Special Project

FARMER PARTICIPATION IN TECHNOLOGY DESIGN AND TRANSFER PHASE II (1990-94)

:

"INSTITUTIONALIZING LOCAL LEADERSHIP FOR FARMER PARTICIPATION IN TECHNOLOGY DESIGN AND TRANSFER IN RURAL COMMUNITIES"

Annual Report

1991

Special topic: Farmers' perceptions of soil conservation techniques.

SECTION ONE: PROJECT SUMMARY

A. Expected outcomes of the Project

The overall goal of this project is to improve the welfare of small farmers in poor rural communities by institutionalizing their active role, through participatory methods, in generating appropriate agricultural technology for their community.

The development of local leadership for farmer participation in agricultural technology development requires the project to build skills, experience and confidence among all participants in order for farmers to be recognized by the scientific community as capable partners in adaptive technology testing.

Implementing participatory methods for adaptive technology testing at the community level will generate documented experience and systematic methodology which the project distills into training materials. These materials are the basis for disseminating and multiplying the approach.

Another outcome of this project is the implementation of a community-based organizational strategy for farmer participation in adaptive technology testing, involving the creation of farmers' local agricultural research committees. Setting up sustainable farmer committees for adaptive research in rural committees requires the project to construct a completely new methodology for the organizational model or "blueprint" for farmers' committees.

This organizational model could be called a social technology which the project is developing. As such the organizational model can be (and indeed already is being) adopted by other institutions. Experience is suggesting that the organizational model is the indispensable or necessary condition for building a truly participatory and sustainable

community-based capacity for managing technological innovation in agriculture, and that this will be a very significant output of the project.

CIAT expects that farmer participation will improve access to new technology for an estimated 1,600-3,200 farm families during the life of the project. Improved welfare of small farmers and farm communities will result from direct food and income benefits generated by adoption of locally-adapted technology.

B. Strategy and activities

The project's strategy is to implement farmer participation methods for adaptive technology testing with community committees of experimenting farmers, and to link these committees with public sector agricultural research agencies (like CIAT) via intermediate organizations (like NGO's and farmer cooperatives).

The project strategy envisages expanding the number of communities linked into farmer participation in agricultural technology generation via community-to-community transfer and training, supported by NGO's. Training farmer and staff of NGO's and other organizations in farmer participation methods for this purpose is part of this strategy. The training anticipates development of an innovative training package to better prepare farmers for taking part in experimental research.

Technology testing with farmer committees is in three main areas: varietal testing; soil conservation; and integrated pest and disease management.

The integration of community-based technology testing with marketing is an important element in the project's strategy. This approach is being tested first with bean varietal selection, bean seed production and marketing, and commercial grain production and marketing.

Formation of Farmers' Local Agricultural Research Committees

The project proposed to create up to six farmers Local Agricultural Research Committees (Comités de Investigación Agrícola Local - CIAL) in each of three types of institutional setting: informal groups linked with NGO's; in local government structure; and in local farmer associations or cooperatives.

Six CIAL were initiated in member associations of a regional farmers' marketing organization, CORMAC, sponsored by the Coffee Growers Federation. Of these, two committees did not continue because there was friction in the communities over control of the committee. However, three other associations of CORMAC have since requested CIAL.

Five CIAL were proposed in informal groups of agricultural NGO's. The regional development NGO, CORPOTUNIA, sponsored by the Carvajal Foundation of Cali (Colombia) set up a new program called "Programa CIAL." in mid-1991. It undertook the formation of eight CIAL together with the project.

In the local government setting the project has encountered complete resistance by farmers to the idea of linking their community CIAL to local government. Intead farmers want to form their own associations, and to sponsor a CIAL as a nucleus of this effort. The project formed CIAL with five communities on this basis, with an understanding with the Carvajal Foundation that the "Programa CIAL" might take on these CIAL if the communities so wish. It appears that this is not an auspicious time to test the CIAL with local government in the pilot site, and that this situation is not likely to change in the short run.

Table 1. Formation of Farmers' Local Agricultural Research Committees - CIAL.

	Organizational Setting	Number of Committees
First stage	A. Farmer Associations-CORMAC	4
	B. Informal groups-NGO sponsored	1
Second stage	C. "Programa CIAL"	8
	D. Community sponsored	6
Total		19

Development of the organizational model for the CIAL

This has been the core activity of the project in 1991, along with development of the training materials required for organizing the CIAL.

The first stage CIAL worked on their own initiative and with project staff to develop a set of statutes. Functions and responsibilities for each of four committee members were elaborated: the leader, secretary, treasurer and extensionist. A mechanism for accountability and community control was established. We recognized that for the CIAL to depend one hundred percent on farmers' voluntarism was not viable, when key research activities such as planting and harvesting come at peak times of labor demand.

The principles of a small (US $500) fund for each CIAL were therefore elaborated. With the establishment of a fund, the opportunity to link the CIAL with development of financial management, cost control, and entrepreneurial skills for farmers became apparent. Farmers became enthusiastic about making their fund grow and decided to reinvest profits from experiments in the fund. With the Carvajal Foundation "Programa CIAL", the project is defining further principles for a self-sustaining fund which will be managed by a joint committee of CIAL representatives in the "Programa CIAL."

The CIAL has progressed as a concept and in reality from a group of volunteers who meet to participate in an experiment for evaluating agricultural technology, to something different. Perhaps the CIAL might evolve to look like a small enterprise that finances itself from doing technology testing for the community. While this is still a hypothesis (or a vision) which has yet to be fully formulated, and proven, this year's work has laid the foundation for this type of development.

Activities of the CIAL: participatory technology testing

Once the first CIAL had debated and accepted the organization and statutes for the CIAL they drew up with the project, they began the first of six steps in participatory methodology. NGO staff supported by the project personnel visited each CIAL every two weeks from diagnosis to planting, monitoring, analysis of results and their verbal report to their community. Similar work began with the second wave of CIAL which planted their experiments in September, 1991.

A farmer-designed seed production strategy for beans

In the previous phase of this project, farmers participated in the selection of improved varieties, showing the importance of including their criteria in the breeding process. In the pilot area, farmers identified several varieties which they began to multiply for seed and produce on a comercial scale, new to small farmers in the area. In November 1991 the variety PVA 773, selected and multiplied by the farmers' seed business, Semillas Pescador, was released by ICA AS "ICA Caucayá."

In response to the seasonal difficulties of marketing beans as grain, a group of farmers who had been participating in the varietal selections, decided to experiment with producing beans for seed.

The project continues to facilitate the participatory decision-making of this group of

seven farmers in evaluating and adapting seed production technology, methods and machinery to their needs and resources. This activity is described in more detail in Roa et al, 1991. Table 2 shows the volume of seed and number of farmers supplied in 1990-91.

Table 2. Bean seed production and distribution in the project pilot area 1990-91.

	1990			1991	
Purchaser	Qty (kg)	No. farmers	Purchaser	Qty (kg)	No. farmers
FEDECAFE	1.600	320	FEDECAFE	8.500	1.700
Local Farmers	980	196	Local Farmers	944	189
			NGO'S	828	166
NGO'S	800	160	Stores, other institutions	885	177
Total	3.380	676	Total	11.157	2.232

The farmers' seed production has been a seminal experience for the project because their experience showed us the tremendous importance of generating organizational and business management skills in connection with participatory research. In addition to participatory technology evaluation with seed producers the project meets regularly with them to monitor costs, marketing strategy, production planning and the decisions involved in the gradual creation of a small business enterprise.

Experimental marketing of beans

Towards the end of the last phase the Carvajal Foundation set up a marketing experiment with the project to assess whether small farmers could sell poor quality beans

that middlemen would often not accept except at a discount price. Farmers and their families selected and bagged in 1 lb bags 1.5 tons of dry beans which were rapidly sold in poor urban neighborhoods at the beginning of the harvest season. However once a glut of beans arrived on the market, poor consumers could buy the better quality beans at a lower price; the small farmers' inferior quality beans could not be so readily sold; and farmers had to wait several weeks to realize a sale. In addition the selection and bagging of grains required more labor at a peak season of hard work. Farmers decided it was not worth the extra work given the slow sales, and now only sell to the experimental marketing outlet when they can get a quick sale.

One conclusion of this experiment was that a storage technology is required, but farmers are sceptical, expecting that the beans will lose color, weight and appeal to the consumer if stored. A second conclusion of the project was the need for a marketing organization to realize the benefits of new technology for small farmers. The CIAL, like the seed producers group, can be expected to have a significant effect on the demand for new technology and so on increasing production. But small farmers must have some channels for selling their product which allow them to be price-makers, not just price-takers, as is the case at present with beans.

Integrated Pest Management

The project has continued to support the CIAT-ICA snap-bean integrated pest management research program in Fusagasuga, Colombia. Support has involved regular visits to this area (financed by the CIAT bean program), in-service training to ICA technicians, assistance with diagnosis and planning meetings with farmers and follow-up interviews to evaluate farmer experimentation with IPM. The results so far of participatory research have been to show that researchers' expectations of how farmers would respond to IPM were quite inaccurate; and that farmer participation has stimulated adaptation of IPM by farmers to suit their own criteria. A detailed report of this work is published in Cardona et al (1991).

Training and Training Materials

The project continues to contribute to CIAT courses in which participatory methods have become a regular feature (see Table 3).

A field training-action program was carried out in June-July of 1990 at the request of the NGO FUNDAEC (the Foundation of the Application and Teaching of Science) to evaluate their 5-year cropping system trials and orient their staff in IPRA methodology.

CELATER (a networking NGO) organized a course with IPRA to introduce participatory methodology to agricultural NGO's working in the Cauca area of Colombia.

In July a training action program was set up with the "Programa CIAL", Corpotunía, Carvajal Foundation, which meets every two weeks for 2 days (1 theory, 1 practice).

Support to Kellogg-Funded Cassava Project, Brazil.

The project associate visited this project for two weeks in May. She taught a workshop on participatory methods for participants in the Kellogg-funded project, who carried out participatory diagnosis in several communities. Participants in the course are conducting diagnoses in their own areas as a post-course assignment.

Training Materials

a) For professionals

Publication of materials developed in the last phase of the project continues (see Publications Section). This activity is seriously handicapped by lack of resources for editorial assistance and translation, which is being carried out by project staff.

b) For farmers

Experimental materials are being developed by project staff with help from a professional writer and illustrator, and the Fundación Carvajal. Eight handbooks are

Table 3. Project training activities June 1990-June 1991.

TRAINING EVENT	No. OF TRAINEES
Project training courses (Colombia)	
Evaluation techniques with farmers to FUNDAEC	8
Participatory Research methods. FUNDAEC and Equatorian researchers	10
Planing techniques. FUNDAEC	7
Methodology to introduce technology to farmers. Visitors from Equator	3
Steps in Participatory Research with farmers. FUNDAEC	8
Participatory Research Seminar. University of Tunja	35
Open ended evaluation.	4
Preference ranking	3
Basis for the improvement of peasant agriculture	30
Training strategy and training materials (ILEIA).	15
Farmer training school-FUNCOP	30
Participatory Research methods	25
Field Training	
Evaluation techniques. Equatorians	3
ICA Course	7
Bean Program. Methodology for farmer participation	3
Farmer Training School: FUNCOP	30
Course on trials and planting	17
Other organizations	82
CIAT Program Training Courses and Events	
International Pasture Course	15
Participatory Diagnosis Techniques with Farmers. Brasil	25
International Course to Improve Diagnosis Techniques - Brasil	22
Participatory Research with Farmers	20
Participatory Research Methods - Loja, INIAP	22
Participatory Research Methods - Guayaquil, INIAP	18
Participatory Research Methods - Fusa, ICA	4
Matrix ranking techniques in farmer evaluation. Researchers from Haiti, Equator and D. Republic.	8

Multidisciplinary Rice Course	15
Seed Systems for Small Farmers	15
Training for Trainers. Fase III	15
Bean Training Course. Introduction to Beans	10
Rice Trainers Course	12
Bean Breeding Course	15
Postgraduate Bean Course	18
Multidisciplinary Bean Course	15

In Service Training

Seed production by farmers	15
Farmer Participatory Methods.	
Rice Program - Equator	3

planned and the first six have been written in Spanish and illustrated, for field testing with the Carvajal Foundation.

1. Qué es el Comité de Investigación Agrícola Local (CIAL).
2. El Diagnóstico.
3. El Ensayo.
4. Planeación del Ensayo.
5. Diseño y Montaje del Ensayo.
6. Los Resultados del Ensayo.
7. El Manejo del Ensayo.
8. El Fondo de Investigación - CIAL.

C. OUTCOMES

1. Progress towards expected outcomes

The project has made significant progress in developing a model or organizational "blueprint" for the farmers' local agricultural research committees (CIAL), in a way which was indefined and unanticipated in the original proposal. The acceptance and feasibility of the CIAL in the short run is demonstrated by requests from the farmers' associations to increase the number of CIAL. The establishment of the "Programa CIAL", and the committment of human resources (15 persons) and financial resources to it by the Carvajal Foundation, is also testimony to progress towards institutionalization of the CIAL after the life of this project.

The purpose of the CIAL is to mobilize local leadhership among farmers to take responsibility for experimenting with and adapting new technologies. The project's participatory evaluation strategy involves the CIAL members in verbally presenting their activities and results of their investigations to their community twice a year. The first cycle of community meetings by CIAL show that farmers' in the committees have understood participatory methods; they manage the principles of experimentation; they can analyse the results so as to report in their own words, what can be learnt from their on-farm trial; and

they formulate recommendations they wish to give to the community. These verbal reports are given by the CIAL to the community, with project observers.

It is too soon to say how the CIAL will impact on technology adoption or incomes. However, significant progress in this area has been achieved by the seed producers (who function A a CIAL specialized in seed).

The seed producers (Semillas Pescador) have distributed approximately 15 tons of seed of the improved varieties previously selected by farmer participation methods. Several of these varieties have since been approved for distribution by the national research program, but have not yet found their way into commercial multiplication by any other outlet, demonstrating that farmer participation research delivers appropriate technology more rapidly than conventional research. An estimated 3,000 small farmers have bought the new varieties from Semillas Pescador. Field reports testify to increased area planted to beans, increased consumption of beans (which are the poor man's substitute for meat), decreased use of chemical pest and disease control due to the improved varieties, and increased employment in harvesting, selecting and packing the grain or seed. A follow-up study will document these benefits.

Farmer participation has also stimulated the development of appropriate machinery for small bean producers. A prototype thresher developed with Semillas Pescador and farmers in their area, is being sold in increasing numbers.

The seed producers are now providing training to other farmers in bean production practices. This multiplier effect, put in place by the project, is increasing the demand for seed and the production of beans, making the process sustainable without project intervention. However, the development of organized marketing channels will be critical to long-term viability of this effort.

SECTION TWO: SPECIAL TOPIC

FARMER'S PERCEPTIONS OF SOIL CONSERVATION TECHNOLOGIES

This section of the report presents some results of a study in north Cauca, Colombia, of farmers perceptions of soil conservation techniques, comparing two different data collection methods: a participatory diagnosis or group analysis of the topic by farmers interested in but not using soil conservation; and a survey of twenty-two users of soil conservation methods.

Participatory Diagnosis of Soil Conservation.

A participatory diagnosis is a group analysis of a situation. It is designed to elucidate local knowledge and perceptions in a systematic way through group dynamics, so that the group improves its understanding of the situation. The results also help outsiders (who are not members of the group or community) to obtain a rapid appreciation of how the group perceives a given situation or topic, since the whole exercise takes from three to eight hours.

The participatory diagnosis of soil conservation involved a group of thirteen farmers from eight different veredas in Caldono municipio in north Cauca. Farmers with small holdings (less than 10 ha) were invited to attend if they felt erosion and soil conservation was of interest to them. This was therefore, a self-selected group of farmers with an established concern with soil conservation. The objectives of the group analysis were defined by research and extension staff as follows: to explore how farmers saw the issue of soil erosion and conservation in the framework of the history of the area; to seek farmers suggestions about possible ways to control erosion; to present some proposals for erosion control practices (using drawings) and to invite their suggestions for changes to the proposed practices.

Results of the group analysis

Historical Analysis: Farmers recalled that their land was once more fertile and they did not need to use fertilizers. There was more woodland, more sources of water, and the rainy

season was more clearly differentiated from the dry season. These days, they commented, after three crops the soil is powdery, the black topsoil has washed away. But they continue to plant cassava because it resists drought.

Proposed solutions: When solutions to the soil fertility problem were discussed by farmers in small groups, they mentioned that live contour barriers, and run-off channels were recommended for erosion control. However, farmers suggested new crop rotations, intercropping (beans with cassava); planting pastures with citrus fruit trees on steep slopes; planting pineapple in barriers; making stone barriers every 10-20 metres, as alternatives they would like to try.

Reactions to proposed techniques: The following suggestions were obtained when farmers reacted to drawings of different types of live contour barriers for soil erosion control in cassava plots:

- for conserving relatively fertile soils, contour barriers of coffee bushes with fruit trees in between;
- live barriers of sugar cane were criticised because cane required fertilization in their soils.
- the women especially liked the idea of two rows of pineapple planted every 10-20 m., because they expected to get something to sell and not to fertilize the pineapple. Also it would not shade other crops.
- barriers of pasture (Brachiaria decumbens) were perceived as having potential for establishing pastures after the prior crop.

- farmers without cattle rejected the barriers of pasture grass because it was too invasive, and too much work to control.
- live barriers of cut-and-carry forage grasses were liked better than pasture grass (especially Telembi).
- farmers wanted to grow a higher value crop than cassava in plots where barriers were established, eg. beans or coffee.

Conclusions

In summary the participatory diagnosis showed that a self-selected group of farmers recognized erosion as a problem, were informed about the technology available for soil conservation, and had a variety of ideas to propose for experimentation. None, however were actually implementing any of these ideas on their own initiative. Farmers' critiqued proposals for contour-skrip barriers in terms of the utility of the barriers' product, rather than its effectiveness in controling erosion. Another important criterion for farmers was the amount of work involved in maintaining, or controling the barrier. Finally, farmers were interested in the use of live barriers to conserve their more fertile soils (where beans could be grown or coffee could be established), and the possibility of changing to a different cropping system or rotation, as an alternative to cassava, if live barriers were established.

Survey of users of soil conservation techniques.

The survey questionnaire was administered to twenty-two farmers currently using soil conservation techniques. The respondents were purposively selected, and are the entire population of users identified by extension services and local farmers in three veredas (San Antonio, El Tablón and Pescador) in the same area of north Cauca. The survey was designed to assess what these farmers understand about the conservation practices they are using, and whether they are disseminating them to other farmers, independently of extension and credit services associated with soil conservation in the area.

Farmers were first asked which farming problems they think are important, to assess the extent to which they spontaneously identify erosion among these. The interviewers were unknown to the farmers and the interviewer's purpose was not explained as connected with erosion, so there was no reason for farmers to expect this topic to be one of special interest. Although only four out of the twenty-two farmers using conservation practices identified erosion as one of their problems (Table 1) soil fertility was mentioned more frequently. However it appears that farmers perceive problems like lack of water and pests and diseases as more pressing concerns than erosion.

Farmers in this area can receive credit and technical assistance for cassava production which includes a package of soil conservation practices, promoted by various organizations, including the Cauca Valley Corporation (CVC) and serveral NGO's. The package is oriented at preventing farmers from planting cassava on steep slopes (above 20%) and encouraging them to turn steep-sloping plots into pastures. Credit, seed, fertilizers, and technical advice is offered for farmers to establish a variety of practices including live contour-strip barriers of various pasture grasses, channels for control of run-off, legume (Arachis pintoi), ground cover, trees (supplied by an on-farm nursery), and help with constructing retention trenches to recuperate badly eroded gulleys. Once a farmer has agreed to take part in the credit scheme, he or she has to participate in some training sessions and receives periodic visits by an extension agent. To establish the live barriers in a cassava plot an extension agent brings the seed material and necessary equipment for planting along the contour, and plots out the location of the barrier. Often some labourers are supplied by the extension agency to plant the barrier. The farmers who were interviewed had on the average, two plots demonstrating different conservation techniques or types of live barrier, (Table 2); none had the same practice established in two plots on their farm. About half the plots (N=18) had soil conservation practices established in the past twelve months; five farmers had conservation practices established for over four years.

The questionnaire asked each farmer to explain what the word "erosion" meant to him or her. Responses, shown in Table 3, demonstrate that most farmers were able to

express the idea that erosion involves physical loss of soil and affects fertility. When asked "Does erosion have any importance for you," most farmers conveyed their sense that the loss of soil and declining fertility was a significant phenomenon for them (Table 4). It is clear from farmers' assessments of the different practices on their plots, that they understood the purpose of these practices. For example the purpose of live contour barriers of forage grass a commonly established practice, was readily explained in terms of reducing soil loss, and building up soil behind the barrier (Table 5). The open-ended evaluation of this practice by farmers showed that there were mixed experiences: some found it easy to manage; others had difficulties in keeping on top of the need to cut regularly. Most comments on another type of live barrier were positive, but also related to the management aspects and the utility of the grass, rather than its effect on soil loss or fertility.

Although these farmers understand the concept of erosion and the soil conservation function of the practices established on their plots, and although their evaluation of the practices is by no means negative, there is no evidence that these farmers are spontaneously undertaking soil conservation on their own initiative. The farmers interviewed constitute the entire population of users of soil conservation practices in the area studied; only two farmers (out of twenty-two) have a plot with a soil conservation practice established without either credit or extension assistance. However, nineteen plots are receiving technical assistance without credit, mostly those established upwards of two years ago.

There are several possible explanations for this lack of spontaneous adoption, which were explored with key informant farmers after the survey was completed. One explanation is that the conservation practices are perceived by farmers as impossible to replicate without technical assistance, because laying out the contour strip seems complicated. Another explanation is that farmers don't consider that the benefits of the practices are worth the extra work involved. A third possible explanation is that because the extension strategy is aimed at recuperating badly-eroded plots, and at cassava plots (normally the least fertile on the farm), farmers see these soil erosion control practices as purely remedial.

The participatory diagnosis discussed earlier, showed that farmers' preferences were to implement soil conservation practices on relatively fertile plots, with the hope that soil erosion control would help them to "graduate" to a higher-value crop (requring better fertility conditions) than cassava. Perhaps the extension strategy aimed at recuperating badly-eroded soil or conserving less-fertile soils is not fomenting spontaneous adoption because it is out of step with these farmers' preferences. It may be that the recommended practices need to be redesigned by researchers, to include a more aggressive strategy for short-run improvement of fertility on a plot, enabling the farmer to upgrade his or her cropping system, and so justify the additional work involved in maintaining the soil conservation practices.

These are hypothesis, not recommendations. But they do suggest the need for to understand farmers' objectives and to develop strategies which are congruent with farmers perceptions and preferences, when designing soil conservation practices.

A preliminary test was made of the hypothesis arising from the participatory diagnosis, that farmers' strategy is to use soil conservation methods to improve relatively more fertile plots, so as to shift to an alternative, higher value crop. Five farmers who volunteered to take part in trials of live contour barriers, were invited to choose the materials to be used in the barriers, the size and number of barriers, and the plots where these were to be located. After a visit to experimental trials where they viewed and discussed the array of conservation practices available, the farmers made the choices shown in Table 9. All farmers decided that they would establish soil conservation practices on plots where they plan to, or are already establishing coffee. Coffee is the cash crop with a secure market, and thus their "premium" crop which occupies their most fertile plots. All farmers except one decided to conserve soil on plots where they could intercrop beans, an indicator of relatively better fertility (compared to cassava plots). The farmer who chose establish soil conservation practices on a fallow plot which had had five successive cassava crops taken on it, decided to combine the live barriers with heavy fertilization at his own expense, in order to upgrade the plot rapidly. This very preliminary test of small farmers'

decision-making suggests that they are disposed to perceive soil erosion control practices in the light of a strategy for aggresively improving the better soils rather than conserving already eroded soil. Participatory research will continue to test this approach with CIAT scientists and the extension agencies in the study area.

Table 1

Farmers responses to the question "What are the three principal problems on your farm at present?" Three municipios, north Cauca, Colombia, 1991.

Problem	Number of Farmers
Lack of water, irrigation	9
Shortage of credit	8
Plant pests and diseases[1]	8
Exhausted soil caused by erosion	4
Infertile soil	3
Farm product prices	3
Difficult to obtain fertilizer	3
Shortage of cassava seed	2

[1] In cassava, cacao, coffee, pineapple, plantain

Source: Survey of 22 users, 1991.

TABLES FOR SECTION TWO

Table 2

Farmers' responses to the question "What soil conservation practices do you presently use?" Three municipios, north Cauca, Colombia, 1991.

Practice	Number of Plots
Live barriers	26
Run-off channels	14
Ground cover (arachis pintoi)	6
Trenches ("trinchos")	3
Planting trees	3
Planting pastures	3
Total number of plots	55

Source: Survey of 22 users, 1991.

Table 3

Farmers responses to the questions "What does the word "erosion" mean to you?" Three municipios, north Cauca, Colombia, 1991.

Example of farmers' responses	No. of farmers
Affects soil fertility:	
"The soil is exposed; the water washes away the nutrients and leaves the soil weak, without "vitamins", the wind dries it to dust, the sun makes it sterile"	13
Loss of top soil:	
"Part of land falls away, the soil is stripped and the top soil is lost down below."	3
Poor Management:	
"Bad management, too many crops taken without proper rotation"	3
Run-off:	
"When the rainy season begins the water washes away everything you have just planted, it washes the seed away."	2
No answer	1

Note: Quotations are farmers' own words.

Source: Survery of 22 users, 1991.

Table 4

Examples of farmers' responses to the question "Does erosion have any importance for you?" Three municipios, north Cauca, Colombia, 1991.

"The plants don't develop well, because the land is infertile" (la tierra no tiene savia).

"Everything is lost, the land is sterile, and the crops don't produce enough to pay one's debts."

"The land no longer yields anything. The plants dry up in the dry season. There is nothing to sustain them and the sun just dries them up."

"Not even weeds grow. You can't plant any crops. Only the subsoil remains."

"You are worse off when you're left with the subsoil and you have to help the crops with chemicals and fertilizers, which increases the costs of production."

Source: Survey of 22 users, 1991.

Note: Quotations are farmers' own words.

Table 5

FARMERS' COMMENTS ON SOIL EROSION PRACTICES.

PRACTICE: Live contour barrier of forage (cut-and-carry) grass, Imperial (*Axonopus Scoparius).*

What is the purpose of this practice?

- "To stop the soil from washing away."
- "The soil builds up in the barrier, it doesn't wash away down below."
- "It keeps the soil and it's used to feed the cattle"
- "It slows down the water running off the plot"

Source: Survey of 22 users, 1991.

Table 6

FARMERS' COMMENTS ON SOIL EROSION PRACTICES

PRACTICE: Live contour barrier of forage (cut & carry) grass, Imperial (*Axonopus scoparius).*

"What advantages or disadvantages has this practice?"

- Imperial grass is not so fuzzy (unpleasant to cut) and doesn't grow too fast.
- Imperial is not so tough for the cattle to eat.
- Even after three or four cuttings it grows back and is always green.
- If you don't have animals you can sell it.
- You can sell the seed at Col $10.000 a sack.
- Imperial is easy to manage.
- It spreads a lot of seed which you have to keep weeding.
- If you cut it too late, then the animals won't eat it.
- If you let it flower then you have to cut it up with machete (difficult to cut and for the animals to eat it).
- It needs a lot of work (to take care of it).
- After I cut it eight times, I had to replace it, it was finished by too much cutting.

Source: Survey of 22 users, 1991.

Table 7

FARMERS' COMMENTS ON SOIL EROSION PRACTICES

PRACTICE: Live contour barriers of pasture grass (Brachiaria decumbens).

What is its purpose?

- "To protect the soil from eroding, so that the soil doesn't wash away with the water in heavily fainfall"
- "So that the rain doesn't wash away the seed"
- "Contains the erosion, so that the soil can recuperate"
- "After planting (the barrier) in a cassava plot you can leave it to establish a pasture"

What advantages or disadvantages has it?"

- You are collecting the soil available to establish a pasture more quickly.
- You can get (vegetative) seed from the barrier.
- Its useful to feed the cattle.
- Live barriers are more useful tan bamboo ones.
- You have to keep cutting it although you can take the cattle (to the barrier) to graze it before planting another crop in that plot.

Source: Survey of 22 users, 1991.

Table 8

Relationship between credit, agricultural extension and the length of time soil conservation practices were used by farmers. Three municipios, north Cauca, Colombia, 1991.

	No. of plots established			
Plots with:	Up to 1 year	2-3 yr	4-10 yr	Total
Credit and extension	11	7	0	18
Extension without credit	6	9	4	19
Neither credit or extension	1	0	1	2
Total No. of Plots	18	16	5	39

Note: 4 cases without data on length of time established.

Source: Survey of 22 users, 1991.

Table 9

Type of land use and proposed future use of plots chosen by farmers for soil conservation.

Farmer No.	Actual use of the land where barriers sited	Future use (next season)
1	beans monocrop	coffee
2	bean/cassava intercrop	bean monocrop
3	new coffee/bean intercrop	coffee/bean intercrop
4	new coffee/bean intercrop	coffee/bean intercrop
5	fallow after 5 successive cassava crops	coffee

Publications

"Targeting New Technology at Consumer Food Preferences in Developing Countries" W. Janssen, J. Ashby, M. Carlier and J. Castaño, submitted to Food Quality and Preference (July, 1991).

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