



Participatory Technology Development Working Paper 3

Trying out PTD with NGOs in Peru and Bolivia

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At an internal workshop of ETC Ecoculture, some consultants in training and coaching Participatory Technology Development (PTD) exchanged their methods and experiences made with workshops to initiate a process of designing farmers' experiments. These workshops involved farmers interested in experimentation and PTD facilitators interested in supporting the farmers' experimentation.

This contribution is about the approach and experiences generated by the PTD project in Peru and Bolivia. This project, which has been operating since 1996, involves Centro Ideas (coordination of the implementation), ETC (technical advisor) and ICCO (funding support). The paper was written during two flights to and from Peru. We would welcome comments and suggestions that can further improve our work in Peru and Bolivia.

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1. BACKGROUND

1.1 Origin

The project originated as part of the follow-up activities, undertaken by ICCO, to the study on Sustainable Agriculture that was carried out in 1994. One of the findings of that report was that, although the ICCO partners in Peru and Bolivia talk a lot about participation, their actual practice at field level was not participatory at all, particularly not when it came to technology development.

Most of the more established non-governmental organisations (NGOs) have a tradition of assisting farmers' organisations in their struggle for access to land and better government services ("concientización" and farmer organisation, linked with leadership education, alphabetisation and other educational programmes). It is only after the start of the liberalisation policies in the mid-1980s that these NGOs started to rethink their own role and develop more economically productive programmes, filling the gap left by the shrinking government extension system.

In the last few years, many NGOs have adopted a strong ecological orientation. These NGOs are tempted to propose their "alternative" technologies to farmers in a way similar to how the conventional package was "transferred" to farmers, although the rhetoric is quite different. Their ideological drive might even make things worse, because this easily leads to an approach that puts much effort into "making the farmers aware" and "convincing" farmers, while lacking critical assessment of the technical, socio-economic and ecological relevance and of the applicability of the technologies proposed by the NGO.

The findings of the study were discussed in a workshop with all partners. Support in the field of methodology development was identified as one of the main priorities. Against this background, ICCO supported my suggestion to develop a support programme to introduce and adapt the PTD approach among their partner organisations and other NGOs in the Andean region. ETC has long been considering ideas of a global programme on PTD; this project (in our minds) could be the Latin American part of that global programme.

1.2 Project preparation process

Selection of coordinating organisation

I visited some organisations that ICCO regarded as potential coordinators of such a programme, in order to discuss this initiative and to sound out their interest. Finally, Centro Ideas was requested to take the lead in the preparation and implementation of this programme, with the assistance of ETC-NL. Centro Ideas has a focus on ecological agriculture, is the leading agency in the Agro-ecological Network of Peru (RAE) and had just implemented a project to systematise NGO experiences with ecological projects. This demonstrated their capacity to coordinate such a project.

Project profile

I wrote a first set-up of the project profile. This was then discussed with some staff members of Centro Ideas.

Selection of participating organisations

A senior staff member of Centro Ideas visited a large number of NGOs in Peru and Bolivia. When drawing up the list of NGOs to visit, we took into account the following criteria: organisations with proven sustainability, with a focus on sustainable agriculture and participatory approaches, and having the capacity to apply and document a PTD process. Preconditions were that:

- the NGO employs at least one agronomist,

- it has linkages with university and/or research institutes, and
- it has an institutional commitment.

Sixteen organisations were selected: eight from Peru and eight from Bolivia, as shown in the table below:

In Bolivia:	
<i>the 1st year</i>	<i>the 2nd year</i>
SEMTA, La Paz	KURMI, La Paz
IICCA, Tarija	ACLO, Potosí
CICDA/PRADEM, Sucre	QHANA, La Paz
CENDA, Cochabamba	CEPAC, Santa Cruz
In Peru:	
<i>the 1st year</i>	<i>the 2nd year</i>
Centro IDEAS, Piura	CICAP, Chiclayo
CEDAP, Ayacucho	IDMA, Abancay
ARARIWA, Cusco	CICCA, Abancay
CIED, Puno	IMA, Cusco

Finalising project document and budget

During the above-mentioned visits, the project profile was discussed with the potential participating organisations. These discussions led to a number of adaptations in the project document and budget, which was then approved by ICCO.

In addition, a Consultative Committee was set up, comprising a representative of Centro Ideas (Alfredo Stecher), an ecologist from Bolivia (Jose Lorini, Instituto de Ecología), an agronomist from Peru (Mario Tapia, CIP-CONDESAN) and myself (from ETC). The committee meets twice a year and advises Centro Ideas on the development of the project.

2. PROJECT OBJECTIVES

The main objective of the project is to experiment with the PTD approach with NGOs in the Andes, in order to adapt the methodology to the situation in the Andes and the normal working conditions of NGOs. At that time, most PTD experiences were generated in the context of international research institutes and projects with human and financial resources that are not commonly available in NGOs. The socio-cultural, ecological and economical conditions in the Andes required adaptation of the PTD methodology and development of “regionalised” staff and materials for training farmers.

As part of the process, the project seeks to strengthen the capacity of the participating organisations to implement participatory approaches in developing and diffusing agricultural technologies.

The results of the process will be shared with other organisations (private and public) that support sustainable agricultural development, both during the course of and at the end of the project.

Concrete expected outputs of the project are:

- a staff training manual, including instruments for documentation, monitoring and evaluation of PTD experiments, and guidelines for facilitating participatory diagnosis, experimental design, implementation, evaluation and diffusion
- illustrated materials for farmer training
- two videos on the PTD process and results
- 32 technicians and 32 thesis students in 16 NGOs trained in the PTD approach
- eight organisations have been involved in the implementation and documentation of at least three experiments each, and eight organisations in the implementation of at least two experiments each (40 experiments in total).

3. PROCESS OF PROJECT IMPLEMENTATION

3.1 Team formation and basic training

The project team consists of three persons employed half-time: project co-ordinator (Julio Chavez Achong, sociologist) and two team members who coordinate and facilitate the activities in Peru (Sandro Chavez) and Bolivia (Rodrigo Villavicencio). Although the original idea was to have at least one woman in the team, three males were appointed in the end. On a consultancy contract, a female staff member of Centro Ideas assisted the team with respect to integrating gender issues. The Peruvian team member is an agronomist with a background in agro-ecology. The Bolivian team member is an agronomist with experience in the PRA approach and participatory project planning.

I met with the newly appointed team in Peru and we discussed the various conceptual, methodological and operational aspects of the project. The team members then began to prepare for the first activities to be implemented. Shortly thereafter, they took part in a training course organised by CIAT in Ecuador on the "CIAL" methodology, which has many similarities to the PTD approach.

During the next team meeting, we discussed the experiences gained during the CIAL course as a way to specify the approach to be followed in the PTD project.

3.2 Meeting with NGO directors

A meeting was organised with the directors and/or programme coordinators of all participating NGOs. We felt that a strong commitment from the top levels of the NGOs would be vital for project success. Training of some staff and implementation of some isolated experiments would not make much impact on the NGO, if the directors and programme coordinators of the NGOs were not well aware of the experiments going on and of the principles behind the PTD approach. If they were properly informed, they would be more likely to support an integration of the methodology into the approach and working methods of the institution.

During the meeting, we introduced the directors and/or programme coordinators of the first batch of eight NGOs to the main PTD concepts and discussed the prerequisites for successful application of the PTD approach. In the second year, eight more NGOs joined the project. At the start of that year, a second meeting was held with the directors and/or programme coordinators of both the first and the second batch of NGOs. These meetings proved to be of vital importance for enhancing "ownership" of the project among the participating organisations and to ensure their commitment to the project.

In order to avoid that NGOs enter the project only or mainly in order to gain access to funding, the budget of the PTD project was based on the assumption that the costs of facilitating and implementing the local experiments would be carried by the participating NGOs themselves. The project covers only costs related to the training and coaching of staff and costs related to the production and distribution of training materials.

This arrangement may sometimes complicate the implementation of the local PTD process in the beginning, for instance in those cases where the PTD activities were not yet integrated into the operational plan of the NGO concerned. Staff involved then complain that they have to do a lot more work and lack the proper means to do it. However, this arrangement prevents that the responsibility for the local activities is transferred by the NGO to the project and puts pressure on the NGO to fully integrate the PTD process into its institutional approach and planning mechanisms.

3.3 Start-up workshop

Each NGO sent one technician and one thesis student to the workshop for starting up the project.

The main activities during this first workshop were:

- introduction to the background, rationale and main characteristics of PTD as compared to formal on-station research and on-farm research and informal farmer experimentation
- presentation and discussion of the participants' own experiences with participatory methods of technology development and diffusion
- review of the main concepts involved in PTD
- discussion on the role of the NGO/technicians in the PTD process, and identification of the skills and attitudes needed in PTD facilitation
- strengthening of basic skills (horizontal communication, listening, asking questions, observation, systematic field notes, etc.)
- review of the PTD process, and self-identification of the main elements of each step or cluster of activities in the process
- small-group preparation of field exercises with the first steps in the process: preparations, entry into the community, participatory diagnosis of community resources and farming systems, prioritisation of themes for experimentation (key problem or potential), focused diagnosis of the priority problem or potential, collection of information regarding technologies to try and evaluation of these options, design of experiments
- implementation of field exercises in a community selected by one of the NGOs with commitment for follow-up and continuity (in reality, the practical exercise did not go beyond situation analysis and identification of the main research priority)
- review of field experiences and preparation of activities to be carried out by the participants after returning to their working situation.

The materials prepared for and enriched during this workshop were used to develop a first and partial draft of a guide for staff training.

3.4 Fieldwork period

Over a period of about eight weeks, the participants initiated the PTD process in their own working situation. During this period, one of the coordinators visited the participating staff and farmers on-site to become better acquainted with the local conditions and participating farmers, to assist the technicians in overcoming certain problems they encountered and to reinforce the learning process (coaching).

3.5 Second workshop

After this period of fieldwork, a second workshop was held, which included the following activities:

- review of the experiences gained with facilitating the first steps of the process
- closer examination of the participatory process and the roles of the various actors
- presentation by each of the participating organisations of the draft design of the experiment they had planned with farmers: rationale, objective, participants, experimental variables and treatment levels, layout and statistical design, organisation and management of the experiment, criteria for monitoring, and methods of recording and monitoring)

- critical review of these draft designs, which resulted in suggestions for improving the individual experiments as well as identification of flaws in the diagnosis and design process
- detailed discussion about the next steps or clusters of activities in the PTD process (implementing and monitoring the experiments, evaluation and diffusion of results, planning of the next cycle of experimentation) and of related working methods and tools
- discussed of proper documentation and reporting of the experiences; this included formulation of the main hypothesis of the project and identification of criteria and indicators of verification (which will be discussed below).

The materials developed before and during the workshop were used to further develop the guide for staff training.

3.6 Implementing the experiments

During the implementation period, each NGO was visited at least once by one of the coordinators.

Both farmers and the NGO (thesis student) maintained certain records. Photo and video registration of the PTD process and the experiments was encouraged.

3.7 Evaluation workshop

During a workshop held after completion of the first round of experiments, each NGO presented the experiences gained during the implementation process and the results of the experiment it had facilitated with farmers, making use of a list of performance criteria and indicators.

On the basis of the two field reports that had been forwarded by each participating NGO to the coordinators, the latter had prepared a synthesis of the main experiences and some recommendations for improvement. These were discussed in the workshop, leading to amendments in the methodology to be applied in the second year.

In this workshop we also discussed in more detail some questions that concerned the diffusion of results and the institutionalisation of the PTD process at local and regional level.

Results of the workshop were used to further develop the draft PTD training guide.

3.8 Second year

During the second year, the process described above was repeated, now with 16 organisations, and the coaching activities were continued. The project staff gave more attention to activities related to documentation and analysis (“systematisation”) and diffusion of the experiences gained. This is being achieved by:

- production of a newsletter (named “DPTeando”, literally translated: “PTD-ing”)
- organisation of a forum in which selected farmer experimenters and NGO staff present their experiences to interested organisations
- introductory lectures at universities for students and university staff
- the production of videos on the PTD process
- writing articles and case studies.

3.9 Third year

In the coming year, the process will be continued as in Year 2, but more attention will have to be given to questions related to sustaining the process at local and regional levels:

- exchange between farmer-experimenter groups and establishment of local networks of farmer-experimenter groups
- strengthening the linkages with local universities and research centres
- creation of appropriate funding mechanisms for local experimentation.

4. METHODOLOGY APPLIED AT FIELD LEVEL

Before presenting some project experiences and results, I will quickly review the methodology as applied at present.

4.1 Initial meeting with farming communities to establish mutual commitments

A initial meeting was held with community authorities and leaders, including women farmers, leading women groups, school kitchens, and other organisations involving women. At a community meeting, a video on PTD was presented, the aims and process of the proposed activity were explained, the commitments of both parties (community and NGO) were clarified, and a date and time was set for the joint analysis of the local situation. After this meeting, an additional discussion was held with the women farmers in order to increase their readiness to participate.

4.2 Global analysis

In order to reduce complexity (and to gain time in the training process) we selected a number of techniques that - in combination - were meant to provide a balanced view of the local situation:

- One group of male farmers and one group of female farmers were asked to produce a map of the community resources. The facilitator guided discussions on the changes that have taken place in the last decade, on the way the community is managing the various resources and on specific problems encountered in relation to each of these resources (forest areas, grazing areas, different types of crop land, water sources, etc.).
- The same two groups then defined the transect they wanted to walk in order to make more detailed observations of each of the zones and production systems they had identified during the mapping exercise: type of soil, vegetation, fauna, availability of water, land use, farming practices, specific problems and potentials of each zone.
- A mixed group of male and female farmers was asked to make a drawing of the organisational resources of the community (both internal and external) and to discuss the role and relative importance of each of them (Venn diagram).
- With the same, or sometimes another, mixed group, technical calendars were produced for the three or four main areas of activity (one or two main crops, particular species of animal, important activities in forestry, fishery, handicrafts, etc.) that indicate both seasonality and division of labour according to gender.
- Finally, the socio-economic stratification of the community was defined (wealth ranking) by two or three (male and female) key informants.

4.3 Community meeting

In a community meeting, the above-mentioned groups presented the results of their work, starting with the last three groups (their results oriented later discussions as to “who should be involved” in the experiments and were used as an input in the focused diagnosis of the selected problem and the design of the experiment). The presentations by the male group and the female group gave male and female perspectives on the

available community resources and the main problems encountered in using and managing these resources.

With help of a simple procedure, i.e. distribution of seeds, the integrated (male and female) problems were prioritised and one or two main problems were selected. In case the community decided to select two, these were the first priority identified by the male farmers and the first priority identified by the female farmers.

Then the next steps in the procedure were explained and there was a discussion as to who should participate in the detailed analysis of the problem (taking into account the existing division of labour and socio-economic stratification).

4.4 Focused analysis

Preliminary study by the technicians

Before entering into the focused analysis of particular problems, the technicians of the NGOs needed to improve their own knowledge of the problem prioritised by the community, through literature, discussions in the team, and contacts with specialists in the university and other organisations.

Farm visits

Subsequently, the technician of each NGO visited one or two farm households in each of the strata that were identified in the global analysis (preferably, households that had been identified as suitable for participating in the focused diagnosis). During this visit, the facilitators:

- developed – together with the family members - a farm diagram, indicating the resources at the disposal of this family, the main areas of activity and the linkages between these areas (flows of energy/materials) and the related division of labour
- discussed with the family how the selected problem presented itself on this farm: when, where, under what conditions, and how the problem affected the other components of their production system
- exchanged information on the solutions that the family members had been trying out for themselves, how, with what kind of results, and other experiments they had been implementing recently and why/how.

Focused diagnosis workshop

With the farmers (male and female) that had shown special interest in the subject and/or had special knowledge and experience in the topic, a meeting is organised to analyse the selected problem in more detail:

- how does the problem present itself (where, when, conditions); this was done by making use of the community maps, transects and farm diagrams
- analysis of causes; this was done with a problem tree.

Then the group:

- defined which of the causes they wanted to address first and why (plus linkages between solving this aspect and the other causes of the problem)
- made a first inventory of possible solutions for this specific problem.

4.5 Searching for “things to try”

Before entering the experimental design workshop, both the farmers and the facilitating technician sought additional information about possible solutions for the specific problem selected. Some NGOs organised visits to other villages or projects, or invited “experts” from other villages and/or information centres in gain from their knowledge. Also the NGO

technician continue to deepen his/her knowledge about the problem and possible solutions.

4.6 Design workshop

In some cases the experimental design workshop was spread over several meetings of short duration. In this workshop, the farmers and facilitators carried out the following activities:

- analysis of the advantages and disadvantages of each of the technical options identified
- selection of the option(s) they wanted to try
- definition of the aim(s) of the experiment and what results are expected (by the farmers, by the technician)
- definition of the experimental variable(s) and levels of application
- definition of the conditions the farmers have to maintain more or less the same during installation and management of the experiment (e.g. soil fertility, sowing date, sowing density)
- design of the layout and location of the experiment
- programming of activities to be undertaken, including acquisition of inputs needed
- definition of the way the group would monitor the development of the experiment (what, when, how to observe, measure and register; and whether as individuals or in groups)
- self-selection of the experimenters and formation of groups.

4.7 Implementation and monitoring of farmers' experiments

Thus far, most groups of experimenting farmers have consisted of six to ten male and female farmers (with the men being in the majority). In two cases, the farmers decided to experiment as a group in a central field made available by the community or by one of the group members.

The groups met regularly, with and without the presence of the NGO technician or thesis student, to discuss how to handle unforeseen factors (e.g. "do we spray against this attack or not") and visited each others' fields to make observations and measurements at crucial moments in the development of the crop or animal.

Each experimenter maintained an individual record of all activities in the experimental plot, the amounts of seed and other inputs applied, and other observations. Each group maintained a group record in which they noted down all discussions regarding the experiment and decisions taken, as well as observations regarding group development (participation, decision making, etc.).

The monitoring was not restricted to the experimental plot. The technicians are encouraged to monitor also what is going on in "spontaneous" additions to the jointly defined experiment and replications of the experiment by other farmers.

4.8 Evaluation workshop

Before entering the evaluation stage, the technician needed to process all the information collected, making simple tables and applying statistical tests whenever appropriate. After completing the experiment, the group came together for an evaluation workshop in which they:

- discussed the development of each experimental plot and factors that influenced its development (this resulted in a matrix of plots against influencing variables), in order to create a good basis for correct interpretation of the results
- reviewed the results of the experiments, looking into each of the criteria defined by farmers and technicians during the design stage, as well as other observations made during the process of experimentation
- formulated a final conclusion regarding the results of the experiment
- discussed for whom the results of the experiment would be of interest and how these persons or organisations could be informed about these results; and planned diffusion activities
- discussed when and where the set-up of the next experiment would be planned.

4.9 Diffusion

In some cases, the group organised a community meeting. In other instances, the NGO assisted in organising an exchange between experimenter groups of different villages. Also, recordings were made for broadcasting on the local radio, or an easy-to-read farmers' report of the experiment was printed for distribution to farmers in other villages.

5. EXPERIENCES TO DATE

Let me present the experiences the project has gained so far, starting from the main hypotheses of the project:

Hypothesis 1:

The PTD approach strengthens farmers' experimentation by:

- providing instruments that facilitate the involvement of farmer groups in systematic experiments designed to generate new agricultural technologies or to try out and adapt existing ones in dialogue with external agents
- strengthening local organisation for innovation and strengthening the capacity of farmer experimenters to make systematic observations; to diagnose problems; to identify underutilised potentials; to design, monitor and implement experiments; and to diffuse the results.

At present, the project is assisting 24 experimenter groups that involve about 300 farm households. As the process is still in its initial stages, we will have to see how it develops over time. It is, however, beyond doubt that the PTD process has generated much enthusiasm among the participating farmers. Farmer experimenters feel recognised. For many of them, it is the first time they experience that the technicians are more than superficially interested in their opinions, knowledge and capacity to manage the design, implementation, monitoring and evaluation of agricultural experiments and the diffusion of results.

The PTD process clearly intensifies the exchange between farmers about their individual efforts to experiment with alternative technologies and management practices or with the improvement of existing ones. PTD helps to overcome the isolation in which farmers are normally conducting their informal experiments.

In many cases, non-members of the experimenting groups replicate the organised PTD experiments. Group members often carry out additional experiments on the same issue next to the experiment designed in the group in collaboration with the NGO.

Experimenter groups that did not have good results in the first year insisted on continuing for a second year of experimentation. The farmer experimenters usually have a very clear idea about topics of experimentation in the coming season. This is often a replication of the same experiment under different growing conditions or application of the same principle or practice in another crop.

Points that we are trying to improve within the PTD process are:

- *the selection of farmer experimenters*: identification of local experimenters, participation of women, preventing that the interests of families with more status and economic power dominate the PTD process;
- *the process towards consolidation of farmer-experimenter groups* and development of adequate relations between experimenter groups and the community (local leaders, other existing organisations) and support organisations. One year is usually not enough to reach a stage at which the groups can continue the process themselves with a much lower support from the NGO. However, one experimenter group that was left alone by the NGO (because of a geographical shift in its activities) continued without the assistance of the technician in the second year. Most NGOs are very much focused on the relationship with "their" communities. However, in order to create more self-reliant farmer-experimenter groups, NGOs involved in PTD have to stimulate the groups to establish linkages with diverse sources of technological information and support. Also, the linkages between the experimenter groups and other farmer organisations at village and intervillage level need to be developed in order to ensure accountability and diffusion of results;

- *the interaction between technicians and farmers.* In the first year, the technicians were too dominant in the PTD process, pushing their definition of the problem, their solutions, their experimental design and their evaluation criteria. In the second year (after reflection), the NGOs tilted over to the other extreme and showed the tendency to do “what the farmers wanted”, restricting themselves to the role of facilitation. Both extremes lead to deficiencies in the situation analysis and experimental design. Now the technicians realise that a good balance is needed between the inputs of the farmers and those of the technicians during all stages of the process (in the global analysis, in the focused analysis of causes of the problem, in the identification and evaluation of options to try, and in the evaluation of the results) and that the level of success of PTD processes is largely explained by the degree of interaction between local knowledge and criteria and the knowledge and criteria of the support organisation.

Hypothesis 2:

The PTD approach leads to the generation or adaptation of technologies that contribute significantly to the development of more productive and sustainable farming systems and improved livelihood of the population.

Very few experiments failed. Where the experiment failed, the participants still valued the lessons learned during the process: improved understanding of why/how a certain problem occurs, enhanced knowledge of a range of potential solutions and their advantages and disadvantages, increased awareness of experiments that others have been doing, etc. In many cases, the farmers evaluated the relevance of the results of the experiments positively.

Nevertheless, there is still room for improvement. In some cases, the experiment did not relate to issues that are strategic in the development of the local farm systems; in other cases, the experimental design was deficient (e.g. insufficient analysis of the available options, application of irrelevant treatment levels, not taking into account the limited availability of certain resources on which the experiment is based).

In the first year, the farmers’ experiments were extremely varied. In the second year, there was an obvious tendency to concentrate on improved management of soil fertility (50%) and of crop pests and diseases (25%). This thematic focus makes it easier to prevent some of the problems mentioned above and to provide backstopping to the NGO staff regarding technical options tried elsewhere and their potential advantages and disadvantages.

Also the number of experiments in livestock management (feeding ratios, management of internal parasites, etc.) are increasing.

In this respect, the project is trying to make the following improvements:

- *enhancing the local analytical capacity:* during the national workshops and the field visits made by the coordinating team to the various sites, the technicians and the national coordinators jointly analyse the problem situations and the proposed solutions in order to enhance the analytical capacity and system-oriented thinking;
- *improving the forward planning:* most NGOs are still used to thinking in terms of an experiment during one cropping season. However, farmers are used to comparing between several cropping cycles. They want to test the same technology in another crop or under other soil/water/input conditions. Certain changes in the technology applied often create a need for adaptations in other components of the farming system. Furthermore, most problems are not fully solved by trying out only one technology and need complementary measures. Hence, farmers urge the NGOs to think at least in terms of a series of experiments with varying but often closely related themes and objectives.

Hypothesis 3:

The PTD approach helps to improve the relevance and efficiency of the research and extension efforts of NGOs by supplying concepts, methods and tools that facilitate the incorporation of farmer criteria and knowledge and the creative interaction between farmer-experimenters and other actors involved in the process of agricultural innovation.

The participation in the PTD project has positively influenced the capacity of the NGOs to implement projects of participatory rural development. The NGOs have responded much better than initially expected. They participated with their own resources, and only a small contribution of the project (daily allowance for the thesis student). All except one NGO have continued their participation in the project; one organisation did not start to implement the experiments on account of an overload of commitments. Several other NGOs requested to be included in the PTD project, but this could not be done, because human and financial resources were too limited.

In various NGOs, the introduction of the PTD approach has led to changes in their concept of extension and research and in their vision of the role of the technical staff with respect to the role of the farmers, and to adaptations in the methodology of their field work.

Most of the institutions involved have at least partly incorporated the PTD methodology and instruments into their work. It could be noted that the concepts and analysis methods have been integrated more quickly than the process of design and implementation of experiments.

Initially, several technicians encountered problems because they had to carry out their tasks in the PTD project in addition to their "normal" work. However, in this year, various NGOs have fully integrated the PTD activities in their medium-term and annual operational plans.

Several NGOs indicate that PTD is very interesting but time-consuming. In general, NGOs have increasing difficulty to attract funds and have a tendency to overload their technical staff with tasks in numerous projects. In such a context, it is difficult for their staff to devote sufficient time to regular interaction with the farmer experimenters. Some organisations left a large part of this work to the thesis students, or even used these students for various other activities, as well. This poses a threat to the continuity of the PTD process (although, in some cases, the "thesis students" were contracted after having finalised their thesis).

These experiences have led to reflection on the relation between the PTD methodology and the methodology of other development activities undertaken by the NGOs. I have the impression that the PTD approach will be easier to accept and incorporate into the NGOs if it is part of a broader methodology, e.g. by using the results of the global analysis not merely to define the participatory research agenda and to enter the PTD process, but also as a basis for the planning of a project or the development of a community resource-management plan. The experimenter group would then become part of a broader process in the whole community. This would justify a greater amount of time input by the NGOs than some of them can justify for the PTD activities alone.

The involvement of the thesis students has led to mixed results:

- On the one hand, they contributed a great deal to the documentation of the process and the stimulation of discussions regarding research methodology in the universities. The latter generated various requests for participation in workshops and training courses for staff and students of universities, as well as to fierce debates on the criteria that are applied to evaluate the thesis. The first four theses have been accepted by the universities, which is generally seen as a major (but unintended) achievement of the project.
- On the other hand, we recognised during the first year that the interests of the thesis student (and the criteria applied by the university, e.g. regarding the statistical design of the experiments) tended to dominate the PTD process. This was corrected in the

second year by requiring a leading role of the NGO worker and the use of "practicants" rather than thesis students to help document the PTD process and results.

Hypothesis 4:

The PTD approach facilitates the diffusion of agro-ecological and gender-oriented approaches among NGOs and farmer communities by stimulating processes and criteria that facilitate enhanced understanding of the importance and principles of good management of local natural resources and re-evaluation of the role and knowledge of women.

This is probably the hypothesis we have been wrestling with most: how to effectively integrate gender issues into the methodology and training courses; how to ensure a holistic and system-oriented approach to problem solving?

Most of the NGOs participating in the project have diffuse ecological notions and technologies. However, some of them showed the tendency to replace the conventional package by an "ecological" package of recommended practices, without proper analysis of the fit between the recommended practices and the local needs, production conditions and systems. The PTD approach has greatly helped to correct this bias.

Even so, we observe that many technicians still lack skills and knowledge that would allow a more profound analysis of the interrelations between the various components of production systems, between the various causes of key problems, of the advantages and disadvantages of certain solutions, etc. The PTD process (in its present form) leads too easily to experimentation with single technologies to solve "single" causes of priority problems. Insufficient attention has been given to the question as to how to deal with multiple causes for the same problem.

However, it is clear that the PTD methodology favours the ecological approach by helping the technician to develop a genuine interest in the local farming systems, and to develop insight into available local knowledge and the criteria the farmers apply in managing their resources.

With respect to gender issues, we could observe that the PTD approach can favour the diffusion and application of gender concepts, if the right method for introducing the issue is chosen. During the first year, gender issues were dealt with by a gender specialist (a part-time consultant to the project). This specialist who applied an approach focused on the suppression of rural women and the need for empowerment. This met with little acceptance by the rest of the coordinating team and could not be integrated into the existing PTD methodology and instruments. Before the start of the second year, an internal workshop was organised to overcome this problem with the help of another external consultant. This person gave much more emphasis to gender analysis and planning as part of system diagnosis and the design of the experiments, and helped the workshop participants realise how a good understanding of the division of labour and the gender differences in tasks, knowledge and interests could have a positive influence on the quality of experimental design and on the sustainability of the results. The project team internalised this approach, and appropriate instruments were included in the methodology and training. The evaluation of the second year indicated that progress in this regard has been made.

We are trying to further improve the project, for example, by preparing "pedagogical cases" on the basis of practical situations taken from the experiences gained in the first two years. These cases are discussed during training sessions, and participants are asked to give their own recommendations as to how to handle the given situation.

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