, with the small-scale processing of potatoes and offering two new products (potatoes for french fries and chips) to the consumers of the city of Riobamba and the community of Guabug, respectively, can obtain $ 19.00/qq of potatoes, which is traditionally sold for a maximum of $ 5.00/qq.

Lessons learned

The indigenous women in Chimborazo, organized as CIALs, have the capacity to process and commercialize potatoes—an activity that might seem utopian for the rural sector.
The CIAL methodology has been the basis for seeking sustainability with other activities complementary to production given that the producers not only need to increase their production but also seek their economic welfare.
The women organized in the rural sector have also been actors in their own development.
The development and implementation of a new participatory method generated innovations among the different production actors (generation of capacities and leadership).

Recommendations

- Legalize the organization as a rural agroenterprise so that it can gain access to other services such as credit and training
- Support the preparation of proposals to seek funding to make the a processing center and sales point of their products suitable.
- They need to make strategic alliances so that the organization has access to training in business management and basic bookkeeping.
- The participatory research and evaluation should continue being the basic tools so that the organization continues to explore new techniques that will let them maintain technological options according to the needs that arise.

"Training the future" – Young researchers: Learn how to run a cial.

Researcher*: José Ignacio Roa V.*[8]

Abstract

Young people in rural areas of developing countries are not exempt from the problems of the rural communities in general, including the lack of access to land, inadequate education and training, low prices for farm products, poor market infrastructure, low level of technology, limitations in the credit and poor participation in community activities. In Colombia one of the problems that affects rural youth is the inadequate education system because the curriculum has a clearly urban orientation, which does not stimulate the young to do research on their ecosystem. In this project the IPRA Project proposes to stimulate the research capacity of rural youth on the topic related to the food security of their communities. To this end, presentations were made, and training was imparted on participatory methodologies such as the community-based research services (CIALs), where the students decide what to investigate, as well as plan, execute and evaluate the alternatives proposed by them. It is expected that in the short term, a research habit will be formed in the school that will stimulate the director and staff of the school Juan Salvador Gaviota[9] *to include these participatory methodologies within the academic curriculum, contributing to the creation of a strengthened academic model to be put into practice in the education of rural youth and that it be, at the same time, sustainable over time.*

Background

There is a very serious problem in many countries of the world, which is the lack of opportunities for young people. The rural youth are being prepared better than their parents because they have easier access to schooling, but they run into the problem that society does not offer them opportunities for developing their capacities. It is common to find young people unemployed in the field; and when they migrate to the cities, the possibilities of work are very scarce.

Introduction

For some time the W.K. Kellogg Foundation has supported projects that train the young. In the year 2000 the project "Communities and Watersheds," in collaboration with the IPRA Project, sent a proposal to the Kellogg Foundation to develop a project with young students, La Hondura (El Dovio township), a community that is found in a mountainous zone, where the farmers grow plantains, a little maize and common beans.

General objective

[8] Professional specialist, SN-3 Project, CIAT, Colombia
[9] Jonathan Livingston Seagull.

In a period of three years, it is expected that the young people from the region of the Canyon of the Garrapatas River and the group “Heirs of the Planet” in Bellavista, will improve their access to high-quality education to stimulate their personal development and improve the conditions of their natural and physical surroundings through research processes.

Justification

Principles of the project

- Education is a fundamental component for rural development.
- Innovative, integrative, collaborative and sustainable forms of providing education for rural youth are required.
- Young people have a great interest in science, innovation and teamwork.
- Rural youth need to explore new strategies to improve their living conditions.
- The sustainable management of natural resources (soils, water, forests, climate and biodiversity) can contribute to improving the living conditions of the rural communities.

Specific objectives

- Facilitate the emergence of young leaders who have not yet developed their potential through the development of communication skills, teamwork and management of information systems. The groups of participants will share their experiences, history and have the opportunity to reflect on the lessons learned.
- Establish alliances among the groups of rural youth and schools, universities, research center and businesses that facilitate the research processes and development in which the rural youth are interested.
- Establish self-financing mechanisms for the members of youth groups or other groups that wish to continue their studies or establish businesses where they can apply the knowledge acquired and improve their income.

In accordance with the results obtained in the development of the project, we expect to develop among all the participants, a model that can be extrapolated to other regions. This model should provide the tools so that these young people become active participants in the management of natural resources and in the improvement of their living conditions. This objective includes the establishment of a participatory monitoring and evaluation system so that the participants acquire the habit of following up the progress made in their projects.

Project partners

- **ACERG** - Association of Educational Centers in the Canyon of the Garrapatas River. Brings together 37 primary and secondary schools located in the watershed of the Garrapatas River, with the mission of working as a team to strengthen the educational program based on three complementary principles: agroecology, agricultural (production-oriented) schools and education compatible with the ethnic diversity of the region.

- **Heirs of the Planet - Youth, Life and Nature of Bellavista** is a group formed by 37 children and young people dedicated to the research and conservation of the natural resources of their region. They form part of a network of 16 similar groups in Colombia.

- **CIPAV -** Center for Research on Sustainable Agricultural and Production Systems. Its objective is to investigate and promote the use of efficient and sustainable systems for using the natural and human resources available, in harmony with the environment.

- **CIAT -** International Center of Tropical Agriculture is oriented toward the reduction of hunger and poverty in the Tropics through collaborative research that improves agricultural productivity and the management of natural resources.

Methodology

This project is based on the application of participatory methods, in which the participants take part in the decision-making in all the processes in which they will be involved. In addition, the methodology of the community-based research services CIALs (participatory diagnoses, participatory evaluations of the technology being tested) will be applied, as well as the concepts of participatory models for natural resource management and conservation.

All these methodologies were discussed in meetings with the young people from the school in La Hondura, where the IPRA methodology was presented and discussed.

Activities

- Participatory diagnosis with the students of the Juan Salvador Gaviota school
- Reading of the CIAL handbooks that explain the concept of research and the CIAL methodology
- Election of the members for the Committees on common beans, maize and rice on 6 February
- Workshop at CIAT on participatory research, 6 May
- Planting of trials with the students from the school, 24 April
- Training on the use of the “smiley faces” format for the CIALs and evaluation of the different trials with the students, 11 June

- Training on the principal pests and diseases of common beans in the coffee-growing zone and postharvest management for the CIAL members, students and teachers of the school Juan Salvador Gaviota, June 11.

Photo No.1: Martha Rodríguez and Leandro Muñoz, members of the CIAL, on their bean experimentation plot.

Photo No.2: Technical from IPRA Project with member of the CIAL,School Juan Salvador Gaviota.

As soon as the project was approved, there were great expectations on the part of the teachers and students of Juan Salvador Gaviota. In order to begin planning the project, a meeting was organized at CIAT with the teachers, director and staff of the school and the different members of the CIAT projects "Communities and Watersheds" and IPRA who participate in this project. At this meeting all the participants voiced their concerns and expectations with respect to the project. Presentations were also made about the mission and the participatory methodologies used in the two CIAT Projects involved in this project.

Later, a similar meeting was held with 30 students in Juan Salvador Gaviota School. In that same meeting food security was defined as one of the objectives relevant for them. For that reason, the CIAL methodology was shared with them, and the possible commitments and responsibilities for establishing the committee were presented. The purpose of this meeting is "Motivation." Once the students decided to form their own Research Committee, it was agreed to program the date of the meeting for electing the members, Leader, Secretary, Treasurer and Extension agent (Table 1).

La Hondura, the community where the school is found, culturally has a high index of common bean and maize consumption; thus it can be affirmed that they are the principal staples of the region. When the meeting was held for the participatory diagnosis and to select the topic to be researched by the CIALs, the students had already elected by consensus the topics that they wanted to investigate. They decided to form a CIAL to investigate maize varieties that were more early-maturing than the regional variety (i.e, can be harvested at 6 mo).

Another CIAL committee was also created that wanted to identify common bean varieties more resistant to common diseases in the zone such as Ascochyta, web blight, anthracnose and angular leaf spot, as well as pests such as leaf eaters. There were 23 students at the diagnosis meeting. Another committee was also created to evaluate upland rice materials. Thus the three committees are trying to conduct research on different alternatives of interest to the community and seek to identify solutions to problems in their production systems.

Table 1. Participation of students in the meetings.

ACTIVITY	STUDENTS (No.)
Motivation	30
Election of the CIAL Committee	25
Diagnosis	23
Planning	12
Planting the trial	5
Training	15

At the meeting for planning the trials of common beans, maize and rice, 12 student members of the CIALs attended. They agreed to plant plots (4 rows, 4 m long) with three replications in different parts of the community. For fertilizer, it was agreed to apply at planting "Bocashi," an organic product that they are learning to make at school. It is low in cost because the ingredients are from the region; moreover, it is a new alternative to the expensive chemical fertilizers that are traditional in the region, costing US$16/50-kg sack of 10-30-10.

The CIAL doing research on common beans planted the variety ICA Catío, supplied by the CIAL in Pescador (Cauca), and the varieties supplied by the CIAT Common Bean Project: AFR 612, AFR 298, Cal 96, Cal 143 and regional Guarzo.

In maize they planted the varieties supplied by the CIAL-San Bosco (Cauca) called Yunga and SiKuani; and the farmers from La Hondura got the regional maize to compare its performance (the yellow check). The CIAL working on upland rice planted the varieties CIRAD 396,IRAT 216 and IRAT 13, provided by the CIRAD Rice Project at CIAT.

In order for the students to be able to identify the commonest pests and diseases that are attacking native bean varieties in their region and at the same time determine which of the new varieties that they are studying in the CIAL are more susceptible or tolerant, training on this topic was provided for 15 students from the school. The methodology used was a slide presentation in the classroom, followed by a visit to the CIAL trial, planted at the school, where the students could identify the commonest diseases in the zone such as anthracnose
(Colletotrichum Lindemuthianum), Ascochyta (Ascochyta phaseolorum) and web blight (Thanatephorus cucumeris).

Through the CIAL trials the students now have a clearer concept of what research is and why one should first plant in small plots rather than in large lots. There is great sense of empowerment as they realize that their trials are providing important information for transmitting to their community.

The committees were also trained to manage the format of closed evaluations (smiley faces) to evaluate the alternatives being tested. When the common bean varieties began to reach maturity, an evaluation practice was done with the students so that they could become familiar with the format and begin to understand the importance of recording the criteria used to evaluate the different varieties and observe which would be the best ones to continue planting, for common beans as well as maize and rice.

Conclusions

- As a result of the practice in the trials and strengthening the students' research capacities in school, both the students and some of their parents wish to plant more trials on their farms. Thus local research has been stimulated.
- Training young students on the scientific method is easier and the learning is more rapid than adults. This can be seen in the way that the students caught on to the different concepts and scientific terms used in this training.
- Despite their age, the students showed a high degree of responsibility in taking care of the trials.
- The children are very aware of the problems in their homes, primarily the lack of food and of the opportunities for them in the immediate future. They want to do research to help find new alternatives for generating income on their farms for their parents.
- At the end of the school period, it was noted that there was instability among the people who formed part of the CIAL as a result of which some students did not want to continue for lack of support from the teachers of the school. In view of this weak, the Project named a person to provide more continuous support to the CIALs.
- It was observed that the students wanted to plant the trials on their farms with their parents because there they have the collaboration of their parents, brothers and sisters. This might possibly be a new model to be tested the second semester of 2003.
- The CIAL system of research has motivated the students to read, go to the CIAT library to do research, communicate more with CIAT researchers, and feel very proud to show their trials.
- The technicians are setting up their own trials, independent of the CIAL trial.
- This has created a lot of expectations among the young people regarding the future, and they ask questions such as: What are we going to do now? ¿What comes next?

OUTPUT 7. CAPACITY OF THE SN-3 TEAM, STRENGTHENED

Milestones

* Team capacity and skills, enhanced

FPR team attendance at training events during the working year 2001-2002

In an effort to strengthen the SN-3 team members with respect to their knowledge and skills, training opportunities were offered. This year members of the team participated in the events shown in Table 1.

Table 1. Information on courses in which SN-3 team members participated.

Date	Topic	Taught by
Feb. 14	Highlights of consultancy on mechanisms for self-financing	Carlos A. Quirós
Feb. 14	Thesis project: "Identification and analysis of the organizational and production principles of 4 CIALs with rural agroenterprises in Cauca Province	Fanory Cobo
April 11	Report on results obtained in the PME course in Bolivia	Luis Alfredo Hernández, Elias Claros
May 3 - 12	International Workshop on Under-utilised Plant species, Leipzig/ Germany.	Susan Kaaria
July 4	Methodological proposal for conducting the impact study in 13 CIALs in Cauca	Susan Kaaria
July 8	Presentation of results of the impact study in five CIALs in Cauca	Fernando Hincapié
July 12 – 27	Training Programme "Dealing with data from participatory studies: Bridging the gap between qualitative and quantitative m.	Susan Kaaria
August 16 – 22	25th International Conference of IAAE, Durban, South Africa	Susan Kaaria
Sept. 10	Experiences in applying PME in CIALs in Cauca	Luis A. Hernández R

STAFF		
Researchers and support staff: position and time fraction		
Carlos Arturo Quirós	Acting Project Manager, Research Associate I,	100%
Boru Douthwaute	Senior Staff	100%
Susan Kaaria	Senior Research Fellow	100%
Vicente Zapata	Senior Research Fellow	50%
Luis Alfredo Hernández	Research Associate I	100%
José Ignacio Roa	Professional Specialist	100%
Pascal Sanginga	Senior Research Fellow	100%
Colletha Chitsike	Senior Research Fellow	100%
Elias Claros	Research Assistant	100%
Fernando Hincapié	Research Assistant	100%
Viviana Sandoval	Assistant	100%
Jorge Luis Cabrera	Technician I	100%
Luisa F Lozano	Secretary V	100%
Fredy Escobar	Technician II	70%
Fanory Cobo	Student	50%
Juan Camilo Cock	Consultant	

DONORS SN3

- BMZ - Der Bundesminister für Wirstschafliche Zusammenarbeit, Germany
- WK Kellogg Foundation, Michigan
- DFID Department for International Development
- Government of Belgium
- Rockefeller Foundation

APENDIX

Acronyms and Abbreviations

ACDI-VOCA	Agencia Canadiense para el desarrollo Internacional
ACERG	Association of Educational Centers in the Canyon of the Garrapatas River
ACIN	Asociación de cabildos Indígenas de Norte del Cauca (Colombia)
ACISAM	Asociación de capacitación e Investigación para la salud mental
ADDAC	Asociación para el Sector Agropecuario (Ecuador)
	África 2000 Network
	Africare
	Agricultural Development Programme
	Agricultural Research Development Centres
	Agricultural Technology System
AMNLAE	Asociación de mujeres Nicaragüenses Luisa Fernanda Espinoza
APEDSAF	Asociación para el desarrollo Sostenible Agropecuario y Forestal.
ARDCs	Agricultural Research and Development Centers (Uganda)
ASAR	Asociación de Servios Artesanales Rurales
ASERCA	Asociación de Empresarios Agroindustriales de la Sub-Cuenca del Río Cabuyal
ASOBESURCA	Asociación de Beneficiarios de la Subcuenca del Río Cabuyal (Colombia)
ASOCIALs	Asociación de CIALs (Honduras)
ASOHCIAL	Asociación Hondureña de CIALs (Honduras)
ATICA	Agua y Tierra Campesina
BANDURAL	Banco de Desarrollo Rural sociedad anónima (Guatemala)
BAPPA	Beyond Agricultural Productivity to Poverty Alleviation
CAD	Centro de apoyo al Desarrollo
CARE	Cooperative for American Relief Everywhere
CEDIR	Centro Ecuatoriano de Desarrollo Rural
CEED	Centre for Entrepreneurship & Economic Development
CESA	Central Ecuatoriana de Servicios Agrícolas
CGIAR	Consultative Group on International Agricultural Research
CGIAR	Consultative Group for International Agricultural Research (USA)
CIAL	Comité de Investigación Agrícola Local (Colombia)
CIAT- IPRA	Investigación Participativa CIAT (Colombia)
CIAT-S.C-	Centro de investigación Agrícola Tropical, Santa Cruz Bolivia
CICDA	Centro Internacional de Desarrollo Americano (Ecuador)
CIDA	Canadian International Development Agency
CIER	Centro de Investigación Ecoregional para el Desarrollo
CIOEC	Coordinadora de Integración de Organizaciones Económicas Campesinas de Bolivia
CIPASLA	Consorcio Interinstuticional para una Agricultura Sostenible en Laderas (Colombia)
CIPAV	Center for Research on Sustainable Agricultural and Production Systems
CIRAD	Centro de cooperación de investigación agronómica para el desarrollo (Francia)
CISAS	Centro de Información y Servicios de Asesoría en Salud (Nicaragua)
CNPMF.	Centro Nacional de Pesquisa de Mandioca e Fruticultura Brasil

COCODE	Community Development Councils with emphasis on the community (Guatemala)
	Communities and Watersheds/CIAT
CONDESAN	Consorcio para el desarrollo sostenible de la ecorregión Andina
CORDES	Fundación para la cooperación y el desarrollo comunal de El Salvador
CORFOCIAL	Corporación para el Fomento de los Comités de Investigacion Agrícola Local (Colombia)
CORPOICA	Corporación Colombiana de Investigación Agropecuaria
CORPOTUNIA	Corporación para el Desarrollo de Tunía (Colombia)
CUNOR	Centro Universitario del Norte (Guatemala)
DALDO	District Dept. of Agricultural & Livestock Development
DARS	Department of Agricultural Research Services, Malawi
DDT	Dirección de Desarrollo Tecnológico de Bolivia
	Dept. of Sociology/Anthropology, University of Guelph
DFID	Department for International Development (UK)
DILPE	Directorio Local de Promoción Económica (Bolivia)
	District Agricultural and Livestock Development Office
	District Extension Coordinators
EAP-Zamorano	Escuela Agrícola Panamericana, El Zamorano (Honduras)
EAT	Enviroment Action Team
EMBRAPA	Empresa bresilera de pesquisa agropecuaria
FAO	Naciones Unidas para la Agricultura y la Alimentación Italy)
	FCAP-UMSS Universidad San Simón- INNOVA
FDTAs	Fundaciones para el Desarrollo Tecnológico Agropecuario (Bolivia)
FDTA-Valles	Fundación para el desarrollo tecnológico agropecuario de los Valles, Bolivia
FEDEPANELA	Federación Nacional de Productores Paneleros.
FIDAMERICA	Fondo Internacional de desarrollo Agricola para América Latina y el Caribe
FIPAH	Fundación para la Investigación Participativa con Agricultores en Honduras (antes IPCA Honduras)
FOCAM	Proyecto Fomentando Cambios, IPRA/CIAT Bolivia
FONDESOY	Fondo de Contrapartida para el desarrollo de Soyapango.
FUNAN	Fundación ANTISANA.
FUNCOD	Fundación Nicaragüense para la conservación y el desarrollo.
FUNDEMI	Fundación para el Desarrollo y Educación de la Mujer
FUNPROCOOP	Fondo de Contrapartida para el Desarrollo de Soyapango (El Salvador)
FUSAI	Fundación Salvadoreña de Apoyo Integral
	Future Harvest Centers
GATE	German Appropriate Technology Exchange
	Gobernación Dptal. de Alta Verapaz
GRUYA	Cassava Group and Associated
	Heirs of the Planet - Youth, Life and Nature of Bellavista
ICA	Instituto Colombiano Agropecuario
ICRAF	International Center for Research in Agroforestry Nairobi, Kenya
IFAD	International Fund for Agricultural Development).
IFPRI	International Food Policy Research Institute
IIED	International Institute for Environment and Development London.
	Imperial College of England
INCAP	Instituto de Nutrición de Centroamérica y Panamá

INCORA	Colombian Institute of Agrarian Reform
INIAP	Instituto Nacional de Investigaciones Agropecuarias (Ecuador)
INSPIRE	Integrated Soil Productivity Initiative Through Research and Education
	Instituto de investigaciones ambientales del pacífico
INTA	Instituto Nacional de Tecnología Agropecuaria, Nicaragua
INTEP	Instituto de Educación Técnica Profesional
IPRA-BOLIVIA	Investgación Participativa con agricultores (PROINPA, Bolivia)
ISAT	Information and Advisory Service on Appropriate Technology
JAINA	Comunidad de estudios Jaina
KARI	Kenya Agricultural Research Institute
	Katamata Farmers group
	Land Tenure Center**,** University of Wisconsin-Madison
	Lilongwe Agricultural Development Division
MACIA	Ministerio de Agricultura campesina y del medio Ambiente (Bolivia)
MAG	Ministerio de Agricultura y Ganadería (Ecuador)
MANRECUR	Proyecto de Manejo de Recursos Naturales (Ecuador)
	Ministerio de Desarrollo Sostenible Bolivia
	Ministry of Agriculture, Dept. of Agricultural Research & Technical Services, Dept. of Agricultural Extension (Malawi)
NAADs	National Agricultural Advisory Services
NARO	National agricultural research organization
NARS	National agricultural research
	National Agricultural Advisory Services
	National Agricultural Research Organization)
	Organisations to develop adaptive research projects
	Organisations to develop agricultural technological
PACOFOR	Proyecto de Desarrollo de la Participación Comunitaria en el Sector Forestal
PELUM	Participatory Ecological Land Use Management
PESA	Programa Especial de Seguridad Alimentaria de Ecuador
PIENs	Proyectos de Innovación Estratégica Nacional
	Plan International Malawi
PNUD	Programa de las Naciones Unidas para el Desarrollo
PREDUZA	Proyecto De Resistencia Duradera Para La Zona Andina
	Prefectura Tarija
PRGA CGIAR	Systemwide Program on Participatory Research and Gender Analysis
PRODESSA	Proyecto de desarrollo de San Dionisio (Nicaragua)
PRODII	Programa de Desarrollo Integral Interdisciplinario
PROINPA	Fundación para Promoción e Investigación de Productos Andinos (Bolivia)
	Projects of National Strategic Innovation
PROLADE	Proyecto laderas en los valles andinos Bolivia
PROMETA	Proyecto Mejoramiento tracción Animal
PRONATTA	Programa nacional de transferencia y tecnología agropecuario (Colombia)
PROSUKO	Programa Interinstitucional de Subakollos
Proyecto CALL	Proyecto Corpo-Buenos Aires en el Depto del Cauca.
	Proyecto INNOVA
PRR	Programa de Reconstrucción Rural (Honduras)
SECAP	Servicios Ecuatoriano de Capacitación Profesional (Ecuador)

SEDAL	Servicios para el Desarrollo Alternativo (Ecuador)
	Seed Production Association
SELVA	Asociación “Somos ecologistas en lucha por la vida y el ambiente
SENA	Servicio Nacional de Aprendizaje (Colombia)
SETAGRO	Servicios Técnicos Agropecuarios
SIBTA	Sistema Boliviano de Tecnología Agropecuaria
SOL	Supermarket of Options for Hillsides
SP-PRGA	Systemwide Program on Participatory Research and Gender Analysis Program (CIAT)
SWNM	Systemwide program on Soil Water and Nutrient Management
TIP	Traditional Irrigation and Environmental Improvement Programme
TROPILECHE	Consorcio, Sistemas de alimentación con leguminosas para Intensificar
TSBF	Africa soil fertility network
TSBF	Tropical Soil Biology and Fertility Institute
TUCAYTA	Corporación de Organizaciones Campesinas (Ecuador)
UCRES	Unión de comunidades rurales del norte de El Salvador
	Uganda National Potato
UMATA	Unidad Municipal de Asistencia Tecnológica Agropecuaria
UMSS	Universidad Mayor de San Simón Bolivia
UNDP	United nations development programme
UNDPT	Unit of Political of Technological Development UPDT
	Unión General Obrera, Campesina y Popular México
	Universidad Católica de Ibarra. Ecuador
	Universidad Nacional Autónoma de Nicaragua, León
USAID	Agencia de los Estados Unidos para el Desarrollo Internacional
UTA	Unidad Tecnológica Agropecuaria Tarija
UVTT	Unidades de Validación y Transferencia de Tecnología, Chimborazo.
VIRUDI	Vision for Rural Development Initiatives
WKK	The Kellogg Foundation
	World Vision

Abreviations

AGM03	Annual General Meeting
AHI	Africa Highlands Initiative
APG:	Asamblea del pueblo Guaraní
ATDT	Project in Rwanda
CBOs	Community-based organizations
CMAD	Communitte Against Desertification
CSOs	Civil Society Organizations
ERI	Enabling Rural Innovation
FCAP	Facultad de Ciencias Agropecuarias
FFS	Farming Field School
FGDs	focus group discussions
FPR	Farmer participatory research
FRG	Formation of farmer research and market research groups
FTDA	Fundaciones Tecnológicas de Desarrollo Agropecuario (Bolivia)
GEC	Groups Evaluating Clones
GEM	Gender evaluation methodology
GFAR	Global Forum for Agricultural Research

GGUSA	Grupo Gestor para el desarrollo del Valle de San Andrés
GNTP	Grupo Nacional de Trabajo para la Participación.
GTZ	Sociedad Alemana para la Cooperación Técnica
IAEM	Integrated agro ecosystem management and conservation
IAM	Integrated Agroecosystem Management
ICTs	Information and communication technologies
IIED	International Institute for Environment and Development
INM	Integrated nutrient management
IPM	Integrated pest management
JACs	Local Administrative Committees
LADD	Lilongwe Agricultural Development División, Malawi
M&E	Monitoring and evaluation
NGO	Non governmental organization
NRM	Natural resource management
PCA	Principal components analysis
PCB	Participatory research in cassava breeding
PD	Participatory diagnoses
PET	Participatory evaluation of technologies
PIM	Participatory impact monitoring
PITAs	Proyectos de Innovación Tecnológica Aplicada, Bolivia
PM&E	Participatory monitoring and evaluation
PME	Participatory monitoring and evaluation systems
PMR	Participatory Market Research
PPB	Participatory Plant Breeding
PPSF	Participatory procedures applied to the development and selection of forage technologies
PR	Participatory Research
PRAs	Participatory rural appraisals
R&D	Research and Development
RAE	Rural Agro-Enterprise .
RD&TT	Research development and technology transfer
R-to-C	Resource to consumption
SG	Stakeholder groups