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ANNUAL REPORT

**FARMER PARTICIPATION IN
TECHNOLOGY DESIGN
AND TRANSFER**

Activity Report

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**For Internal Circulation
and Discussion Only**



Centro Internacional de Agricultura Tropical

FARMER PARTICIPATION IN TECHNOLOGY
DESIGN AND TRANSFER

CIAT

SPECIAL PROJECT
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1. THE PROJECT

The Project "Farmer Participation in Technology Design and Transfer" (also known as the IPRA Project) is a special project supported by a three-year grant from the W.K. Kellogg Foundation (April, 1987-April 1990) to the International Center for Tropical Agriculture (CIAT) in Colombia, South America, a member of the CGIAR International Centers Network. The Project has also received support from the Ford Foundation. CIAT has a worldwide and Latin American regional mandate for development oriented agricultural research in specific commodities. The CIAT strategy emphasizes the development of improved varieties for those commodities, and is dedicated to the alleviation of hunger and poverty among resource-poor farmers and consumers in developing countries.

The Project is co-ordinated by a Ph.D. Sociologist, with a team consisting of two Assistant (B.Sc. level) Agronomists and an assistant Sociologist. In August, 1988, a full time training Associate, with masters degree in sociology joined the Project.

2. PROJECT OBJECTIVES

The overall objective of this Project is to develop, evaluate and disseminate participatory methods for putting agricultural scientists in regular contact with an important client group, small farmers, so that technology design, testing and transfer is carried out with accurate knowledge of the criteria and preferences small farmers are likely to use when making decisions about adoption. Assessing the effectiveness of participatory approaches in improving and accelerating the transfer of technologies to small farmers addresses several specific objectives.

- . Evaluation and further development of participatory techniques and procedures for joint scientist-extensionist-farmer involvement in the identification and analysis of research problems; in the planning of technology testing; and in the evaluation of results.
- . Development and testing in field conditions of training materials on participatory research methods.
- . Training in participatory research methods in order to develop a cadre of scientists and extension staff in the Colombian National Program for agricultural research and extension who are familiar with the application and results of these methods.
- . Evaluation of the impact of participatory research methods on scientists' research priorities and their definition of appropriate solutions to small farmer's problems (generation of feedback); and on the acceptance of new technologies by small farmers.

3. PROJECT ACTIVITIES 1987-1990

Project activities in 1987-90 have emphasized creating capacity in formal research systems to conduct farmer participation research, through methodology development and training . Four areas of participatory research methodology were identified: participatory diagnosis; planning research with farmers; farmer evaluations of technology; monitoring and feedback. Diagnosis was emphasized in field work and training in 1987-8; planning and evaluations have received most attention in 1988-90. A participatory method for monitoring or self-evaluation was developed internally but has yet to receive field testing or development into a training manual.

An average of 300 farm families have taken part each year in participatory diagnoses, planning trials, or evaluations of technology carried out with Project staff. The number of individual farmers involved in participatory diagnoses by the Project ranges from 252 in 1987/8 to 140 in 1988/9; in 1988/9 Project trainees worked with approximately 1000 farmers in their own participatory diagnoses. The number of farmers taking part in planning trials or evaluations ranges from 127 in 1987/8 to 400 in 1988/9. Trainees have worked independently of the Project with an average of 160 farmers per year in evaluations or planning.

Researchers argue that farmer participation is easy with farmers who are accustomed to interacting with researchers, but difficult otherwise. In response to this criticism, the Project purposively has worked with new farmers each semester, to test the methods. Though convincing to researchers, this approach is disadvantageous to farmers who need to build skills through continuous participation in adaptive research. The new Project objectives outlined in this document address the need to build research capacity among farmers.

As part of methodology development, the Project carried out a total of 102 agronomic trials with farmers in 1987-9, providing experimental inputs (mainly seed) to farmers who were responsible for providing all other inputs and for decision-making in the management of trials. Project trainees and collaborators conducted a further 60 agronomic trials for farmer evaluation purposes.

In 1989/90 the Project staff is collaborating in the evaluation of approximately 20 CIAT trials. Farmers in the pilot sites are conducting entirely their own trials with monitoring by Project staff. To date, approximately 70 of

the 102 farmers who have planted trials with the Project are carrying out further independent tests or seed multiplication. A study of farmer experimentation in three pilot sites identified increasing numbers of small experiments carried out by a sample of 114 farmers, independently of the Project or other institutions. Experiments by farmers with bean varieties and the impact of these are discussed in detail later in this report.

Training has grown in importance to Project activities. Five formal courses or workshops have been held for a total of 141 participants. Follow-up training was held for 83 trainees. An additional 95 individuals took part in field training, informal exercises in the field in 1987/9. From April-December 1989 over 200 visitors or field trainees were attended by the Project for explanations or demonstrations of farmer participation methodology. In the first three months of 1990 alone, a further 282 people received this type of informal training from the Project. The Project trained 282 participants in CIAT training courses, in events ranging from 2 hours to 3 days input by Project staff. In sum, approximately 600 professionals have taken part in formal training by the Project up to March, 1990; and over 300 individuals have received informal training. Details of training activities in 1990 are given later in the report.

4. ACHIEVEMENTS OF THE PROJECT

Since it began in 1987, the Project has shown that farmer participation in research makes a significant difference to technology design. The development of simple, but scientifically rigorous methods for involving farmers in the evaluation of alternative technologies has generated novel feedback to scientists about farmers' priorities.

As a result, breeders at CIAT and ICA, the Colombian national program, are taking farmers' criteria into account in the selection of new genetic material. For example, some bean varieties selected by farmers were used to make new improved crosses which as a result incorporate the characteristics desired by farmers. Experiences in cassava and beans has shown that CIAT varieties, selected with farmer participation, are not the same ones as those preferred by researchers. These farmer selections have recently entered pre-release testing and are being multiplied by farmers for seed. Participatory evaluations identified storage characteristics desired by farm women, but lacking in improved maize varieties. Breeders are working to incorporate desired storage characters into varieties.

Another result occurred in the evaluation of technology for artisanal seed production by farmers in the Project's pilot area in Colombia which led to changes in the design of the prototype machinery. Farmers are also working together with researchers and extensionists to design a pilot production scheme to multiply and distribute the new bean varieties which farmers have helped to select. As a result of farmer participation researchers are working with new information, and farmers have access to new technology which now incorporates their criteria for successful adoption.

The principle of consulting farmers about their criteria for success of a new technology well before it is launched, is gaining acceptance in programs collaborating with the Project. Their usual adoption studies give scientists information about farmers' preferences only several years after varietal release. Using Project methods, CIAT and ICA are for the first time monitoring farmers' reactions to new bean and cassava varieties prior to deciding which of

these to release. Their programs' capacity to do so independently is being developed through training of their staff by the Project, who are involved in joint efforts to extend the applicability of participatory methods. This collaboration helps to ensure that these methods are being adopted for regular use and transferred to others by CIAT and ICA programs, as well as by the Project.

In addition to demonstrating that practical methods for farmer participation have concrete benefits in bringing applied research closer to the farmer, the Project is showing that these methods are teachable by producing fully-tested training materials. The Project has developed two manuals and numerous instructional units to make participatory research methods accessible to a broad audience, ranging from the Ph.D. scientist to the extension officer. Two more manuals and related instructional units are in preparation.

Training expanded in the second year of the Project from small-scale pilot-testing to national-level in Colombia. ICA requested support in training on-farm researchers from throughout the country in participatory research methods (see Figure 4.1). In 1989-90 the Project began to prepare seven ICA trainers to provide this training in participatory research methods. They are now conducting their own monthly workshops with Project support. ICA is training on-farm researchers from Central America and the other Andean countries, so that the trainers prepared by the Project will eventually help to spread participatory methods beyond their own country.

In its third year, the Project is responding to international demand for farmer participation methods, although this is much beyond the activities envisaged in



FIGURE 4.1. Training expands to national scale in Colombia.

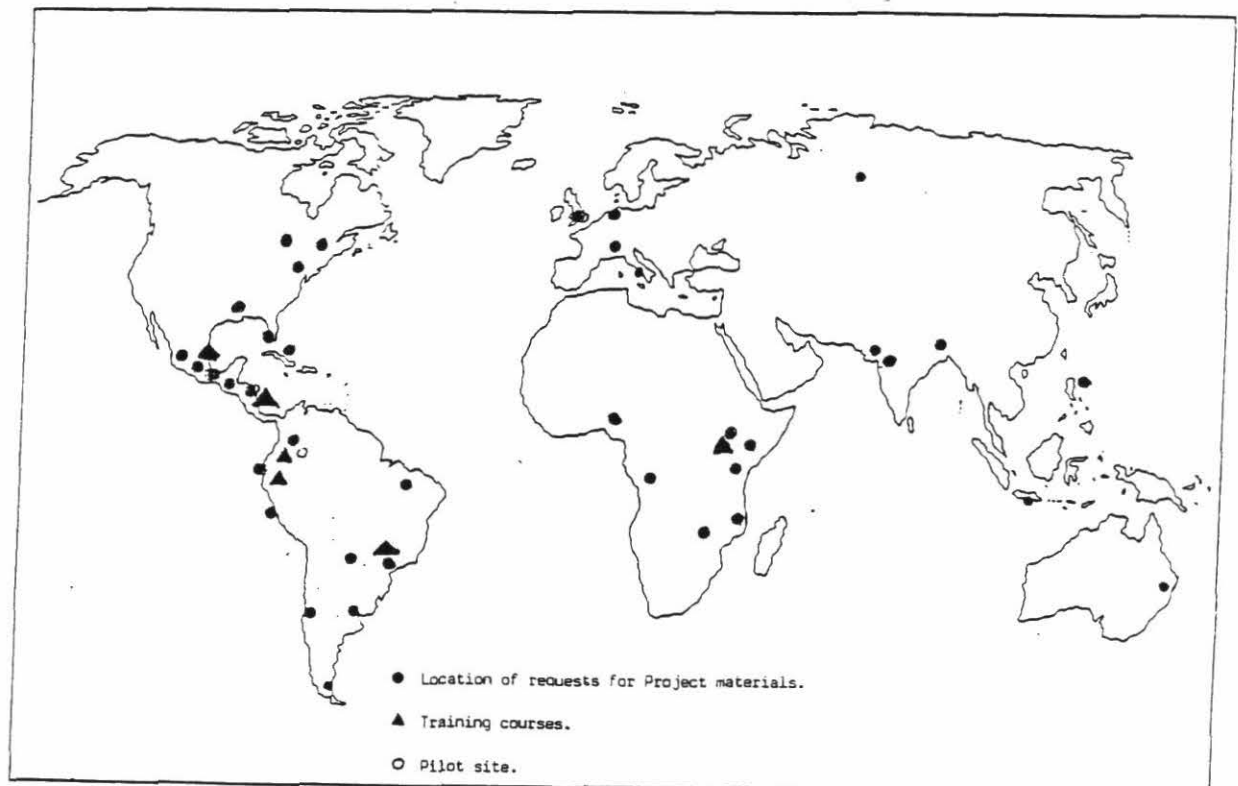


FIGURE 4.2. International dissemination of farmer participation methods.

1987 (see Figure 4.2). In response to requests from national programs to CIAT for this training, farmer participation methods are being integrated into courses at CIAT regularly given by the Rice, Bean, Cassava, Tropical Pastures and Seed Programs. The Project staff has also taught these methods in CIAT courses given in Nicaragua, Costa Rica, Brazil and Ecuador. The costs of internationalization other than Project staff time, have been provided by CIAT and national programs. A "Model Course" on farmer participation planned by the CIAT all-Africa Training Officer, the CIAT Anthropologist in Ruanda and the Project, is being taught first in Ethiopia in May, 1990, and will then be taken to other African countries, and financed by CIAT.

In summary, the Project has developed participatory methods which are rapidly being adopted and integrated into research and training regularly carried out by CIAT commodity programs and their national counterparts, due to the Project's input of training and training materials.

5. TRAINING MATERIALS

5.1. Objectives

Training materials developed by this Project are designed to provide practical guidelines for implementing participatory research to design and test new technology with small farmers. These materials focus on training in skills and methods for participatory research, oriented at professionals (research and extensionists) in national agricultural research programs and other organizations carrying out technology development for small farmers in low-income countries.

5.2. Approach to Training Material Development

The Project has designed a variety of materials with guidelines as to their respective instructional methods, which can be combined selectively into modules or "packages," depending on the needs, capabilities and resources of the user (ie. trainer).

In 1988, an overall plan was formulated for the production of modules for training the effective participatory research practitioner in three dimensions: theoretical concepts; field work methodology and data analysis (emphasizing practical skills); and attitudes. In addition; a component called "training for trainers" was designed, to build a multiplier effect into the training. Materials related to each dimension are part of training modules for each of four different stages of participatory research methodology, as illustrated in Figure 5.1.

There is great flexibility in the way in which modules can be put together, depending on the content desired for any particular training situation. For example, training in participatory methods can be initiated by an institution at the diagnostic or planning stage of research; at the evaluation stage, or for monitoring and feedback. In contrast, if attitudinal sensitization is the main area of interest, materials relevant to this topic and to each of the four stages of research can be combined into a single workshop. In this way, Project materials can be combined to suit users' needs.

5.3. Progress in the Production of Training Materials

Materials have been drafted and tested in training in each of the four modules: participatory diagnosis; planning research with farmers; farmer evaluations, and participatory

TRAINING AREAS	STAGES OF RESEARCH			
	1 PARTICIPATORY DIAGNOSIS	2 PLANNING RESEARCH WITH FARMERS	3 FARMER EVALUATIONS	4 PARTICIPATORY MONITORING
A) THEORETICAL CONCEPTS				
B) ATTITUDES FOR INTERACTION WITH FARMERS				
C) METHODS AND SKILLS FOR FIELD WORK				
D) DATA ANALYSIS AND REPORTING				
E) TRAINING OF TRAINERS				

FIGURE 5.1. Participatory research training modules

monitoring. Of these, the most comprehensive treatment has been given to farmer evaluations: the module consists of a manual (Evaluating Technology with Farmers. A Handbook - 140 pages) and three Instructional Units (each approximately 100 pages).

The manual "Evaluating Technology with Farmers. A Handbook" is being translated into French by the CIAT Bean Program in Africa. This manual and Instructional Unit No. 1 Methodology for Open-ended Evaluation will be translated into Portuguese for a proposed course in North East Brazil in September 1990 on participatory evaluation methodology to be conducted with the CIAT-Kellogg funded Project there.

Table 5.1. summarizes the relationship between modules and materials which have been prepared and tested to date. Table 5.2. shows progress in the production of these and other materials.

TABLE 5.1. Training modules for participatory research.

MODULE	MATERIAL	
1. PARTICIPATORY DIAGNOSIS	1. Participatory Group Diagnosis	I.U.
	2. The Semi-structured Interview	I.U.
	3. Skills for Managing Group Analysis	I.U.
	4. Follow-up Training for Participatory Diagnosis	W.P.
2. PLANNING RESEARCH WITH FARMERS	1. Planning Research with Farmers	I.U.
	2. Training Case Studies	W.P.
3. FARMER EVALUATIONS	1. Evaluating Technology with Farmers. A Handbook	M
	2. Methodology for Open-ended Evaluation	I.U.
	3. Preference Ranking	I.U.
	4. Farmer Evaluations. An Introduction to Data Analysis	I.U.
4. PARTICIPATORY MONITORING	1. A Methodology for Participatory Evaluation in Groups	M

NOTE: I.U. = Instructional Unit ; W.P. = Working Paper ; M = Manual.

The volume of materials being prepared, means that there remains about six months work for the Project Coordinator, Training Associate and Secretary to finalize production of these materials.

Desk-top publishing is still at an experimental stage in CIAT. Work is being done on production of the handbook in English Evaluating Technology with Farmers with desk-top publishing in CIAT (see Annex No. 1). In the meantime, English language versions other than the handbook are being printed in the only alternative low-cost format available at CIAT (see attachment - Methodology for Open-ended Evaluation, Instructional Unit No. 1). Working papers are almost exclusively in Spanish and will be printed in the format of the Instructional Unit No. 1 attached to this report (see Table 5.3. for a list of working papers).

TABLE 5.2. Production of training materials

TITLE	No. pages	SPANISH		ENGLISH	
		TRANSLATION/ EDITION	PRINTING	TRANSLATION/ EDITION	PRINTING
Video: <u>The IPRA Method</u>	20 minutes				
Video: <u>"The IPRA Method:" A Study Guide</u> Ashby, J.A. and M.P. Guerrero	8				
<u>Evaluating Technology with Small Farmers.</u> <u>A Handbook.</u> Ashby, J.A.	140				
<u>The Design of Learning Units for Training.</u> Zapata S., V.	107	*		*	
<u>Effective Interaction with Farmers for</u> <u>Participatory Research in Agriculture.</u> Ashby, J.A. and V. Zapata.	210				
<u>Methodology for Open-ended Evaluation.</u> Quirós, C.A., T. Gracia and J.A. Ashby. Instructional Unit No. 1.	108				
<u>Methodology for Preference Ranking.</u> Guerrero, M.P., J.A. Ashby and T. Gracia. Instructional Unit No. 2.	105				
<u>Farmer Evaluations: An Introduction to Data</u> <u>Analysis.</u> Roa, J.I., J.A. Ashby and T. Gracia. Instructional Unit No. 3.	130				
<u>Participatory Group Diagnosis.</u> Gracia, T. and J.A. Ashby. Instructional Unit No. 4.	70				
<u>La Entrevista Semi-estructurada.</u> Gracia, T. Instructional Unit No. 5.	69			No English version	
<u>Planning Research with Farmers.</u> Gracia, T. and J.A. Ashby. Instructional Unit No. 6.	In prep.	In preparation		In preparation	
<u>Participatory Monitoring and Evaluation.</u> Zapata, V., J.A. Ashby and T. Gracia. Instructional Unit No. 7.	In prep.				
<u>Skills for Managing Group Analysis.</u> Zapata, V., J.A. Ashby and T. Gracia. Instructional Unit No. 8.	In prep.				
<u>La Evaluación de Variedades de Yuca con</u> <u>Productores: Una Guía.</u> Hernández, L.A., T. Carey and J.A. Ashby.	In prep.				
<u>Investigación Participativa en Agricultura:</u> <u>Una Bibliografía.</u>	In prep.: 500 entries	In preparation			

* Produced by CIAT Training and Communications Support Program.

TABLE 5.3. Project working documents.

TITLE	No. PAGES
<u>Participación de los Pequeños Agricultores en el Diseño de Tecnología.</u> 1987. Ashby, J.A. Documento de Trabajo No. 1.	36
<u>Metodología para la Participación de los Agricultores en el Diseño de Ensayos en Fincas.</u> 1987. Ashby, J.A. Documento de Trabajo No. 2.	33
<u>Los Efectos de Diferentes Tipos de Participación del Agricultor en el Manejo de Ensayos a Nivel de Finca.</u> 1987. Ashby, J.A. Documento de Trabajo No. 3.	29
<u>Participación del Agricultor en Ensayos de Variedades en Campos de Agricultores: Informe de Trabajo en Progreso.</u> 1987. Ashby, J.A., C.A. Quirós and Y.M. Rivera. Documento de Trabajo No. 4.	39
<u>Estudio de Diagnóstico Rápido: Maíz en Asociación con Frijol Voluble en Pescador, Cauca</u> 1987. Quirós, C.A. and J.A. Ashby. Documento de Trabajo No. 5.	45
<u>Pasos en una Metodología para Investigación Participativa en Agricultura.</u> 1988. Quirós, C.A. and J.A. Ashby. Documento de Trabajo No. 6.	20
<u>Evaluating Technology with Farmers. A Handbook.</u> Ashby, J.A. and D.H. Pachico. 1988. Working Document No. 7.	132
<u>Dejando que los Agricultores Decidan en la Investigación en Campos de Agricultores.</u> 1989. Lightfoot, C., O. de Guía Jr., A. Aliman and F. Ocado. Documento de Trabajo No. 8.	35
<u>Three Training Case Studies for Participatory Research in Agriculture.</u> 1989. Ashby, J.A. and T. Gracia. Working Document No. 9.	50

5.4. Instructional Units: A New Concept in Training Materials for Farmer Participation Research

In 1989, the Project held a workshop on "Formación de Capacitadores en Investigación Participativa" based on the manual for the design of instructional units. As a result, several new training materials were drafted based on this approach. An instructional unit combines theoretical concepts, exercises for training in methods and skills, and guides for their use by instructors in a single volume.

Table 5.2. shows Instructional Units in preparation. Table 5.4. lists Instructional Units prepared by trainees in this workshop. These are being edited and commented on by Project staff, and revised by the authors, with a view to subsequent printing and circulation.

TABLE 5.4. Instructional Units prepared by trainees in a workshop. June 15-30, 1989.

A. With participants from ICA

- Rivera, Martha Cecilia. Investigación Participativa. CIAT, May 1989. 62 pages.
- Rivera, Martha Cecilia. Trabajo Interdisciplinario. June 30, 1989. 75 pages.
- Insuasty, Orlando. El Diagnóstico Informal como Base para el Diagnóstico Formal. CIAT, July 21, 1989. 86 pages.
- Hernández, Ramiro. Utilización de la Información Socio-económica para Tipificación de Productores. June 1989. 75 pages.
- Miranda, Diego. El Diagnóstico Dinámico: Seguimiento o Monitoreo en Sistemas de Producción. July 1989. 90 pages.

B. With participants from the Grupo Yanapai, Peru

- Olivera, Edgar. Conocimiento de la Tecnología Local. June 1989. 65 pages.
 - Canales, Norma. Roles y Actitudes del Equipo Interdisciplinario en las Cuatro Fases de la Investigación Participativa. CIAT, June 1989. 90 pages.
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6. TRAINING ACTIVITIES IN 1989-90

In the past year, the Project has emphasized integrating its methods and principles into the existing training programs of other programs, instead of mounting its own courses as was done last year. The objective of this strategy is to institutionalize farmer participation training, after completion of the Project. Table 6.1. summarizes Project training activities for the period April 1989-March 1990.

Table 6.1. Project training activities, April 1989-March 1990.

Activity	No. of participants
1. Project Training Courses (Colombia)	
<u>Research Planning with Farmers' Participation.</u> Intensive Course. ICA-CIAT, April 3-7, 1989	30
<u>Participatory Research in Agriculture: Training for Trainers.</u> Intensive course, June 15-30, 1989.	15
2. CIAT Program Training Courses	
<u>Seed Systems for Small Farmers.</u> CIAT, June 8-16, 1989.	30
<u>On-farm Research IV Region (3rd. phase).</u> IRR-CIAT, Managua, Nicaragua, August 7-12, 1989.	30
<u>"Artesanal" Bean Seed Promotion and Production.</u> INIAP-CIAT Andean Project, September 19-30, 1989.	20
<u>National Workshop on Training for Trainers.</u> CIAT Rice Program, Ecuador, Nov. 18-19, 1989.	30
<u>Promotion and Production of New Bean Seeds Varieties with Farmers' Participation.</u> Gualaceo, Ecuador. Phase I: October 2-10, 1989. Phase II: January 10-20, 1990.	27 25
<u>On-farm Research Interphase Course.</u> Phase I: San Isidro del General, Costa, Rica, November 20-December 1, 1989. Phase II: Barao, Dominican Republic, March 8-17, 1990.	23 19
<u>Participatory Research Methods.</u> IAR - East Africa Bean Program, Ethiopia, Feb. 13-20, 1990.	22
<u>Advanced Bean Breeders' Course.</u> CIAT, March 8, 1990.	20
<u>XIII Program for the Development of Scientific Training for use and Production of Tropical Pastures,</u> CIAT, March 29, 1990.	19
<u>Principles of Farmer Participation Research.</u> Tropical Pastures Program, Senior Staff Seminar, CIAT, March 26, 1990.	12
3. In-service Training (ICA professionals)	3
4. Field Training¹	282
TOTAL	607

¹ Includes: People who took part in video presentations; in field activities; ICA staff who attended evaluations with us in the field, presentations to other organizations.

6.1. Training for Trainers

Our cycle of training courses with ICA (The Instituto Colombiano Agropecuario) was completed this year with two courses: Research Planning with Farmers' Participation (30 ICA participants) held in April 1989 and partially financed by CIAT and ICA, as was the Project's Training for Trainers Course (15 participants), held in June 1989.

Upon completion of these two courses, ICA set up its own National Farming Systems Research Training Team. This group, trained by this Project, works with 8 pilot CRECEDS or on-farm research teams in Colombia, approximately 240 individuals. A sequence of 8-12 monthly seminars are taught in rotation by the Training Team: these include seminars on concepts of farmer participation, methods for participatory agronomic trials, and for farmer participation in on-farm livestock research for example.

ICA trainees of this Project are also an important resource for the Latin American region: they are being invited to international workshops (eg. one of their members will take part in a workshop in the N.E. of Brazil in 1991 on participatory diagnosis). And they are being called upon as consultants by other national programs interested in farmer participation research. This Project cannot respond to all the regional demand for such services: hence its training-for-trainers has been a vitally important investment in expanding the impact of farmer participation research in Latin America.

Also participating in the Training for Trainers was an NGO Grupo Yanapai from Peru (they financed their travel to the course). This NGO is developing training materials for an international association of NGO's called CELATER. This

Project expects to multiply its impact through the NGO's by the training of trainers, in the same way as is being done in national agencies.

6.2. Training with CIAT Programs

A close working relationship has developed between the Project and the CIAT Training Program, in part because this Project's part-time educational consultant of last year obtained a full-time position as a Senior Research Fellow in CIAT's Training Program. The orientation this professional received to farmer participation with this Project has greatly assisted the Project in introducing its approach into CIAT Training Programs.

For example, farmer participation is now an integral part of CIAT's Artesanal Seed courses and On-farm Research courses. The farmer participation approach has been integrated into the Rice Program's new training strategy which trains trainers to prepare extensionists, and then trains farmers. A similar integration is being assessed with the Tropical Pastures Program, at the time of writing this report. The Cassava Program has taken over training of national program professionals involved in farmer evaluations of varietal testing in the North Coast of Colombia and in Ecuador.

7. DISSEMINATION

The Project disseminates its results and experience through various channels.

- (a) Formal training and informal field training (607 individuals in 1989-90).
- (b) Providing written materials (working papers, articles, training materials) in response to requests by mail.

The mailing list compiled from these requests now has 769 entries. We hope to supply training materials in Spanish free of charge and English materials at a minimal cost once desk-top publishing has been completed.

- (c) Scientific publications: These allow Project experience to reach a broad international audience including the scientific community (CGIAR centers and national programs), universities around the world, and development workers. With this objective the Project has produced five book chapters which are aimed at a broad audience (see Table 7.1).

TABLE 7.1. Scientific publications, 1987-90.

-
- Ashby, Jacqueline A., Carlos A. Quirós and Yolanda M. Rivera. 1987. Farmer Participation in On-farm Varietal Trials. Agricultural Administration (Research and Extension) Network, Discussion Paper No. 22, ODI, London, England.
- Ashby, Jacqueline A. 1990. "Small Farmers' Participation in the Design of Technologies." In: Miguel A. Altieri and Susana B. Hecht Agroecology and Small Farm Development, Boca Raton, FL: CRC Press.
- Ashby, Jacqueline A. and Carlos A. Quirós. 1990. "Participatory Research Methods for Evaluating Technologies with Small Farmers." In: Andrew Speedy (ed.) Developing World Series - Agriculture and Food, Oxford, England, Grosvenor Press.
- Ashby, Jacqueline A., C.A. Quirós and Y. Rivera. "Farmer Participation in Technology Development: Work with Crop Varieties." In: Robert Chambers, Arnold Pacey and Lori Ann Thrupp (ed.), 1989. Farmer First. Farmer Innovation and Agricultural Research. Intermediate Technology Publications, London, England: 115-122.
- Ashby, Jacqueline A., C.A. Quirós and Y. Rivera. "Experience with Group Techniques in Colombia." In: Robert Chambers, Arnold Pacey and Lori Ann Thrupp (ed.), 1989. Farmer First. Farmer Innovation and Agricultural Research. Intermediate Technology Publications, London, England: 127-131.
- Ashby, Jacqueline A., 1990 "Adopters and Adapters The participation of farmers in successful on farm research." In: Tripp, R. (ed.), Cases of Successful On-Farm Research. Mexico: CIMMYT (Forthcoming).
- Ashby, J.A, M.P. Guerrero, T. Gracia, C.A. Quirós, J.I. Roa. 1990 "Farmer Participation Early in the Evaluation of Technology." Farming Systems Research and Extension Symposium. Proceedings October 14-17, University of Michigan, ILL, USA.
- Ashby, J.A. and T. Gracia, 1990 "Farmers as Researchers: An introduction to farmer participation in on-farm research." Paper prepared for the CIAT Tropical Pastures Program RIEPT Workshop on On-Farm Research, August 27-29, 1990.
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8. IMPACT OF FARMER PARTICIPATION ON ACCEPTANCE OF NEW TECHNOLOGIES BY FARMERS

This Project expects that farmer participation in generation of technology will help to identify technologies which are more acceptable to farmers, and which will therefore, lead to higher levels of adoption, improved income and general welfare for farm communities.

The external evaluation of the Project in December, 1988 noted that by far the most important effect of farmer participation on technology generation to that date, was on scientist's criteria for developing new varieties. Principally, this impact consisted of demonstrating that production scientists were selecting different varieties from those selected with farmer participation, and that scientist's selections typically gained little acceptance among farmers. The external evaluator, Dr. Michael Collinson, noted that the impact of the Project at the farm-level would only be fully realized, once new crosses made in response to this information about farmers' preferences could begin to reach farmers as varieties, a process that can take several years. This is certainly the case in the Project's work with cassava, maize and snap-beans where feedback from farmers has been generated by the Project, but new technology has yet to be made available based on new information about farmer's priorities.

8.1. Impact on Research

In the case of farmer participation in bean varietal selection however, it is possible to measure its impact at present, partly because the crop can be planted and evaluated twice a year, in contrast to cassava which is harvested every 17 months. Also farmer participation has

been integrated into the process of screening nurseries, ie. at an earlier stage of research than has been seen as desirable by scientists in other programs. The pay-off to farmer participation in bean technology development is already measurable because of this early integration of farmers into the research process.

It is possible to show that farmer participation has had an impact on CIAT scientists' priorities for bean varietal selection in Colombia. This in turn, has made it possible for the Project to involve farmers in making selections from among a much more varied "menu" of alternative varieties.

TABLE 8.1. Varietal composition of breeders' regional bean trials for the coffee-zone of Colombia, 1985-1990.

Varietal type	1985-6	1986-7	1987-8	1988-9
..... Percent of varieties				
Farmers' priority:				
Red (radical)	5.9	12.5	33.0	23.0
Mottled (Calima)	70.6	62.5	30.0	44.0
Other types	23.5	25.0	37.0	33.0
TOTAL PERCENT	100.0	100.0	100.0	100.0
TOTAL NUMBER	16	17	30	18

This impact can be observed in Table 8.1., which shows the varietal composition of regional trials which are put together by CIAT and ICA breeders for the region of Colombia where the Project pilot sites are located (the coffee-producing zone).

Farmers producing beans for the market in Colombia face quite strong regional preferences among middlemen and urban consumers for either "Calima" or "Radical" types of grain. In 1985-6, regional trials included a small proportion of Radical types, actually only one variety. In 1987 the farmer evaluations carried out by this Project confirmed a preference expressed by farmers who took part in planning evaluation trials in early 1987, for Radical types, which was also found to be emerging in other areas of the country. By 1989-90, the proportion of varietal types preferred by farmers in the trials had doubled in the breeders' selections of advanced materials for the regional bush bean trials, in response to farmers' requirements for both Calima and Radical varietal types.

8.2. Impact on Acceptability to Farmers

In response to information generated by the Project on farmers' need to include red, "Radical" grain types among improved bean varieties, the CIAT Breeder put together a greatly expanded nursery of red types for evaluation by farmers. Figure 8.1. illustrates in flow-chart form the history of this nursery from fall 1987 to spring 1990.

The original 101 varietal materials were reduced to 16 considered promising by experimenting farmers in the pilot area. Some of these farmer selections were used by the Breeder to make new crosses; others went into the regional trials for the coffee zone in Colombia.

To the 16 original selections, nine additional materials were added as "checks:" (a) some selections made by the Breeder for confirmation (or pre-release) trials were added to the nursery; (b) some varieties not selected by farmers but thought to be promising by the Project agronomist were also included.

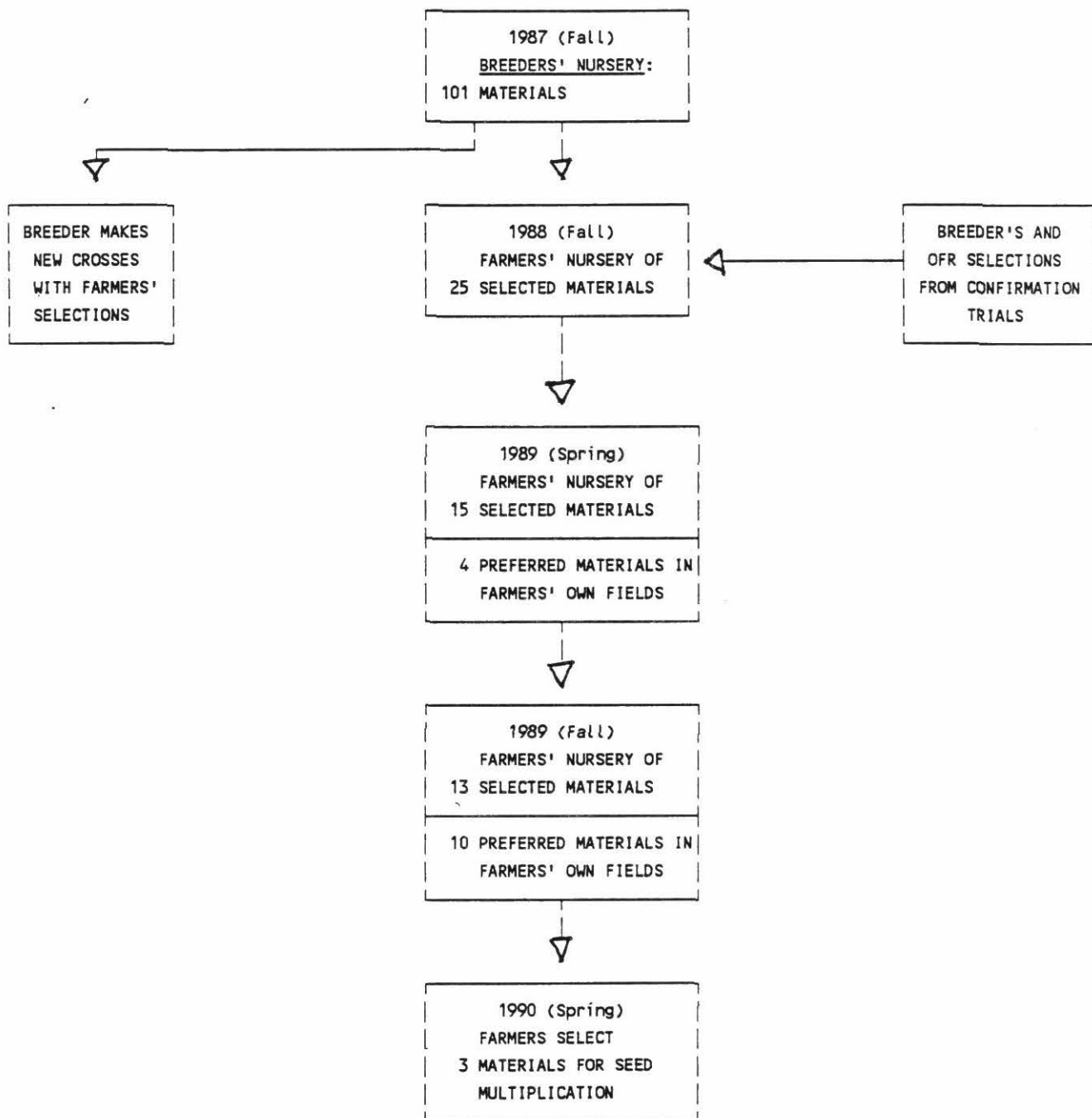


FIGURE 8.1. Flowchart showing selection of bush bean varieties with farmers.

Table 8.2. shows how 42 bean producers in one pilot site rated eight varieties chosen by Project participants (farmers), out of ten varieties planted in the fall 1989 "Farmers Nursery." Each was rated "excellent," "very good," "good" or "average." Of the 42 farmers, more than half rated the top six lines in Table 8.2. as "good" or "very good-to-excellent." This confirms that the selections by experimenting farmers evaluating the farmers' nurseries was broadly representative of the opinions of bean producers in the area. As a result, a diversity of materials acceptable to farmers is now available for seed multiplication, which was totally lacking in 1987.

TABLE 8.2. Evaluation of bush bean varieties by 42 farmers. Cauca, Colombia: Spring, 1990.

VARIETY	EVALUATION SCORE		
	Excellent/very good	Good	Average
 Percent of farmers		
Radical Bitaco	80	7	2
Radical Pescador*	57	13	11
Duva*	45	13	21
AFR-185	42	16	19
PVA-773	26	17	30
PVA-476	35	12	35
AFR-291	21	12	47
PVA-698	16	13	52

* Farmer-introduced varieties.

8.3. Impact on Production

As a result of this work it is possible to show that farmer participation in varietal selection of beans helped to identify varieties which are both more acceptable to farmers and outyielded other varieties selected either by farmers, or by researchers working on their own. In other words, there is synergy or complementarity in bringing together scientists and farmers to participate in technology generation, which produces better results for the farmer than either group can achieve in isolation from each other.

TABLE 8.3. On-farm yields of bush bean varieties evaluated with farmers. Cauca, Colombia, 1987-89.

VARIETY/YEAR	FARMER-INTRODUCED VARIETIES		CIAT LINES					
	DUVA	RADICAL PESCADOR	AGRONOMIST SELECTION	BREEDERS' PRE-RELEASE TRIALS		FARMER SELECTIONS		
 kg/ha		AFR 291 kg/ha	PVA 916	PVA 476	AFR 185	RADICAL BITACO	PVA 773
TYPE OF GRAIN	Radical	Radical	Radical	Calima	Calima	Radical	Radical	Calima
Fall 1987	677	1804	781	NI	NI	1776	1566	885
Fall 1988	1849	653	1055	1337	1328	1614	1806	1754
Fall 1989	1311	1680	2147	NI	1325	1760	1602	1231
3 YEAR AVERAGE	1279	1379	1327	--	1326.5	1717	1658	1290

NI: Not included in trials.

Table 8.3. illustrates this. In this Table, yields obtained over three seasons in trials managed by farmers collaborating in the Project are shown. The two best-liked farmer-introduced varieties Duva and Radical Pescador (that

is, new varieties selected independently by experimenting farmers in the pilot area) yielded an average of 1279-1379 kg/ha.

This is comparable to yields of the Project agronomist's best selection, AFR-291. Two varieties from the breeders' pre-release trials were also originally selected without farmer participation evaluated. Yields are comparable to farmers' introduced varieties. However one, PVA-916 was eliminated by farmers after one season, because they say the yellowish mottling makes the grain "look old" and that it will receive a lower price as a result. The other variety from the pre-release trials, PVA-476, farmers consider has a very acceptable grain type. However, farmers have observed that it has marked susceptibility on occasions to local races of anthracnose, a major disease of beans. As a result, despite its beautiful grain, PVA-476 is perceived by local farmers as risky to grow.

Finally, Table 8.3. shows the yields of three varieties selected with farmer participation. One (PVA-773) is a Calima type selected by farmers because they want to grow both Radical and Calima types. Even though its yield is not markedly better than other improved Calima types evaluated by farmers, its grain quality is considered more acceptable. Its resistance and yield is better than local Calima varietal types.

The two Radical types selected with farmer participation both have more acceptable grain types and higher yields on average, than any other CIAT materials evaluated so far, or the farmer-introduced varieties in Table 8.3.

8.4. Economic Impact

Farmer participation in selecting bean varieties has significant potential for improving the income and welfare of farmers taking part in the Project. Table 8.4. illustrates some of the economic benefits. If the 435 farmers who took part in the project from 1987-90 plant an average of 0.5 ha per season (1 ha per year) with the new varieties they have selected, they will generate an additional gross income of US\$104,400 annually, equivalent to more than 1,800 man-months of employment at local wages.

TABLE 8.4. Economic benefits of farmer participation in varietal selection of beans.

GROUP OF BENEFICIARIES	HAS CULTIVATED IN BEANS/YEAR	GROSS VALUE OF FARMER SELECTED, VARIETY: US\$ ¹
Farmers with trials (N = 150)	150	36,000
Farmers in the Project (N = 435)	435	104,400
Bean growers in Cauca ²	1,267	304,080
Bean growers in coffee District ²	35,000	8,400,000

¹ The highest yielding CIAT line accepted by farmers yielded 338 kg/ha above the highest-yielding recommended variety averaging three seasons over three years. An average seasonal bean price of US\$ 0.71/kg was used to calculate the gross benefit of a change in variety.

² Area represents a proportion of area planted to beans. Estimated from data in Bastides Ramos, G. (1989) "Producción e Investigación de Frijol en Colombia," ASIAVA, ED. No. 31: 27-33, Table 2.

If the farmer-selected variety maintains its yield advantage in other parts of Cauca, for example in 1,267 ha estimated at about 30% of bean area in Cauca, gross income to farmers would amount to \$304,080. And if the variety can be supplied to farmers in about 30% of the same agro-ecological

zone as the pilot sites, the coffee zone, then a gross annual income gain of US\$8,400,000 is estimated to occur to bean producers, as a result of farmer participation.

In the Project pilot area, beans have become a crop for young people, both men and women. Fathers give sons or daughters a plot to cultivate beans and the extra income keeps them at home. Young people now take out agricultural credit, and have begun to experiment with other crops, providing leadership in agricultural innovation for their community. With the extra income they have bought consumer goods which reduce the drudgery of rural life, and migration to the city seems less attractive. Older people comment on how the quality of community life has improved now that young people are beginning to stay on the land, and to organize themselves into co-operatives and mutual self-help groups to market the new crops they are experimenting with.

Results obtained with beans are just one example of what this Project aims to achieve through institutionalizing active participation by farmers in technology testing.

8.5. Realizing Economic and Welfare Benefits of Farmer Participation: An Experiment in Marketing with Farmer Participation.

Farmer participation in research to generate new technology is spreading to other areas of activity. Under the impetus of local experimenting farmers who have participated in the bean trials, some farmers have formed groups and allied themselves with co-operatives. A marketing experiment was initiated by the Project in March 1990, after the results reported in Tables 8.2. and 8.3. were shared with farmers.

The marketing experiment involves the Project in coordinating: the CIAT Seed Unit, the ICA Seed Unit, the

CIAT Bean Breeding Program, FEDECAFE (Coffee Growers Association) and an NGO, the Carvajal Foundation, with groups of experimenting farmers and six farmer co-operatives.

The marketing experiment aims to integrate the flow of new varieties from farmer participation research managed by groups of experimenting farmers with artisanal seed production and with sale outlets for grain. Seed will be produced and marketed by farmers via their associations and co-operatives. Grain will be sold via the NGO small business program.

Figure 8.2. shows conventional marketing channels for beans among small farmers in Cauca. Farmers often sell their grain, and later buy it back as seed. Project evaluation of its impact shows that in beans as well as other crops like maize that we have worked on with farmers, seed supply is a major constraint. Poor farmers often eat up all their seed before the planting season arrives. When they later buy seed, they do not buy certified seed (almost twice the price of grain). What they do buy is grain of uncertain quality.

Figure 8.3. shows the future structure for integrating farmer participation research, seed multiplication and marketing this experiment is aiming towards. It is too early to assess the results of this experiment, initiated in March 1990. However, the evaluation of seed production technology by experimenting farmers has stimulated local inventors to design new prototype machinery. The strategy of the CIAT-ICA Seed Units towards seed production is adjusting to accommodate farmers' objectives: to produce seed and grain, not one or the other as is usual. Farmer participation is radically influencing the design of technology and the way it is made accessible to farmers in this integrated experiment.

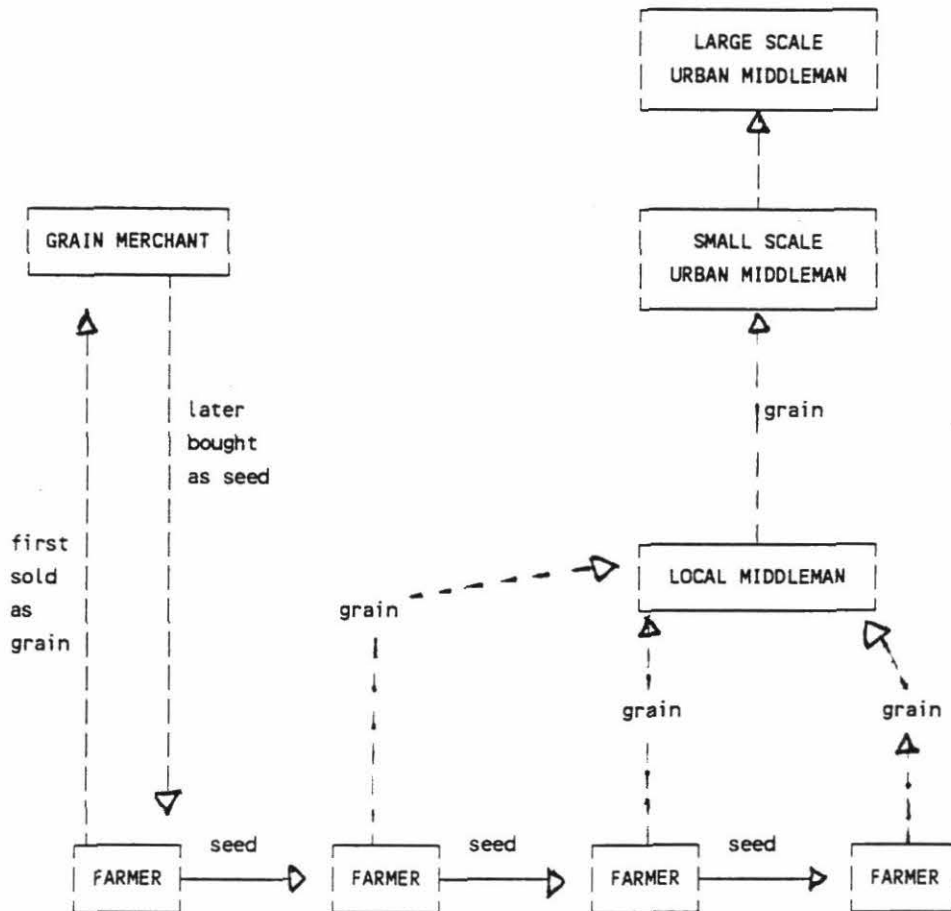


FIGURE 8.2. Conventional marketing channels for beans among small farmers in Cauca.

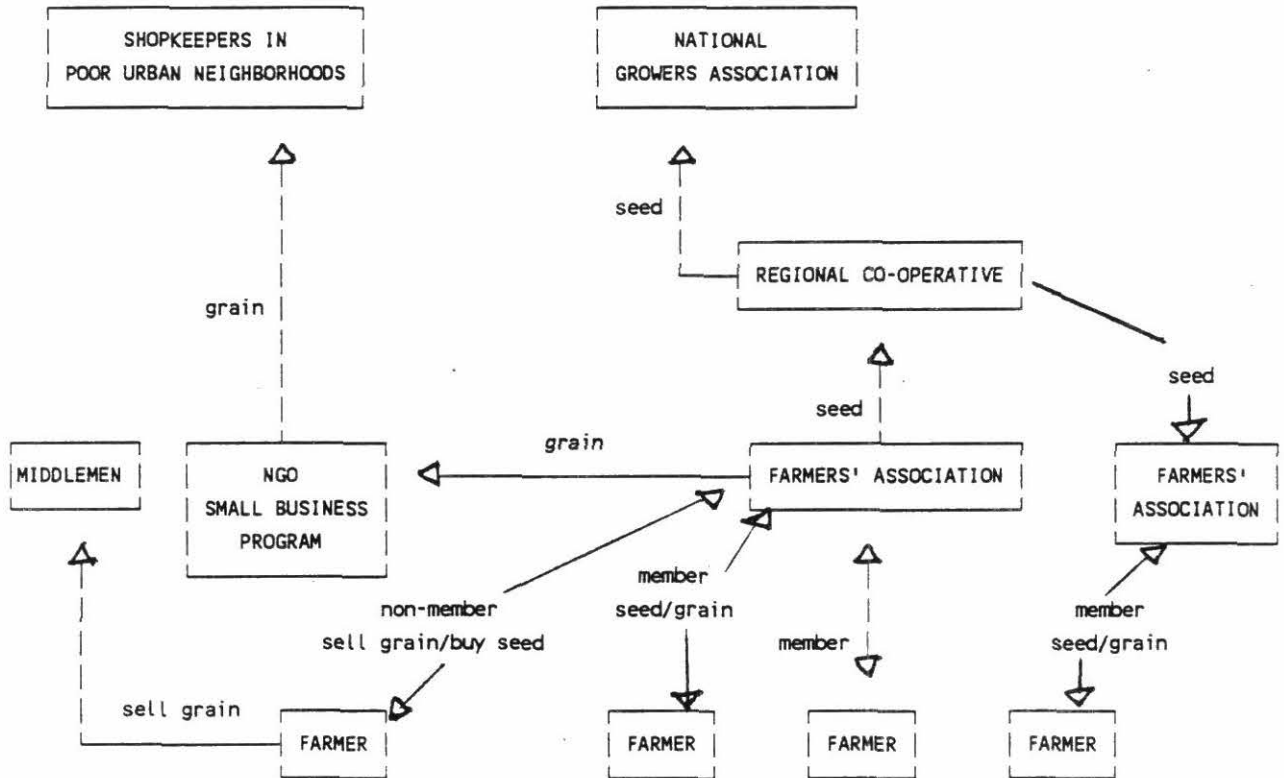


FIGURE 8.3. Experimental marketing channels for beans being designed and tested with farmer participation.

Some indication of potential impact is given. The NGO small business program is training farmers for the first time in its methods: and its first test marketing of the farmers' selected variety sold 0.5 ton of beans in 2 hours to poor shopkeepers in the urban barrios of Cali, indicating the potential of this new direct market linkage. Farm families are busy in the evenings selecting and bagging beans which they will supply under their own brand label. The farm people participating in this experiment comment on how family life is strengthened, and on how hope for improvement in the community is being strengthened by these new activities.

