FINAL REPORT

CATIE/AID

FOURTH INTERNATIONAL SHORT COURSE

"AGROFORESTRY FOR THE HUMID TROPICS"

24 APRIL - 4 MAY 1984

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TROPICAL AGRICULTURAL RESEARCH AND TRAINING CENTER (CATIE)
Renewable Natural Resources Department
Turrialba, Costa Rica
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1. Introduction

1.1 Background of Courses

In 1982, the Tropical Agricultural Research and Training Center (CATIE) and the United States Agency for International Development (USAID) signed a cooperative agreement to conduct a series of four international agroforestry short courses. The series has two basic purposes: 1) to train USAID and host-country personnel in the state of the art methodologies and techniques in agroforestry for field implementation and research and 2) to increase the agroforestry training capability at CATIE, specifically within its Renewable Natural Resources Department.

All four courses have been offered on the CATIE campus in Turrialba. The first course was held between 16-25 March 1982 and delivered in English. The two subsequent courses were taught in Spanish from 11-21 January and 8-18 November 1983. The fourth course was offered from 24 April to 4 May 1984 and taught in English.

2. Synthesis of Fourth Agroforestry Short Course

2.1 Introduction

CATIE's fourth and last agroforestry short course financed by USAID was held between 24 April and 4 May 1984 at CATIE's campus in Turrialba, Costa Rica. The course was taught in English to predominately USAID project personnel.

This synthesis is based on an oral evaluation session, a written evaluation and students' remarks to the course organizers.

2.2 Course Objectives

Considering the type and background of the participants, the course organizers developed a course which gave emphasis to project design, analysis and implementation rather than stressing agroforestry field techniques (e.g. measuring, pruning, planting). The purposes and objectives of the course are stated below:

Purpose

- to train USAID and host country project personnel in the state of the art techniques in agroforestry for project implementation and research.
- to develop and evaluate agroforestry training materials for use in the field and classroom.

Objectives

- to introduce basic concepts of farming systems research methodology and its relationship to agroforestry.
- to prepare course participants to utilize farming systems research techniques in their own project experiences.

- to present a selection of practical examples of agroforestry systems and applications under different environmental and socio-economic conditions.

- to assess possibilities of transference of promising systems to analogous regions.

- to assess the role of agroforestry in rural development.

- to introduce various techniques for obtaining and analyzing economic data of agroforestry systems.

2.3 Course Participants

As in other CATIE/AID agroforestry short courses, 24 scholarships were available. These scholarships included all course-related expenses (e.g. transportation, food, lodging, laundry, instruction costs, etc.) from the time of the student's arrival to his departure. USAID or donor agencies paid the students' international air fare and in-transit per diem.

A telex initially announcing the course was sent to all AID missions on 16 November 1983. Initial response was poor. A second and final telex was sent on 10 February 1984, again with poor response. Gradually through additional telexes and personal communications, an ample number of course candidates was acquired.

The selection of participants occurred on 2 March. Representatives of AID (Frank Zadroga, Regional Environmental Management Specialist, ROCAP) and CATIE (Rolain Borel, Head of CATIE's Agroforestry Program and Michael Major, Agroforestry Short Course Coordinator) used three criteria to select participants: 1) direct involvement of candidate in agroforestry projects; 2) relation of candidate to AID; and 3) candidate's ability to speak and understand English. Participant selection was greatly hindered by lack of information about the candidates. Although CATIE requested that each mission send candidates' curriculum vitaes, few missions responded. Follow up was impeded by this lack of information since telexes that were sent did not give candidates mailing address or telephone number. Confirmation of selection was sent immediately by telex to participants. After the initial candidate selection, several participants were unable to assist and several new candidates were selected. One month before the course, 24 participants were scheduled to attend. For various reasons, four participants withdrew bringing the total number of participants to 20. Two full-time observers, with outside funding, also assisted the course.

The twenty-two participants held a wide array of educational levels and disciplines represented. A summary is presented in Tables 1 and 2.

Table 1. Academic level of participants

B.S.	8
Licenciatura	2
M.S.	9
Ph.D.	3
TOTAL	22

Table 2. Disciplines represented by participants

Forestry	11
Agriculture	4
Biology	2
Natural Resource Management	2
Cultural Anthropology	2
Soils	1
TOTAL	22

Course participants were asked to comment on the number of participants and the heterogenity of the group. All participants, except one, felt that the size of the group, 22 participants, was the optimal size. They also all strongly felt that a wide mix of disciplines was greatly advantageous to the course. Whereas heterogenity of disciplines represented was advantageous, a homogeneity of participants regarding field workers versus administrative workers and climatic region (e. arid zones versus humid zones) would have been preferred. A list of participants appears in Appendix 2.

2.4 Pre-course Arrangements

After participants were selected, a letter with general information (Appendix 1), a tentative program and visitor's information about CATIE was sent. In most cases, this arrived at least one month before the course's start. All but one participant received the information. All participants felt that this information was sufficient and very good and that nothing major was lacking. One participant commented that "CATIE was very responsive and helpful". Several participants commented that they would have liked to have received an annotated participant list which summarizes the work of each participant.

A great deal of confusion was caused when USAID canceled the course. CATIE was not even informed of the cancellation until after it had been done! This most uncomfortable situation may have caused several participants (i.e. 2 participants from Jamaica) from not assisting the course.

2.5 Teaching Materials

As supplementary materials to the course lectures and activities, publications on agroforestry bound in a notebook were given to participants. Many more documents were distributed throughout the course. A list of documents appears in Appendix 4. CATIE's INFORAT also provided participants with a large quantity of documents on request. The teaching materials were not fully utilized by the students during the course since they had little time to read the materials. An error of the course organizers was not to draw sufficient attention to the documents.

2.6 Course Structure

Since few technicians can afford to spend much time away from the job, the course was intensive to diffuse the maximum amount of information in the minimum amount of time. The course lasted 10 1/2 days. The average work sessions were from 7:30 am to 12:00 pm and 1:00 pm to 5:00 pm. Evenings were free. As table 3 indicates, most participants felt the length of the course was adequate, although some felt it could be shortened. The length of the work session was also considered adequate.

Table 3. Course structure

Aspect	Too long	Adequate	Too short
Course length (10 1/2 days)	4	15	0
Daily working session	1	17	0

Many participants felt the need for a longer lunch hour to provide more time for relaxing, jogging, swimming and consulting with CATIE staff during their working hours. A time table of 7:30 am to 11:30 am and 2:00 pm to 6:00 pm was proposed. This suggestion seems practical and should be considered in subsequent courses. Using this time table, classes are not held during the hottest part of the day and students come to the afternoon sessions rested and alert. Many participants would have preferred more free time for individual research and consulting with CATIE staff. Although free time was given during evenings, consultation with CATIE staff was not possible since it was outside of working hours. It was suggested that one of the sessions be held in the evening to free one of the afternoons.

The course organizers attempted to maintain a balanced equilibrium between the amount of classwork and the amount of fieldwork. Many classroom sessions were unavoidable due to special needs such as audiovisual equipment. 43% of the class time was spent in the field. Most students felt the balance was adequate (Table 4). The course organizers also realized that most of the participants already had a strong working knowledge of agroforestry and extensive field experience. Therefore instead of instructing in a oneway didactic manner, instructors tried to generate interaction amongst participants in order to stimulate a greater interchange of ideas and personal experiences. Although most participants found the ratio of formal lectures to group interaction activities well balanced, some thought there were too many lectures (Table 5).

Table 4. Ratio of classwork to fieldwork

Aspect	Too much classwork	Well balanced	too much fieldwork
Classwork compared to fieldwork	4	14	1

Table 5. Ratio of formal lecture to group interaction activities

Aspect	Too many lectures	Well balanced	Too many group activities
Formal lectures compared to group interaction activities	5	14	0

2.7 Course Content

As stated in section 2.2 Course Objectives, the course content dealt heavily with a systems approach to project design, analysis and implementation. Since students worked in a variety of climatic conditions, general methodologies were presented. Although participants were generally quite satisfied with the course content, many made suggestions. Some of these are: "more concentration on worldwide diversity of systems; less on theory and theoretical research which in most cases we do not have time to do in project development" "more concentration in assessment of field conditions and how to assay the situations and develop intervention alternatives" "too much emphasis on coffee production" "more critical in LDCs is food production and CATIE should address agroforestry systems that improve food production on farms of less than 20 hectares" "farming systems research overemphasized" "need more emphasis on extension so agroforestry can be effectively utilized and extended to farmers" "more of a macro-worldwide approach" "more diversity in types of systems looked at and less concentration on 1) coffee, poro and 2) the micro scale" "include visits to dry areas".

2.8 Course Instruction

The instruction of the course was given in a collegial form by 15 instructors. Although the majority of the instructors were CATIE staff members, several instructors from other institutions were involved (Table 6). A list of instructors appears in Appendix 3.

Although funds were available to bring in high-level course consultants (instructors) CATIE chose to use the funds for only one consultant. Experience shows that bringing instructors in from various institutions, particularly outside of Costa Rica, creates a loss of cohesiveness in the course. Course instructors are generally not well informed of the content of other instructors' talk and therefore there is a great duplication, or omission, of material. By using instructors within CATIE, activities can be carefully coordinated.

Since the participants had diverse levels of academic grades, it was difficult to choose a level of instruction. Nevertheless, as Table 7 shows, the level of instruction matched the participants' level.

Table 6. Institutional Affiliation of Instructors

CATIE		
Renewable Natural Resources Department		8
Agroforestry Program	7	
Silviculture Program	1	
Crop Production Department		1
National University		2
International Council for Research in Agroforestry (ICRAF)		1
Consultants		3
TOTAL		15

Table 7. Level of Course Instruction

	very basic				very advanced
Level of instruction	1	2	3	4	5
		(2)	(9)	(4)	(3)

$\bar{X} = 3.3$

The quality of presentations varied considerably from excellent to poor. One participant remarked "lecturers were overall well chosen and made good presentations". While other participants remarked "some speakers were not too dynamic" "little innovativeness was used by many" "public speaking principles were not observed". As Table 8 shows, CATIE should put more emphasis in aiding instructors in developing public speaking skills and teaching techniques.

Table 8. Quality of Presentations

Quality of Presentations	Poor 1	2	3	4	Excellent 5
			(8)	(9)	(1)

$\bar{X} = 3.6$

Some students remarked that they would have liked the objectives of each activity better clarified. This is a valid point and each instructor should emphasize the activity's objective before each session. Nevertheless, many instructors did this and discovered a communication problem. For example, quite a number of participants did not see the objective of the practicum in Puriscal. In reality the objectives were clearly delineated both in an introduction to the practicum and in a handout! The old rule of thumb in teaching is applicable here:

"Tell them what you will tell them,
Tell them,
Tell them what you told them"

One way to eliminate the problem of stating the objective would be to give students an annotated program that not only denotes time/activity/instructor but also a brief description and objective of the activity.

Participants commented that their attention span during formal lectures was quite short. If instruction is going to be presented as a formal lecture there should be a frequent number of breaks or change of pace. One instructor alleviated this successfully during his formal lecture by frequently asking the participants questions. Not only did this keep students more alert, but it also involved them more in the talk.

Course participants suggested implementing several different teaching techniques that were not used during the course. Role playing could have an important use in agroforestry courses. One application would be to illustrate to students the proper questioning techniques that the agroforester should use when interviewing farmers. Instructors could play the roles of agroforester and farmer. The roles could be exagerated to prepare students for all possible reactions during the field visit. Another teaching technique suggested is the "devil's advocate". Since agroforestry is a fairly controversial and opinionated field, a devil's advocate with a viewpoint somewhat different from the mainflow could spark some interesting discussion and interaction.

The language of the course was a slight problem to many instructors. English was the native language of only four of the fifteen instructors. Whereas this was not a great hindrance to the course, it did impede some

instructors from giving smooth, easy to listen to, talks. Several good instructors did not participate, or played reduced roles, because of this language barrier.

The CATIE staff was available for consultation on an individual basis. Although students had little time for consultation, those that did, found the CATIE staff to be cooperative and willing to help them (Table 9).

Table 9. Availability of CATIE Staff

	Not available 1	2	3	4	Very available 5
Was CATIE staff available for consultation and willing to assist?		(2)	(1)	(5)	(9)

$\bar{X} = 4.2$

2.9 Physical Facilities and Resources

The course participants were quite pleased with the physical facilities and resources of CATIE (Table 10). One student remarked "All of CATIE was enjoyable. The bad part was not having enough time to enjoy it fully". The course was held principally at the CATIE campus in Turrialba, although 2 1/2 days were spent visiting areas near Snn Jose. A classroom located in the participants' dormitory was used. Tables were placed in a U-formation. Except for heat and lack of circulation of air, the arrangement was convenient and comfortable. On the fourth day, students were given a check for US$ 150 to day for their meals; this seemed to be adequate. Students were given the option of eating at CATIE's cafeteria or International Club or in Turrialba. Within CATIE, students were allowed to sign their bill and pay just before departure. The only complaint received was the lack of Pilsen beer at the Club and cold beer in the afternoon. While in the field, arrangements were made beforehand at restaurants to ensure rapid and efficient service. Lodging was provided on the CATIE campus in the new European Community Building. Two nights were spent at a hotel in San Jose. All transportation from the time of the students' arrival to departure was provided by CATIE. Participants were met at the airport by CATIE staff and taken directly to CATIE. During the field trips normally two vehicles were used; one a 20-passenger microbus, the other a 10-passenger Suburban.

During their free time, students were able to swim at CATIE's pool, bird watch, hike on the nature trail, jog or enjoy the night life in Turrialba.

Table 10. Physical Facilities and Resources

Conference Room	$\bar{X}$ = 4.2
Library Services	$\bar{X}$ = 4.3
Per-diem Payments	$\bar{X}$ = 4.5
Lodging	
CATIE	$\bar{X}$ = 4.8
San Jose	$\bar{X}$ = 3.9
Food Services	
CATIE	$\bar{X}$ = 4.4
Field	$\bar{X}$ = 4.5
Transportation	$\bar{X}$ = 4.0

2.10 Monitoring and Evaluation

One of the basic purposes of the course was to develop an increased agroforestry training capability at CATIE. Admittedly, CATIE staff are basically researchers and only a few are trained in teaching techniques. Each course is an important learning experience to CATIE staff as they receive feedback that allows them to improve their presentations. A simple activity evaluation form was handed out at the end of each day's session (Appendix 5). These forms provided course organizers with a daily monitoring of the activities.

At the end of the course, the course organizers and participants orally evaluated the course. Immediately afterward a written evaluation form (Appendix 6) was distributed to the students.

2.11 General Comments

The consensus of the participants and the instructors was that the course was a success and a valuable experience both to the participants and CATIE. Some of the participants' remarks were:

"Would rank the course as excellent. It was very instructive, the staff was very capable and I appreciate the opportunity afforded me to attend. I believe that, if possible, agroforestry courses should be continued to be offered by CATIE to AID personnel and I highly recommend it".

"Overall the course was very valuable to me. It served as a good introduction to humid tropical ecosystems and to the possibilities of agroforestry. Given the variety of participants, the technical content was about right ... overall was very positive and worthwhile".

"The project presentations exercise is one in which I have little experience but found it interesting and necessary to know".

"I think the course is excellent for introducing agroforestry to people working in development. Another series of courses should be offered at CATIE and others organized in other countries".

"Give short courses to extension agents in countries associated with CATIE".

3. Analysis of Program

The course consisted of six different modules or thematic areas a. Orientation to CATIE; b. Agroforestry Concepts, Classification and Definitions; c. Farming Systems Research Methodology Applied to Problems of Agroforestry; d. Economic Analysis of Agroforestry Systems; e. Analysis of Alternative Agroforestry Technologies, and f. The Role of Agroforestry in Rural Development.

This analysis is based on activity evaluations that students filled out. The numbers correspond to a numeric evaluation based on the applicability of the information to the students. The scale was based on one being "not useful" and five being "very useful". The course program appears in Appendix 7.

3.1 Orientation to CATIE

Module	(Not evaluated)
Inauguration	(Not evaluated)
What is CATIE	(Not evaluated)
Tour of CATIE	$\bar{X} = 4.3$
INFORAT	$\bar{X} = 3.3$

The first morning of the course was dedicated to orientating students to CATIE's projects, objectives and facilities so they could take full advantage of these during their stay.

Representatives of AID and CATIE spoke at the inauguration. Following the inauguration, each student and instructor identified himself and briefly described his work. A slide-tape show describing CATIE was presented after a coffee break.

A formal lecture on INFORAT (Forestry Information and Documentation Center for Tropical America) was given to introduce the Center to students so they could take full advantage of its services while in CATIE. When asked how they would improve the talk the majority of the students suggested the talk could be condensed. A short 10-15 minute talk drawing attention to the services of

INFORAT would have been sufficient if documents were distributed that explained in more detail the objectives of INFORAT and how students can use it.

Students then boarded a bus to visit CATIE's facilities. The students thought the tour was quite valuable but felt that more time should be dedicated to it. Some suggested that they be given a map of CATIE and agenda of the tour.

3.2 Agroforestry Concepts, Classification and Definitions

Module $\bar{X} = 4.5$

Small group discussion: Agroforestry: Terminology, Concepts and Classification $\bar{X} = 4.0$

Slide show: Agroforestry Systems of the World $\bar{X} = 4.2$

The objective of this module was to stimulate an interchange of ideas on agroforestry concepts to set the base for the proceeding modules and to also illustrate the wide diversity, applicability and adaptability of worldwide systems.

Since most participants already had strong opinions formulated about the concepts of agroforestry, the course organizers decided to eliminate a formal talk which defines agroforestry and instead promote discussion in small groups. Participants were divided in small groups and given a handout with various points to consider. They wrote their ideas on news print which were reviewed with the whole group.

The idea of working in small groups to discuss a relatively complex list of issues was well received. One participant remarked "small group discussion and presentation of findings were an excellent way to get each participant to think about what agroforestry is. It greatly enhanced the usefulness of the slide show which followed".

There are several additional teaching methods that could be used to present this theme. One could be a type of formal debate where two advocates of opposing points of view could address a prepared list of concepts. After a formal address, the debater could address audience responses. Another version would be in the form of a round table where four of five experts give brief introductions to their opinions concerning concepts and definitions and then respond to remarks from the participants.

A slide show illustrating the diversity of worldwide agroforestry systems was presented after the discussion of concepts. Nearly all students found this very valuable. Some suggestions were: "Cover a larger variety of climatic regimes rather than just humid tropics" "a list of names of species mentioned in the presentation would have helped so we wouldn't have to guess at how to spell the names and also to give us a permanent reminder to take home", "use title slides for different sections of the presentation".

Some students were unclear of the show's organization. One way to alleviate this would be to give students an outline of the presentation which shows the order in which the systems are mentioned and the names of the species. Many students found it difficult to watch a long slide show at the end of the day. And many others would have liked more time for discussion. Perhaps the show could be better presented and received in the evening in a informal setting and with refreshments. With this arrangement more time and discussion could be spent on the presentation.

3.3 Farming Systems Research (FSR) Methodology Applied to Problems of Agroforestry

Module	$\bar{X} = 4.3$
Conceptual Bases for the Application of FSR Methodology to Agroforestry	$\bar{X} = 3.5$
Agroforestry- A Production Agroecosystem of the Small Farm (a Diagramatic Description)	$\bar{X} = 3.0$
Characterization of Areas for FSR: The Case of Agroforestry in Honduras	$\bar{X} = 3.0$
Validation of Technologies: Evaluating the Appropriateness of Alternative Technologies	$\bar{X} = 3.5$
FSR Field Exercise	$\bar{X} = 4.3$
Introduction to ICRAF's Diagnosis and Design Methodology	$\bar{X} = 3.8$
Elaboration of FSR Work Plans	$\bar{X} = 4.3$

This module was divided into three parts: day one provided the theoretical bases of farming systems research; day two involved a field exercise where students visited small farmers; and on day three students elaborated a work plan based on their own agroforestry projects or hypothetical projects. The objectives of the module were:

1) introduce basic concepts of FSR methodology; 2) demonstrate the relationship of FSR to agroforestry; 3) prepare course participants to use FSR techniques in the own projects.

During day one of the module (25 April), a series of formal talks were given to provide a theoretical base for the rest of the module as well as the course. Many participants suggested ways to improve the presentation of this information. Some suggested that the papers be handed out to be read before the class and then discussed in small groups. Others suggested that the overhead transparencies used should be greatly simplified and that slides could be used to better illustrate some concepts. Another suggestion was to use case studies of development work.

On day two of the module (26 April), students broke into six groups of four students and visited small farmers in the La Suiza area near Turrialba. Each group spent a half-day with a farmer in order to characterize his farm. The exercise was based on the previous day's discussions on the farming systems approach to agroforestry research and development. The objectives of the exercise were to:

- familiarize participants with small farms in one area of Costa Rica
- expose participants to the difficulties of obtaining information from farmers
- emphasize the value of the farming systems approach to farm description and analysis
- to provide the basis for discussion of agroforestry's role in rural development and land use management

In the afternoon, students returned to the classroom to analyze their information and present their findings. As the evaluation note indicates, students found the visit and the presentations very useful. Some students thought some information was lacking such as "clarity in expectations for presentations" "some knowledge of alternative technologies", "some background data concerning crops, practices, climate, etc. characteristic of the area" "a preliminary tour of a representative area to acquaint us with the type of agriculture common to the study area" "more time" "a second visit to the same farmer" "a written guide that states the objectives of the exercise and steps to take along the way".

Some students suggested doing the phase later in the course after a background of alternative technologies had been presented. One student summed up the feelings of many students after day two of the module by writing "overall the farm systems work was an interesting and well planned series of activities. The second day's farm visit and presentations, redeemed the presentations of the first day. I come away from the two days with many ideas which I can apply to improve the field work I am doing".

On the morning of the third day of the module (3 May) students again worked in groups and prepared a project work plan based on FSR methodology. The objective of this activity was to tie together the variety of systems students had seen and give them a framework for integrating these into their own projects. In the afternoon the groups presented their plans. Students' comments were: "we should repeat this two or three times" "this exercise was excellent in pulling together all the lectures on FSR. It was good to have a directed small group exercise pulling in our individual experiences. Incorporate more such exercises throughout the course", the activity was "challenging" and "thought - provoking" "the presentations and group sessions were very interesting" "very productive in terms of participant involvement" "the activity should be deleted. It was mostly mental masturbation" "I liked the idea of a theoretical project" "I think we (Haiti) came up with a good plan for incorporating FSR in our extension program ".

3.4 Economic Analysis of Agroforestry Systems

Module	$\bar{X} = 4.0$
Introduction to Economic Analysis of Agroforestry Systems	$\bar{X} = 3.9$
Economic Data Taking and Practical Analysis in Agroforestry Systems	$\bar{X} = 3.5$
Practical Exercise "Monitoring and Classification of Economic Data"	$\bar{X} = 3.0$
The Use of Microcomputers in Agroforestry Systems Analysis with Emphasis on MULBUD	$\bar{X} = 3.3$

The economic module consisted of three formal lectures and a practical exercise presented on the morning of 27 April. Participant responses to each presentation were: Introduction to Economic Analysis "I've had all the theory before, but not applied in this fashion, so I enjoyed it" "should have section on how to incorporate 'economics' of landless in project design" the presentation was "very effective" and "had a good pace with good changes of style of presentation (acetates, slides, talk)" "example of actual application of the techniques for evaluating potential of Leucaena alley cropping was well presented and very useful" "excellent presentation"; Economic Techniques "presentation of the forms was interesting and useful" "include more group discussion and less charts" "probably will be more useful in the future, i.e. its a good source of information to hold on to", Economic Exercise "supply us with projected prices, yields, etc. from the tree crop so we could complete an analysis of the potential rentability of the practice" "busywork" "some information needed to be clarified, e.g. was farmer's time to be charged at all times?"; Microcomputers "I've worked a good deal with microcomputers, but the MULBUD software was new and looks like it has good potential" "could use an agroforestry model example rather than mono-crop" "would have liked to have seen results of comparing several alternative land uses using the program" "needs more information on availability of software, etc". "MULBUD not compatible with USAID Wang System"

3.5 Analysis of Alternative Agroforestry Technologies

Module	$\bar{X} = 4.4$
Shade Tree-Crop Interactions	$\bar{X} = 4.1$
Pasture Systems	$\bar{X} = 4.0$
Taungya System	$\bar{X} = 4.3$
Field trips (Lowlands)	$\bar{X} = 4.3$
Field trips (Highlands)	$\bar{X} = 4.4$
Practical Exercise: Determination of Biomass in Live Fence Posts	$\bar{X} = 4.2$
Practical Exercise: Characterization of Coffee Plantations with Shade	$\bar{X} = 4.5$

The objectives of this module were 1) to present examples of various alternative technologies and techniques; 2) to assess the possibilities of transfering them to analogous regions; 3) to expose the difficulties of agroforestry research at the "farm field" level.

The module was introduced by two formal talks which stressed the biological foundations of two types of systems and also provided the base for the field trips. In the shade tree system talk, the advantages and disadvantages of associating shade trees in plantings of perennial crops such as cocoa, coffee and tea was discussed. Students' remarks to the presentation were: "excellent presentation ... the examples added a lot to the discussion" "discussion in small groups would have been more stimulating" "the species mentioned are not too suitable at home, but the principles are great" "use slides to illustrate systems" "the presentation was very effective - he had a wealth of examples" "use more of a variety of species" "this is the most substantive and most effectively presented lecture to date".

In the pasture systems talk the potential benefits derived from animal production systems that used trees were discussed. The students commented "cite results of controlled experiments comparing pastures with and without trees" "include more information on spacing and planting configurations" "perhaps use slides" "this was one of the most down-to-earth presentations so far" "he involved the participants more than any other lecturer".

A brief, formal talk on the Taungya system was given. Regarding the content, the participants remarked "more elaboration on legal aspects" "more information on actual layout; techniques; etc." "pleased to hear the derivation and definition of the term". Regarding the presentation many participants felt the use of slides would reinforce and strengthen the talk.

A number of field trips were conducted. On one day participants visited plots where local traditional agroforestry systems are studied. One visit was to a coffee plantation using Erythrina and Cordia as shade trees and the other visit was to a pasture using Psidium guajava. Within the CATIE grounds an additional four plots were visited to see studies of a) the effects of Erythrina on coffee production and king grass; b) the determination of the biomass and accumulation of nutritive elements in coffee, cacao and pasture associations shaded by C. alliodora and E. poeppigina; and c) the ability of leguminous trees to maintain yields and supply nitrogen in an annual cropping system.

On the following day several sites in the lowlands were visited which included a visit to the Celulosa wood chipping plant to discuss the possibilities for small scale wood production as part of an agroforestry system, a visit to a managed secondary forest, a visit and a practicum on live fence posts; and a look at a cacao plantation using Cordia alliodora as a shade tree.

Two additional field visits were conducted in the highlands; one to see a pasture together with Alnus acuminata, a local timber species; and another to visit a farm using Cupressus lusitanica as windbreaks for a dairy pasture.

As in most short courses, the field trips were the activities best received by the students. Although the educational value of the field trips

is not doubted, their effectiveness is. In many of the field visits information was orally presented while participants stood in the hot sun and looked at a distance at the plot. This type of presentation could be given in the classroom using slides and at a great savings of time and money. Nevertheless, experience shows that this method is not effective either! Therefore field trips should be greatly strengthened by having more of a "hands on" look at the sites. This was attempted in the live fence post practicum. Rather than just showing students the live fence posts (which could have been done in the classroom with slides) and stating their potential biomass, the course organizers had students personally calculate the biomass. Not only was this practicum successful in describing live fence posts, but also in introducing a technique for determination of biomass. This type of "hands on" practicum is of great value as students "learn while doing" and is information that remains with students longer than information told to them. Another suggestion to improve field trips is to give a one-page handout with concise factual information on the site being visited. These should be handed out previous to the visit so students can review them and formulate questions before seeing the site.

For one full day, participants worked on a practicum in Puriscal to characterize coffee plantations with shade trees. The students were divided into four groups of six people. In the morning each group made a reconnaissance of the plantation and then made a number of measurements. In the afternoon, they analyzed their information and presented it to the group. The students remarked "it was a good chance to do some field measurements and work off of them afterwards" "the practical was a very good process to go through, very instructive" "would there be any useful function by measuring light intensity below various shade covers with a photometer? e.g. cedrela's shadow would be much less intense than mango's, although the overall area of a large cedrela would be larger than that of the mango. Would this information have any practical significance?"

3.6 The Role of Agroforestry in Rural Development

Module	$\bar{X} = 3.0$
Has Agroforestry Played its Role in Rural Development	$\bar{X} = 3.3$
The Role of Rural Extension in Latin America: The Case of Costa Rica	$\bar{X} = 2.4$

Before the course began, many AID missions expressed interest in including sessions on extension. Although CATIE is not an extension agency and is admittedly weak in the field, consultants were brought into the course. The module was presented in two formal talks. Concerning the Rural Development talk, participants said "it was interesting and positive to have another Costa Rican viewpoint on forestry" "perhaps the information could be better presented through a panel discussion" "include more scientific objectivity in the talk" "the presentation created a very stimulating discussion". Regarding the Extension talk, participants remarked "include recommendations, on how to improve extension or what the ideal should be" "try a round table discussion on why extension programs do not work very well and what AID and others can do to fix them".

APPENDIX 1

DIRECT TELEPHONE: 56-60-21

RNR-720
5 March, 1984

Dear

It is our pleasure to inform you that you have been selected as a participant for the 4th Agroforestry Short Course to be held at CATIE from 24 April to 4 May 1984.

... Enclosed you will find a tentative program and general information about CATIE.

Since the majority of the participants are professionals working in agroforestry projects, we have designed the course so there is a maximum of interaction among participants and work in small groups. We have left a considerable amount of free time so participants can consult the resources in CATIE for working on their specific needs and interests. As the program indicates we would like participants to share their ideas and experiences in the agroforestry field. If you have a topic or project which you could present that fits into the basic themes as outlined in the program, please contact us immediately so we can include your presentation in the program.

It is essential that you confirm your participation in the course by phone, cable or telex before 23 March. The course is limited to 24 participants. If for some unfortunate reason you are not able to attend, this would allow us to award the scholarship offered by AID to another candidate.

We will spend some time in the field. Bring appropriate clothing such as boots, work clothes, rain gear and a hat. Also come prepared for cool weather (15°C) which we may encounter in the mountains.

All in-country expenses (food, lodging and transportation) will be paid for by CATIE. Participants are responsible for providing their own transportation to San Jose, Costa Rica. You should plan to arrive at CATIE no later than Monday, 23 April. It is essential that you send a cable or telex (N° 8005) to the course coordinator in CATIE indicating your arrival information.

RNR-720

Since the week before the course in Easter, make sure that this information arrives in CATIE no later than Wednesday 18 April. With this information we will send a vehicle to meet you at the airport and bring you to CATIE (70 kilometers).

If you are unable to inform CATIE of your arrival, you can travel by bus and taxi to the Center. From the airport take a taxi to the Turrialba bus stop in San Jose. Buses leave for Turrialba hourly on the hour. Upon arriving in Turrialba take another taxi to CATIE.

Once in CATIE, go directly to the principal building (see map) where you will find the key to your room. Further information will await you there.

We look forward to meeting you.

With regards,

Gerardo Budowski
Course Director

Michael Major
Course Coordinator

Enclosure: As indicated

APPENDIX 2

LIST OF PARTICIPANTS

	INSTITUTION ADDRESS	PERSONAL ADDRESS
HAITI	James Talbot USAID/Port-au-Prince Washington, D.C. 20520 USA	Boite postale 1634 c/o Ambassade Americaine Port-au-Prince Haiti
	Thomas E. Greathouse Forestry Advisor USAID Agroforestry Project USAID/Haiti Washington D.C. 20523 USA	Same
	Glenn Smucker Fondation Pan Americaine de Développement Project Agrosylvicole d'Haiti BP 15574 Pétionville, Haiti	Same
	Wendy King c/o USAID/Haiti - Agroforestry Department of State Washington D.C. 20523 USA	c/o John King 50 Sutton Place South Apt. 10-C New York City, NY 10022 USA
	Daniel David Stephens Fondation CARE BP 773 Port-au-Prince, Haiti	326 Canon Drive Santa Barbara, CA 93105 USA
	E. Paul Campbell Fondation CARE BP 773 Port-au-Prince, Haiti	12175 Ave. North Nashville, Tennesse 37208 USA
	Marcia McKenna Fondation CARE BP 773 Port-au-Prince, Haiti	50 Walton Dr. Synder, NY 14226 USA

	INSTITUTION ADDRESS	PERSONAL ADDRESS
DOMINICAN REPUBLIC	Grant W. Thomas Apartado 221 San Jose de Ocoa Republica Dominicana	1084 Old Nicholasville, KY 40356 USA
MEXICO	Miguel Angel López López Colegio de Postgraduados Programa Forestal Chapingo, Mexico, Cod. 56230	Francisco Villa #55 Chapingo, Mexico
	Santiago Daniel Sánchea Avila Colegio de Postgraduados Programa Forestal Chapingo, Mexico, Cod. 56230	Texcoco, Edo. de Mexico Palmas 69
HONDURAS	Mark M. Dripchak CARE Apartado Postal 729 Tegucigalpa, D.C. Honduras	Apartado Postal 188 Choluteca, Choluteca (or) 4 Standish St. Enfield, CT 06082 USA
	Richard T.A. Ince Vermont-Honduras Partners Project P.O. Box 36 E. Calais, VT USA	285 North St. Burlington, VT 05401 USA
ECUADOR	Peter Arnold USAID a/c Embajada Americana Quito Ecuador	Principal Forestry Advisor Proyecto PROFAF/AID Quito/AID Department of State Washington D.C. 20523
	Fernando Montenegro Panamericana Sur km 9 y Morán Valverde P.O. Box 150 Quito, Ecuador	Vasco de Contreras 706 y Mañosca Sector 28 - Quito Ecuador
PERU	William Deese AID - LAC/DR/EST Rm. 2252 New State Washington, D.C. 20523 USA	5203 Duke St. Unit 101 Alexandria, VA 22304 USA

	INSTITUTION ADDRESS	PERSONAL ADDRESS
PERU	David L. Faulkner c/o USAID LAC/DR Room 2253A N.S. Washington, D.C. 20523 USA	1761 N. Troy St. #441 Arlington, VA 22201 USA
BOLIVIA	John A. Fasullo USAID/Bolivia APO Miami 34032 USA	Same
USAID/ Washington	Kathleen McNamara Asia Regional Forestry Advisor USAID/ASIA/TR/EFE M53311 Washington, D.C. 20523 USA	4395 Embassy Park Dr. N.W. Washington D.C. 20016 USA
	John Edward Palmer Forestry Support Program USDA, Forest Service Room 606 A RP-E P.O. Box 2417 Washington, D.C. 20013 USA	2703 Farnsworth Dr. Alexandria, VA 22303 USA
	Jeffrey Goodson AF/TR/SDP USAID 2480, New State Washington, D.C. 20523 USA	507 N. Roosevelt Blvd. #C-319 Falls Church, VA 22044 USA

LIST OF OBSERVERS

Angelika Marmillod Proyecto Agroforestal CATIE-GTZ Turrialba, Costa Rica	c/o CATIE Apartado 68 Turrialba, Costa Rica
Frédérik Bauer Programm Chinorbe Apartado 229 Chinandega, Nicaragua	Apartado 141 Chinandega Nicaragua

APPENDIX 3

LIST OF INSTRUCTORS

Gerardo Budowski, Ph.D.
Head, Department of Renewable Natural Resources
Course Director
CATIE

John Beer, M.S.
Agroforestry Researcher
German Agency for Technical Cooperation (GTZ) Project
CATIE

Rolain Borel, Dr. Sc. Tech.
Head, Agroforestry Program
CATIE

Manuel González, Ing. For.
Forester
Head, Forest Sector
Finca Las Esmeraldas
Course Consultant

Jorge Hernández, B.S.
Forester
Course Consultant

Jochen Heuveldop, Dr. Rer. Nat.
Head, German Agency for Technical Cooperation (GTZ) Project
CATIE

Dirk Hoekstra, M.S.
Farm Economist
International Council for Research in Agroforestry (ICRAF)
Nairobi

Jeffrey Jones, Ph.D.
Sociologist/Anthropologist
Course Consultant

Donald Kass, Ph.D.
Soil Management Specialist
CATIE

Norman Price, M.E.S.
Resident Scientist
CATIE

Carlos E. Reiche, M.S.
Natural Resource Economist
Firewood Project
CATIE

Fernando Rivera, Ing. Agr.
Agricultural Extensionist
Professor, Faculty of Land and Sea Sciences
National University, Costa Rica
Course Consultant

Sylvia Rodríguez, M.S.
Professor of Rural Sociology
School of Environmental Sciences
National University, Costa Rica
Course Consultant

Ricardo Russo, M.S.
Coordinator a.i.
Erythrina Project
CATIE

Eduardo Somarriba, M.S.
United Nations University Agroforestry Project, Coordinator
CATIE

APPENDIX 4

Upon arriving to CATIE each student received a 3-ring looseleaf notebook containing documents that could be used as supplements to the course's activities. During the course additional documents were distributed. Students also were given a tourist information kit to Costa Rica and two books, Tropical Agroforestry: A Bibliography and Summary of M.S. Theses in Renewable Natural Resources in CATIE. The publications distributed are listed below as they correspond to the different modules of the Course.

Module 1: Introduction to CATIE

- General Information to Visitors to CATIE
- What is CATIE
- International Cooperation and CATIE
- Roster of Personel of the Renewable Natural Resources Department

Module 2: Agroforestry Concepts, Classification and Definitions

BUDOWSKI, G. Applicability of Agroforestry Systems.

COMBE, J. and BUDOWSKI, G. Classification of Agroforestry Techniques.

BUDOWSKI, G. National, Bilateral and Multilateral Agroforestry Projects in Central and South America.

Module 3: Farming Systems Research Methodology

PRICE, N. Criteria for Evaluating Agroforestry Technology.

ROCKENBACH, O. Biosocioeconomic Analysis of the Forestry Component of an Agroforestry operation in the Area of Turrialba, Costa Rica.

JONES, J. Conceptual Bases for Applying Farming Systems Methodology in Agroforestry Sustems.

JONES, J. Evaluation of Farmer Goal and Project Goal Compatability: Validation, Notional Technologies, and Technology Evaluation.

ICRAF. Guidelines for Agroforestry Diagnosis and Design (Working Paper Number 6).

Module 4: Economic Analysis of Agroforestry Systems

HOEKSTRA, D. Economic Appraisal of Agroforestry Systems/Technologies (DRAFT).

HOEKSTRA, D. Choosing the Discount Rate for Analysing Agroforestry Systems/Technologies from a Farmer's Point of View.

REICHE, C. Economic Data Taking and Practical Analysis in Agroforestry Systems.

REICHE, C. Practical Exercise: The Use of Records for Production Costs and Classification Applied to an Agroforestry System.

Module 5: Analysis of Alternative Agroforestry Technologies

BUDOWSKI, G. Quantification of Current Agroforestry Practices and Controlled Research Plots in Costa Rica.

BUDOWSKI, G. Testing Various Agroforestry Hypothesis; Research Undertaken in the American Humid Tropics.

BUDOWSKI, G. Summary of Forestry Research Projects Carried Out at CATIE.

BUDOWSKI, G. Agro-forestry in the Humid Tropics: A Programme of Work.

BEER, J. Cordia alliodora with Theobroma cacao.

BEER, J. Alnus acuminata with Pasture.

FOURNIER, L. Alder Crops (Alnus jorullensis) in Coffee Plantations: Costa Rica.

PRICE, N. The Tropical Mixed Garden: An Agroforestry Component of the Small Farm.

BELIARD, C.A. and MORA, E. Preliminary Fresh Weight Tables for Gliricidia sepium branches of live fence posts.

PALMER, J. Notes on a Legal Contract for Participation in a Taungya Scheme.

Module 6: The Role of Agroforestry in Rural Development

RODRIGUEZ, S. Rural Development: A Challenge for Agroforestry

RIVERA, F. Rural Extension Programs in Costa Rica.

APPENDIX 5

ACTIVITY EVALUATION

Title of Activity _____

CONTENT

1. Was the information presented useful to you? 1 2 3 4 5
   not useful ---- very useful

2. Is there any information you would eliminate? _____

3. Was any information lacking?

PRESENTATION

1. Was the type of presentation (e.g. formal talk, directed discussion, practical) effective in communicating the major ideas of the theme?

2. Could the information be presented better in another manner?

COMMENTS

1. Do you have any other suggestions for ways to improve the activity?

APPENDIX 6

COURSE EVALUATION

One of the purposes of the CATIE/AID contract to offer a series of agroforestry short courses is to improve CATIE's capabilities for providing future training activities in agroforestry. In order to improve each subsequent course, careful evaluation must be carried out. Evaluation provides insights and guidelines for future courses by determining whether the course achieved its objectives. We greatly value your comments and suggestions.

Section 1. Pre-course arrangements

1.1 When did you first hear about this course | month/year |

1.2 How did you find out about the course (telex, personal communication, etc)? _____

_____

1.3 Did you receive the pre-course information before coming to CATIE? | Yes | No |

1.4 What additional information would you liked to have received before the start of the course? _____

_____

_____

1.5 Suggest any pre-course improvements. _____

_____

_____

_____

Section 2. Course Structure

Since few technicians can afford to spend much time away from the job, the course was intensive in order to include the maximum amount of information in the shortest period of time. The course was also structured to allow a maximum amount of interchange amongst the participants and instructors since the majority of the participants had a strong working knowledge of agroforestry and field experience. Based on this structural format, please answer the following:

	Too long	adequate	too short	Optimal length
2.1 Course length (11 days)				_____ days
2.2 Daily working sessions (7:30 am to 5:00 pm)				_____ hrs/day
2.3 Free time				_____ hrs/day

	too much classwork	well balanced	too much fieldwork	
2.4 Amount of classwork compared to fieldwork				

	too many lectures	well balanced	too many group interaction activities
2.5 Amount of formal lectures compared to group interaction activities			

2.6 Please suggest any course structure improvements _____

Section 3. Course Content

Disregarding the type and quality of the presentation, please mark the applicability of the following modules to your working conditions.

	Not applicable ⟶ very applicable				
3.1 Introduction to Agroforestry	1	2	3	4	5
3.2 Farming Systems Research Methodology Applied to Problems of Agroforestry (25, 26 April; 3 May)	1	2	3	4	5
3.3 Economic Analysis of Agroforestry Systems (27 April)	1	2	3	4	5
3.4 Description of Specific Agroforestry Systems (27 April, classroom; 28, 29, 30 April, 2 May, field visits; 1 May Puriscal practical)	1	2	3	4	5
3.5 The Role of Extension and Rural Development in Agroforestry (30 April, 2 May)	1	2	3	4	5

3.6 Please suggest any course content improvements (e.g. eliminate emphasis on one module, add additional modules

Section 4. Course Instruction

4.1 Based on your previous background in agroforestry, how would you rank the level of instruction?

1 2 3 4 5
very basic ——→ very advanced

4.2 What is your overall opinion of the quality of the presentations?

1 2 3 4 5
poor ——→ excellent

Comments? _____

_____

_____

_____

4.3 Did you find the CATIE staff available for consultation and willing to assist you?

1 2 3 4 5
not available ——→ very available

Section 5. Participants

Twenty participants representing various disciples and working in a variety of environmental conditions participated in the group. Please comment on the following.

5.1 Size of Group

1 2 3 4 5
too small ——→ too large

Optimal size? _____ people

5.2 Many disciplines were represented among the participants. Did you find this disadvantageous or advantageous?

1 2 3 4 5
disadvantageous ——→ advantageous

Section 6. Physical Resources and Facilities

1 2 3 4 5
not adequate ——→ very adequate

6.1 Conference Room 1 2 3 4 5

6.2 Library Services 1 2 3 4 5

6.3 Per-diem payments 1 2 3 4 5

6.4 Lodging

6.4.1 CATIE 1 2 3 4 5
6.4.2 San José 1 2 3 4 5

6.5 Food Services

6.5.1 CATIE 1 2 3 4 5
6.5.2 Field (Siquirres, Puriscal) 1 2 3 4 5

6.6 Transportation in Field trips 1 2 3 4 5

6.7 Comments and Suggestions.

_____

_____

_____

Section 7. General Comments

Please note any further comments you have as well as recommendations for future short courses.

_____

_____

_____

APPENDIX 7

COURSE PROGRAM

Monday 23	Arrival of participants to CATIE
Tuesday 24	
7:30	INAUGURATION (R. Tarté, D. Joslyn, R. Borel, G. Budowski)
8:15	Introduction of participants
8:30	COFFEE BREAK
8:45	What is CATIE
9:00	INFORAT
10:15	Course logistics
10:30	Tour of CATIE
12:00	LUNCH
1:00	Course Objectives and Overview (M. Major, G. Budowski)
1:30	Small group discussion "Agroforestry: Terminology, Concepts and Classification (G. Budowski)
3.15	COFFEE BREAK
3:30	Slide show "Agroforestry Systems of the World" (G. Budowski)
7:30	RECEPTION (International Club)

...

Wednesday 25

7:30	Introduction to Farming Systems Research (FSR) exercises. Participant expositions of their own FSR experience. (J. Jones, N. Price)
8:30	Conceptual Bases for the Application of FSR Methodology to Agroforestry. (J. Jones)
9:30	COFFEE BREAK
9:45	Agroforestry - A Production Agroecosystem of the Small Farm (A diagramatic description). (N. Price)
10:45	Characterization of Areas for FSR Research - The Case of Agroforestry in Honduras (J. Jones)
11:45	LUNCH
1:00	Introduction to Exercise: Agroforestry in Rural Development (S. Rodríguez)
1:30	Validation of Technologies - Evaluating the Appropriateness of Alternative Technologies. (J. Jones)
2:45	Organization of working groups for field exercises.
3:15	COFFEE BREAK
3:30	Interactive group process - Project Elaboration and Job Descriptions for FSR Projects.

Thursday 26

7:30	Farm Systems Field Exercise (in field interviewing farmers).
1:00	Farm Systems Field Exercise (in classroom analyzing data).

...

Friday 27

7:30	Introduction to Economic Analysis of AF Systems. (D. Hoekstra)
9:00	COFFEE BREAK
9:15	Techniques for Obtaining and Analyzing Economic Data. (C.E. Reiche)
9:45	Practical Exercise "Monitoring and Classification of Economic Data". (C. Reiche)
10:30	The Use of Microcomputers in Agroforestry System Analysis with Emphasis on MULBUD. (D. Hoekstra)
12:00	LUNCH
1:30	Shade Trees - Crop Interactions. (J. Beer)
3:15	COFFEE BREAK
3:30	Pasture Systems. (R. Borel)

Saturday 28

7:30	Field Trip to La Suiza. (E. Somarriba, J. Beer, R. Russo)
12:00	LUNCH - CATIE
1:00	Tour of Experiments in CATIE (La Montaña) (R. Borel, D. Kass, J. Heuveldop)
3:30	The Taungya System. (G. Budowski)

Sunday 29

Morning and afternoon — Field trips to:

- Celulosa: Taungya system and small indutry development
- Siquirres: Managed secondary forest
- Madre de Dios: Laurel with cacao
- Guapiles: Living fence posts (G. Budowski)

...

Monday 30

7:30	Travel to San Jose
9:00	Field trip to San Ramon de Tres Rios: Alders with cattle.
10:00	Has Agroforestry Played its Role in Rural Development? (S. Rodriguez)
11:00	Introduction to ICRAF's Diagnosis and Design Methodology. (D. Hoekstra)
12:30	LU CH
2:00	FREE TIME
	Lodging in San Jose

Tuesday 1 May

Morning and afternoon	- Practical exercise in Puriscal "Characterization of coffee plantations with shade". (J. Beer, G. Budowski, R. Borel, J. Heuveldop)
Evening	- Lodging in San Jose

Wednesday 2

Morning	- Field trip to San Jose de La Montaña: Windbreaks
2:00	The Role of Rural Extension in Latin America: The Case of Costa Rica (F. Rivera)
3:00	Participant Presentations

Thursday 3

7:00	Elaboration of Farming Systems Research Work Plans (J. Jones, N. Price)
	1. Personnel 2. Characterization 3. Notional Technologies 4. Experimentation 5. Validation
1:00	Presentation of Work Plans

...

Friday 4

9:30	Open Discussion "Training Needs in Agroforestry". (M. Major)
10:00	Course Evaluation
11:00	CLOSING (R. Tarte, H. Tschinkel, P. Campbell, G. Budowski)
11:30	FAREWELL LUNCH