

SANREM CRSP
LAG-4198-A-00-2017-00
QUARTERLY REPORT
First Quarter, Year Two
1 August 1993 to 31 October 1993

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I. SUMMARY

Introduction:

The first quarter of the second year of the program (1 August 1993 to 31 October 1993) has been extremely productive and the project has met all planned objectives for the quarter.

Accomplishments:

The major activities and accomplishments for this reporting period include the following:

- ▶ Finalized Frame Work Plan and call for responses to the Invitation to Work in the Philippines
- ▶ Signed Memorandum of Understanding with Philippines Subcontractor - Heifer Project International/Philippines
- ▶ Initiated the Philippines Priming Activity
- ▶ Shipped of Weather Stations to the Philippines Site
- ▶ Hosted Board of Directors and Technical Committee Meeting
- ▶ Reviewed Literature in Preparation for Honduras and Ecuador Site Activities
- ▶ Made Follow up Trip to Formulate Plan of Action in Honduras
- ▶ Made Follow up Trip to Morocco to Identify Collaborators and Key Issues to be Addressed
- ▶ Hosted Education Working Group Meeting
- ▶ Participated in Tuskegee University SANREM CRSP Discussion and Meeting on Administrative Matters.
- ▶ Participated in the Annual Meeting of the Center for PVO/University Collaboration in Development
- ▶ Participated in the Annual Meeting of the Association for Women in Development.
- ▶ Participated in Training Program for Chinese Financial Management Personnel from the Ministry of Finance at the Center for PVO/University Collaboration in Development.

- ▶ Published and Distributed Ecolinks
- ▶ Established of SANREM CRSP Library for SANREM Collaborators located at the Site of the Management Entity
- ▶ Published and Distributed the General Brochure for the SANREM CRSP

Funding Status:

- ▶ Funds expended during the first quarter, second year were \$278,608.23.

Planned Activities for the Subsequent Quarter:

- ▶ Drafting of Frame Work Plan for the Burkina Faso site by the National Coordinating Committee
- ▶ Hold Philippines Roundtable for integration of Philippines Work Plans for Second Phase Implementation.
- ▶ Participation in the American Society of Agronomy Meetings
- ▶ Initiation of Soil Survey Activities at the Philippines Site
- ▶ Initiation of Weather Station Activities at the Philippines Site
- ▶ Hold SANREM CRSP Training Workshop, Virginia Polytechnic and State University.
- ▶ Host Indicators of Sustainability Working Group Meeting
- ▶ Put in Place - Site Coordinator, Philippines Site
- ▶ Make Follow-up Trip to Morocco to identify areas of interest to be pursued by AID/Rabat and National Programs with SANREM.

II. Detailed Accomplishments - Planned versus Actual

Planned Accomplishments:

The Scope of Work for the First Quarter of the Year Two was to include the following:

- ▶ Finalization of Frame Work Plan and call for responses to the Invitation to Work in the Philippines

- ▶ Signing of Memorandum of Understanding with Philippines Subcontractor - Heifer Project International/Philippines
- ▶ Shipment of Weather Stations to the Philippines site
- ▶ Hold Board of Directors and Technical Committee Meeting
- ▶ Review of Literature for the Ecuador Site
- ▶ Drafting of Frame Work Plan for the Burkina Faso site by the National Coordinating Committee

Actual Accomplishments:

- ▶ **Finalization of Frame Work Plan and call for responses to the Invitation to Work in the Philippines**

The Frame Work Plan for the Philippines developed by a writing team from the Philippines and non-Philippine collaborators was reviewed, edited, and approved by the Philippine National Coordinating Committee and the Global Technical Committee prior to distribution to program collaborators.

The Frame Work Plan provides both an outline of the priority research issues for the SANREM CRSP/Philippines and the basis for the development of research programs to address the issues of soil and water quality and quantity, biodiversity, deforestation and forestation, process documentation and land, labor and tenure in the Manupali watershed. In this document, research activities for each focal issue are subdivided into database or characterization studies, action oriented programs, human resource development activities, and assessments of indicators of sustainability.

In mid-August, the Frame Work Plan and Invitation to Work were sent to program collaborators in the Philippines and US. These documents served as the basis for the development of work plans for research to be conducted in the Philippines. The Invitation to Work provided collaborators with guidelines for work plan preparation. It also specified landscape and lifescape characterization as the priority issue to be addressed during the first funding cycle.

By the October 27 deadline, twenty-two work plans were submitted in response to the Invitation to Work. These work plans were being distributed to members of PNCC and the GTC for initial review. Formal review and integration of these work plans will occur during a round table review session to be held on December 1-3 in Los Baños. This meeting will be attended by members of the PNCC, outside reviewers from each of the priority areas, five members of the GTC - Bill Hargrove, Constance Neely, Bill Deutsch, and Bob Rhoades, David Midmore, and selected work plan representatives.

Finalized work plans are currently scheduled for submission and review during the month of January. This schedule will allow for research activities to be initiated by March or April, in time for the onset of the first planting season. **The Frame Work Plan and the Invitation to Work can be found as Attachment A.**

▶ **Sign Memorandum of Understanding with Philippines Subcontractor - Heifer Project International/Philippines**

Jim Orprecio, Heifer Project International/Philippines, visited the SANREM CRSP office at the University of Georgia during the week of August 2-6. Heifer Project International/Philippines will contract with the University of Georgia and be the responsible party for the subcontracting and communications linkages for the SANREM CRSP/Philippines. Jim Orprecio, the Country Director, spent three days at the Georgia Station to discuss the logistical linkages to proceed with subcontracts within the Philippines.

▶ **Initiation of the Philippines Priming Activity, October, 1993**

The active involvement of community members and local collaborators in the development of the research agenda for SANREM will enhance the appropriateness and effectiveness of this program. However, the time involved in participatory methodologies can result in a delay in the initiation of on-site program activities. The Priming Program is designed to effectively utilize the time between the finalization of the Frame Work Plan and the onset of the major SANREM work plans in order to stimulate and maintain community interest in SANREM CRSP research activities.

Initiated in mid-September, this five month program is coordinated by Heifer Project International (HPI) in partnership with Network for Environmental Concerns (NECI) and San Hermanigildo Agro-Industrial School, Inc. (SHAISI). The strong development background of these three organizations provide them with an ideal position to undertake this crucial introductory program. HPI has an established record for identifying real organizations to work with in conjunction with programs that provide community members with immediate, positive benefits. NECI and its network organizations are recognized throughout Mindanao for their unique combination of sensitive community integration/organizing and technical resource assessment capabilities. SHAISI, based in Alanib, Lantapan, has served as a center of community organizing and trainings in regenerative agricultural practice within the Manupali watershed for over six years.

The community-participatory (CO-PAR) approach to community development forms the basis for program implementation. This approach is used to facilitate the strengthening of existing community groups while enhancing their awareness of sustainable and regenerative agricultural practices. Specific program activities included a three day training, conducted on October 24-26. This training was attended by 38 members of community-based groups and included dialogues on the root causes of poverty; trainings

on low-cost and sustainable agricultural, agroforestry, and animal husbandry practices; and discussions on the impacts of resource-use practices across the landscape. In November, program participants will undertake cross-farm visits to the Mindanao Baptist Rural Life Center, an agricultural and agroforestry demonstration and training farm, as well as to various community-based and farmer-managed alternative agriculture programs. Following trainings and discussions on sustainable agriculture practices, the program will assist participants in implementing the practices of their choice.

▶ **Shipment of Weather Stations to the Philippines Site**

Five Weather Stations were shipped to Lantapan, Mindanao, Philippines. These weather stations are to be placed through out the landscape of the Philippines site to measure precipitation, evaporation, and temperature maximum and minimums. Installation will take place during November/December 1993.

▶ **Hosted Board of Directors and Technical Committee Meeting, October 4-6, 1993**

There was a joint meeting of the Technical Committee and Board of Directors in Atlanta, GA from October 4-6. The program for the Technical Committee meeting included site updates, new activity reports, working group reports, the process for reviewing workplans and budgets, the process for affiliating with other projects, self monitoring and evaluation procedures, publication procedures, preparation for the External Evaluation Panel visit, and upcoming workshops in Indicators of Sustainability, Farmer First Research Methodologies, and Geographic Information Systems. The Board of Directors met on the final day to address the following agenda items: budget status of the project, a report from AID (Jim Bonner AID/W and Program Officer), and the role of the Board of Directors. **The minutes can be found as Attachment B.**

▶ **Literature review on Indicators of Sustainability for Honduras and Ecuador, July 15-August 16, 1993**

Greg Eckert, graduate student, Institute of Ecology, University of Georgia, spent 4 weeks in Honduras at Zamorano University to evaluate the "grey literature" for Honduras and Ecuador with particular emphasis on indicators of sustainability. **A trip report and bibliography are provided as Attachment C.**

▶ **Follow up Trip to Formulate Plan of Action in Honduras, September 12-14, 1993**

Bill Hargrove and Jim Hoey visited Honduras to discuss USAID/Tegucigalpa to discuss potential SANREM CRSP activities in Honduras, September 12-14, 1993. Hargrove and Hoey met with Dr. Vince Cusamano (USAID/Tegucigalpa), Vicky de Diaz (Executive Director - Fundación VIDA), René Gamero (Technical Director - Fundación VIDA), and David Knoll (United Nations Volunteer), Dr. Jay Hughes (temporary head the Department of Natural Resources and Conservation Biology, Zamorano), and Elias

Sanchez (Organic Farmer and Trainer).

Fundación VIDA was created as a result of part of a debt-for-nature swap between Honduras and the U.S. The Honduran government established this NGO to fund environmental projects with other NGOs. The foundation is also supported by USAID/Honduras. Some of the technical needs include: a) assistance in developing sustainability criteria for selection of projects, b) assistance in developing sustainability criteria for design of projects, and c) assistance in identification of indicators of sustainability to be used in monitoring and evaluation and measurement of success or impact. The last item would include working closely with NGOs with funded projects to include sustainability criteria and indicators in their project activities. Dr. Hughes from Zamorano was interested in the idea of their institute's involvement in research on indicators of sustainability. A possible outcome of these visits could be a collaboration between SANREM, VIDA and Zamorano at VIDA project sites researching indicators of sustainability along with demonstrations on sustainable agricultural practices in various resource systems, including monitoring and evaluation.

Another highlight of the group's visit to Honduras was a day long visit with Elias Sanchez. Sanchez is an organic farmer just outside of Tegucigalpa who does consulting and training. They discussed his work and philosophy. A trip report can be found as Attachment D.

► **Follow up Trip to Morocco to Identify Collaborators and Key Issues to be Addressed, September 27 to October 1, 1993**

Drs. Bill Hargrove (Program Director), Jim Bonner (Program Officer, USAID/W), Bryan Duncan (Auburn University), Dave Swift (Colorado State University) and Ed Kanemasu (University of Georgia) traveled during the week of September 27 and October 1 to Morocco to further identify the research priorities and interests of national programs (INRA/Settat, IAV/Rabat, and ENA/Meknes); identify a network of potential collaborators; evaluate potential sites with respect to sustainability, natural resource issues, landscape linkages, and farmer-first approaches; and develop a plan for proceeding to be considered by AID/Morocco, SANREM, and the Moroccan institutions.

The team met with John Mullenax and Jeff Allen (USAID/Morocco), John Day and Daniel Debye (TSM), Tom Gillard-Byers (MIAC Team Leader) in Rabat. Following these meetings, the team traveled to Sattat to meet with MIAC researchers, Tom Gillard-Byers and Keith Moore and Center Director, Dr. El Mourid.

The team then went on a field trip, guided by Dr. Mohammad El Gharous, Leader of Soils Program (Trained in soil fertility with Bob Westerman at Oklahoma State), and Haddou Bouksirat (soil physics and pedology) to some of the area around Settat where INRA is working. Following the field trip, the team had a meeting with INRA/Settat

sub-program leaders. Mustapha El Bouhssini, cereal entomologist, was the moderator. Other participants included Mohamed El Gharous, soil scientist, Haddou Bouksirat, soil scientist, Mohamed Karrou, crop physiologist, Mohamad Mazhar, forage scientist, El Houssin El Mzouri, forage scientist, Fatima Nassif, rural sociologist, and Mohamed Moussaoui rural economist. Bill Hargrove gave an overview of SANREM using slides. Moustapha El Bouhssini gave an overview of INRA/Settat using slides. Moustapha gave some of their perspectives on sustainability. These included the following needs: soil erosion control, preservation of genetic resources, water economy, increased farmer revenues, flexible and adaptive systems, and information dissemination.

The group identified four areas of potential collaboration of high interest to both SANREM and INRA/Settat:

- 1) A farmer-first approach to erosion control problems
- 2) A farmer-first approach to water harvesting techniques
- 3) A broad-based program in agrometeorology/GIS/modelling
- 4) A farmer-first program in integration of livestock/forage/crop production

The team then went to IAV to meet with Dr. El Debbah, Dr. Mhamed Oussible (Head of Agronomy), and Dr. Mhamed Tayaa. The IAV faculty were enthusiastic and willing to pursue mutual research interests. The site near Tangiers is particularly interesting as it contains mountains, forests, agriculture, a degrading environment, and a large reservoir whose life is threatened by siltation. It would make a very interesting SANREM site.

The team followed this visit with a trip to Meknes to meet with ENA Director, Dr. Mohammed Rochdi, and Secretary General of INRA, Dr. Mohamed Kamel. Bill Hargrove explained SANREM and the mission of the visit.

Dr. Kamel pointed out that "here we must do something for the farmers. Service to the farmers is demanded" and that with INRA, ENA, and DPA, a sort of research, teaching, extension model like the Land Grant system could be implemented. Dr. Kamel thinks that the Rif is perfect for SANREM. He said that "if Morocco had designed a SANREM, it would have been in the Rif (mountain range)."

The group then toured ENA and met with faculty including: Mohamed Mounsif (Plant Ecology & Range Science), Abdelwahed Maataoui (Agronomy & Plant Breeding), Abdelwaliab Filali (Agricultural & Irrigation Engineering), Mohamed Benbella (Agronomy & Plant Breeding), Mustapha El Youssoufi (Plant Ecology & Range Science) Abdellah Aboudrare (Agricultural Mechanization), Fouad Rachidi (Crop Physiology) and three members of the Rural Economy group, Ahmed Driouche, Ait El Mekki Akka, and Khalil Allali.

The team then went on a field trip to view the Rif mountains. The issues in the Rif are

soil erosion, overgrazing, and de-vegetation. The deforestation is a result of the need for fuel wood and for forage for animals.

The group returned to Rabat for an exit meeting with Charles Uphaus, John Mullenax, and Mohamed Hanafi (USAID/Morocco). Bill Hargrove gave a summary and analysis of the week. The team was asked to provide a trip report, a proposal with the identified scenarios for potential collaboration, and a letter asking them to respond with respect to a follow-up trip. A site selection trip in the time frame of November-January is planned. **The trip report can be found as Attachment E.**

▶ **Hosted Education Working Group Meeting, October 4, 1993**

Irma Silva-Barbeau (VPI and Silva Associates), Ron Carroll (University of Georgia), Bill Deutsch (Auburn University), Suchet Louis (Tuskegee University), Kevin McSweeney (University of Wisconsin), Ralph Montee (PVO/University Center), and Constance Neely (SANREM, UGA) comprise the Education and Training Working Group. At a recent meeting of the working group on October 4, 1993, Bill Deutsch was made the Chairperson. They outlined a work plan to compile information on environmental education and policy and programs at the site and country level, to assist researchers and service organizations to include education components in their programs, and to develop education materials based on output from the SANREM CRSP activities.

▶ **Meeting with Ambassador Blake, Committee on Sustainable Agriculture, October 21, 1993**

Drs. Bill Hargrove and Constance Neely traveled to Washington, D.C. for several days of meetings. Jim Bonner (USAID/W and Program Officer of the SANREM CRSP) accompanied Hargrove and Neely during their visits. They met with Ambassador Blake of the Committee on Sustainable Agriculture. Ambassador Blake has been extremely supportive of the SANREM CRSP and had several suggestions for the project.

▶ **Participated in Tuskegee University SANREM CRSP Discussion and Meeting on Administrative Matters, September 22, 1993**

On invitation by Suchet Louis, Director of International Programs, Tuskegee University, Bill Hargrove and Tonia Davis visited Tuskegee in Alabama on September 22. The purpose of the visit was two-fold. Tonia Davis, Accountant, visited with the business office of the International Programs Office. Bill Hargrove gave a lecture on the SANREM CRSP. There was a very good discussion following the presentation.

▶ **Participated in the Annual Meeting of the Center for PVO/University Collaboration in Development, September 30 to October 2, 1993**

Many collaborators with the SANREM CRSP attended the 9th Annual Membership Meeting of the Center for the PVO/University Collaboration in Development in Fayetteville, Arkansas from September 30 to October 2. The theme of this year's meeting was *People, the Environment, and Sustainable Development: Integrating Theory and Practice at the Grassroots Level*. The meeting was attended by representatives of 12 University/Research Institutions and 8 International NGOs. Dr. Jim Bonner of AID/W (Program Officer - SANREM CRSP) gave a presentation on the AID Reorganization. Dan Gudahl (Heifer Project International) gave a talk on ethno-veterinary Medicine in the Cameroon and Constance Neely (Asst. Program Director - SANREM CRSP) discussed the Participatory Landscape/Lifescape Appraisal Process of the SANREM CRSP.

- ▶ **Participated in the Annual Meeting of the Association for Women in Development, October 21 to 24, 1993**

Dr. Cornelia Flora (Virginia Polytechnic and State University), Dr. Irma Silva-Barbeau (Silva Associates, Inc.), Ms. Gladys Buenavista and Dr. Constance Neely (SANREM CRSP, UGA) attended the sixth International Forum for the Association of Women in Development (AWID) from October 21-24, *Joining Forces to Further Shared Vision*. The group led a roundtable discussion entitled "Mainstreaming Gender through a Participatory Landscape/Lifescape Approach" which covered the SANREM CRSP process, the activities in Burkina Faso and the Philippines, and the method for integrating research and development. The discussion around the SANREM CRSP activities was well received and very appropriate to the two key themes of the conference, multiple strategies women use to effect change and the benefits of sharing our vision.

- ▶ **Participated in Training Program for Chinese Financial Management Personnel from the Ministry of Finance at the Center for PVO/University Collaboration in Development, October 18, 1993**

On October 18, Mr. Bob Wallace, Contracts and Grants (UGA), Mr. Dave Richardson, Sponsored Programs (UGA) and Bill Hargrove Program Director, SANREM CRSP, participated in a training program for a group of Chinese financial management personnel from the Ministry of Finance at the Center for PVO/University Collaboration in Development. The 17 trainees are responsible from the financial management of a \$115 million World Bank funded "Agricultural Systems Services Project". The training program was a three week course in Project Management and Financial Management related to agricultural development projects.

The project will assist in increasing agricultural production and farmers' incomes by strengthening institutions that provide support services to farmers including improved information, computer networking, and monitoring and evaluation systems; reorganization and improvement of crop and livestock extension systems; reorganization

of seed centers and promotion of seed commercialization ; strengthening of veterinary and preventive animal health services; establish a national breed improvement program for livestock; tighten pharmaceutical, agro-chemical, and feed quality control; and promote cost recovery for services provided to farmers.

► **Publication of Ecolinks Newsletter, September, 1993**

The first issue of the SANREM Ecolinks Newsletter was published by the Center for PVO/University Collaboration in Development and mailed out in October, 1993. This newsletter is focused on sharing practical information and the results from the SANREM CRSP activities. At this time, it is published in English, French and Spanish. A copy of the Ecolinks can be found as Attachment F.

► **Establishment of SANREM CRSP Library for SANREM Collaborators located at the Site of the Management Entity.**

At the location of the Management Entity at the Georgia Station, Griffin, GA, there will be a central library for project related materials for the use of Collaborators. The library is housed within the Georgia Station Library. The materials have been organized into general categories as well as within site information. Dr. Vlahinic Mihovil has put the entries into Reference Manager so that there will be a ready computer reference by key word available for SANREM CRSP needs. There will be an update of new arrivals to the library in the subsequent newsletters.

Presently, the "Miho" Database has 1170 entries including site maps. There are presently 165 key words. Users of the database will be able to retrieve documents by author, key word, journal name, publication year, editors, titles and type of document.

The SANREM CRSP would like to use the SANREM Library to assist collaborators in obtaining information related to sustainable agriculture and natural resource management. This will be particularly useful for site-specific documents including grey literature collected on SANREM CRSP missions.

III. Significant Findings and Impacts

► **The Priming Program**

The Priming Program was designed to effectively utilize the time between the finalization of the Frame Work Plan and the onset of the major SANREM work plans in order to stimulate and maintain community interest in SANREM CRSP research activities in the Philippines.

This five month program is being coordinated by Heifer Project International (HPI) in partnership with Network for Environmental Concerns (NECI) and San Hermanigildo

Agro-Industrial School, Inc. (SHAISI). The strong development background of these three organizations provide them with an ideal position to undertake this crucial introductory program. HPI has an established record for identifying real organizations to work with in conjunction with programs that provide community members with immediate, positive benefits. NECI and its network organizations are recognized throughout Mindanao for their unique combination of sensitive community integration/organizing and technical resource assessment capabilities. SHAISI, based in Alanib, Lantapan, has served as a center of community organizing and trainings in regenerative agricultural practices within the Manupali watershed for over six years.

The community-participatory (CO-PAR) approach to community development forms the basis for program implementation. This approach is used to facilitate the strengthening of existing community groups while enhancing their awareness of sustainable and regenerative agricultural practices. Specific program activities included a three day training, conducted on October 24-26. This training was attended by 38 members of community-based groups and included dialogues on the root causes of poverty, trainings on low-cost and sustainable agricultural, agroforestry, and animal husbandry practices, and discussions on the impacts of resource-use practices across the landscape.

The second phase of the training was an exposure trip to the concept of the watershed from the top of the Manupali Watershed to the Pulangi River to the Hydroelectric Dam to the Cotabato River to the Coast. The trip allowed the participants to discuss the interactions in the landscape and to truly see the repercussions of soil erosion in the uplands.

The trip also included model farming areas in Davao and Cotabato. Program participants undertook cross-farm visits to the Mindanao Baptist Rural Life Center, an agricultural and agroforestry demonstration and training farm; as well as to various community-based and farmer-managed alternative agriculture programs. Following trainings and discussions on sustainable agriculture practices, the program will assist participants in implementing the practices of their choice.

IV. Problems/Issues and Approaches to Resolution

- None

V. Financial Status

SANREM CRSP QUARTERLY EXPENDITURE REPORT
 GRANT NO. LAG-4198-A-00-2017-00
 QUARTER ENDING OCTOBER 31, 1993

COST ELEMENT	PLANNED LIFE OF PROJECT BUDGET	CUMULATIVE ANNUAL BUDGETS	AMOUNT SPENT THIS QUARTER	CUMULATIVE AMOUNT SPENT TO DATE	BALANCE
MANAGEMENT ENTITY					
SALARIES	750,518.00	287,298.00	36,836.85	171,833.46	115,464.54
FRINGE BENEFITS	202,230.00	76,402.00	10,328.65	48,159.34	28,242.56
CONSULTANTS	34,560.00	5,120.00	0.00	0.00	5,120.00
TRAVEL/TRANSPORTATION					
-DOMESTIC					
-INTERNATIONAL	119,659.00	45,994.00	2,214.89	10,942.79	35,051.21
OTHER DIRECT COST	152,001.00	63,596.00	1,039.45	14,707.73	48,888.22
INDIRECT COST	78,703.00	34,440.00	17,510.23	86,645.56	(52,205.56)
SUBTOTALS	661,439.00	328,504.00	59,353.62	153,340.59	175,163.50
	1,999,110.00	841,354.00	124,283.09	485,629.43	355,724.57
RESEARCH SUBCONTRACTS					
<u>US COLLABORATORS</u>					
UNIVERSITY OF GEORGIA	1,956,548.00	868,829.00	44,155.01	323,514.09	545,313.91
PVO/UNIVERSITY CENTER	405,568.00	197,050.00	51,760.00	51,760.00	145,290.00
VIRGINIA TECH UNIVERSITY	417,052.00	173,487.00	0.00	0.00	173,487.00
UNIVERSITY OF WISCONSIN	664,187.00	190,230.00	0.00	0.00	190,230.00
COLORADO STATE UNIVERSITY	184,950.00	46,249.00	0.00	0.00	46,249.00
USDA ARS	119,190.00	23,838.00	0.00	0.00	23,838.00
TUSKEGEE UNIVERSITY	356,629.00	134,325.00	0.00	0.00	134,325.00
HEIFER PROJECT INTERNATIONAL	240,000.00	203,000.00	37,728.86	37,728.86	165,271.14
AUBURN UNIVERSITY	499,100.00	154,820.00	20,681.27	20,581.27	134,139.73
WASHINGTON STATE UNIVERSITY	265,000.00	108,000.00	0.00	0.00	108,000.00
<u>INTERNATIONAL COLLABORATORS</u>					
IRRI	801,694.00	215,590.00	0.00	0.00	215,590.00
PCARRD	301,860.00	145,744.00	0.00	0.00	145,744.00
CMMYT	129,725.00	0.00	0.00	0.00	0.00
ICRAF	94,000.00	0.00	0.00	0.00	0.00
ICRISAT	152,350.00	0.00	0.00	0.00	0.00
AVRC	99,325.00	64,865.00	0.00	0.00	64,865.00
FUNDAGRO - ECUADOR	325,380.00	0.00	0.00	0.00	0.00
<u>SITE AND SPECIAL PROGRAMS</u>					
PANAMERICAN AGRICULTURE SCHOOL					
-HONDURAS	318,530.00	0.00	0.00	0.00	0.00
MIN. - HIGHER EDUC & SCIENCE RES.					
-BURKINA FASO	632,802.00	125,550.00	0.00	0.00	125,550.00
SUBTOTAL - RESEARCH CONTRACTS	8,000,890.00	2,658,646.00	154,325.14	433,684.22	2,224,561.78
TOTAL AMOUNT	10,000,000.00	3,840,000.00	278,608.23	919,313.65	2,920,686.35

PARTICIPANT TRAINING EXPENDED TO DATE TOTALS \$89,851.40 THESE AMOUNTS ARE INCLUDED IN THE RESEARCH SUBCONTRACTS.

*ADDITIONAL \$340,000 INCLUDED IN THE BUDGET TO BE USED FOR OTHER SANREM CRSP RESEARCH ACTIVITIES BUT NOT YET LINE ITEMIZED.

VI. Summary of Reports Issued During Reporting Period

▶ Literature review on Indicators of Sustainability for Honduras and Ecuador, July 15- August 16, 1993

Greg Eckert, graduate student, Institute of Ecology, University of Georgia, spent four weeks in Honduras at Zamorano University to evaluate the "grey literature" for Honduras and Ecuador with particular emphasis on indicators of sustainability.

▶ Honduras Trip Report, September 12-14, 1993

Bill Hargrove and Jim Hoey visited Honduras to discuss USAID/Tegucigalpa to discuss potential SANREM CRSP activities in Honduras, September 12 -14, 1993. Hargrove and Hoey met with Dr. Vince Cusamano (USAID/Tegucigalpa), Vicky de Diaz (Executive Director - Fundación VIDA), René Gamero (Technical Director - Fundación VIDA), and David Knoll (United Nations Volunteer), Dr. Jay Hughes (temporary head the Department of Natural Resources and Conservation Biology, Zamorano), and Elias Sanchez (Organic Farmer and Trainer).

▶ Morocco Trip Report, September 27 - October 1, 1993

Drs. Bill Hargrove (Program Director), Jim Bonner (Program Officer, USAID/W), Bryan Duncan (Auburn University), Dave Swift (Colorado State University) and Ed Kanemasu (University of Georgia) traveled during the week of September 27 and October 1 to Morocco to further identify the research priorities and interests of national programs (INRA/Settat, IAV/Rabat, and ENA/Meknes); identify a network of potential collaborators; evaluate potential sites with respect to sustainability, natural resource issues, landscape linkages, and farmer-first approaches; and develop a plan for proceeding to be considered by AID/Morocco, SANREM, and the Moroccan institutions.

VII. Attachments

- A. Frame Work Plan and Invitation to Work - Philippines
- B. Minutes for the Board of Directors and Technical Committee Meeting
- C. Literature Review and Trip Report of Honduras on Indicators of Sustainability
- D. Trip Report - Honduras
- E. Trip Report - Morocco
- F. Ecolinks Newsletter
- G. Acronyms

ATTACHMENT A

FRAME WORK PLAN

**For the Sustainable Agricultural and Natural Resource Management
Collaborative Research Program
(SANREM CRSP)
Philippines Site**

August 1, 1993 - July 31, 1997

Frame Work Plan Authors

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I. Situational Analysis

I.a. Geophysical Information. The program site for SANREM-Philippines is the Manupali watershed and the area around the Pulangi IV Reservoir (Figure 1). This site is located on the southern island of Mindanao, and is politically in the province of Bukidnon, which is within Region X. Geographically, the project location extends from Mt. Kitanglad, in the northwest (longitude 124° 55'W, latitude 8° 09'N), to the Pulangi IV Reservoir, in the southeast (longitude 125° 15'W, latitude 7° 30'N). It encompasses an area of approximately 60,000 hectares. The Manupali River is a tributary of the Pulangi River, which flows into the Pulangi IV Reservoir. The upland area of the watershed includes a closed-canopy dipterocarp forest recently placed under protection by the National Integrated Protected Area Site (NIPAS) program. The area around the reservoir is included in the SANREM-Philippines project site in order to examine the impacts of downstream runoff and siltation. Initially, project activities will focus on the municipality of Lantapan, Bukidnon and the barangays (small villages) surrounding the Pulangi IV Reservoir. A summary of the biophysical characteristics and interactions occurring across this watershed is presented in Figure 2.

Elevations within the Manupali watershed range from 320 m.a.s.l. at Brgy. Bugcaon to 2,938 m.a.s.l. at the summit of Mt. Kitanglad. The mean elevation for the watershed is 1,561 m.a.s.l. Approximately 44% of land in the watershed has slopes of 40% or more, 29% of the land is rolling to hilly, while 27% is categorized as flatlands (FORI, 1982). The predominate soil in the watershed is Aduyon clay, a deep clay of volcanic origin having, in undisturbed condition, 10-25 cm of surface soil. The Kidapawan clay loam is the second most extensive soil in the area. It is reddish brown to brown in color and is 25-30 cm deep under undisturbed conditions (FORI, 1982). Erosion rates in the forested, grassland, and maize production areas of the Manupali watershed were calculated to be 162, 171, and 584 tons/ha/year, respectively (FORI, 1982). Six agroecozones were identified within this landscape by the Participatory Landscape/Lifescape Appraisal (PLLA) team (Bellows et al., 1993). These agroecozones, extending from the lower to the higher elevations, are: the paddy rice fields, the relatively flat sugar-cane fields, the rolling corn lands, the rolling to steeply sloping grasslands used for rotational and swidden-fallow agriculture, the forest margins, and the closed-canopy forest. The average rainfall, recorded between 1958-1978, at the lowest elevation of the landscape was 2,347 mm (FORI, 1982). Annual rainfall recorded in 1990 was 1,434 mm (DENR/MMWDP, 1992). Major yield-impacting droughts occurred in 1982 and 1991. Rainfall peaks occur in June and October. The driest months are March and April. For areas below 500 m elevation, the effective growing season is 8 months, from April through November. Above 500 m.a.s.l. elevation, the effective growing season extends from April to December (MA/BSWM, 1985).

I.b. Ethnic Communities and Demographic Changes. The indigenous ethnic groups found within the Manupali watershed are the Tala-andig and the linguistically similar Higa-onon. Migration into the area by the peoples from Luzon and Visayas occurred primarily during the 1950's and 1960's. Igorots migrated from Luzon while Visayan migrants are either from Cebu, Bohol, or Negros. Presently, the percentage of Tala-andig in the population ranges from 40% in the lowland barangay of Bugcaon to 96% of the population in the upland barangay of Basak. In the lowland barangays, the Tala-andig have been assimilated, culturally and linguistically, into the politically dominant Cebuano culture. In contrast, in the outlying districts of the upland barangays, the Tala-andig are less culturally assimilated and continue to use Binukid as their primary language.

Between 1970 and 1992, the population of Lantapan increased from 14,523 to 36,321 (NBOO, 1991; Lao, 1992). This represents a population increase of approximately 11% annually. This population increase resulted both from a high birth rate and from in-migration. The average household size in 1981 was 6 family members (FORI, 1982). Presently, the majority of the population is less than 34 years of age (NBOO, 1991).

I.c. Deforestation. Between 1952-1963, the island of Mindanao was deforested at the rate of 91,564 ha/year (Kummer, 1991). According to Lantapan community members, major logging activities in the Manupali watershed occurred between 1960 and mid-1970s. An extensive forest fire, associated with the drought of 1982, destroyed most of the remaining forests in the watershed. Currently, closed-canopy forests are found only in areas above the cloud-forest zone. These remaining native forests in Lantapan are rich in dipterocarp species of high potential commercial value. Prior to deforestation, wild pigs, monkeys, deer, civet cats and various birds were reportedly common. These forests still exhibit the highest faunal biodiversity within the Philippines (NIPAS, 1992). The Philippine Eagle (*Pithecophaga jeferrii*), an endangered and rare avian species, has been reported to have been spotted in Brgy. Victory at the upper slopes of Mt. Kitanglad.

Deforestation facilitated agricultural exploitation of cleared areas by the rapidly growing population. Agricultural exploitation of the area was further encouraged by the integration of the community into the regional and national market economy and the adoption of land use intensive agricultural practices by local farmers. Land-degradation combined with the high market demand for temperate-climate vegetables, currently is encouraging both migrant and Tala-andig farmers to encroach into the native forests on the upper slopes of the Kitanglad and Kalaturigan ranges in search of fertile agricultural land.

Deforestation of this watershed has coincided with decreased ground and surface water levels. Many springs upon which the villagers depend for drinking

and washing water are unproductive during the dry season causing women and children to walk 3-5 kilometers extra in search of productive wells. In addition, river flows have decreased in volume and increased in silt load resulting in insufficient water to fill the hydroelectric Pulangi IV Reservoir fed by the Manupali River and other tributaries of the Pulangi River.

I.d. Agricultural and Livestock Practices. Agriculture and land use practices are inextricably interlinked with ethnic relationships, poverty, tenurial relationships, labor relationships, marketing and credit practices, the promotion and adoption of introduced technologies, and the implementation and enforcement of resource use policies. Traditionally, the Tala-andig practiced land use extensive slash-and-burn (kaingin) agriculture which included the protection of forest trees, especially those known to provide habitat to honey bees and wild game. The major crops grown by the Tala-andig included root crops (cassava, comote, lutyá, and taro root), abaca, and upland rice. Igorot and Cebuano migration into the Lantapan area increased both population and land use pressure. The migrants also affected the agricultural practices of the Tala-andig through the introduction of new crops and agricultural technologies and by increasing market integration. Currently, the major crops grown in the area are sugarcane, rice, maize, potatoes, leafy vegetables, and root crops. Rice, hybrid maize, sugarcane, potatoes, and leafy vegetables are grown predominately for market while traditional maize varieties and root crops are grown for both market and subsistence use.

Current agricultural practices include clear-culture, up-and-down slope planting of corn and vegetable crops. These practices have stimulated high rates of soil erosion, especially when employed on steep slopes. Short or no-fallow slash-and-burn agricultural, practiced predominately in the sloping upland areas, has caused physical and chemical soil degradation. Due to loss of genetic variability for successional species, these areas are presently dominated by *Imperata cylindrica* grass. With the adoption of land use intensive practices, farmers have adopted the use of fertilizers and pesticides. Improper use of these agrochemicals is common due to a combination of lack of training information and a lack of economic resources to follow prescribed procedures.

Livestock raised in the area include water buffalo, cattle, horses, goats, pigs, and chicken. Water buffalo and cattle are used as draft animals. Due to the shortage of draft animals in the area, families who own these animals may be able to profit from plowing the fields of their neighbors. During times of financial emergencies, cattle, carabao, and horses may be sold to supply needed cash. Pigs are raised, predominately by women, to serve as a financial reserve in times of need and a source of food under favorable conditions.

I.e. Economic Relationships. Despite the relative geographical remoteness of the Manupali watershed from market centers, residents display strong links to the

provincial and national economy. Market links are apparent in the transition from subsistence maize and root crop production to the production of market-oriented crops, particularly sugarcane, hybrid maize, Irish potato, and temperate-climate vegetables. Farmers also have adopted land use intensive, input-based agricultural practices. In addition, international industry-promoting market distortions (such as exchange rate overvaluation) have reduced the profitability of agricultural production and, consequently, the value of farm land.

Throughout the landscape, over 95% of the farmers purchase their agricultural inputs from financiers (Biadp-CMU Report, 1992). Financiers provide farmers with inputs, on credit, at prices 50-75% above market costs. Farmers obtaining inputs on credit are obliged to sell their agricultural products to the financiers at low prices. Less than one-half of the farmers in the watershed own their own land. For the remaining farm families, high share expenses, lease costs, or CLT (Certificate of Land Transfer) payments further reduce agricultural returns. In the sugarcane area, many farmers work as seasonally employed landless laborers in the fields of a few large landowners.

For many farm families, both male and female members need to secure off-farm wage labor during and between growing seasons in order to supplement the low income derived from their on-farm labor. In the less commercially-integrated upland areas of the landscape, farm families still engage in exchange labor relationships. According to these relationships, a farmer will work for one day on the farm of a neighbor in exchange for food and the receipt of exchange labor from the neighbor when needed. This practice is more common during the plowing and planting season when cash availability is low. During the harvest season when cash is available from the sale of produce, wage labor relationships predominate.

I.f. Health and Nutrition. Low incomes, low agricultural productivity, and difficult access to water have direct impacts on human health and nutrition. The typical local diet consists of rice or maize with a vegetable entre. Occasionally, fish is served but meat is uncommon. Cheap protein substitutes are unavailable to community members. Results from the 1992 Operation Timbang (child weighing) showed that Lantapan has the third highest rate of undernutrition for children ages 0-6 among the twenty-two municipalities of the Province of Bukidnon. For children 0-6 years old, the major causes of illness are pneumonia, gastro-intestinal diseases, influenza and bronchitis while for death of the same age groups are pneumonia and gastro-intestinal disease. Wells in several lower elevation barangays are reported to be contaminated by pesticides, fertilizers, and pathogenic microorganisms due to land use practices in upper-elevation areas.

Community members of Lantapan are separated from trained health professionals not only by physical distance but also by sociocultural disparities. Many villagers are reluctant to approach professional health personnel for their

problems. Instead, they rely on the local "hilots" (medicine men/woman). The hilots usually come from the same social stratum as their clients and their methods of cure are part of the people's traditions. They also use medicinal plants that are found in the local environment. In the municipality of Lantapan, rural health midwives are stationed in eight barangay health stations with six barangays as radiation areas. They are assisted by health care volunteers called Barangay Health Workers (BHW). The midwives and BHWs provide primary health care services for the community and pre-and-post natal care for mothers and children. Their work, however, is hindered by the lack of basic medicines and medical supplies.

I.g. Development Interventions. The Manupali watershed has a long history of development interventions. These projects have impacted on the resource use and conservation practices in the area and on the attitude of community members towards program participation. Typically, policies affecting resource use in the Manupali watershed have been made not by community members but by officials in government or private offices far removed from the watershed. Consequently, many community members view hand-outs, infrastructure programs, and employment as the only benefit to be derived from development programs. Development program interventions also have not considered clearly the context of the community in relation to the adoption of conservation farming practices. For example, farmers in the area have been exposed to alley cropping and other soil conservation practices. The adoption of these conservation agricultural practices has been inhibited by insecure tenurial relationships, poverty, and obligations to plant crops as dictated by the financier.

Recent programs implemented in the Manupali watershed include the Asian Development Bank (ADB)/Department of Environment and Natural Resources (DENR) funded Muleta-Manupali Watershed Development Program (MMWDP), the Australian funded Pilot Provincial Agricultural Extension Program (PPAEP), and the Netherlands funded Barangay Integrated Development Approach through Nutritional Improvement (BIDANI) program. The MMWDP was a reforestation and infrastructure development program implemented between 1982-1992. PPAEP is a highly participatory rural development program currently being implemented in Brgys. Songco and Kibanggay. PPAEP was initiated in 1990 and is scheduled to continue at least through 1995. BIDANI is a research and development program implemented by Central Mindanao University (CMU). This ten-year program which began in 1988 is designed to enhance the nutritional status of community members through improvements in crop production and the promotion of cottage industries. The DENR/WWF-supported National Integrated Protected Area System (NIPAS) program was initiated in 1992 with site implementation scheduled to begin in mid-1993. The ADB Integrated Area Development Program is scheduled for implementation by early 1994. Two International Agricultural Research Centers, IRRI and ICRAF, are planning on conducting reconnaissance and baseline research

studies of resource use practices within the area. Both of these studies are scheduled to begin in 1993.

Within the municipality of Lantapan, there are currently 52 accredited Peoples' Organizations (POs). These accredited POs include 14 women's organizations associated with the Bukidnon Women's Organization, Inc., several farmers organizations, proponents of comprehensive land tenure laws, and environmental organizations. All accredited POs are registered with the municipal office of the DILG.

II. Program Areas

Based on PLLA activities and the Program Planning Workshop, three priority issues have been identified that affect the sustainability of resource use across the landscape. These issues form the program areas for research and development activities to be conducted in the Philippines by the SANREM CRSP:

- Soil and Water Quality and Quantity
- Biodiversity Management for Conservation and Enhancement
- Land, Labor, Credit, and Marketing

A fourth area of work will be in process documentation.

Although not mentioned explicitly as a program area, the following issues are considered to be included as components within each of these program areas:

- Gender, Ethnic, and Social Issues
- Transportation Impacts
- Communication and information exchange
- Education

As a participatory research program, SANREM CRSP will integrate baseline characterization analyses with action oriented programs and human resource development activities. In order to monitor the impact of resource use practices, development interventions, and policies across the landscape, indicators of sustainability will be identified and analyzed. For each of the major program areas the overall goal, specific objectives, action oriented programs, data base requirements, human resource development activities, indicators of sustainability, and expected outputs for the life of the program are identified below.

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III. Soil and Water Quality and Quantity

III.a. Goal. To conserve and improve the soil and water quality and quantity of the Manupali watershed.

III.b. Objectives.

1. To determine the soil and water conservation, degradation, and rehabilitation processes occurring across the landscape.
2. To determine the interrelationships between soil and water quality and quantity and human activities and welfare.
3. To determine the perceptions of the community toward the issues of soil and water sustainability and the interactions between these perceptions and various interventions such as educational programs, institutions, and policies. This would include enhancing the awareness of community members to environmental issues and providing mechanisms for community awareness and research results to influence policy.
4. To identify, design, and disseminate sustainable land-management practices for soil and water conservation.

III.c. Action Oriented Programs.

1. Potential soil conservation technologies that may be adapted for use in various agroecosystems across the watershed include:
 - alley cropping, hedgerow farming, mulching, and other soil erosion control measures
 - accelerated fallows/green manuring/use of nitrogen-fixing trees
 - integrated crop-livestock-fish systems, enhanced crop diversification and intercropping systems
 - agroforestry and agrosilvopastoral systems
 - multi-storey farming
 - integrated nutrient and pest management systems
2. Potential water conservation and water quality maintenance methods include:
 - water harvesting
 - efficient and appropriate use of farm inputs to decrease contamination of surface and subsurface water
 - increasing access to and control over potable water supplies

III.d. Database Requirements.

1. Land/soil characteristics and conservation database: soil biological, physical, and chemical properties related to soil fertility; factors associated with erodibility such as soil drainage, slope, and soil cover; land use classification; and other data necessary for the implementation of soil and water conservation technologies.
2. Crop and livestock database: crop growth requirements including rooting conditions, shade tolerance, nutrient uptake patterns, water use, pest and disease incidence, and crop diversification, livestock production requirements including feed sources and availability, water availability, and disease incidence.
3. Water quality and quantity database: physical, chemical, and biological properties of surface waters including sedimentation, flow rates, flashiness of stream flows, and surface and subsurface water levels.
4. Climate database: precipitation amount, intensity, and duration, temperature, and relative humidity.
5. Indigenous technology database: swidden-fallow and crop rotation practices, crop and livestock diversification practices, exchange-labor methods, herbal pesticides and human and ethno veterinary medicines, fishing methods, etc.
6. Socioeconomic profile of the community as related to soil and water use: tenurial relationships, sources of credit, cropping patterns, use of agrochemicals, livestock holdings and use, marketing outlets, sources of agricultural information, etc.

III.e. Human Resource Development.

1. Training in sustainable land use practices including agroforestry, integrated pest management, integrated nutrient management, and crop/livestock systems.
2. Training in postharvest processing methods that recycle resource materials.
3. Training in nursery management, identification of appropriate tree species for propagation, propagation techniques, and village-level seed production and storage strategies.

4. Training in the conservation of water resources and how to monitor the aquatic environment.
5. Training in water harvesting and aquaculture.
6. Community-based discussions to enhance awareness of linkages between soil and water resources across the landscape so as to increase resource conservation.
7. Community-based discussions on the relationships between water quality and human and animal health.

III.f. Indicators of Sustainability.

1. Soil quality and quantity indicators
 - soil organic matter levels
 - soil physical, chemical and biological properties
 - crop and livestock productivity
 - crop diversity
 - time spent weeding and cultivating
2. Water quality and quantity indicators
 - water pollution level including excessive or inappropriate use of pesticides and fertilizers
 - availability of irrigation and potable water throughout the year
 - stream siltation
 - water-borne diseases of humans and animals
 - aquatic biodiversity and other biotic indicators
 - length of time spent hauling water

III.g. Expected Outputs.

1. Maps: land use, soil suitability, crop/livestock production practices, agroforestry practices, hydrology including water table levels and location of community and private wells, and social information.
2. Assessment of factors that enhance or decrease the sustainability of resource use across the landscape and the determination of interactions among various biophysical, socioeconomic, and policy factors. These will lead to the determination of indicators of sustainability and substantiating information for advocating policy changes.
2. Identification and dissemination of locally-adapted and socially acceptable land management systems, including practices that decrease soil erosion

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and stream siltation, decrease farm input contamination of surface and subsurface waters, enhance the fertility and productivity of the different agroecosystems, and increase crop diversification and the integration of crop-livestock systems, and improve human and animal health and nutrition,

3. Enhancement of agricultural productivity and returns on investment farmers obtain from their agricultural activities.
4. Decreased rates of agricultural encroachment on forest lands.

IV. Biodiversity Management for Conservation and Enhancement

IV.a. Goal. To develop a new paradigm for agricultural and natural resource management to restore, enhance, and conserve the remaining flora and fauna biodiversity within the Manupali Watershed.

IV.b. Objectives.

1. To evaluate the species richness of the area in order to further identify the biodiversity and conservation status of native flora and fauna.
2. To identify and evaluate the existing lowland and upland conservation farming techniques and practices (e.g., indigenous agroforestry techniques) with respect to their soundness, sustainability, productivity, economic feasibility, and applicability in other areas of the landscape.
3. To develop appropriate strategies to strengthen community-based farming systems and biodiversity management schemes.
4. To determine factors (sociocultural, economic, technical, etc.) that may influence participation of the community in biodiversity conservation projects.
5. To determine possible identifiable changes across the landscape, over space and time, that can be related to deforestation and loss of biodiversity.
6. To integrate sustainable food production systems with biodiversity and conservation management.

IV.c. Action Oriented Programs.

1. Technology piloting and transfer of appropriate land use practices for lowland and upland areas, including:
 - home gardens
 - multiple cropping
 - diversification of the farming system
 - cover cropping and mulching for soil and water conservation
 - agroforestry practices
 - silvopastoral techniques
2. Buffer zone management practices, including:
 - Assisted Natural Regeneration
 - Timber Stand Improvement
 - other reforestation and afforestation techniques
3. Identification and promotion of appropriate land tenurial arrangements to enhance land equity, labor utilization, and conservation of natural resources and biodiversity.

IV.d. Database Requirements.

1. Surveys and inventories of the area's natural resources and biodiversity: This shall include collection of voucher specimens for identification and validation and biodiversity index measurements to establish baseline information on presence and/or availability of the resource. These studies also will include ethno botanical investigations.
2. Documentation of past and existing conservation farming techniques and practices: This shall examine traditional and current resource use practices including indigenous agroforestry techniques and swidden-fallow practice to determine their impact on resource conservation, biodiversity, and traditional values.
3. Analysis of identified conservation farming techniques as to appropriateness and soundness for technology diffusion:

IV.e. Human Resource Development.

1. Biodiversity survey and characterizations
2. Ethno botany training
3. Diagnosis and design of agroforestry systems

4. The importance and benefits of biodiversity, including crop and animal diversity in the farming system
5. Training for productive and sustainable lowland and upland farming system
6. Technologies for biodiversity conservation and agroforestry systems.

IV.f. Indicators of Sustainability.

- conserved biodiversity
- absence/minimal occurrences of plant and animal pests and diseases (including zoonotic diseases)
- microclimate improvement and maintenance
- food security and optimum productivity
- balanced and harmonious relationship within the landscape/lifescape
- enhanced total yield per unit area of land

IV.g. Expected Outputs.

1. Enhanced understanding of the interrelationships between biodiversity and agroecosystem sustainability.
2. Enhanced conservation of the natural ecosystem
3. Enhanced development, promotion, and adoption of conservation-based agricultural and forest production systems.
4. Enhanced diversity in farming systems.

V. Land, Labor, Marketing, and Credit

V.a. Goal. To enhance farm families' access to and stewardship of natural and economic resources.

V.b. Objectives.

1. To determine interrelationships between access to land, labor, capital, and credit and the resource use practices of farm families (including technology adoption, allocation of labor time, cash allocation, and utilization of natural resources).
2. To compare access to resource use according to gender, ethnic, and social group.

3. To determine constraints to and transition costs associated with the adoption of natural resource conservation practices.
4. To identify and promote institutional arrangements and policies (including marketing and credit systems and tenurial policies) that enhance human health, economic welfare, and resource conservation.

V.c. Action Oriented Programs.

1. Analysis of policies to enhance equity of access to and stewardship over natural resources, including:
 - policies to enhance the access to natural resources by women and ethnic minorities.
 - analysis of DAR and DENR land retention limit policies and promotion of comprehensive and equitable tenurial policies.
2. Assessment of the private (financier) systems and government systems and policies for assuring equitable access by small and landless farmers to credit and markets.
3. Identification and promotion of technologies, labor-relationships, land use policies, or marketing interactions that increase the sustainability of natural resource use while enhancing the equity of economic relationships, including:
 - Development of community livelihood projects
 - Promotion of integrated farming systems included crop-livestock systems
 - promotion of cooperatives or other socially-just credit programs (e.g. Grameen Bank) for marginal farm families.
 - identification and promotion of indigenous community-based self-help programs.

V.d. Database Requirements.

1. Assessment of resource use and resource access by farm families in different parts of the watershed. This information will be desegregated according to gender, ethnic, and social group.
2. Development of a set of models based on the responses of farm families to changes in economic incentives, institutions, markets, and policies. These models will reflect the consequences of these responses on indicators of sustainability. To understand these interactions clearly, models representing the farm level, watershed, and regional/national/international economies will be developed.

3. Socioeconomic maps delineating economic relationships across the landscape as related to resource use and conservation. These maps would show locations of ethnic communities, labor movement across the landscape, market locations, and the range of influence of financiers, development interventions, and tenurial practices and programs.
4. Transition cost data associated with the adoption of natural resource conservation practices by marginal farm families or the implementation of policies designed to enhance resource conservation.

V.e. Human Resource Development.

1. Land tenure policies (e.g. filing for Certificates of Land Tenure (CLT) and Community Forest Management/Integrated Social Forest (CFM/ISF) leases.
2. Ancestral land issues including communal land tenure policies for upland communities.
3. Management practices and policies for cooperatives or other social-just credit systems.
4. Management practices and policies for other community support services including health and nutrition programs.
5. Legal rights of farm workers and efficient and effective use of exchange labor practices.
6. Farm planning and budgeting.

V.f. Indicators of Sustainability.

1. Land equity
 - equity of land distribution
 - security of land tenure status
2. Labor availability and equity
 - timely availability of affordable labor for agricultural activities
 - access of farm laborers to reasonable wages
 - access to and use of exchange-labor relationships
3. Credit and Marketing availability and equity
 - timely access to credit at reasonable interest rates (adoption of socially-just alternatives to the current financier system)
 - access to credit for health care
 - access to natural resources and credit as related to gender, social, and ethnic group

- access to market price information
- increased return on agricultural investments by marginal farm families
- adoption of integrated farming practices

V.g. Expected Outputs.

1. Development of models analyzing the interrelationship among natural resource use, farm income, and the access of the farm family to land, credit, labor opportunities, and markets.
2. Formulation and adoption of policies that enhance the sustainability of resource use and the equity of access to land, credit, markets, and employment opportunities.
3. Enhanced adoption of natural resource conservation practices by decreasing the transition costs for their adoption.
4. Enhanced access by marginal farm families, women, and ethnic minorities to land and affordable credit.
5. Adoption of agricultural and natural resource use practices that increase the labor productivity and land use sustainability especially among the most marginal groups in the area.

VI. Process Documentation

VI.a. Goal. To maintain an accurate and critical record of program/project activities and processes in order to be responsive to issues and problems arising from program activities and to enhance program replicability.

VI.b. Objectives.

1. To record program development including processes for achieving interdisciplinary approaches, collaboration between government and non-government organizations, and the involvement of the local community.
2. To record program development from the perspective of community members.
3. To record and analyze processes used in developing intersectoral and interdisciplinary relationships within and among SANREM-Philippines funded programs/projects.

4. To enhance community involvement in program activities through community-based validations of process documentation information.

VI.c. Action Oriented Programs. Process documentation activities will document topics and issues as outlined by Chiong-Javier (1987). These topics include:

1. Interactions between program/project personnel and community members including:
 - mobilization/participatory processes used
 - who interacted actively in project activities, who lead project activities, and who refrained from interactions
 - what factors motivated the involvement of community members
 - what commitments were made by project personnel during participatory activities.
2. Issues and problems arising from program/project activities including:
 - problems emerging due to the conduct of project activities
 - how problems were resolved and by whom
 - changes in policies or program activities based on the resolution of problems
3. Coordination between or among the institutional sectors, social sectors, and disciplinary groups participating in program activities.

VI.d. Expected Outputs.

1. A detailed document of program process that can be used to evaluate program/project activities and to serve as a guide for replicating program successes in other areas.
2. Enhanced flexibility of program activities and increased responsiveness of program processes to the needs and aspirations of community members.

VII. Procedures for Work Plan Integration, Program Reporting, and Monitoring and Evaluating Program Activities.

VII.a. Work plan integration. Efficient program implementation as well as continuing community participation of program activities is dependent on effective integration of funded programs. Close interactions among programs will be ensured through the attendance of representatives from all programs at regular round-table discussions. During these meetings, program representatives will discuss program implementation processes, share preliminary data, and suggest

potential opportunities for linking with other programs. Process documenters will identify areas of successful collaboration among collaborators as well as areas where programs currently overlap or are using conflicting methodologies. Round-table discussions will begin during the work plan review stage in order to allow work plan submitters to consolidate their activities with other work plans, as appropriate. Additional, submitters may be advised to more thoroughly address issues that were inadequately addressed initially. During the program implementation stage, program efficiency will be enhanced through collaborative training sessions, sharing literature, and sharing or recycling program equipment and supplies. Additional processes for program work plan integration will be identified through program collaborator discussions and interactions.

VII.b. Program reporting. The Principal Investigators for each approved work plan will be required to submit brief progress reports quarterly and a more detailed annual report. The quarterly report should contain the following components:

- Brief summary of accomplishments
(research, training, education, technical assistance, information dissemination, technology transfer, networking)
- Brief summary of significant findings and impacts
- Problems/Issues and approaches to resolution
- Financial report

The annual report should contain the following components:

- Institutional relationship to the project
- Detailed accomplishments (research, training, education, technical assistance, information dissemination, technology transfer, networking)
- Significant findings and impacts
- Problems/Issues and approaches to resolution
- Attachments (if necessary)

Reports should be delivered to HPI/Philippines.

VII.c. Monitoring and Evaluation. Program evaluation will be conducted using the Participatory Monitoring and Evaluation (PME) scheme, developed by the FARM program (FARM, 1992). A unique feature of the PME is that it integrates the role of the farming communities in the monitoring and evaluation process at the beginning at the designing, planning, and implementation phases. Community members participate in regularly measuring, collecting, and processing provide information to enable adjustment and redefinition of institutional arrangements or redeployment of resources as necessary. Since community members are integrated into the monitoring and evaluation process from the onset of the project activities, evaluations processes become part of the management and information-exchange system of the program.

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Besides evaluating the achievement of program objectives, program evaluation will also assess the impact of program processes or recommended technologies on environmental and socioeconomic processes. These evaluation programs will include the following:

- Environmental impact assessments - soil and water conservation, microclimate improvement, and biodiversity conservation.
- Socioeconomic impact assessments - the impact of program activities on income, food security, enhanced conservation consciousness, community self-reliance, and gender, ethnic group, and social equity in project activities and in decision making processes.
- Indicator of sustainability assessments using indicators identified analytically and through the participation of community members.

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SANREM CRSP INVITATION TO WORK IN THE PHILIPPINES

Based on the Participatory Landscape/Lifescape Appraisal (PLLA) and through a series of workshops, a Five-Year Frame Work Plan (see attached) was cooperatively developed by representatives from the Lantapan community, Philippine NGOs, GOs, and universities, U.S. PVOs and universities, and International Agricultural Research Centers (IARCs). As a collaborative effort by community members, development workers, and researchers, this Frame Work Plan is a synthesis of community-identified needs and aspirations, NGO-recommended development processes, and researcher-suggested methodologies for verifying and quantifying resource-use interactions across the watershed.

The Frame Work Plan identifies three crucial issues affecting sustainability of resource use in the watershed.

1. Soil and Water Quality and Quantity
2. Biodiversity Management for Conservation and Enhancement
3. Land, Labor, Marketing and Credit

These issues form the major program areas for the SANREM CRSP in the Philippines. In order to enhance program responsiveness to issues and problems arising from program activities and to facilitate program replicability, Process Documentation will serve as a fourth area of research and development activities.

High Priority Research Questions based on the Frame Work Plan are identified herein for specific programs/projects to be implemented by the SANREM CRSP in the Philippines for year one. The work plans developed to fit these tasks must be consistent with the information described in the Five Year Frame Work Plan and the SANREM CRSP proposal. Individual work plans should focus primarily on one major program area while addressing interrelationships with other program areas.

Responses to the invitation to work should be in the form of a work plan that will be reviewed and evaluated by the Philippines National Coordinating Committee, the Management Entity, and the Global Technical Committee of the SANREM CRSP.

Work plans should be developed in the following format:

- I. Overall Goal and Rational (1/2 p)
(Briefly describing the big picture)
- II. Specific Objectives (1/4 p)
- III. Activities Planned (1 1/2 - 3 p)
(Including travel, meetings, research, etc., by objective)
- IV. Collaboration (1/2 p)
(Identify collaborators and roles, briefly)
- V. Time Schedule (1/2 p)
(Can be an actual timeline or in outline or tabular form)
- VI. Expected Output and Impacts (1/2 p)
(Training planned, manuscripts, reports, proceedings, etc.)

It is recognized that work to answer the priority research questions might require a longer time frame than one year. The total time required should be indicated in the work plan with details for year one and an outline for subsequent years. It is expected that some of the work will be accomplished through graduate research assistants which requires two to three years of commitment.

Priority will be given to work plans that include the following:

1. Collaboration between U.S. and Filipino organizations and between government and non-government organizations
2. Interdisciplinary approaches
3. Explicit descriptions of community and/or farmer interaction or participation.
4. Attention to the interrelationships between the focal program area and the other major program areas.

Work plans will also be judged according to the following criteria:

1. Objectives and purposes must be stated in a Specific, Measurable, Attainable, Realistic, and Time-bound (SMART) manner.
2. There must be consistency between project/program objectives and the requested budget.
3. Secondary collaborators must have the organizational structure and intellectual capability for undertaking proposed activities.

Work plans should be sent to:

Dr. Barbara Bellows
c/o NECI
61-A 7th Street
Nazareth, Cagayan de Oro PHILIPPINES
Tel/Fax: 63-8822-72-4642

or

Dr. W.L. Hargrove
SANREM CRSP
Georgia Station
1109 Experiment Street
Griffin, GA 30223

Work plans are due on **September 30, 1993**. Applicants will receive notice of acceptance or required revisions by **November 30, 1993**. Expected date of program/project initiation is **January 1, 1994**.

**PRIORITY RESEARCH QUESTIONS FOR 1993-94
SANREM CRSP PHILIPPINES SITE**

SOIL AND WATER QUALITY, CONSERVATION, AND MANAGEMENT

Inventory

1. Develop a land use map
 - A. What is the distribution of vegetation types and forest types currently? Over time?
 - B. What are the soil and water conservation and rehabilitation practices currently employed? Employed in the past?
 - C. What are the practices currently employed that cause degradation and destruction to soil and water quality? Employed in the past?
 - D. What are the land uses, crop and livestock choices, and technology practices by gender, class, tenurial arrangement, and ethnicity?
 - E. What are the outputs of sediment, water, and chemicals (nutrients and pesticides) in the landscape?

2. Determine the consequences of actions.
 - A. What are the consequences of soil and water conservation and rehabilitation practices and those practices leading to soil and water degradation and destruction?
 - B. What are the pluses and minuses of land production practices?

3. Characterize the water quality and quantity at the point of use including:
 - Human drinking water
 - Livestock drinking water and water for wallowing
 - Irrigation water
 - Water for hydroelectric power
 - Aquatic ecosystem
 - Aquatic biodiversity (as an indicator of water quality)

Relational

4. How are land uses, crop and livestock choices, and technology practices affected by gender, class, tenurial arrangement, and ethnicity?
5. How do outputs of sediment, water, and chemicals (nutrients and pesticides) relate to land use systems (natural, production, fallow) by agroecozone, season, topography, and soil type?
 - A. Empirical information
 - B. Modeled Data

Perceptions

6. What are the local perceptions of conservation practices, hazards, and mitigation?

7. What are the options and motivations for people to engage in agricultural and resource use practices that conserve resources and those that cause the degradation of resources?

BIODIVERSITY

Inventory

1. Quantify/Index the present biodiversity of flora and fauna (macro/micro) across the landscape.
2. Quantify/Index land uses: primary forests, secondary forests, grazing land, fallow land, pasture land, crop land.
3. Compile all relevant information on practices aimed at conserving and enhancing biodiversity and forest growth and those causing degradation or decreases in biodiversity and forest growth.
4. Evaluate plant species for suitability in mixed production systems.
5. Identify the key indicator taxon for biodiversity conservation.
6. Conduct ethnological surveys of ethno veterinary and ethno botanical practices.

Relational

7. What is the relationship between the loss of the biodiversity in the forest to water availability, food availability and diversity, natural calamities, and human and animal health and nutrition?
8. How can people regenerate native forests while providing themselves with a source of income?

Perceptions

9. How do users perceive the loss of biodiversity and how do they presently replace its social, economical, and environmental value?
10. What currently occurring practices either constrain, promote, or nurture biodiversity? What are the social, physical, and economical basis for the acceptance of these practices?
11. What are the priority areas for regeneration? (local perception vs. GIS aided)
12. How do people cope with seasonal shortages and what is the impact of how people cope with these shortages on the biodiversity across the landscape?
13. Identify factors that influence biodiversity conservation in the landscape. What are the local perceptions of biodiversity? What is the value perceived? Why?
14. Conduct a participatory appraisal focused on agroforestry systems.

LAND, LABOR, CREDIT, AND MARKETS

Inventory

1. Arrangements and allocations
 - A. Current labor arrangements in the production systems
 - B. Current household labor allocations by:

community task
production task
household task

2. What are the formal and informal organizations relating to land, labor, credit, and markets (e.g. labor exchange groups, credit and marketing organizations, and organizations promoting or discouraging land tenure)?
3. What is the availability of support services (including agricultural development programs, credit, and health and nutrition services) by gender, social class, ethnic group, and location in the landscape?
4. Classify and map land tenure arrangements across the landscape.
5. Characterize food security and food seasonality across the landscape.
6. Develop socioeconomic maps showing economic relationships across the landscape as related to resource use and conservation/degradation. These maps would show locations of ethnic communities, labor movement across the landscape, market locations, and the range of influence of credit systems, development interventions, tenurial arrangements, and land tenure programs.
7. Inventory access to and control over land including:
Value of labor
Agricultural technology
Land type

Relational

8. What economic factors and policies in the wider economy influence flows of people and resources into and out of the fragile upland environment?
9. Determine the interrelationships between access to land, labor, capital and credit, and the resource use practices of farm families (including technology adoption, allocation to labor time, cash allocations, and utilization of natural resources based on gender, social class, and ethnicity).
10. What are the advantages and disadvantages of different sources of credit? How does the source of credit available or used relate to resource management?
11. How do market prices and access to markets influence uses of resources relative to investment?
12. How are land uses, crop and livestock choices, and technology practices affected by changes in prices and other conditions (e.g. access to markets, transportation networks, etc.)?
13. What is the extent of farmer and community participation in decision making regarding natural resource management? What is the relationship between participation in decision making processes and resource use practices?

Perceptions

14. What are the perceptions of land use rights and classification across the landscape? How are these perceptions affected by social class and ethnicity?
15. How do perceptions of property rights affect resource use practices?

16. What is the perception of support services (including agricultural development programs, credit, and health and nutrition services) by gender, social class, and ethnicity?
17. What is the perception of the value of different labor relationships by gender, social class, and ethnicity?

PROCESS DOCUMENTATION

1. What are the processes used by other programs and organizations in implementing programs? How do these processes affect program efficiency, intersectoral and interdisciplinary interactions, and identification of new research topics, and community involvement?
2. What are interactions between or among the institutional sectors, social sectors, and disciplinary groups participating in SANREM CRSP program activities? How did the types of interactions or relationships developed affect program efficiency, the identification of new research topics, and community involvement?
3. What are the interactions between SANREM program/project personnel and community members including:
 - A. Mobilization/participatory processes used
 - B. Who interacted actively in project activities, who led project activities, and who refrained from interactions
 - C. What factors motivated the involvement of community members
 - D. What commitments were made by project personnel during participatory activities?
4. What issues and problems arose from program activities including:
 - A. Problems emerging due to the conduct of project activities
 - B. How problems were resolved and by whom
 - C. Changes in policies of program activities based on the resolution of problems?
5. How flexible were programs to revising program methodologies or objectives based on new information, intersectoral or interdisciplinary interactions, or community interactions? How did process documentation affect program responsiveness to community needs?

INFORMATION

1. Begin developing a library for SANREM CRSP related materials.
2. Provide a complete compilation of existing literature on sustainable agriculture and natural resource management for the Site Office. This literature compilation should include both published and "grey" literature.

ATTACHMENT B

SANREM CRSP MINUTES OF MEETING
Board of Directors
October 6, 1993

Minutes by: D. Belvin

Contract No: LAG-4198-A-00-2017-00

SANREM Representatives: K. Shapiro, G. Arkin, J. Bonner, S. DeDatta, B. Gurevich, B. Hargrove, S. Louis, C. Neely, E. Sotomayor, B. Ziegler

Others present: C. Flora, D. Belvin, T. Davis, I. Silva-Barbeau

Members not present: Jim Hoey

Wednesday, October 6

The meeting was called to order at 8:30a. There are several topics to be inserted in the proposed agenda. These include discussion of the Gender component issue in light of C. Flora's leaving VPI; discussion of the core sites; a brief presentation by S. K. DeDatta on the IPM CRSP; outreach strategies.

Report from the Technical Committee. Cornelia Flora gave a report from the TC. She discussed the plans for approval of work plans both from international sites and those that arise globally. When the international site work plans are initiated, the mechanism will be as follows. When they come in they are received by both the NCC and GTC. In terms of the GTC, there will be 3 principle TC members to review for each of the four themes. A working sheet and a rating schedule has been devised. Once we have the summary report and recommendations, one rep from each theme (TC) plus the chair of the TC will meet with the entire NCC in the country or in an intermediary spot geographically. Recommendations coming out of this will be which will be funded, level of funding and integration. The new strategy will assist in building partnerships.

The Global work plans will be deeply reviewed by three appointed persons from the TC. All TC members will receive the work plan for review.

B. Hargrove: A point concerning Irma Silva-Barbeau. Irma has been reviewing work plans to see if they meet the format and have the changes made prior to forwarding these to the TC. Bill wanted to put the revision of Irma's pre-screening. Bill suggested that Irma, Constance, and Bill flow diagram the new mechanisms and these will go for the TC and the Board. A clean copy will go to all.

K. Shapiro asked if we could put it through a mail vote. Everyone agreed.

G. Arkin made a motion that this would be put forth with a recommendation to the BOD by the TC. It was seconded and the motion carried.

C. Flora: Domestic timing of review of proposals should be two weeks maximum.

B. Hargrove: On the international, Irma could be a check point to see that all work plans so that she can be there for the final filter. A time line will be added to the flow charts.

The last piece of both of those cycles - notification to the Board. Does the Board want to see proposals and comments? Yes.

What about an executive summary of approved proposals. J. Bonner gets a full set for his files. B. Ziegler thinks that this would be a lot of proposals. For the Philippines - ask for an abstract - especially for the ones up for revision.

K. Shapiro asked that the group put forth the addition of an executive summary for the next invitations to work. This and the budget would be forwarded to the BOD. Abstract and Budget with an Executive Summary.

Cornelia Flora has accepted a position as Director of the North Central Rural Development Center - 75% teaching and 25% will be available for research. She will be leaving in August. Flora, Bonner, DeDatta, Hargrove and Shapiro discussed this last night. The options outlined were :

- a. Gender Activities of the CRSP would be executed by VPI, C. Flora would not be associated with the CRSP
- b. C. Flora would keep the Gender component and it would move from VPI
- c. There could be shared responsibilities
- d. Other disciplines could be brought in from VPI.

Questions: Person hired by DeDatta would be working with WID - University wide activity. The person would be available for SANREM CRSP. Concerns raised since new personnel hired at VPI will be hired on non-tenure track and possibly may not be senior level personnel.

BOD should consider a policy to take into account the institution as well as the individual researcher. We may/may not need the institutional clout or may/not need the researcher expertise. WID is a key element of SANREM. We need some mechanism in place to deal with particular circumstances on a one on one basis. VPI intends to replace WID rep (Flora). Flora would like to stay involved with SANREM from her next appointment at Iowa State.

There are key personnel qualifications as well as key institutions. Judgements will be difficult in assessing qualifications of replacements. BOD has a tough task ahead in making these determinations. Suggested that each review the policy outlined in the Policy and Procedure Handbook. This allows for some flexibility and we have two avenues of applying the rule.

No discussions have transpired between C. Flora and Iowa State concerning linking to SANREM. Her new responsibilities will be largely domestic. Iowa State may not even give consideration to any role in the project. A subcontract through VPI to Flora may be an avenue for participation on Flora's part.

We should give serious consideration to the Policy to be adopted by SANREM. Case by case consideration would be required. The project should be given utmost consideration.

Concerns expressed by Shapiro: DeDatta staffing situation, vice-Flora position at ISU, WID activities in future, future training. Options for subcontracting: financial trade-offs, time trade-offs.

ME should provide a portfolio of information to BOD for consideration and discussion prior to next meeting.

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ME should provide policy and procedure as well alternatives and rapid response mechanisms for discussion at next meeting.

Budget. Some budget figures such as other direct costs can be amended to make the picture clearer. Jim Bonner recommended that the ME make modifications in the next year to get the money allocated as we truly plan to spend it. We need to include the work plan modifications particularly training dollars and number of persons trained. It is imperative that participants bill the ME as promptly as possible. It is not important that we reflect it as expended. We need invoicing from the institutions regularly to ensure we are spending at a level anticipated. Universities are inherently slow in billing their expenditures. BOD recommends that we keep an eye on spending progress. ME sends out a quarterly inquiry report that will assist in assessing where each subcontractee stands.

We need to encourage flexibility in the budget to allow ME to send representatives outside of the ME for travel, training, workshops, etc.

Budget should have line item to reflect additional funding (\$340,000 from Bonner).

\$1.7 mil last year budget
\$1.8 + \$340,000 this year

Per person months and training dollars are imperative for AID reporting. These figures are periodically reported to Congress.

Jim Bonner will write a letter of concern regarding the budget pipeline to ME (B. Hargrove); B. Hargrove and K. Shapiro, BOD Chair will in turn write letters of concern to each BOD-TC rep for life and concern of project.

Jim Bonner can defend committed funds where he cannot defend accrual funds. Committed funds are designated for a specific purpose. We need to be sure that our terminology is synonymous with AID. Bonner has to buffer and defend our tax response in spending. We do not need to jeopardize the project in the paper pipeline. We need to expend the funds, bill for the funds, and stay on track.

This is not a grant, it is a cost-reimbursable contract. The costs should comply with the approved budget. We need a PAS (prior approval system/form - PAS) to handle monies that are carried over. This could be submitted to the ME for notification and approval prior to spending the funds carried over for an activity other than what it was originally budget. We may need a clause and form added to handbook. Technically, our contract contains wording which in effect allows carry-over funds to be spent.

Dr. Hargrove will initiate a letter confirming the request for carryover funds to be expended in a secondary manner. This would suffice for files and serve as PAS.

Column for actual expenditures should be added to the form presented so that a clear picture is presented.

Other Business. From the last BOD meeting, Irma Silva-Barbeau was hired under outside contract to review the work plans and assist with expediting the work plans.

Communications: introductory program brochure, C. Neely is developing a training brochure in collaboration with education/training group. C. Neely and W. Hargrove to travel to Washington for

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a series of meetings during Centers Week. Appointments during this visit include: Senator Robert Blake, VOCA, recommended to touch base with CIAT concerning possibility of Ecuador site not coming to fruition.

We have received a request for information to do training workshops to be done on farmer-first in Jerusalem.

TropSoils is reorganizing and reorienting their program. An ASA meeting will be held to discuss their refocusing activities. Their program will for optimized soil productivity, minimized land degradation, to quantify land quality indicators, and increased impacts. We have made several attempts to collaborate and coordinate some activities. Dr. Hargrove will attend this meeting.

It would behoove all programs not to overlap activities and to utilize resources effectively. As funds are diminishing, other CRSPs do not need to feel threatened by SANREM and we need to work toward a common goal. We have good relationships with some of the other CRSPs, but with some of the more traditional disciplines, we have are considered an outsider and pose a threat to their control especially considering we are multidisciplinary. S. K. DeDatta recommends that we may want to pursue TropSoils communications with Charlie McCants - does not recommend that we attempt further communications with Roger Hanson.

Soil/Water/Nutrient Management discipline is perceived as a mess in the eyes of donors according to Bob Rhoades. A meeting is scheduled during Centers Week for the 40 members of a steering committee. Their charge is to make a recommendation through a donor called commissioned paper for revision of how we do business. This team has been formed to assess this dilemma

Official charge to the this committee: to prepare a position paper to evaluate the needs for:

1. soil/water/nutrient management
2. current international capacities (who's doing what, how?)
3. enhancing group interactions (intercrsping, consortia collaboration)
4. proposed recommendation for improving research

G. Arkin recommends that the BOD address this since TropSoils seemingly does overlap with some areas of sustainability. Ken Shapiro asked Jim Bonner if there is a forum for communication between these activities. Our BOD may act as a resource of information to AID mgmt. re: mission/country perceptions of CRSPs (as a whole, individually). Our model could serve as training tool to educate AID and enlighten them in decision making. Processes would be the focus of the forum, not SANREM, and the ME would need to work to orchestrate this activity including other CRSP members, Bureau personnel, and SANREM personnel. This would be a large project on process, but we would have a great opportunity for outreach.

Concern expressed that we may open ourselves up to great ridicule and forced to defend our approach. It may be risky to go head to head, but we may have no choice to attempt a line of communications for intercrsping.

Letter from WLH/BOD to AID concerning TropSoils for meeting to the extent that we have noticed changes in their focus and we know funding is diminishing. We would like an opportunity to meet to discuss potential collaboration. Letter should require action to address this matter. Letter should be addressed to Alan Hurdis with cc: to Ann VanDusen. Contracts up for renewal this year include Small Ruminant CRSP and Peanut CRSP. We should look at these for collaboration opportunities. Opportunity with IPM CRSP could be used as an example for collaboration. This might include a workshop/conference on neutral grounds for a forum to address the players to address concerns.

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Recommended that we invite three +/- persons from TropSoils to attend our next BOD/TC meetings to give a presentation of their approach and work toward means of linking some activities.

Personal appreciation expressed by W. Hargrove to BOD for giving their time to meet with the TC to hear first hand concerns from participants.

AID Report. Jim Bonner gave a presentation for AID reorganization. As we all know by now, AID is currently undergoing comprehensive review and reorganization scheduled for Jan 94.

Reorganization will encompass three tenets:

1. must be simple in structure
2. must be driven by performance
3. must outline greatest strengths, field missions, and integrate knowledge

Organizational as well as functional changes will occur.

Courses are not cast in stone at this point in time, as things develop we will need to remain flexible. As programs are assessed, we need to have a mechanism in place to allow us a rapid response to proposed opportunities. We should remain open to opportunities available, but discussions should be channeled through the ME. We do not necessarily need to align ourselves with just any program for the sake of preserving that program. Some programs obviously do not need continuance. Jim is a resource and avail to us for assistance appraising opportunities.

SANREM will be buffered over the next year, programs are being asked to reduce 25-30% during next fiscal year. SANREM will not hit that hard at least at present.

It may be feasible to consider one core site with many satellite projects in light of the many cutbacks both at the domestic and mission level. We not only need to remain global, we need to make significant impacts. We must remain flexible.

S.K. DeDatta asked that we reconsider Guatemala as a core site.

ME may choose path of least resistance; i.e. what can be up and going relatively soon? We may not want to rush into finding two alternative sites simultaneously. We may want to select two core sites, and multiple smaller projects in multiple sites.

J. Bonner asked that we wait 30-45 days to access whether to pursue Burkina Faso and/or Ecuador. We would like a decision.

Burkina Faso: an alternate location may need to be considered. The Gambia is one to be considered.

Ecuador: 20% chance of continuance of working in Ecuador. Changes in strategy by mission and personnel cuts due to reorganization will reflect our potential there.

Motion made to cease efforts in pursuing a core site in Ecuador unless we have a firm commitment from AID by November 15

Vote: 7 in favor, 0 opposed

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E. Sotomayor will make a visit to AID representing a local organization that they are losing an opportunity for funding and that the window of opportunity is closing November 15. He will present things as a matter of concern from the ground level. Hopefully we would have a prompt response to this appeal.

The ME should make the recommendation to the BOD to pursue or cease this effort toward Ecuador once a response has been received from Ecuador.

Burkina Faso: we have been given a go by the mission, but the mission is closing according to the sites scheduled for closing. It might be a poor communication if we go looking for another location at this time. We may be able to continue working there without the mission. Laurent Millogo on board gives us another avenue for continuing work in Burkina Faso. We have invested a lot of time and money in developing opportunities there. Is there an alternative solution to working in Burkina without AID mission? Jim Bonner should continue pressing for us to be able to do business there. ME needs to keep the BOD updated on the status so that participants do not waste time in developing work plans that may not come to fruition.

We may be able to pursue funding from World Bank to work in Burkina. Outside fund leveraging will affect the initial funding level from AID.

IPM CRSP. S. K. DeDatta gave a presentation on the IPM award. The funding level is \$7.5 million. Joint efforts may be in training activities as trainers and participants, joint training programs should be offered in the future, strong economic links for impact studies, build on current networks and joint networks in future, what are the researchable issues? access their role in sustainability in relation to SANREM in existing Mindanao site. In their Luzon site, they invite SANREM to participate with IPM activities to address researchable issues there. Technological issues and economic issues were strongly addressed in their proposal. One SANREM CRSP person invited to serve on IPM CRSP BOD.

If Guatemala should be revisited by SANREM, joint efforts with IPM CRSP in Guatemala would be welcomed. IPM CRSP does not want to waste time duplicating efforts that SANREM CRSP may be pursuing.

S.K. DeDatta acknowledged appreciation for the assistance and participation of C. Neely and B. Hargrove for their role in developing the IPM CRSP.

BOD Role. A subcommittee consisting of G. Arkin, S. DeDatta, C. Flora, B. Gurevich, B. Hargrove, R. Montee, C. Neely, K. Shapiro, and D. Swift worked to bring forward a recommendation to redefine the role of the BOD. Issues that were considered in this process included reviewing and approving research proposals; reviewing and approving budgets; reviewing and approving new activities and new sites; monitoring relations with the complexity of SANREM researchers, collaborating institutions, and others; monitoring progress toward overall goals; possible need for subcommittees of the BOD.

With regard to reviewing and process for handling work plans, it was recommended that we include some language to reflect that the ME budget will be made available to the BOD for consideration no later than July 1. (This year it will be due in March for the consideration during the joint BOD/TC meetings).

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Ken Shapiro requested that ME provide an overall budget (all sites, entities) for BOD approval. This may not be one single form but some type of presentation by WLH needs to be given at to the BOD for the overall assessment/evaluation.

DeDatta recommends that some time be set aside in each BOD meeting for a financial status report.

Suggested that one member of BOD and BOD chair work in a subcommittee with ME and Jim Bonner in developing budget totals to be spent by site.

Recommendation made for ME redraft process for reviewing budget and advising BOD of finance issues anticipated by site

Discussion of range of authority for ME without outside advice - travel would be an easy decision. Other more involved issues would be brought before the BOD chair and TC chair and AID officer as deemed necessary by the ME. Approval for non-programmatic issues should be dealt with at the discretion of the ME. Programmatic issues (pertinent to budgetary constraints) should be brought before the chairs and AID officers.

New Sites. AID approval will be required for new sites.

Outreach Publications/Communications. Three dimensions to this:

1. actual substance of activities: training, workshops, newsletters
2. strategy to coordinate the activities: who to target
3. expansion: staffing needs for ME to perform tasks

Historically agriculture has not told their story to the public and have not been fully appreciated for many significant contributions. Consensus to hire additional staff for ME to assist in editing, reviewing, and communication aspects. We are not taking full advantage of telecommunications, slides, video, and editorial opportunities due to the lack of personnel. We do not necessarily have to hire at the ME level, but should consider a call for work for participants to compete for the dollars to get this task accomplished.

C. Neely has a spectrum of potential outreach strategies which were detailed at the last meeting.

Technical presentations are expected, we need to reach out to broader unexpected audiences. Quick news bullets, multiple language presentations, common language presentations are important considerations.

Jim Bonner stated that there is an urgency for some immediate allocation for 3 or 4 types of target publications that we can quickly get involved (PR pushes) and get going now. World Bank, donor organization, Congressional, farmer-participatory organization audiences need to be targeted now. \$50-75k needs to be allocated immediately to get this task underway. AID is looking for these types of presentations in evaluating reorganization strategies.

Consultancy. We may need to consider hiring someone to come in and visit the ME and participant locales as well as Bonner, then offer their recommendations for how we should present the story of SANREM.

We may want to hire someone part time: one quick issue to be told is our process. We need help in evaluating how to get the stories told.

Person needs to be able to access material, value of material, excellent method of communicating the material/value. Tom Hargrove (IRRI) may be able to offer some advice.

Motion to allocate up to \$75k for the ME to proceed in pursuing a communications consultant to plan the immediate needs for SANREM CRSP publications/communications in response to AID request and to develop and produce short term products and a long term strategy for future publication products.

Vote: 7 in favor, 0 opposed

New Business. Ron Carroll, SANREM CRSP TC member, was recognized for our input and participation in the BIOTEC consortium in Washington.

Gladys Buenavista has been selected for Philippines Site Coordinator.

Unanimous motion to adjourn meeting.

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SANREM CRSP MINUTES OF MEETING
Technical Committee
October 4-5, 1993

Minutes by: D. Belvin

Contract No: LAG-4198-A-00-2017-00

SANREM Representatives:

C. Flora, J. Bonner, W. Butcher, R. Carroll, W. Dar, B. Deutsch, J. DeVries, B. Hargrove, C. Neely, M. Ngandu, J. Reed, R. Rhoades, D. Swift

Others present:

B. Bellows, D. Belvin, G. Buenavista, I. Flitcroft, S. Louis, T. Davis, B. Gurevich, R. Montee, J. Orprecio, K. Shapiro, I. Silva-Barbeau, E. Sotomayor, B. Ziegler

Members not present:

E. Kanemasu, K. McSweeney, D. Midmore

Monday, October 4

Dr. Cornelia Flora, chairperson, welcomed everyone. Packets of information including the meeting agenda were distributed and minutes of previous meeting circulated for proofing and acceptance.

AID Update: Dr. Jim Bonner gave a brief statement of the state of AID. Finances of the operating budget will be \$30-60 million short this year. Cuts will be inevitable as far as manpower. Program funds: two levels to budget for 15% cut and 50% cut. Currently shapes up to 28% cut in program funds. Program personnel travel will be eliminated. Closing of missions: list entails some 20 +/- missions will be closed. The programs may continue without mission offices in country. Some programs will have to be phased out over time. Graduating country status will begin to apply for phasing AID programs from some countries. We really don't know what the bottom line is at this point. One issue is becoming thematic "sustaining economic development". Downsizing, refocusing, changes in current level of funding will occur during the few months.

Announcement: VPI was announced as IPM CRSP award winner.

Site overviews were presented by Constance Neely.

Philippines:

1. There are now two committees in the Philippines, the National Coordinating Committee and the Community Advisory Committee. They are chaired by Dr. Dar and Ronelo Alvarez, respectively.
2. The Invitations to Work went out on September 1 and are due in 1 October. They will be reviewed by the National Coordinating Committee and the Global Technical Committee and work will begin in January.

3. The advertisement for a site coordinator has been out and there are three Filipino candidates for the position that will be interviewed by a screening committee of Willie Dar, Jim Orprecio, Barbara Bellows and Ronelo Alvarez. This position should start after November 1. The Facilitators position will phase out over the course of a year. The office set up and hiring of additional staff will take place after the Coordinator is in place.
4. There are to be 6 weather stations installed in the landscape in Mindanao. They have been shipped out and will be installed at the end of November by Ian Flitcroft and Galen Harbers with assistance from personnel at CMU and local hire.
5. There will be a Soil Survey started in late November. This is a joint effort between the USDA Soil Conservation Service, the Bureau of Soil and Water Management, Central Mindanao University, and the University of Georgia. This will involve updating prior sites as well as identification of 12 sample sites for complete characterization.
6. We have signed an MOU with Heifer Project International as key subcontractor for the Philippines and are in the process of signing one with Central Mindanao concerning the soil survey.
7. Barbara Bellows, Gladys Buenavista, Marhz Ruscoe and Romy Banaynal have finalized the document for the Philippines Participatory Landscape/Lifescape Appraisal and it should be ready for publication soon.

Burkina Faso:

1. The Burkina collaborators have identified their representatives to the National Coordinating Committee. These individuals will represent INERA, IRBET, IDR/University of Ouagadougou, Plan International and the local government service. They are to meet on September 29. Plan International will be organizing a local Community Coordinating Committee who will also have a representative on the National Coordinating Committee.
2. Laurent Millogo of USAID/Ouagadougou will serve as the in-country SANREM Coordinator. By proposal from AID, he will hold this position in which we pay his salary, and USAID will provide secretarial, office and communication services in support of the project. He has been designated as the point person for the NCC and will call the first meeting. They elected their chair and designated a writing committee of 3 Burkinabé to work with 3 U.S. individuals to write the frame work plan. We need to discuss who will work on work plan. Proposed names include: Ngandu, Silva-Barbeau, and Hargrove with reviews and input from Louis, Surgi, Neely, Reed, Burt, and Butcher.
3. The Schedule of Events is that the Work Plan will be written this fall. The invitation to work will be issued at the beginning of January. During March and April, work plans will be evaluated and revised and work will begin on June 1.
4. Julie Burt and Jess Reed are finalizing the Participatory Landscape/Lifescape Appraisal for Burkina Faso.
5. The news on the street is that Tom Lucche, USAID/BF is quite impressed with the fact that the work shop worked. It seems that Burkina collaborators are truly talking the SANREM philosophy which was not expected.

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Ecuador:

We have heard that we need to rethink our collaborators. We were asked to come back to Ecuador to visit with new Mission personnel. We were then told not to come as Ken Weigand, the new ADO for USAID/Quito, was going to be in Washington. At this time, he is going to be in Washington, but will be unavailable to meet with us. We have been told that we are on hold. We believe we will be invited down to meet again with the mission and potentially decide on a new strategy for the site and partnerships. Our feeling at this time would be to go down on invitation, meet with the Mission and ask that we be allowed to take time in choosing partners and sites. We are potentially going to recommend that Bob Rhoades spend 2 months down there during our winter to really "get to know" the situation. Although this is a further delay, we feel that the pause will allow us to get on the ground in the SANREM fashion and do a good job in the long run.

Honduras:

1. During the summer, Greg Eckert, a graduate student of Ron Carroll, spent two months at Zamarano - working in their library. His mission during the trip was to gather any gray information concerning Ecuador, and to put emphasis on any information concerning indicators of sustainability.
2. Bill Hargrove and Jim Hoey traveled to Honduras on invitation from USAID/Honduras. They met and Jim Hoey gave a talk to Fundación VIDA. This foundation was created as a result of the debt-for-nature swap between Honduras and the US. It is a NGO to fund environmental projects with other NGOs. The Foundation received \$5M from the Honduran government and is also supported by USAID/Honduras. The group is in need of technical assistance including: assistance in developing sustainability criteria for selection of projects, b) assistance in identification of indicators of sustainability to be used in monitoring and evaluation and measurement of success and impact.

They also visited with Zamarano, EAP and discussed the possibility of a collaboration between EAP and SANREM to do research on indicators of sustainability.

There is a strong likelihood that a small project focussed on Indicators of Sustainability will be done in Honduras. It has been suggested by USAID/Honduras that a proposal and an MOU be drafted with EAP and VIDA. The ultimate goal would be that EAP get involved in service (i.e. to VIDA), SANREM gets some research in indicators of sustainability, and VIDA gets the technical assistance that they are looking for.

Philippines: discussion of the work plan review process needs attention.

W. Dar would like to approach at three levels.

- 1) Receipt of proposals, selection of proposals for consideration; NCC would review proposals and bring in outside reviewers ("outside reviewers" those in-country in same discipline a minimum of one reviewer per discipline) for more objective opinions.
- 2) Roundtable discussions for proposals to integrate "like proposals".
- 3) Then to forward proposals to the Global Technical Committee (GTC). GTC members should assist in the integration process.

Ken Shapiro referred back to the minutes and notes as voted on during the last BOD meeting. Integration would be based on recommendations from the NCC.

Lengthy discussion of matter led to topic being tabled for further discussion until joint meeting of October 5.

Burkina Faso: Ready to discuss process and work horses.

Honduras: Team consisting of W. Butcher, R. Carroll, K. McSweeney, and R. Montee to proceed
Tuesday, October 5

Continuing from Monday's agenda, reports from committees were presented.

Indicators of Sustainability. Report presented by Walt Butcher. Barbara Bellows and Kevin Stokes contributions were noted. Group is proposing one of two workshop options.

Option 1 - Proposes a 5-day conference and workshop. Combines both expertise presentations and phases into working groups to develop indicators which would be useable to SANREM.

Option 2 - Dispenses with conference and presentations and moves directly to developing indicators

It was recommended that we amend changing from conference to workshop - hit high spots with presentation of SANREM and brief plenary session, turn it over to the experts and divided into working groups, return from working groups with indicators having been developed.

This proposal is an abstract for revision.

Shapiro asked that we develop this to present to Congress to support linkages between domestic and international expertise. We need to use this to support how SANREM CRSP benefits sustainability. This could become vital to enhancing our program. We can control the agenda and componentry of participants (2/3 international and 1/3 domestic participants, NOG/PVO representatives should also be included to community participation) to keep SANREM focus center point.

Papers generated from this may/may not be published.

Workshop format would be more acceptable with higher budget figure to allow commissioning expertise. Papers/prep material would be distributed prior to workshop and participants would review documents and come to workshop prepared to work.

Call for a vote to continue to develop this activity (develop the abstract presented into a work plan for funding)

Vote of TC members: 8 in favor, 0 opposed

Dr. Hargrove offered to work with CGIAR, TropSoils, and other programs to leverage funds.

TC would like to review Barbara Bellows and Kevin Stokes papers (literature review of April 93), recommended that they be made available through newsletter at cost of approximately \$2.00.

Gender/User. Report presented by Cornelia Flora.

Training has been scheduled for November 19-24 at VPI. A large part of training will be indicators. A request to look at our approach - a draft of this is being developed - Chambers approach is part of the basis - this will be circulated for TC input. A follow on activity may be a forum to discuss the paper prior to presentation. A target date of early 94 would be a good time frame to schedule further discussion.

GIS/Modeling. Dave Swift and Ian Flitcroft gave reports.

Dave Swift reported that work has begun to develop a plan that can be adapted to the Philippine site. A plan for this will be ready and sent to ME soon for consideration.

Question: how well can existing models work?

Crop modeling takes existing models and evaluates to see if they can give us some information or if new models will need to be developed. Dave has not received any volunteers to assist in this effort and would welcome the assistance. Timelines would be in FY 94. Outlook is for 1-2 year time period.

Dave anticipates a GIS/Modeling workshop in FY 94 to evaluate lifescape/landscape interaction. This would be a 3-5 year activity and we do not have the model developed at this time to implement at present.

Dave needs someone to assist to take the lead on this activity to work to this end. IRRI has a number of modelers and could meet with our representative on the next trip to Phil. We need to move toward getting a team appointed.

Morocco expressed interest in developing a short term project for a watershed model and could be an opportunity for the modeling group.

Ian Flitcroft reported on GIS activities. Team is busy making contacts (Lee Hunt, IRRI) currently they are archiving data for the lab and SANREM for a database; soil and water modeling for the Philippines activities; working on imagery and baseline data collection for outline of what's available and the format. Most of the maps available were compiled during the 50's by the U.S. Army Corps of Engineers. Often these photos cannot be taken out of the country.

In Burkina Faso few maps are available and we will have to rely heavily on spot imagery materials.

Ecuador has only been inventoried and thus far has been covered by clouds. Eduardo Sotomayor will assist Ian with getting photo/maps from Ecuador.

These materials would be made available to communities for future land use and development strategies.

WSU will be doing some crop/crop growth modeling with Claudio and Deybe taking lead there. They may be of assistance to Dave.

IPSNAP model may be useable to SANREM. We would not want to become involved in any activity that might not have results for a long term.

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Kanemasu's proposal was presented which entailed a workshop in GIS currently being developed and scheduled by IRRI for FY 94 and Bob Zeigler recommended that we cooperate with them in this endeavor and combine resources. Continue to develop this potential and may be more feasible if conducted at IRRI, AIT is also a possible site for this workshop.

Committee consensus that we should work to develop this abstract into a work plan for presentation to the TC.

Education Group.

Information coming out of training sessions should be tailored to the sites for distribution. Information would need to be evaluated. Ultimately we would like to develop training materials based on our research. Information coming from the sites should be geared toward outreach impacts

Main areas of concern to the education group include:

Impact Assessment: qualitative/quantitative; it might be helpful to tie in with existing programs that can assist us in this area
Develop a trainers manual

Publications/Outreach: will be discussed in pm session

BOD Report. Report from BOD presented by Ken Shapiro covering:

The BOD presented a certificate of appreciation to Jim Bonner for his participation initiating SANREM CRSP.

A subcommittee of the BOD has worked on redefining the role of the BOD and review processes and Ken's notes were distributed.

Discussion resumed on roles of users in the review process. We want a true partnership presented in all the processes of SANREM. In order to accomplish this, clear, concise directives are needed to keep lines of communication clarified. Communication should be continuous and should be fed back into communities on an ongoing basis. Initially communication would begin in the community, go through CAC, NCC, GTC, ME and back.

Documentation of each meeting should be included separate from the actual work plans presented from in-country participants so that a true picture of how it came about is presented on U.S. sides.

SANREM is not Santa Claus with a bag of money - we will not issue a blanket rejection, especially when the work plan has been sent with the recommendation of the NCC.

Key concern: trust - trust comes over time. We are not experts in every aspect of this program. We cannot expect a tight timeline on each aspect. Some things take longer and we must not place strict constraints on processes. We must take one another into consideration, we need to move at a pace that is visually possible to the users. Delays will result in loss of community participation. We need to turn our frustrations into fruitful education.

Timeline and process for work plan reviews

- 0:00 Call for work given
- 60 days after call issued work plans received by NCC, NCC submits copies of work plans to GTC - during next 30 days, NCC will hold a roundtable discussion to review work plans and develop recommendations
- 30 days after work plans sent NCC and GTC will convene to review (3 reps, TC chair, 1 outside reviewer, if necessary).

GTC will make 1 of 4 recommendations:

1. decide to fund work
2. decide not to fund work
3. based on NCC recommendation revise and resubmit for funding consideration*
* TC chair, NCC, and GTC consensus to pursue revisions is required
4. GTC will advise PI and NCC of decision, NCC in turn will advise CAC

Next issue as topic of discussion: outline for review of work plans. Recommended that innovative approaches be considered and more emphasis placed on impacts. Currently we focus a lot on user approaches, but fall short when taking into consideration the originality or innovative methodology. Innovative plan would be a plus, but is not a requirement (item 1 on proposed review form).

Some of the comments on the proposed review form were:

#5 some things are not applicable for each work plan

#8 scale does not indicate direction (1 low, 10 high)

#pg2, part b. Sampling and analysis, Environmental soundness of work plan (property rights, interviews, etal)

forms should include question for an interdisciplinary approach (is this an interdisciplinary approach?)

Response concurred with invitation to work (did the work plan submitted follow the invitation?)

Add statement to be checked:

This work plan will impact () environmental sustainability, () economic sustainability,
() expected outputs? () future educational use?

Important to note that any study being conducted with human subjects, human subject rights form. Is the budget consistent with the objectives? Is this work plan cost effective?

Barbara Bellows will rework the form and resubmit to GTC for review. A scoring scheme should be developed to assess responses.

Dave Swift will chair subcommittee comprised of W. Butcher and Willie Dar to develop this scoring scheme.

The review form will be drafted for use in the Philippine work plans only. If it is adaptable, we may try to model it for use in considering other work plans.

Farmer groups should be eligible to participant and submit work plans for consideration. However, any organization to be funded must meet the same AID criteria as other entities in meeting AID guidelines for approval.

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Farmers have skills other than academic and SARE/ACE has a separate form to allow the farmers to submit work plans for funding a specific research agenda (SARE/ACE encourages farmers to participate working in collaboration with extension specialists/scientists).

We will work to clarify with Jim Bonner if funding of farmer groups will be possible within SANREM. (Financial accountability is key ? here)

New Projects. Bill Hargrove gave a presentation on some new potentials for SANREM and gave a one page report to the BOD for consideration. This report considered how we respond to different requests - proposed a method for responding to these types of requests without calling conference calls or meetings. How does new criteria link to original SANREM sites? Swift recommended that this be changed to include any site that helps extrapolate information pertinent to SANREM goals and not necessarily those that are in original site. Rhoades recommends that we reject those that overextend us or do not appear in keeping with SANREM theology/methodology.

K. Shapiro asked that we add ME has discretion to act without permission from BOD/TC chair.

Consensus from the group that we adopt this plan.

Self-monitoring and Evaluation. We need something in place for self monitoring and evaluation outside of the EEP. We recommend that the TC come up with a method for evaluating ourselves.

J. DeVries recommended that we use the original work plan objectives to determine where we are in relation to timeline/financial line/goals.

It was recommended that we establish a work group parallel to the other work groups to evaluate the progress of the CRSP. Recommended that we have an annual review to document our progress/shortcomings. DeVries recommended establishing a Participatory Performance Review to establish and monitor that we stay on target with 3 cornerstones of SANREM: gender, participatory, and landscape approaches.

We should have a forum that allows us to be self-reflective and critique our progress (knowledge, successes, failures). Allow room for feedback to enhance the outreach of SANREM.

Process documentation may help in addressing the monitoring of progress. A subcommittee to develop self-evaluation process. This subcommittee will be comprised of C. Neely, R. Montee, W. Dar, and J. DeVries. They are requested to submit a draft for self-evaluation. Their charge to task force is to devise a monitoring system to address the logframe accountability in relation to goals of SANREM philosophy: landscape/participatory/gender. The science progress will be evaluated in annual meeting primarily process and progress toward goals of sustainability. Are we providing the bang for the buck? This may involve periodic field visits to assess, confirm, review.

Policy Handbook. Please review and work toward developing a final policy prior to EEP meeting in January.

External Evaluation Panel. Report presented by Bill Hargrove. The first EEP evaluation is scheduled for 1995. We determined that we would like to have a preliminary meeting in January 1994 to get a feel for what we anticipate in this evaluation. The dates of the initial EEP meeting will be January 13 and 14 in Griffin.

Training Activities. Constance Neely reported that a Training Workshop is scheduled at VPI in November, 1993. A copy of the First Announcement has been included in the information packets distributed - enrollment will be limited to 45 persons. Questions were answered regarding the invitation list and recommendations were made to include CGIAR centers and mission personnel.

Jim Bonner has given \$40k to have an informal series of meetings to take place in Arkansas at HPI headquarters. NEXUS meetings.

Ecuador mission will in all likelihood be closed. AID is closing 23 missions/overseas posts and tentative list includes Ecuador. Currently the list includes Africa: Burkina Faso, Botswana, Cameroon, Cape Verde, Chad, Cote d'Ivoire, Lesotho, Togo, Zaire; Asia: Afghanistan, Pakistan, Papua New Guinea, South Pacific Regional, Thailand; Latin America/Caribbean: Argentina, Belize, Chile, Caribbean Regional, Costa Rica, Uruguay; Near East: Oman, Tunisia. There is a very slim chance of getting to do research in Ecuador at this point (10-20% chance).

Burkina Faso is also on the hit list. We need to monitor the situation with Ecuador and BF in the next few weeks. There is risk in continuing trying to do research in Burkina Faso.

Publications/Outreach. Topic was presented by Cornelia Flora. We now have a self-promotion brochure. But we need to determine the kinds of documents we want to published and how quickly do we want them out: papers by indicators of sustainability working group, PLLAs should be near ready for publication and need to be available as soon as possible.

What is the best way to make these available?

Recommended by Cornelia Flora: Non-refereed working paper series, attractive, less numerous pages, available at cost - no freebies.

Recommended by Jim DeVries: Center for PVO/University Collaboration in Development to publish and distribute working paper series, aiming for cost recovery by charging domestic institutions so that project is virtually no cost process. There would be no charge for foreign institutions.

Availability will be announced through other organizations (AWID, Sustainable Ag Newsletter, LAST Update, Anthro Newsletter) to allow any interested source access to this information.

Working papers should be submitted in fair shape, we would not want the rough draft too rough. It requires a lot of time to edit. Let the responsibility of primary review lie with the author(s). The primary author should have the document reviewed and edited by two or three persons prior to submitting it to the PVO Center.

We will monitor this process and amend as necessary.

Next Meeting. Tentatively would like to schedule something in March.

ATTACHMENT C

Trip Report

**Research in Sustainable Agriculture and Development and
Research Contacts for Ecuador and the Neotropical Region at the
Escuela Agricola Panamericana, El Zamorano, Honduras
July 15 - August 16, 1993**

**submitted to Dr. William Hargrove, Director, SANREM CRSP
September 10, 1993
UGA Contract AID RF SANREM CRSP
10-21-RR271-274**

**Greg Eckert
Institute of Ecology
University of Georgia**

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SANREM Honduras Trip Report

Section #1 Secondary Literature Review --- Regional Research on Indicators of Sustainability

Introduction: The SANREM CRSP has developed a matrix of indicators of sustainability. This includes socio-economic, ecosystem, water, soil and farm productivity parameters under scenarios such as various stressed and unstressed ecosystems and the linkages between them. It was requested that information be gathered on methods developed and/or used at the Escuela Agrícola Panamericana (EAP, or "Zamorano") be collected and evaluated for potential use by the SANREM CRSP.

Observations were made of the experimental designs, particularly with approaches to measuring indicators of sustainability. I worked on the assumption that, generally, rapid and technologically simple methods would be the most appropriate. These could include high and low precision analysis methods. More technical, research-monitored analysis methods could be implemented at a limited number of sites and serve as an analysis baseline. Less-technical, "end-user" methods could be used at a greater number of sites and correlated against the more technical methods to provide a greater breadth of analysis. While this report does not directly address end-user input to the development of indicator selection or measurements, it attempts to draw on experience of station and off-station research at Zamorano to begin to develop a group of appropriate measurement techniques.

Zamorano Methodologies: Experimental and monitoring biophysical and socioeconomic approaches were evaluated. These include survey, and field diagnosis methods. Most of these methods developed at Zamorano relate to aspects of pest control. This is probably due to two reasons. First, pest control is the most active area of research at Zamorano and secondly, because the emphasis on integrated pest management requires that the biotic community that provides the pest control "services", i.e., the predators and parasitoids, be maintained within the system. Therefore, more than other areas of research at Zamorano, the integrated pest control programs are concerned with long-term sustainability issues.

a. Pests - The following investigations and methods address the roles of insect, disease and weed pests in the agroecosystem. Most

methods attempt to quantify pest populations for control decision-making purposes. Sustainability issues include: fossil fuel use, environmental pollution, water quality, percentage of exotic to native species, integrity of biotic communities, productivity of agricultural systems, adequate economic returns, and, of course, pest infestations. These sustainability issues are subsequently related to the following categories of indicators: excess use of pesticides, input use intensity, tillage practices, percentage of ecological generalists to specialists, changes in population densities, disease incidence, agricultural pest density, diversity of pests and beneficials and removal of plant residues.

Several sources found cite the 1976 Guía de control integrado de maíz, sorgo y frijol (MAG/FAO/PNUD Proyecto Control de Plagas, Managua, Nicaragua); King and Saunders' Invertebrate Pests of Annual Food Crops in Central America and also H.L. Harcourt's work on survey methods as standards for methods and method development in MIPH. Andrews (1983) developed a pitfall trap for pest slugs (Sarasinula sp.) in dry beans that used an oil can containing a mixture of beer, molasses, bran and carbaryl. Farmers did not make great use of this method, in part because, they did not have access to empty oil cans nor did they take to pouring beer into the ground (Bentley and Andrews 1991). Another study evaluated options to the baited-tin can trap normally used for in-farm evaluations of slug population densities. Aside from this method, six treatments were 1. quantity of baits; 2. bait placed beneath a small board; 3. small board without bait; 4. folded jute sack with bait; 5. jute sack without bait; 6. "trash" trap (piles of cut weeds, etc.). The baited sack attracted most slugs, while the board attracted the fewest. Finally, the can trap has almost the same regression curve as these traps (Caceres, Andrews et al. 1986). The amount of bait used per trap was evaluated, and it was found to be dependent on the value of manual labor as an alternative to baited traps (Sobrado, Andrews et al.). Andrews (1987) reviews methods for evaluating slug populations. These include direct observation, crop damage, feed baits, plant indicators, poison baits, passive and poisoned traps, counts, extraction methods (in lab & field), and mark and recapture techniques. He concludes that none of the methods reviewed had undergone serious systematic field validation. Some validation has been conducted for slugs, testing an average of one slug/tin can trap/night in 30x30 meter plots as the action level for slug control. Six cans were placed in these plots and slugs were sampled 20 days before bean planting through 20 days after planting. This level was

based on the marginal cost of slug control so that if slug levels reached an average of 1 per tin per night, bait should be added to the tins as a method of control. (Portillo, Rueda et al. 1986).

A larger, portable trap was developed for leafhoppers (Empoasca sp.) (Sobrado, Andrews et al. 1986). This method uses construction materials of pine, aluminum, plastic and velcro for ease-of-use and low costs. It requires between 7 to 22 samples per field depending on degree of accuracy needed. This triangular trap is set down over crops; a window allows the farmer to stir up the leafhoppers to be counted in the upper part of the trap. Insects are viewable through the transparent plastic.

Trap crops were evaluated in the context of early-planting small areas of beans to predict the severity Apion godmani levels in subsequent large-scale bean (commercial) plantings (Fuentes, Cáceres et al. 1989). A high correlation ($r=0.85$) was found between percent damage in the "trap" and commercial crops. This test, conducted in 2 locations, successful in providing advance notice of A. godmani buildup to farmers.

Farmer ingenuity has also been utilized to develop or modify sampling methods (Bentley 1992), such as an open jar filled with alcohol tied to a stick for collecting wasps. Only one paper found addressed sampling variance (O'Neil, Andrews et al. 1989). Presence-absence sampling was used to monitor fall armyworm (Spodoptera frugiperda) infestations, and insecticide treatment decisions were made against predetermined action thresholds. Simplification of the sampling program for grower acceptance required standardization of sample size. Two methods for estimating sample size were compared, which involved analysis of different probabilities. Sample sizes needed to maintain a level of sample precision were larger than sample sizes needed to make control decisions. By reducing sampling effort and standardizing sample size, the authors provide a sampling program more appropriate for local grower needs and skills. This acknowledges lack of understanding of fall armyworm dispersion patterns and difficulties of field sizes and landscape patterns (R. O'Neil, personal communication).

Pepper weevil, Anthonomus eugenii, was addressed in one paper. Andrews, Rueda et al. (1986), found it to be a pest in most pepper crops in Central America and the southern United States. Use

of adulticide coupled with monitoring the numbers of exposed adults per 100 terminals of the plant permitted a lower action threshold and reduced pesticide use by 38%. In this study chemical control coupled with certain cultural controls (eg., removal of fallen, damaged fruits) was not more cost-effective.

EAP's Department of Plant Protection (DPV) has, and continues to collect information on natural enemies and plant hosts of pests and natural enemies. DPV's Melon Project has used this information to develop a variety of pest management options for farmers (Lastres, Contreras et al. 1991; Lastres and Rueda 1992).

Biological Control is an area gaining support and interest at EAP. A conference was held recently to establish some organization among bio-control workers in Central America. Ron Cave, Ph.D., is the Zamorano contact. Some work done in this area include an analysis of natural enemies and potential control measures for slugs (Bennett and Andrews 1985).

Research on weed management does not appear to have gone beyond identification of weeds as hosts for certain pests and/or natural enemies. The predaceous earwig, Doru taeniatum, was found to prefer large grasses, utilizing large sheaths and whorls for protection and oviposition sites. Some large nymphs were found on non-grasses (Jones, Gilstrap et al. 1987). D. taeniatum is a predator of Spodoptera frugiperda, the fall armyworm, although this study provides some evidence that D. taeniatum may not feed on S. frugiperda during the dry season in Honduras. Cover crop research may increase via the Hillside project, and Honduras is the center for the International Cover Crop Information Clearinghouse (CIDICCO - see bibliography and directory).

b. Soil - Although there are references to soil conservation projects, little research is being done at Zamorano at this time. One soil microbiologist is testing strains of rhizobia compatible to a species of *Leucaena*. The Agronomy Department has primarily focused on production of grains. The only ongoing tillage experiments are in the Department of Plant Protection, which has concentrated on the relationship between tillage methods and pest control, pest dynamics (see various reports by Pitty, Munoz and/or Vega in SANREM Honduras bibliography). This experiment has been ongoing for approximately 10 years but the plots are relatively small for studies of insect population dynamics (R. O'Neil, personal communication)

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and have suffered from lack of replication and are confounded by the numerous student projects being conducted within larger plots. Two sets of larger plots, that will be kept separate from student projects, have been established within the last few years (The Agronomy Department has yet to be involved). There is a new major effort to study dry-beans and the relationship of tillage and weed-management to invertebrate pest population dynamics, such as slugs (Pitty and Andrews 1990). This is an example of problems that may be encountered when an indicator (eg. zero-tillage) may be useful under one regime of analysis (soil conservation) but may be misleading as an indicator for another regime (pest dynamics).

Roland Bunch, formerly of World Neighbors and now of COSECHA (see Directory), suggested an appropriate farm-level comparison test of soil organic matter is to fill porous bags with various types of soil and dry and weigh them. Water is then added to the bags until it drips out. The bags are allowed to drain and then re-weighed. The soil with greater amount of organic matter will retain more water and thus be heavier.

c. Socio-economic and Technology Transfer - For SANREM purposes, this work is useful for "Issues of Local knowledge and the Participatory process". Indicators related to this are: educational level, market prices, labor availability, and use of traditional management practices.

While no specific report at EAP outlines methodologies for surveys, EAP's Integrated Pest Management in Honduras Project (MIPH) uses the sondeo approach. One sondeo (Barletta 1985) was divided into these parts: SOCIO-ECONOMIC SITUATION: history, organization, farm economy, nutrition, health, education, living, social structure and leadership, communication; AGRONOMIC SITUATION: production systems, individual vs. collective work; LAND, CAPITAL AND FINANCES: manual labor, resources and inputs, perception and recognition of pests, participation of women, insitutional services and technical assistance, CONCLUSIONS AND RECOMMENDATIONS.

A general, methodology for MIPH sondeos would be the following (Secaira and Barletta 1987):

~ *Formation of groups* - Groups of 5 -10 people integrating different disciplines or institutions

~ *Integration of equipment* - a) Data collecting equipment was organized by 2-3 people and alternated within groups and sub-groups to permit individual interaction, variety, and the sharing of ideas among personnel with different interests and/or specialties; b) Each sub-group was coordinated by one of its members who had the authority to preside or direct the technical and logistical aspects of the sondeo. General guidelines for these processes had been given by the overall program.

c) Equipment for accounting/narration was integrated during the sondeo by a member of each sub-group. This secretary recorded results (by consensus) and each days conclusions.

~ *Field work and technical applications* - Each sub-group (~10 people) selected a zone and decided on a sondeo route. Personnel were paired-off. Sub-groups would regroup for lunch and discuss information and considering data gathered and needs, adapt the afternoon's data collection plan.

~ *Confirmation and discussion of results* - in evenings sub-groups analyzed information collected and scheduled the next day's plan. Later, a larger session was held to present that day's findings, hold discussions and gain consensus on relevant information.

~ *Final discussion* - The final activity of the sondeo process was to do a comparative analysis of information from the study sites, together for a general analysis of conditions in each area with the objective to ascertain the feasibility of conducting research, validation, development and/or technology transfer (in ipm) considering the active participation of the farmer.

~ *Interviews* - Individual interviews were conducted with independent producers, those socially prominent and not, day laborers, vendors of agri-chemicals, health workers,

intermediarios, transportors, food vendors in regional centers, administrators for markets and supermarkets, and consumers. The following recommendations were given for conducting interviews:

- Avoid the use of technical language
- Do not write in front of the subject but retain the majority of the information as possible. Between interviews, summarize and record relevant observations.
- Do not prolong the interview if the subject is distracted or not enjoying the interview, with the purpose of avoiding unreal information.
- Difficult questions or those related to economics should be made indirectly.

Absent a full-time anthropologist on its staff at the inception, MIPH teams utilized 1 member, although trained as an agronomist, as a para-anthropologist. Using unobtrusive investigative techniques they gathered the kind of qualitative information about farmer's immediate reaction to the project which formal surveys cannot pick up. Without formal training, the agronomo-anthropologists made significant contributions to the development of the extension materials and improvement of communication with the farmers; the verification of farmer's actual rates of adoption and explanations for their variation; the simplification of technology which the project was developing; and to a deeper understanding of socio-political dynamics internal to the farmer's groups, which decisively affected the projects results (Goodell, Andrews et al. 1990).

A survey form was developed (Sobrado, Andrews et al. 1986) to address socioeconomic/ecological issues when attempting to present new technologies to farmers. It obtains information about infrastructure; environmental effects; farmer/family beliefs and customs, inconveniences of the technology (displaced workers), work inside and outside the farm; economic factors such as costs (money labor and any other), inputs per hectare, production, price, inputs per harvest, net benefits, changes in net benefits, rates of marginal returns, increase in non-monetary benefit and costs. Other economic parameters outside of the farm are considered such as markets (acceptability by consumers, marketers, availability of inputs or

commodities, labor), coordination, customs (beliefs and taboos), credit (availability and political institutions), programs and extension (extensionists, equipment), time, quantitative ability, family health, and diet. Back on the farm, the farm environment is considered: risks, the agroecosystem, and perceptions of the farmer. Guidelines are presented for interpreting results.

Finally, informal ethnography methodologies were applied to data-collecting for an econometric model to analyze socio-economic influences on the choice of pest control technologies by smallholders (Shaxson and Bertley 1991). Parameters include capital/labor ratios, crop type, distance from farmhouse to field, distance from farm to "agrotown", size of field, slope of field, producer/consumer ratio for farm household, contact with extensionists, season of planting, size of farm, and age of farmer. Results (among others) found an increase in labor used with increasing field size; field slope is an important factor in selection of tillage and "non-pest control" activities; producer/consumer ratios have a positive effect on the amount of capital used in chemical pest control; household labor availability has the greatest influence on tillage and weed control decisions; in general, farmers apply higher value inputs (labor and capital) in fields closer to the farmhouse; and that the "traditional view of risk-averse farmers who are slow to adopt new technologies does not appear to hold" as well as the "blanket assumption that farmers are starved of cash and will use labor-intensive technologies has not been supported by this study."

Perspectives on Indicators by EAP Researchers and others

When I first described our interest in developing measurable indicators of sustainability, Roland Bunch made an excellent point that what may be most important is that end-users are instilled, or encouraged to innovate and experiment in the face of changing economic, social and political conditions. Those are the reasons he gave for stating that no single technology is sustainable. When we shifted the conversation to "conditions" for sustainability, he mentioned soil organic matter but really honed in on the degree of tillage, feeling that the less tillage, the better chance the system has of being continually used. He also suggested the efficiency of farms. Dry weight biomass of covers in fields could be a method used (Interestingly, C. Staver, of CATIE mentioned total biomass, or NPP as a possible indicator that is not often considered in agricultural situations). Mr. Bunch was the only person who really took time to read through our lists. He submitted the following comments: Under Baseline Indicators, overall health should be added to Socioeconomic Integrity. Measurable parameters used for this include malnutrition rates between ages 0-5 and mortality rates. Market depth, or elasticity should be included in this section, also. He also raised the idea of diversity of marketing channels, or how to avoid forced monoculture packages, or overuse of inputs via one market. Rainfall intensity could be added to Ecosystem Integrity, as well as the aforementioned total biomass (vs. "extent of non-crop vegetation"). An addition to Soil Quality indicators could be water-holding capacity. As mentioned above, Mr. Bunch has successfully used his farm-level comparison test with porous bags filled with soil. Under Stressor Indicators, he suggested the addition of thievery, as an indicator of interpersonal relations and economic inequality; and the harvesting of non-renewables - including excessive hunting and gathering. He also pointed out that we should change "excessive decrease in soil organic matter" to simply "decrease in soil organic matter."

For Exposure Indicators, we should consider pest diversity and density and diversity of predators. Under Process Indicators, add levels of violence and levels of community organization. Mr. Bunch also inserts that the movement from subsistence to cash-crops may have both negative and positive implications. Sensitivity Indicators can include innovativeness of farmers, access to outside information, and again, organization as measured by attendance and frequency of

meetings. Finally, Boundary Indicators should list "permanent migration" and the percentage of youth remaining in the community.

Daniel Meyer, who teaches aquaculture at EAP, also felt that having and knowing your markets and micro-markets are key ingredients to successful agriculture. This would even affect marker interpretations. For example, an important component of aquaculture operations, and something that could be used as an indicator of a well-managed operation, is stocking density. This is directly related to the farmer's ability to raise a reasonable-sized fish in one growing season. This may not be important, however, if there is enough demand locally, or seasonally, for smaller fish. Dr. Meyer stresses quality control as critical to the success of aquaculture operations and as being a distinguishing feature of farm-raised fish vs. wild fish as a marketable commodity. Meyer is developing a research program in tilapia and fresh water shrimp and has set up integrated ponds with hogs (most Honduran fish-farmers use chicken "heces"). He pointed out that while smaller ponds still have little to no ecological impact, as these operations grow to commercial status, their effects become proportionately greater. Along with the destruction of habitat (ie, mangroves), commercial operations flush thousands of gallons through their ponds daily, creating concentrated nutrient loads in the receiving streams or estuaries. This can be compounded by neighboring commercial operations pulling in nutrient-laden outflows and then dumping even greater concentrations of nutrients into ambient waters. Few noxious chemicals are used in these operations. Diseases are primarily viral so little is added in the way of antibiotics, etc.

Dr. Boyd at Auburn will probably be most useful for establishing water quality indicators (as well as B. Deustch). Certain algae may be associated with different levels of pond fertility, although they go through their own successional cycles in a growing season.

Dr. Meyer had some knowledge of the shrimp industry in Ecuador. He stated that the Ecuatorianos had reached peak production at 80,000 metric tons, but due to poor disease and resource management, they are only achieving total annual harvest of 40 - 50,000 metric tons. A second interesting point is that it takes approximately \$10,000/ha to establish a shrimp culture operation.

Odilo Duarte, a fruit researcher, pointed out the usefulness of fruit shrubs and trees on a farm. He indicated satisfaction that his department (Horticulture) was branching out from its three main commodities, coffee, citrus and mango.

Juan Carlos Rosas, is the director of Agronomy (last 1.5 yr) and while he is interested in redirecting his department's approach toward sustainability-oriented activities, this is occurring slowly. He felt that there was nothing that had previously been done in this department that would be useful to SANREM.

Keith Andrews, an entomologist and director of EAP and former head of DPV and MIPH, said that the most important issues are social. One needs to know "what is inside people's heads;" what is their level of understanding, of skills and competence levels when trying to transfer concepts of sustainable resource to end-users. He wondered if we can get beyond mitigation and actually manage with the future in mind. An important concept is "how aggressive one gets with technology transfer (how willing to get hands dirty with end-user, willingness to let end-user know when they are "messing up!"). He encourages the avoidance of overconceptualizing and getting the job going; and that although SANREM may come up with principles for how to implement and evaluate "sustainability" projects, he believes that for the foreseeable future, "we will have to muddle our way through."

Jeff Bentley, MIPH anthropologist, proposed 3 indicators: soil (erosion/conservation), maintenance of genetic diversity and independence from international agri-technology corporations. Philosophically, he sees that our society is not sustainable and that real change may only come with drastic policy decisions (removal of subsidies). Regarding Bunch's comment on farmer experimentation, he felt that experimentation reflects a crisis, or need, or results from an exposure to new ideas.

Elias Sanchez has been managing a successful organic demonstration-teaching farm near Tegucigalpa for several years. Through various sources of funding, he runs farmer workshops and lets them see that various approaches to agriculture are possible (ie., growing corn among trees), and applies many useful analogies in describing concepts such as sustainability, soil as a living organism, etc.

Milton Flores, of CIDDICO, questions how we can establish a research situation with farmers without promising that they will receive something out of this.

Dr. Vélez, Ph.D. and head of Animal Science, suggests that using livestock diversity is probably not appropriate, as it may be with crops. He emphasizes accounting for externalities.

Lorena Lastres, M.S., does extension work for MIP/Hillsides in the southern part of Honduras as well as being part of a cooperative farm. She encourages vegetative diversity, and a decrease in inputs as indicators of sustainability. She emphasizes creativity and a mixed-bag approach to pest management, as well as testing methods that may not have much theoretical basis.

Alfredo Rueda is the acting head of DPV. He cited records of purchases in stores of villages and towns to look for changes in what is purchased (ie., fertilizers, domestic goods as an indicator of monetary savings), how much and when. We discussed plant indicators briefly. He believes that farmers observe dynamics of weed populations but do not use many associations of the weeds outside of some medicinals and some soil traits.

Ernesto Palacio has been, up until the formation of DDR, the head of PDR. He had no specific suggestions for indicators but emphasized long term studies and an integrated, multi-scale approach to resource study and management.

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Sobrado, C. E., K. L. Andrews, et al. (1986). Un muestreador absoluto de *Empoasca* sp en el cultivo del frijol en Honduras. XXXII Reunión Anual del PCCMA, San Salvador, El Salvador,

Sobrado, C. E., K. L. Andrews, et al. Efecto del tamaño de las posturas de cebo para el control de la babosa. Escuela Agricola Panamericana.

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Section #2 Directory

Ecuadorianos from EAP

See attached lists of current students from Ecuador (separated by graduating class) and EAP graduates from Ecuador (with home and business phones). The Equatoriano alumni group is coordinated by Guillermo Guerrero (AGEAPSE Casilla 7060, Guayaquil) and Dr. Vincente Novillo (FUNDAGRO). FUNDAGRO apparently put EAP's data base together and more information about current employment will be found there.

Directory of Researchers, Projects or Institutes in Tropical Latin America

1. Staver, Charles, Ph.D. Proyecto CATIE/MIDINRA
Manejo Integrado de Plagas
Apartado Postal 4830, Managua, Nicaragua
fax: 505-2-52158
Administration Office: Oficina CATIE,
#50 Reparto Belmonte, Managua, Nicaragua
telephone: 505-2-51443, 51757
Also: NICA Box 112, P.O. Box 527444
Miami, Florida 33152
note: I have previously received some project information from Dr. Staver. See bibliography.
2. Specialists in Integrated Pest Management
A directory from the 4th International Congress in Integrated Pest Management, held at Zamorano is attached.
3. Escuela Agricola Panamericana
A directory of faculty at EAP is attached. This general directory includes job titles, giving some indication of research orientation. More detailed information has to come department by department. In the case of Plant Protection, see publications catalogue.

4. Roland Bunch
COSECHA fax (504) 31 4328
Apartado 3586 Tegucigalpa, Honduras C.A.
office phone (504) 76 2354
5. Milton Flores
CIDDICO - Centro Internacional de Informacion sobre Cultivos
de Cobertura tele/fax (504) 32-7471
Apartado # 3385
Tegucigalpa, Honduras
6. Weed Science Society of America publishes membership
directories that include international members, by country. A
Pitty had an old version; might as well check a recent one in
Griffin.
7. Phil Stansly, PhD
U of Florida (Omacolee Research Stn)
- worked with soybeans and insects in Quevedo area
Integrated Pest and Crop Management
8. Micky Swisher, PhD (Geographer)
U of Florida, Gainesville (International Programs)
Has worked for OTS; done a lot of work with bananas
9. Directory - of institutions, technicians and specialists
in Plant Protection in Central America
Published by CATIE October 1992
10. Memoria Resumen
4th National / 3rd International Congress on IPM
Managua, Nicaragua
12. Specialists in Biological Control
in Central America - see Primera
Reunion del Panel de Especialistas
en Control Biologico
13. Hans Gregorson (Univ. of Minn.) and Roni Camino (IICA) are
also apparently researching "indicators of sustainability"

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Section #3 ZAMORANO MISCELLANEOUS

It was requested that other resources at EAP be investigated. This included smallholder and hillsides projects, of which little information was available on the previous SANREM team visit to EAP in 1992.

Zamorano Programs: At this time, the programs most applicable to the SANREM CRSP and Indicators of Sustainability are the Rural Development Program (PDR) and Integrated Pest Management in Honduras (MIPH) because they incorporate concepts of interdisciplinary research, sustainable systems, on-farm work and end-users.

PDR was created in 1987 to complement the work EAP was doing in rural areas. PDR's mission is to develop and conduct formal education programs and strengthen institutional ties between development groups - public as well as private. It is funded by the Kellogg foundation, and the German and French governments. A German Technical Assistance (GTZ) contact works in PDR.

The objectives of PDR are 1. extend EAP's educational and research activities to the rural areas, to improve living conditions for producers; and 2. raise levels of small farmer production directly, through the validation and transfer of technology, training and technical assistance; and indirectly through the training of farmers, extensionists, technicians, and researchers of rural areas. It has 3 main sections, extension, training and communication.

In a recent interview, Raul Zelaya, departing Assistant to the Director of EAP, explains some of the philosophy behind PDR. He states that "universities and schools must become a source for development in our region;" that is, they must become more responsive to local needs and conditions. "Universities have been separated from the development arena. We'd like to set the example for pulling together formal education and extension outreach." He concludes by stating that among all PDR participants, all are "being trained to better serve and understand a complex world with limited resources where we have to balance the ever-growing need for food with a respect for nature." (VanBuren 1993). Acknowledging the goal of PDR, and the new Department of Rural Development (DDR), to expose EAP students to different types of farming, the extension work of PDR is to encourage and develop farmer

experimentation with those farmers who have worked with other development or research projects, and to introduce new approaches to farmers who have not. It hopes to do more work developing and evaluating different methods of extension work.

MIPH was initiated in 1983 "to validate management techniques for pests of the maize-bean polyculture system under small and medium-scale producer's conditions" (Goodell, Andrews et al. 1990). Previous technical recommendations had not been tested outside experiment stations for site-specific socio-economic, environmental and agronomic conditions. It initially focused on farmer cooperatives of the land reform sector (Goodell, Andrews et al. 1990).

Zamorano Smallholder Project

This apparently is the Rural Development Program (Programa Desarrollo Rural, or PDR), which is now part of the new Department of Rural Development at EAP. PDR is housed in El Centro de Capacitacion W.K. Kellogg, a hotel-conference-workshop center on EAP's campus. PDR uses the Kellogg Center continually for workshops, seminars, etc.

Other Resources at Zamorano

EDUCATIONAL: The Departamento de Protección Vegetal (DPV) has over 40 audio-visual programs for sale covering entomology (series of 14); pests and diseases of maize, beans, peppers and cabbage; IPM and natural enemies; plant pathogens (bacteria, fungi and viruses, nematodes); sampling methods; economic thresholds; and pesticides. These are used in CERED, el Centro de Recursos Didacticos para la Fitoproteccion, a self-learning module of a-v films, written materials and insect and slide specimens of plant pests found locally, in Honduras, and Central America.

SPECIMEN MUSEUM: Ron Cave, PhD (Plant Protection) is the curator of of the insect collection and DPV herbarium (there is a larger herbarium with a resident plant taxonomist elsewhere on campus).

HILLSIDE PROGRAMS: Agronomy has a Soil Conservation Program, DPV has its IPM/Hillsides Program and Peace Corps has a program, all directed at hillside agriculture which, as Vince Cusumano put it, "...is most of Honduras." I believe the program in question is out of

DPV, which is an extension of MIPH, and has been under development for less than a year.

CIAD - Centro de Inventario Agroecológico y Diagnostico: In DPV, it interacts with other programs (MIPH and PDR), as a resource for farmers or projects to indentify specimens from their respective areas. The learning laboratory, CERED, is in the adjacent building to CIAD. Suyapa Meyer, along with R. Cave has developed a d-base program (dos-based) to manage agroecological data of insects, weeds, nematodes, slugs and natural enemies found in agroecosystems. This program has already been shared and is being used by several institutions in Central America and the Caribbean. Sample data sheets are attached. We will request a copy of the software through Director Andrews for possible use in SANREM CRSP.

NATURAL RESOURCES AND CONSERVATION BIOLOGY DEPARTMENT:
Newly created and will be led by Dr. Jay Hughes of Colorado State University for 1 year. Has an Ecologist, wildlife biologist, and 2 foresters and on staff at this time. They are interested in adding a resource economist (EAP has none), within the year. I spoke with the ecologist, Johann Kammerbauer, who has a 2 year contract partially funded by GTZ. He has worked in applied ecology in Germany, Brasil and Peru and places a strong emphasis on the social context of managed ecosystems. His job at EAP, at present, is not very clear (he has only been here 2 weeks).

R. C. Alonso. 1985. Parasitoides de *Plutella xylostella* L. (Lepidoptera: Pluelligidae) en cultivo de repollo en Honduras. Memoria Resúmenes VI Semana Científica, Tegucigalpa, Honduras.

K. L. Andrews and P. Morera. A mollusc-weed-rat-nematode parasite connection: An agrecological perspective. *Agriculture, Ecosystems and Environment* (submitted). Although both agricultural pest management and public health specialists advocate holistic views of problems which impact on rural populations, seldom do these disciplines collaborate on ecologically complex problems. Current understanding of the aforementioned relationship, which negatively impacts on CA farmers and families in 4 manners, is discussed. Each might be ameliorated through relevant ecosystem management.

K. L. Andrews and A. H. de Mira. 1983. Relación entre densidad poblacional de la babosa *Vaginulus plebeius* y el dano en frijol común. Turrialba. 33(2):165-168.

Direct nighttime observations and baited pitfall traps were used to determine population densities of active slugs, *Vaginulus plebeius* at various distances from a source of infestation. These observations were related to seedling damage and yield of dry beans. Each active slug m⁻²/night, resulted in plant stand reduction of 20% and yield reduction of 16%. For each slug captured in the pitfall traps per night, the plant stand was reduced by 14% and yield by 11%. Tentative economic injury levels of 0.25 active slugs m⁻² or 0.4 slugs/trap/night were calculated. In the presence of bean seedlings, slugs move only short distances.

K. L. Andrews. 1983. Trampa para determinar la densidad poblacional de la babosa, *Vaginulus plebeius*, plaga del frijol común. Turrialba. 33(2):209-211.

Pit fall traps baited with a mixture of bran, molasses, beer and carbaryl are accurate indicators of the population of active slugs, *Vaginulus plebeius*. For each active slug encountered in direct nighttime counts, 7 were trapped. The traps were simple and inexpensive to construct and use. They should be useful for dry bean farmers of Central America who must make chemical control decisions.

K. L. Andrews. 1984. El manejo integrado de plagas invertebradas en cultivos agronómicos, hortícolas y frutales en la Escuela Agrícola Panamericana. EAP, El Zamorano. 85 pages. 1st.

Contains basic info about principle pests in crops at EAP, including crops affected, identification, damage, biology and importance, sampling and critical levels, cultural control methods, biological control methods, chemical control, and integrated control methods and host plant resistance for 24 pests. The second part gives info, for 13 crops, for sampling and critical levels of pests at different life stages of the plants. It also provides a brief presentation of what critical levels are - that they are not static, that certain situations (susceptible life stage of plant, # of pests) warrant action, but others (resistant plant stage, presence of enemies) do not. It explains general considerations for sampling methods and frequency, such as varying with

the pest and plant in question. It also states that there are no simple methods to establish economic damage and that while sometimes a method may provide information on 2 or more pests, it is more likely that more than one method will have to be used when sampling fields for pests. Methods include: visual inspection, entomological nets, "attractant" traps, pheromone-bait traps, black light traps, and evaluation of damage. Recommendations and formulae are provided for determining losses and costs of control.

K. L. Andrews, R. Caballero, R. Kaminsky, M. Medina and J. Ordonez. 1985. Estudios ecologicos relacionando roedores, babosas, cultivos, malezas y humanos en Honduras. Memoria Resúmenes VI Semana Científica, Tegucigalpa, Honduras. 18.

See Andrews and Morera

K. L. Andrews, A. Rueda, G. Gandini, S. Evans, A. Arango and M. Avedillo. 1986. A supervised control program for the pepper weevil, *Anthonomus eugenii* Cano, in Honduras, Central America. Tropical Pest Management. 22(1):1-4.

Adult pepper weevils, *Anthonomus eugenii* Cano, were more exposed and hence easier to count between 0800 and 1100 hours than at any other period of the day. Twice weekly counts of exposed adult weevils and the use of action thresholds of either 1 or 2 per 100 terminals resulted in more cost effective control than did weekly scheduled applications. The former threshold is recommended for capital intensive farmers, while the latter may be most appropriate for capital-limited producers. Manual collection and destruction of fallen fruits was not a cost-effective supportive tactic where insecticides were used, but may be of limited value in the absence of chemical control. The low cost, simplicity and efficacy of the procedures described should make them acceptable to small-scale capital-limited farmers. This was apparently done w/ EAP students - probably before the development of a more objective view of capital-limited farmers and their attitudes to adoption of more labor intensive management options.

K. L. Andrews. 1987. Técnicas de muestreo para la determinación de la densidad y actividad poblacional de las babosas veroncellidos. CEIBA. 28(2):209-228.

Andrews reviews the types of methods for evaluating slug populations. Methods include direct observation, crop damage, feed baits, plant indicators, poison baits, passive and poisoned traps, counts, extraction methods (in lab & field), and mark and recapture techniques. He concludes that none of the methods reviewed had undergone serious systematic review or field validation.

K. L. Andrews and J. R. Quezada. 1989. Manejo Integrado de Plagas Insectiles en la Agricultura: Estado Actual y Futuro. Escuela Agricola Panamericana, El Zamorano. 623 pages. 1st.

Contains sections of several chapters on required background info needed for ipm

projects; tactics used in pest management; development and transfer of ipm programs; and ipm programs (developing or implemented) for sugarcane, coffee, banana, cacao, citrus, yuca (cassava or manioc), beans, corn and sorghum, rice, grains, pasture, horticultural plants and cotton

K. L. Andrews, J. W. Bentley and R. D. Cave. 1991. Enhancing biological control's contributions to integrated pest management through appropriate levels of farmer participation. Florida Entomologist (submitted).

The recent development literature is full of calls for greater farmer participation in agricultural research and technology transfer. Interestingly, biological control specialists do not seem to be involved in the discussion. 4 methodological models for developing and implementing biological control (b.c.) are proposed and then analyzed. Profit-generating biological inputs can be developed without farmer input, but grower involvement is required in the implementation phase. Inoculative releases and classical b.c. do not require farmer involvement in the implementation phase, but may benefit from farmer's support and participation in the research and development phase. Alternatively, conservation and manipulation techniques require extensive farmer involvement in both the research and implementation phases. Unfortunately, b.c. researchers generally ignore farmers as collaborators, even when their participation is key for implementation in heterogenous agroecological and socioeconomic environments.

Anonymous. 1990. Proceedings of the 4th National and 3rd International Integrated Pest Management Congress. Managua. 375 pages. Papers given at this congress under topics of weeds, technology transfer, biological control, entomology, plant pathology, and pests, environment and health.

M. Ardón Mejía. Metodología de Diagnostico Agrosocioecologico. Escuela Agrícola Panamericana. DPV-EAP 447

Discusses the use of farmer-based approaches in order to carry out interdisciplinary research in agricultural settings. This article does not contain actual methodologies.

M. Ardón Mejía. El papel del extensionista en el proceso de desarrollo rural. EAP. Suggests change in the traditional role of agricultural extensionists in Latin america. Extensionists need to leave behind apathy and prejudices in order to carry out their work more productively. An extensionist must participate with the local populations.

M. Ardón Mejía and R. Sánchez. 1989. La relación de medianía entre los productores de repollo en Honduras: su incidencia en la adopción de tecnologías MIP. Memoria XXXV Reunión Anual del PCCMCA, San Pedro Sula, Honduras. II. 557-564.

Using medianías (intermediates - land-owners/leasers) is a functional production mode among Honduran horticulturalists, despite conflicts of interest that are

generated during the final stages of the productive cycle. The power to make decisions, the degree of risk involved and the potential of a technology to optimize the contributions of each associate during the different stages of cultivation are the 3 elements that determine an individual's interest in participating in the development and adoption of IPM technologies. IPM practices related with phytogenetic control, chemical control and biological control are of interest to all individuals. Cultural control methods seem to interest minor associates, while supervised control interests major associates (land-owners) more.

M. Ardón Mejía. 1993. Agricultura Prehispánica y Colonial. Editorial Guaymuras, Tegucigalpa. 187 pages. 1st.

Short book on the history of pre-colonial and colonial period agriculture in Central America.

C. S. Barfield and K. L. Andrews. 1993. Catalogo de Programas Audiovisuales - Zamorano. Zamorano, Honduras. Escuela Agrícola Panamericana. catalogue of audiovisual materials.

EAP (or el Departamento de Protección Vegetal) has over 40 audio-visual programs for sale covering entomology (series of 14); pests and diseases of maize, beans, peppers and cabbage; IPM and natural enemies; plant pathogens (bacteria, fungi and viruses, nematodes); sampling methods; economic thresholds; and pesticides.

H. Barletta. 1985. Sondeo del asentamiento la Talnquera, Olancho. EAP, El Zamorano. 21 pages. This sondeo was divided into these parts: SOCIO-ECONOMIC SITUATION: history, organization, farm economy, nutrition, health, education, living, social structure and leadership, communication; AGRONOMIC SITUATION: production systems, individual vs. collective work; LAND, CAPITAL AND FINANCES: manual labor, resources and inputs, perception and recognition of pests, participation of women, institutional services and technical assistance, CONCLUSIONS AND RECOMMENDATIONS

F. D. Bennett and K. L. Andrews. 1985. El control biológico clásico de veroncellidos en Centroamérica: Una propuesta. CEIBA. 26(1):77-82.

The principle natural enemies of terrestrial mollusks include protozoans, helminths, insects and other mollusks. Many other groups of organisms attack slugs. Because *S. plebeia* is suspected to be an introduced species, it is proposed that searches be made in its native range and that promising natural enemies which are proven to be safe be imported and established in Central America.

J. W. Bentley. 1988. Farmer participation in integrated pest management research in Honduras. Annual Meeting of the American Anthropological Association, Phoenix, Arizona. 9.

Cites general observations of limits to farmer knowledge but spends most of the talk on the farmer as experimenter.

J. W. Bentley. 1989. What farmers don't know can't help them: the strengths and weaknesses of indigenous technical knowledge in Honduras. *Agriculture and Human Values*. Traditional C. American peasant farmers know more about some aspects of the local agroecosystem than about others. In general, farmers know more about plants, less about insects, and less still about plant pathology. Without discounting economic factors, ease of observability must explain part of this difference. Certain local beliefs may affect what farmers observe and know. For example, a belief in spontaneous generation may lead people to fail to observe insect reproduction. The implications of the gaps in farmer knowledge are discussed in terms of the sustainable agriculture movement.

J. W. Bentley. 1990. Conocimiento y experimentos espontaneos de campesinos Hondureños sobre el maiz muerto. *Manejo Integrado de Plagas*. 17(16-26).

Honduran farmer knowledge of maize ear rots compare favorably to scientific knowledge of origin, cause, control, symptoms, toxin production, and relationship of maize varieties with the diseases are detailed. The number and kinds of experiments farmers have designed and carried out suggest that farmers confront new plant protection problems creatively. The disease-causing fungi are local, and recent high incidence of maize ear rots is probably caused by newly introduced agronomic practices, especially the use of "improved" maize varieties.

J. W. Bentley. 1990. ¿Que es hielo? *Interciencia*. "Hielo", the Spanish word for "ice" is also used by farmers as a term for plant diseases. The author considers emic and etic sources for the various uses of the term.

J. W. Bentley and O. Cáceres R. 1990. Memoria del Simposio Participacion del Agricultor en la Investigacion y Extension Agricola. G. E. Pilz CEIBA 31(2). Escuela Agricola Panamericana, Tegucigalpa. 234 pages. This edition of the EAP journal CEIBA contains a series of papers related to farmer participation in both research and extension activities.

J. W. Bentley and K. L. Andrews. 1991. Pests, peasants and publications: anthropological and entomological views of an integrated pest management program for small-scale Honduran farmers. *Human Organization*. 50(2):113-12?

This debate between an anthropologist and an entomologist is a frank, detailed account of an ipm research and extension project for subsistence maize and bean farmers in Honduras. Dialectic tension runs through questions of the style of technology generation through on-farm research, the value of farmer experimentation and indigenous technical knowledge, farmer participation contributing to greater pesticide use, and worth of media in extension. The authors argue some of the ethical, pragmatic and scientific issues of human experiments in agricultural extension.

J. W. Bentley and W. Melara. 1991. Experimenting with Honduran farmer-experimenters. Agricultural Administration (Research and Extension) Network. ODI Newsletter 24

Anthropologists often assume that peasant agricultural technology is simply part of the cultural lore of each people, ignoring the creative role of the individual. Several recent authors have argued that small farmers are creative and often invent technology and practices. Taking off from this point, several writers have suggested that agricultural scientists should collaborate with farmers to take advantage of their creativity, and thus develop appropriate, indigenous technology. While this seems useful, farmer-scientist interaction is difficult because the methods and purposes of farmer experiments are quite different from those of scientists. This paper summarizes the results of 2 years of observations for technology generation. Problems, advantages and future directions of this collaboration are discussed.

J. W. Bentley. 1991. The epistemology of plant protection: Honduran *campesino* knowledge of pests and natural enemies. R. W. Gibson and A. Sweetmore. Proceedings of a Seminar on Crop Protection for Resource-Poor Farmers, East Sussex, U.K. Natural Resources Institute, Chatham, U.K.

Folk knowledge of the natural environment, including pest control topics, is highly uneven. Examples from Honduran peasant show that rural people have extensive folk taxonomies and much cultural lore for relatively conspicuous organisms that are of perceived cultural importance, such as social wasps and bees. Conspicuous but unimportant subjects, like sphecid wasps, fit into shallow taxonomies and have less community knowledge associated with them. Important but difficult-to-observe topics, such as bean leaf diseases, may have poorly developed folk taxonomies, and are sometimes linked with beliefs that are incongruent with western science. Unimportant and difficult-to-observe creatures such as parasitic wasps are generally neither known nor named. This scheme allows pest control workers to classify organisms, whether natural enemies or pests, according to level of community knowledge, and to anticipate the unique opportunities and challenges that each kind of folk knowledge offers.

J. W. Bentley. 1992. An alcohol trap for capturing vespids and other hymenoptera. Entomology News. 103(3):86-88.

A jar filled with alcohol and tied to a pole can be used to capture social wasps and other Hymenoptera. The method may be safer for some highly aggressive wasp species. Since the trap can be made from simple materials it is easily accessible to field workers in the tropics, and it is a good way of getting specimens in alcohol for shipping. The technique was invented with the collaboration of Honduran small-scale farmers.

J. W. Bentley. 1992. Alternatives to pesticides in Central America: Applied studies of local knowledge. Culture and Agriculture. 44(10-13).

See Bentley, 1991

D. Buckles, I. Ponce, G. Sain and G. Medina. (The use and difusion of the

green manure, *Macuna deeringianum*, on the hillsides of the Honduran Atlantic coast.). Soil conservation, nutrition, and water availability are the main problems being tackled by agronomists and agricultural researchers in cultivation systems based on corn in Central America and Mexico. Some producers in Honduras have identified and refined a more efficient technology to grow corn on hillsides through the planting of *Macuna deeringianum* in rotation with corn during the dry season. The results of a survey indicate that 66% of the farmers on hillsides grow most of their corn during the dry season through the use of the cover provided by the beans during the rainy season. Among the advantages of this kind of rotation, in comparison with traditional slash and burn are higher yields with less dependence on external inputs, briefer fallow periods, lower labor costs to prepare the land, less erosion, and reduced risk of damage due to the dry season. Problems associated with the system include the risk that there will be landslides on steeper slopes and a higher incidence of rats and other pests in the corn that is grown in the cover of beans. The amount of available land in local markets is the factor that determine the spread of this technology, rather than the size of farm or land-holding patterns.

R. Bunch. 1982. Two Ears of Corn: a Guide to People-Centered Agricultural Improvement. World Neighbors, Oklahoma City. 250 pages. 1st.

Summarizes experiences on what works and what doesn't in development projects.

R. Bunch. 1993. El Trabajo de Epagri en el Estado de Santa Catarina, Brasil: Nueva Posibilidades para Agricultores de Escasos Recursos. Cosecha. Trip Report Report summarizing author's trip to Brasil. Emphasizes soil management, no-tillage, reduced tillage, cover crops and green manures.

R. Caballero and K. L. Andrews. 1985. *Anagrus* sp. y otros enemigos naturales del lorito verde (*Empoasca* spp.) en el cultivo del frijol en Honduras. CEIBA. 26(1):90-102.

3 natural enemies of *Empoasca* spp. were detected in Honduran green beans. The fungus *Erynia radicans* attacked adults and a mite belonging to the family *Erythraeidae* was commonly found on nymphs. The presence of the egg parasite *Anargus* spp. in Honduras was confirmed; parasitism averaged 40%. No other nymphal or adult parasites were recorded.

O. Caceres, K. L. Andrews and K. Taylor. 1986. Estudio de trampas alternativas para el monitoreo de la babosa del frijol *Sarasinula plebeia* (sensu latu) (Fischer). XXXII Reunión Anual del PCCMA, San Salvador, El Salvador.

This study evaluated options to the baited-tin can trap normally used for in-farm evaluations of slug population densities. Aside from this method, six treatments were 1. amount of baits; 2. bait placed beneath a small board; 3. small board without bait; 4. folded jute sack with bait; 5. jute sack without bait; 6. "trash" trap (piles of cut weeds, etc.). The baited sack attracted most slugs, while the board attracted the fewest.

Finally, the can trap has almost the same regression curve as these passive traps.

O. Caceres, J. Bentley and K. Andrews. 1988. Factores agrosocioeconómicos que influyen en el apredizaje de los campesinos de El Paraíso. VI Semana Científica, Tegucigalpa, Honduras. UNAH. 165.

An evaluation of factors that influence learning new technologies were developed based on talks and exams on pests to 40 farmers. Factors included previous experience with the pests, belief in magic/religion, and attitude about farming as a profession (he says there are 12 factors but that is all that are presented).

CATIE. 1990. Guía para el Manejo integrado de plagas del cultivo de repollo (Guide for ipm in cabbage). Centro Agronómico Tropical de Investigación y Enseñanza. Informe Técnico 150

Guidebook for integrated pest management in cabbage

CATIE. 1990. Guía para el Manejo integrado de plagas del cultivo de maiz (Guide for ipm in corn). Centro Agronómico Tropical de Investigación y Enseñanza. Informe Técnico 152

Guidebook for integrated pest management in corn

CATIE. 1992. Avances Tecnicos Tomo II. Centro Agronómico Tropical de Investigación y enseñanza. Progress Report Progress report of short papers for IPM project in Nicaragua. Includes methods.

R. D. Cave. 1988. Cultivos trampa para muestro de *Apion godmani* Wagner. II Taller Internacional sobre *Apion*, Dánli, Honduras.

This evaluated the utility of trap crops as a sampling tool in the managment of *A. godmani* in beans. Researchers evaluated the efficiency and cost-effectiveness of two trap crops, to predict *A. godmani* infestation levels.

R. D. Cave. 1990. Primera Reunion del Panel de Especialistas Centroamericanos en Control Biologico. Escuela Agricola Panamericana, El Zamorano. pages. Lists researchers and institutions in C.A. involved with biological control

C. I. d. I. s. C. d. C. (. C. f. C. C. I. CIDDICO. 1993. Bibliography, Technical Reports and Bulletins. Tegucigalpa, Honduras.

Folder containing Ciddico's reference list, selected papers, technical reports, bulletins and newsletters plus subscription form.

CIMMYT. 1993. Gorras y Sombreros: Caminos hacia la colaboración entre

técnicos y campesinos. D. Buckles. Taller sobre Los Métodos participativos de investigación y extensión aplicados a las tecnologías basadas en abonos verdes, Catemaco, Veracruz, Mexico. Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT). 123.

Series of papers examining participatory research on the use of cover crops and green manures.

CongresoMIP. 1990. Memoria Resumen. 4th Congreso Nacional/3rd Congreso International Manejo Integrado de Plagas, Managua, Nicaragua.

Abstracts of this ipm conference

L. Del Rio, J. W. Bentley and J. Rubio. 1989. Comparacion de adopcion de nuevas tecnologicas en Olancho, Honduras, bajo diferentes niveles de participacion de agricultores. Memoria Resúmenes VII Semana Científica, Tegucigalpa, Honduras. Universidad Autónoma de Honduras. 14.

Abstract of MIPH efforts to discern adoption of technologies under various farmer participation schemes.

H. Domínguez. El muestreo de nematodos. Escuela Agricola Panamericana. EAP-DPV 336

Short book on sampling methods for farmers of nematodes.

R. Escobar, O. Cáceres, K. Andrews and R. Cave. 1989. Evaluación de diferentes niveles críticos de *Empoasca* spp. basado en porcentaje de hojas infestadas con ninfas en el cultivo de frijol. Memoria XXXV Reunión anual del PCCMCA, San Pedro Sula, Honduras. 1. 194-202.

In May, 1988, trials were initiated to determine optimum critical levels for control of *Empoasca* spp., based on % of nymph infested leaves. The efficiency of this sampling comparing it to absolute values obtained from insect traps was also evaluated. A randomized complete block design was employed at 2 locations with 3 replications and 5 treatments per location. Insecticides were applied when leaves had infestation %s of 0, 15, 30 and 45%. An added check was also included without insecticide applications. To each treatment, "dimetoato" was applied to determine the critical level. plot sizes were 49m² while harvest areas were 4 m² taken from the center of each plot. The combined analysis of variance indicated significant differences between yield among applied treatments ($P < 0.01$). Yield increases of 0 and 5% were significantly higher than the control for 30 and 45% defined above. The correlation between %s of infested leaves and # of nymphs determined from the traps was significant ($r = .78$ and $r = .56$) at the 2 sites. The treatment with 15% infestation provided the greatest net benefits. The marginal rate of return for this critical level was 5 and 20% for the 2 areas.

FAO. 1983. Ecology and control of perennial weeds in Latin America. Panel of Experts on Ecology and Control of Perennial Weeds, Santiago, Chile. UN FAO. 339.

Papers on *sorghum halepensis*, *Cynodon dactylon*, *Cyperus rotundus* & *esculentus*, *Convolvulus arvensis*, *Bidens aurea* and a by-country analysis of problem perennial weeds in Latin America.

R. W. Fischer, K. L. Andrews, A. Rueda and C. E. Sobrado. 1986. Impact economico de practicas culturales y quimicas en el control de la babosa del frijol, *Sarasinula plebia* en Honduras. IV Congress de Manejo Integrado de Plagas, Guatemala.

Compares 3 methods of slug control in beans - poison baits, herbicides in corn grown before beans, and "trash" traps. Compared to traditional control methods, yields were significantly higher with all of these treatments and there was a net benefit of \$118/ha and a net return of \$1.35 for each dollar invested. Economic benefits varied among the 3 methods due to differences in pest levels, subsidies, etc. among the areas where the survey was conducted.

R. W. Fisher, H. Barletta and K. L. Andrews. 1987. Aprendizaje y adopcion de tecnolgyas sobre manejo integrado de plagas por campesinos de Honduras. IV Congreso de Manejo Integrado de Plagas, Guatemala. 155-166. See Seaira, 1987

R. Fuentes, O. Cáceres, R. Cave and K. L. Andrews. 1989. Validación de cultivo trampa para monitoreo de *Apion godmani* Wagner a nivel comercial. Memoria XXXV Reunión Anual del PCCMA, San Pedro Sula, Honduras. 1. 163-171.

This evaluated the efficiency and profitability of a "cultivo" trap for monitoring *A. godmani* in bean fields to determine appropriate action levels/responses as well as effects on bean yield. Small plots of beans were planted 20-30 days before normal planting time. Pods were collected from these plots and adjacent commercial bean fields (with pesticide treatments) to determine yield loss when the plants were mature. The study showed a strong correlation ($r=0.85$) of pest densities in the trap crop plots to those in the commercial plots. Variability between study locations was analyzed and discussed.

G. Goodell, K. L. Andrews and J. I. López. 1990. The contributions of agronomo-anthropologists to on-farm research and extension in integrated pest management. *Agricultural Systems*. 32(321-340).

The project "Integrated Pest Management of Honduras" based at EAP, validates pest management techniques for resource-poor farmers in the region's primary subsistence crops, maize and beans. During the period covered by this study the project combined on-farm research and extension, in order to guarantee farmer-scientist-farmer information exchange and to test the transferability of technological recommendations. Each field team included 1 member, although trained as an agronomist, also performed the work of a para-anthropologist. Using unobtrusive investigative techniques he gathered the kind of qualitative information about farmer's immediate reaction to the project which formal surveys

cannot pick up. without formal training, the a-a's made significant contributions to the development of the extension materials and improvement of communication with the farmers; the verification of farmer's actual rates of adoption and explanations for their variation; the simplification of technology which the project was developing; and to a deeper understanding of socio-political dynamics internal to the farmer's groups, which decisively affected the projects results.

B. M. Gregory. 1987. Observations on velvetbean caterpillar (Lepidoptera: Noctuidae) in a hyacinth field in Honduras. Florida Entomologist. 70(2):296-7.

J. J. Herrera M., R. F. Lee, L. W. Timmer and K. L. Andrews. 1985. Determinacion de la existencia y distribucion del virus de la tristeza de los citricos en Honduras. XXXI Reunión Anual del PCCMA, San Pedro Sula, Honduras.

Not farm-oriented but provides methods used in viral disease analysis

R. W. Jones, F. E. Gilstrap and K. L. Andrews. Dinámica poblacional de la tijereta, *Doru taeniatum* en maiz y sorgo en Honduras. CEIBA. The population dynamics and biology of the predaceous earwig, *D taeniatum*, were studied in 2 common corn and sorghum cropping systems in Honduras. Adult earwigs were the colonizing stage and were found within 2 weeks of the planting in corn and sorghum in early June. Females were found tending eggs in early whorl stage corn the 3rd week of June and immatures found in late July. Maturation time of the first generation was estimated to be 30 days. Total adult and immature densities were greater than 3 per plant in corn in the 2 planting systems in early September. Earwig densities remained high in Sept. and Nov. in late maturing sorghum. Earwigs quickly colonized monoculture sorghum planted in Oct. and reached densities of 0.3/plant in 3 weeks. Densities of *D taeniatum* and *S frugiperda* were weakly correlated, suggesting a density independent relation. Observations of the biology of *D taeniatum* and its role in corn and sorghum systems are discussed.

R. W. Jones, F. E. Gilstrap and K. L. Andrews. 1987. Activities and plant associations of the earwig, *Doru taeniatum*, in a crop-weed habitat. The Southwestern Entomologist. 12(2):107-118.

The behavior and plant associations of the predaceous earwig, *D taeniatum*, were investigated in Honduras in a field of cassava containing 17 weed species. This earwig was mainly nocturnal and remained almost exclusively on plants. Preferred host plants appeared to be large grasses, especially those with large leaf sheaths and whorls large enough to provide protection and oviposition sites. Early instar nymphs were found almost exclusively on large grasses and often close to oviposition sites. Large nymphs and adults also were found primarily on large grasses, but these stages were more active and found more often on non-grass plant species than were small nymphs. This earwig passed the dry season as inactive adults in the leaf sheaths of large grasses.

R. W. Jones, F. E. Gilstrap and K. L. Andrews. in revision. Seasonal abundance of *S. frugiperda* and *Diatraea* spp. in corn and sorghum monocultures and a corn-sorghum polyculture in Honduras. Seasonal dynamics of 2 key C.A. corn and sorghum (c&s) pests, *Spodoptera frugiperda* and *Diaptera* spp. were investigated in c&s monocultures and a c&s polyculture (casado). During 1982-3 during all whorl stages, larval densities of *S. frugiperda* were significantly higher in monoculture corn than corn in polyculture. Higher densities of *S.f.* in monoculture corn were apparently due to greater oviposition in monoculture than polyculture corn and not due to differences in densities and diversity of predators or parasites. Sorghum had significantly fewer *S. frugiperda* larvae and less damage than interplanted corn. Densities of *S.f.* parasites were highest during the first growing season (June-Aug) while predator densities were highest during the second growing season (Sept-Dec). *Diatraea* densities were highest during the second growing season and in sorghum in polyculture. High *Diatraea* densities in sorghum in polyculture were apparently due to the long maturation time of the sorghum variety used in the planting system which allowed several generations to develop.

M. L. Lastres, F. E. Gilstrap and D. Meckenstock. 1989. El papel de las hormigas como depredadores de larvas de cogllero segundo estadio en el suelo. Studied the role of *S. geminata* as predator on second-stage borers in reduced-till corn at EAP. Mortality was 92.5%, 78.5% of which was caused by *S. geminata*

L. Lastres, M. Contreras and A. Rueda. 1991. Memoria: Tercer Taller Centroamericano en Fitoproteccion del Melon. Escuela Agricola Panamericana, El Zamorano. 65 pages. Abstracts from this melon workshop unders topics of status of melon production by country, diagnosis and management of diseases, lepidoptera, white fly, weeds and fungi, and fertilization and management options

L. Lastres and A. Rueda. 1992. Menu de alternativas para prevenir virosis en melon. Escuela Agricola Panamericana. Publicación DPV-EAP 364
Methods to limit viral damage to melons include controlling weeds, keeping livestock from melon fields, managing planting dates, placement and densities, using living fences, plastic covers, natural enemies and pesticides

J. F. Marengo. Hospederos alternos de *Listronotus diétrichi* (Stockton) (COL: Curculionidae) en la EAP. Escuela Agricola Panamericana. DPV-MIPH-EAP 144

Abstract on evaluation of grasses other than corn in corn cultivation as hosts for *L. diétrichi* until next growing season.

W. Melara and L. del Río. El cultivo de maiz y frijol en laderas: (I)

Caracterización de los sistemas de producción. Escuela Agrícola Panamericana. DPV-EAP 372

An overview of corn and bean cultivation on hillsides in Honduras, of which 75% of its terrain is sloping. Because of erosion and lower productivity, a general introduction is provided for tillage methods, cover crops, planting and management methods and pest management for small farmers on marginal lands.

J. A. Monroy, A. Pitty and R. Muñoz. Influencia del sistema de labranza sobre la comunidad de malezas en maíz y frijol en relevo. Escuela Agrícola Panamericana. DPV-EAP 352

From May to December, 1990, an evaluation was made of weed communities in conventional (ct) and zero-tillage (zt) plots at EAP. Plots were cultivated in a maize-bean sequence. Weed counts were made at 45 and 150 dap maize and 45 dap beans. Shannon and Wiener diversity indices were used to evaluate weed communities.

Indices of diversity were similar at each sampling date in ct and zt. Analysis of the combined dates showed greater diversity in zt. Broad-leaf weeds were more diverse in zt and grasses in ct. Ct improved conditions for perennial species dependent on vegetative reproduction. Poaceae, Fabaceae and Asteraceae were the most common families and *Ageratum conyzoides* (Asteraceae), was the most common individual.

R. Muñoz and A. Pitty. El cambio del complejo de malezas en labranzas de maíz con diferentes años de uso agrícola. Escuela Agrícola Panamericana. DPV-EAP 249

Evaluates differences in weed communities in various aged fields at EAP (Zamorano).

R. Muñoz, E. Santamaría and A. Pitty. Efecto de tres manejos de malezas sobre las plagas, enemigos naturales, rendimiento y rentabilidad del frijol. Escuela Agrícola Panamericana. DPV-EAP 456

3 weed management methods were evaluated to determine their effects on dry bean pests, natural enemies, crop yield and profits. It was conducted at EAP in 1990. The methods were hoe weed control (hwc), strip herbicide application (sha) and broadcast herbicide application (bha). hwc had the higher # of weeds. Weed diversity in hwc was significantly lower compared to sha & bha. *Commelina diffusa* dominance of other weeds caused a lower diversity index. The *Bemisia tabaci*, *Empoasca kraemeri* and *Diabrotica* spp populations were similar between weed management methods. The insect diversity was significantly higher in hwc. The % of grain damage by *Apion godmani* was similar in the 3 methods. The % of bean plants infected by virus was significantly lower in hwc. The crop yield and profits were higher in hwc.

R. Muñoz and A. Pitty. 1990. Evaluación de herbicidas preemergentes en maíz bajo el sistema de labranza cero. Escuela Agrícola Panamericana. DPV-EAP 266

Several preemergent herbicides were evaluated in no-till plots. Herbicides were atrazine (gesaprim) and cyanazina (bladex) for broad leaf weeds and alachlor (lazo), metachlor (dual) and pendimetalina (prowl) for grasses. Each of the herbicides from both groups were mixed. see paper for results

R. J. O'Neil, K. L. Andrews, C. S. Barfield and C. E. Sobrado. 1989. Sampling program for fall armyworm in maize. *Journal of Economic Entomology*. 82(1):134-138.

A sampling program for fall armyworm (faw) in maize, is described. Presence-absence sampling was used to monitor faw infestations and insecticide treatment decisions were made against predetermined action thresholds. Simplification of the sampling program for grower acceptance required standardization of sample size. 2 methods for estimating sample size were compared, which involved analysis of varying probabilities. Sample sizes needed to maintain a level of sample precision were larger than sample sizes needed to make control decisions. By reducing sampling effort and standardizing sample size, we provide a sampling program more appropriate for local grower needs and skills.

V. J. Ortiz Cortez. 1991. *Biología y Control Químico de la Maleza Tithonia tubaeformis* (Jacq.) Cass. Escuela Agrícola Panamericana. Ingeniero Agronomo.

Thesis, and probably one of the few publications on *Tithonia tubaeformis*, a common weedy plant of disturbed areas. This paper includes information on seed germination, role as an insect host, chemical control and plant biology. It is becoming a prominent weed of no-till plots at EAP.

S. Passoa. 1983. Lista de los insectos asociado con los granos básicos y otros cultivos selectos en Honduras. *CEIBA*. 26(1):1-98.

Lists 564 insects found in corn, sorghum, beans, rice and other important crops in Honduras. Generated by review of published lists, Honduran collections and those collected by PCV's around the country. Where available, information is given on months and life-stages of insect on given crops. An appendix cross-references 92 plants or plant groups ("weeds" or plant family) that act as hosts to different insects.

A. Pitty, J. Vega, A. Valdivia and L. Quiroz. Rendimiento y analisis economico del maiz y frijol en relevo en labranza convencional y cero, en el tropico seco Hondureno: Los primero cinco anos. This article tries to determine the effect of tillage on pests of corn and beans, soil chemical properties, agronomic response and economic analysis. In 1986 and 1987 conventional tillage produced a mean of 2.04 TM/ha more corn than no-tillage. However, in 1988, 89 and 90 no-tillage produced a mean of 0.45 TM/ha more than conventional tillage. Bean production under conventional tillage during the 5 years of the experiment produced a mean of 0.34 TM/ha more than no-tillage. These differences are probably related with the development of corn and bean plants; every year the tillage system with the best yield had the more developed plants. In corn, better development is probably due to increased availability of water in no-tillage systems. Every year, the

microeconomic analysis of the traditional tillage system has brought in more profits than the no-tillage due the increased benefits of beans, which always produces more under conventional practice. This analysis does not include any consideration of long-term benefits of no-till to soil conditions.

A. Pitty and R. Munoz. 1989. Aumento del control de malezas con atrizina en postemergencia, usando aditivos. Memoria XXXV Reunión del PCCMCA, San Pedro Sula, Honduras. III. 841-845.

A. Pitty and K. L. Andrews. 1990. Efecto del manejo de malezas y la labranza sobre la babosa del frijol (Effect of weed management and tillage on the slugs of field beans). Turrialba. 40(2):272-277.

Zero tillage and inadequate control of broadleaved weeds are thought to be responsible for the slug (*Sarasinula plebeia*) problem in field beans (*Phaseolus vulgaris*) in Honduras. Increased use of herbicides to control weeds in maize grown in rotation with beans is advocated as a means of reducing slug populations. Planned extension work to advise farmers on slug control strategies and further research on the food sources for slugs under field conditions are required.

A. Pitty. 1990. La resistencia de las malezas a los herbicidas
Weed resistance to herbicides. Manejo Integrado de Plagas. 16(61-67).

Weed resistance to herbicides has not developed as fast as with insects, bacteria and fungi. Possibly this is due to: the way weeds inherit resistance, the long generation time, the low mutation frequency, low selection pressure of herbicides, reduction in fitness of resistant biotypes, plasticity, and non-resistant seed soil bank reserve. Mechanisms of resistance that have been found vary according to herbicide type. In triazines, resistance is due to a change in herbicide binding site that reduces herbicide control. In paraquat, resistant plants exclude the herbicide molecule from the chloroplast avoiding phytotoxicity. In dinitroanilines herbicide resistance is caused by insensibility of tubuline to the herbicide. An alteration of the enzyme acetolactate synthetaza has conferred resistance to sulfonylurea and imidezolinone herbicides. To avoid development of herbicide resistance it is recommended not to use overdoses of herbicides, rotate herbicides with other types of control, and rotate herbicides with different mechanisms of action.

A. Pitty and R. Munoz. 1990. Reduccion de la dosis de atrazina en postemergencia usando aditivos. 4th Congreso Nacioanl y 3rd Internacional de Manejo Integrado de Plagas, Managua, Nicaragua.

Looks at reducing doses of atrazine by using additives.

A. Pitty. 1990. La resistencia de las malezas a los herbicidas. Manejo Integrado de Plagas. 16(61-67).

Weed resistance to herbicides has not developed as fast as with insects, bacteria and fungi. Possibly this is due to: the way weeds inherit resistance, the long generation time, the low mutation frequency, low selection pressure of herbicides, reduction in

fitness of resistant biotypes, plasticity, and non-resistant soil seed banks. Mechanisms of resistance that have been found vary according to herbicide type. In triazines, resistance is due to a change in herbicide binding site that reduces herbicide control. In paraquat, resistant plants exclude the herbicide molecule from the chloroplast avoiding phytotoxicity. In dinitroanilines herbicide resistance is caused by insensibility of tubuline to the herbicide. An alteration of the enzyme acetolactate synthetaza has conferred resistance to sulfonylurea and imidazolinone herbicides. To avoid development of herbicide resistance it is recommended not to use herbicides too residual, rotate herbicides with other types of control, and rotate herbicides with different mechanisms of action.

A. Pitty and R. Munoz. 1993. Guia Practica para el Manejo de Malezas. Escuela Agricola Panamericana, El Zamorano. 223 pages. Text used at EAP for course in Weed Management. Contains drawings and biological descriptions of approximately 100 common tropical weeds.

H. Portillo, A. Rueda and K. L. Andrews. 1986. Comprobacion de un nivel critico para la babosa del frijol, *Sarainula plebeia*, en Honduras. Escuela Agricola Panamericana. Publicación MIPH-EAP 72

Study was to verify that the use of critical levels of 1 slug/trap/night could result in a difference of economic loss for beans in a corn - bean sequence. Trials were conducted up to 20 days after bean planting in 6 locations under differing environmental and agronomic conditions. In each location, complete randomized blocks were used with 2 repetitions/treatment. Treatment plots were 30m x 30m; in one, poison bait was applied when traps were found to have 1slug/trap/night or greater. A second treatment had no poison application. The plots without the application generally had higher population densities of slugs and lower yields. For each slug/trap/night, there was an approximate 10% decrease in yield. For each dollar invested in slug control, net benefits returned were calculated to be \$1.11. A regression line was developed for critical population levels on cost - benefit axes.

H. Portillo, A. Rueda, K. L. Andrews and C. Sobrado. 1987. Evaluacion de cultivo trampa como un metodo de muestra para el picudo de la vaina del frijol (*Apion godmani* W.) en Honduras. XXXIII Reunión Anual del PCCMA, Guatemala City. 103.

The method to evaluate trap crops was to plant beans in patches or strips 20 to 30 days before normal planting. The trap crops were primarily used to evaluate picudo populations for pesticide application decisions. A correlation was established between trap crop levels and larger field levels ($r=.84$). Critical levels depended on the type of trap crop and harvest averages of the beans.

A. Rueda, G. Wheeler, K. Andrews and C. Sobrado. 1985. Distribucion geografica y porcentaje de infestacion de *Listronotus dietrichi* (Coleoptera Curculionidae) en maiz en Honduras. XXXI Reunión Anual del PCCMA, San Pedro Sula, Honduras.

Sampling was conducted at 22 farms. Method was to randomly select 10 locations in

a corn field and select 5 plants from each location. Plants were placed in plastic bags and transported to lab for detailed observation for signs of insect damage such as perforations from oviposition or feeding. Larvae were counted into calculations for percentage of infestation.

A. Rueda. 1986. Sistema de evaluación utilizado en la investigación de transferencia de tecnologías. Escuela Agrícola Panamericana. EAP-DPV 99 see Secaira, 1987

A. A. Rueda, F. Slansky and G. S. Wheeler. 1989. Compensatory feeding response of the slug *Sarasinula plebia* to dilution of 2 different diets. for publication in: Journal of Experimental Biology.

E. Secaira and H. Barletta. 1987. Sondeo agro-socioeconómico de las zonas productoras de repollo en Siguatepeque y Lepaterique. Escuela Agrícola Panamericana. A general, methodology for MIP sondeos would be the following:

- *Formation of groups* - Groups of 5-10 people integrating different disciplines or institutions
- *Integration of equipment* - a) Data collecting equipment was organized by 2-3 people and alternated within groups and sub-groups to permit individual interaction, variety the sharing of ideas among personel with different interests and/or specialties; b) Each sub-group was coordinated by one of its members who had the authority to preside or direct the technical and logistical aspects of the sondeo. General guidelines for these processes had been given by the overall program.

c) Equipment for accounting/narration was integrated during the sondeo by a member of each sub-group. This secretary recorded results (by consensus) and each days conclusions.

- *Field work and technical applications* - Each sub-group (~10 people) selected a zone and decided on a sondeo route. Personel were paired-off. Sub-groups would regroup for lunch and discuss information and considering data gathered and needs, adapt the afternoon's data collecting.

- *Confirmation and discussion of results* - in the evenings sub-groups to analyze information collected and schedule the next day's plan.

Later, a larger seesion was held to present that day's findings, hold discussions and gain consensus on relevant information.

- *Final discussion* - The final activity of the sondeo process was to do a comparative analysis of information from the study sites, together for a general analysis of conditions in each area with the objective to ascertain the feasibility of conducting research, validation, development and/or technology transfer (in ipm) considering the active participation of the farmer.

- *Interviews* - Individual interviews were conducted with independent producers, those socially prominent and not, day laborers, vendors of agri-chemicals, health workers, intermediarios, transportors, food vendors in regional centers, administators for markets and supermarkets, and consumers. The following recommendations were given for conducting interviews:

- Avoid the use of technical language
- Do not write in front of the subject but retain the majority of the information as possible.

Between interviews, summarize and record relevant observations.

- Do not prolong the interview if the subject is distracted or not enjoying the interview, with the purpose of avoiding unreal information.

- Difficult questions or those related to economics should be made indirectly.

E. Secaira, K. L. Andrews, H. Barletta and A. Rueda. 1987. Research on

transference methodology of integrated pest management technologies in Honduras. CEIBA. 28(1):3-28.

Describes the test used by MIPH to evaluate various extension methods. Farmers were "trained" with assorted levels of extension goodies such as audio-visuals. Results showed that "big production" extension methods led to no difference in farmer adoption of technologies

R. A. Sequeira, F. E. Gilstrap, K. L. Andrews, D. Meckenstock and H. Fuentes. 1987. Dinámica de poblaciones de *Diatraea lineolata* (Walker) en sistemas de cultivo de pequeños agricultores del sur de Honduras. Escuela Agrícola Panamericana. Publicación MIPH-EAP 82

D lineolata is a occasional pest of corn & sorghum in C.A. Damage can be more than gusano cogollero. 4 cropping systems were studied at the beginning and end of their cycles in 1985 in the s. of Honduras population dynamics of *D lineolata* and its associated parasites. the 4 systems were 1. monoculture sorghum (stick-planted); 2. monoculture corn; 3. corn and sorghum planted alternately; and 4. corn and sorghum planted "casado" Infestations with corn were much higher but there was no system difference. There was a greater infestation in alternate planted sorghum/corn than there was in monoculture sorghum and the casado system.

R. A. Sequeira, F. E. Gilstrap, K. L. Andrews, D. Meckenstock and H. Fuentes. 1987. Importancia de la hormiga brava, *Solenopsis geminata*, en maíz y sorgo sembrados en cultura mixta en Choloteca, Honduras. Escuela Agrícola Panamericana. MIPH-EAP 83

Study looked at affects of pests in corn/sorghum system with and without *S geminata*. Levels of *Spodoptera frugiperda* and *Diatraea lineolata* were lower in the presence of *S geminata*. Yield differences were not marked.

L. J. Shaxson and J. W. Bentley. 1991. Economic Factors Influencing the Choice of Pest Control Technology by Small-scale Honduran Farmers. Natural Resources Institute - Overseas Development Administration. Report R1664(S)

A method was developed to analyze socio-economic influences on the choice of pest control technologies by smallholders. It applies econometric parameters and a model to informal ethnography data-collecting methods. Parameters include capital/labor ratios, crop type, distance from farmhouse to field, distance from farm to "agrotown", size of field, slope of field, producer/consumer ratio for farm household, contact with extensionists, season of planting, size of farm, and age of farmer. Results (among others) found an increase in labor used with increasing field size; field slope is an important factor in selection of tillage and "non-pest control" activities; producer/consumer ratios have a positive effect on the amount of capital used in chemical pest control; household labor availability has the greatest influence on tillage and weed control decisions; in general, farmers apply higher value inputs (labor and capital) in fields closer to the farmhouse; and that the "traditional view of risk-averse farmers who are slow to adopt new technologies does not appear to hold" as well as the "blanket assumption that farmers are starved of cash and will use

labor-intensive technologies has not been supported by this study."

C. E. Sobrado, K. L. Andrews, N. Urbina and C. Ward. Efecto del tamaño de las posturas de cebo para el control de la babosa. Escuela Agrícola Panamericana. MIPH-EAP 214

The amount of bait used in slug traps was evaluated in 3 sections of Honduras. Results present guidelines for amount of bait based on cost-effectiveness when compared to availability and cost of the most common alternative to traps, manual labor.

C. E. Sobrado, K. L. Andrews, A. Rueda and H. Portillo. 1986. Un muestreador absoluto de *Empoasca* sp en el cultivo del frijol en Honduras. XXXII Reunión Anual del PCCMA, San Salvador, El Salvador.

Sampling method to count leafhoppers. Uses pine, aluminum, plastic and velcro for ease-of-use and low costs. Requires between 7 to 22 samples per field depending on degree of accuracy needed. This triangular trap is set down; a window allows the farmer to stir up the leafhoppers to be counted in the upper part of the trap; viewable through the transparent plastic.

C. E. Sobrado, K. L. Andrews and J. French. 1986. Filtro socioeconómico y ecológico para la preselección de tecnologías alternativas en programas de comprobación de tecnologías. Escuela Agrícola Panamericana. EAP-DPV 100

A survey form was developed to address socioeconomic/ecological issues when attempting to present new technologies to farmers. It obtains information about infrastructure; environmental effects; farmer/family beliefs and customs, inconveniences of the technology (displaced workers), work inside and outside the farm; economic factors such as costs (money labor and any other), inputs per hectare, production, price, inputs per harvest, net benefits, changes in net benefits, rates of marginal returns, increase in non-monetary benefit and costs. Other economic parameters outside of the farm are considered such as markets (acceptability by consumers, marketers, availability of "insumos", labor), coordination, customs (beliefs and taboos), credit (availability and political institutions), programs and extension (extensionists, equipment, time, quantitative ability, family health, diet. Back on the farm, the farm environment is considered, risks, the agroecosystem, and perceptions of the farmer. Guidelines are presented for interpreting results.

R. Stewart, M. Cuastra and M. Acosta. 1988. La Política de Incentivos y La Ventaja Comparativa del Ecuador en la Producción de Soya. Ministerio de Agricultura y Ganadería Unidad de Análisis de Políticas. August. Documento 3

Background information on sources in Ecuador MAG for soybean research and production.

C. R. Trabanino, H. N. Pitre, D. H. Meckenstock and K. L. Andrews. 1988. Influence of plant population on *Spodoptera frugiperda* (JE Smith) infestation and damage to sorghum. *CEIBA*. 29(1):31-40.

Four tests were conducted using different sorghum planting densities to investigate the effects of host plant spatial patterns on fall armyworm (faw), *S frugiperda*, infestation and damage to sorghum plants. Although total numbers of faw per unit were greater in higher plant populations, observed plant damage was lowest in the more dense plantings because the large number of larvae were spread over an even greater number of plants (density of larvae per plant was low). The higher number of insects developing in the high plant population will influence faw dynamics; faw population size may be increased dramatically and crop damage could be serious later in the growing season or on crops planted late.

C. Trabanino, H. N. Pitre, K. L. Andrews and D. H. Meckenstock. 1989. Effect of seed size, color, number of seeds per hill and depth of planting on sorghum seed survival and stand establishment: relationship to phytophagous insects. *Tropical Agriculture*. 66(3):225-229.

Sorghum seeds were planted in 2 different cropping systems, casado (sorg. & maize on same hill), and golpe alterno (sorg & maize on alternating hills) in 1 test; and in monoculture in a second test to determine the effects of # sorg seeds/hill and depth of planting, and seed size and color, respectively, on seed survival and stand establishment in an area in C. Hond. infested with seed and seedling insect pests. Seed size and color did not influence the amount of damage to seeds/seedlings. More seeds were destroyed or removed where seeds were planted 7.5 cm deep than at 2.5 cm, although seedling emergence was the reverse. Seeds were damaged less by insects, and seedling emergence higher in the casado system. The loss of seeds and reduction in plant stand was due mainly to ants (*Solenopsis geminata*), although white grubs (*Phyllophaga* sp.) and fall armyworms (*Spodoptera frugiperda*) contributed to stand destruction.

S. Trimino de Meyer. 1992. Directorio de instituciones y especialistas presentes en el 4to. Congreso MIP, Manejo Integrado de Plagas. El Zamorano, Honduras. Escuela Agricola Panamericana., directory.

Directory of institutes and specialists present at the 4th Congress on IPM, integrated pest management.

A. R. Valdivia, L. Lastres and P. Calderón. 1992. Malezas del Sur de Honduras identificadas como hospederos alternos de virus transmibles a las cucurbitaceas. Escuela Agricola Panamericana. DPV-EAP 452

Samples were taken of plants with symptoms of viral infections to determine which were hosts of cucurbitaceae virus. The samples were analyzed via the ELISA technique. 20 species from 12 families were found to be hosts of one or more of the cucurbit viruses. Important alternate hosts, found to have 3-5 of the viruses were *Cucumis melo*, *Curcubita pepo*, *Cucumis anguria*, *Cleome viscosa*, and *Boerhavia erecta*.

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A. R. Valdivia, A. Pitty and K. L. Andrews. 1989. Manejo de malezas en maiz con leguminosas de cobertura y su efecto en la dinamica poblacional de plagas. XXXV Reunión Anual del PCCMCA, San Pedro Sula, Honduras. III. 806-816.

Treatments were established to observe affects of 2 legumes, *Mucuna pruriens* and *Dolichos lablab*, planted at different times in corn and beans, on weed suppression, invertebrate pest populations and corn production. Pests observed were, *Spodoptera frugiperda*, *Saaraninula plebia*, *Listronotus dietrichi*, *Geraeus* spp., *Empoasca Kraemeri*, and *Apion godmani*. Both legumes were found to be effective in weed control, best when planted at the same time as the corn. No significant differences were found in pest populations among the treatments and crop damage was not significant except in the case of *A. godmani*. Crop production, via competition, was not affected by the presence of the legumes.

M. VanBuren. 1993. WKKF International Journal. RZ: "Universities and schools must become a source for development in our region." (they must become more responsive to local needs and conditions. PDR "takes a systematic approach to 2 important aspects of development: training people who work with farmers, and developing programs for rural programs in the region." "Universities have been separated from the development arena. We'd like to set the example for pulling together formal education and extension outreach." among other things, it emphasizes 'short courses and seminars for farmers, training manuals and other teaching materials, educational opportunities for field level agricultural technicians and agricultural researchers.' all are "being trained to better serve and understand a complex world with limited resources where we have to balance the ever-growing need for food with a respect for nature."

J. Vega, R. Munoz and A. Pitty. 1992. Evaluacion de plagas, factores agronomicos y economicos del maiz y frijol en relevo bajo dos sistemas de labranza. III Rendimiento y analisis economico. Revista Manejo Integrado de Plagas. In 1989-90 a comparison was made of tillage systems at EAP. Corn yields were inconsistent in both years under the 2 treatments. In 1989 the net benefits of the corn-bean system were greater under no-till. Corn production and the costs of production were similar in both systems, but no-till produced more beans. In 1990 the net benefits were greater under conventional tillage due to the higher production and higher prices received for beans. In both years, the cost-benefit relationship was greater under no-till.

G. S. Wheeler, T. R. Ashley and K. L. Andrews. 1989. Larval parasitoids and pathogens of the fall armyworm in Honduran maize. Entomophaga. 34(3):331-340.

Parasitism by natural enemies of all larval instars of the fall armyworm was quantified in 5 Honduran maize fields during the 1984 growing season. Overall, 42% of the host larvae were killed by the natural enemy complex. The braconid parasitoid *C. insularis* was the most common natural enemy accounting for 36.8% of the complex and causing 15.5% mortality of fall armyworm larvae. Other natural enemies included the nematode

Hexameris sp., the tachnid *lespesia* sp. and the imperfect entomopathogenic fungus *Nomuraea rileyi*. Distinct ranges of larval instars were attacked by several natural enemy spp. *C. insularis* was important at all larval densities observed.

Zamorano. 1991. Escuela Agricola Panamericana - Catalogue (Catalogo). Zamorano. EAP.

Zamorano. 1992. Programa y Resúmenes: 4to. Congreso Internacional Manejo Integrado de Plagas (MIP). 4to. Congreso Internacional Manejo Integrado de Plagas (MIP), El Zamorano. Escuela Agricola Panamericana. 116.

Abstracts of this IPM conference, held at EAP

Zamorano. 1992. Investigación Participativa: Concepto, Metodología y Experiencias. Escuela Agricola Panamericana, Tegucigalpa. 58 pages. 1st.

Papers addressing methods, case studies and experiences of researchers in farmer participatory research.

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ATTACHMENT D

SANREM CRSP TRIP REPORT
Honduras
September 12-15, 1993

Report by: **Bill Hargrove**

Contract No: **LAG-4198-A-00-2017-00**

SANREM Representatives: Bill Hargrove, University of Georgia
Jim Hoey, Heifer Project International

Sunday, September 12

Arrival in Tegucigalpa (minus luggage). Brief meeting with Tim Wheeler, HPI country rep.

Monday, September 13

USAID/Honduras. After retrieving our luggage at the airport, we met with Dr. Vince Cusamano (USAID/Honduras/RD). Vince had made two appointments: one with an NGO, Fundación VIDA, in the morning, and one with Jay Hughes at Zamorano in the afternoon. We proceeded to the appointment with Fundación VIDA.

Fundación VIDA. At Fundación VIDA, we met with Vicky de Diaz, the Executive Director, René Gamero, Technical Director, and David Knoll, a United Nations Volunteer. Fundación VIDA was created as a result of part of a debt-for-nature swap between Honduras and the U.S. The Honduran government established this NGO to fund environmental projects with other NGOs (approximate funding level, \$5 million). The foundation is also supported by USAID/Honduras. We presented an overview of the SANREM CRSP and Jim Hoey presented a description, using slides, of our site activities in the Philippines. Vicky de Diaz explained some of their technical needs, which included: a) assistance in developing sustainability criteria for selection of projects, b) assistance in developing sustainability criteria for design of projects, and c) assistance in identification of indicators of sustainability to be used in monitoring and evaluation and measurement of success or impact. The last item would include working closely with NGOs with funded projects to include sustainability criteria and indicators in their project activities. Vicky de Diaz said that she would like to receive a proposal from us describing what the contribution of SANREM will be, what the benefits will be, and what will be expected of VIDA. This proposal would be presented to the VIDA Board of Directors for action. Vince Cusamano suggested that after approval by the VIDA Board, we should develop an MOU between SANREM and VIDA. Specific task orders could be drafted under such an MOU. We agreed to draft a proposal for consideration by USAID/Honduras and VIDA.

Zamorano - EAP. We visited Dr. Jay Hughes the temporary head of the new Department of Natural Resources and Conservation Biology. The new department currently has a faculty of five in the following areas of expertise:

- Watershed Management/Water Systems
- Wildlife Biology
- Ecology
- Forestry
- Forestry

A sixth faculty member will be the Department Head and a Resource Economist. They are recruiting for this position now. They currently have ten students in the program. They will be building a new facility for the department next year. They are generally well supplied with computers and GIS equipment. They do GIS training as a part of their course on Information on and Use of Natural Resources. The students are currently on a field trip visiting some of the government ministries.

We explained the SANREM CRSP and expressed an interest in collaborating with Zamorano in research on indicators of sustainability. Jay Hughes was interested in pursuing this idea. He suggested two models as to how this might work: 1) SANREM cooperate with EAP on their demonstration areas to research indicators of sustainability, and 2) EAP collaborate with SANREM and VIDA at VIDA project sites to research indicators of sustainability. The demonstrations would be on sustainable agricultural practices in various resource systems, including monitoring and evaluation.

Vince suggested that we develop a proposal and MOU with EAP, and then program one or two activities (start small). Vince liked the idea of SANREM, VIDA, and EAP working together. With that model, the university gets involved in service, SANREM gets some research in indicators of sustainability, and VIDA gets some technical assistance.

Tuesday, September 14

Elias Sanchez. On Tuesday morning, we visited the farm of Elias Sanchez, an organic farmer just outside of Tegucigalpa. We first sat at his kitchen table and discussed his work and philosophy. Elias does consulting and training for Kellogg. He also does training of campesinos funded by NGOs. Originally he trained only poor farmers but now he works with other groups as well. He says he is "using rich people to help poor people. Why should the guy living on the mountain manage his land in a way that the guy in the city can have good water?" So, he is working to get rich city dwellers to pay for clean water through providing educational scholarships for the children of campesinos, etc. Kellogg is funding his training farm because they care about what happens to small farmers and what happens to young people on farms. He is also working as a consultant for Kellogg to assist Catacamas, a local technical or vocational school. He wants to assist Catacamas become more of a service to local farmers. There is another school in Barinas, Venezuela with the same idea.

Elias shared some of his personal attitudes concerning the soil and sustainable agriculture. His primary concern is for the "life" in the soil. "Smell the soil; you can tell if there is something living there." He explained that "God has given me many opportunities. I am 60 years old and have never been sick. I have to give something back." Elias was trained in the U.S. at the University of New Mexico. He has a B.S. degree in agriculture and an M.S. degree in business. He bought his farm in 1960, but has only been working it for the past 14 years. Before that it was fallow. He is growing organic vegetables, especially a new variety of Romaine lettuce, onions, beans, and peppers. He markets them in Tegucigalpa to restaurants. He said that "organic" doesn't mean anything to the common man, but only to the elite who can afford to pay. He said he liked to grow plants because they "give more hope for living. Plants are not just for money. There is beauty in plants and animals."

Elias said that there are two big problems in Honduras: a) too many people going to the city, and b) the topography (i.e. sloping land). He said that a problem with technologies taught in formal schools like Zamorano is that they are not appropriate for campesinos who farm hillsides. He said, "If you bring the man trained at Zamorano here to my farm, he begins to cry". He said that

students from Zamorano have toured his farm, "but they don't like to get their hands dirty." He also said that their first question is always "Is this profitable?" He asserts that there are other profits besides money. "Ethics are important. After you, other people are coming."

Another problem is that less and less people want to farm. "Farming in Latin America is not a distinguished profession." Only about 50% of young people remain in farming, the rest move to the city.

Returning to the soil and management of the land, he explained that he was not totally against fertilizers, but "there are other ways, a more rational approach." He emphasized that we as scientists tend to study the inorganic components of the soil, the sand, silt, and clay, and the geology, the parent material. "We should be studying the biological component." "The soil is your other wife. You must love it as your wife. When you plant seeds you are impregnating the soil. But, you must provide love along with water and nutrients. If you don't love your soil, you might as well be selling bananas in town. People need to understand that in the food that we eat is longitude, latitude, humidity, genetics, etc., and my contribution as a human. We do farming with our brain not the tools. The contribution of humans is very important. The soil reproduces what we produce."

"A major problem with development projects and with agrarian reform is that we give land or tools, but not the know-how. We have to develop the 'human farm'. We must develop brain skills."

"Another problem is borders and conflict across borders. A border is a political division but not a human or ecosystem division. Pollution never asked for a passport."

"The soil is an ecosystem. Soil is a living thing. We teach two concepts in our farmer training: The soil is composed of a body (the sand, silt, clay, water), and a soul (the life). The body can be retained but it is the soul that must be conserved. To conserve the soul, we must stop burning and monocropping and put mulch to keep the water and nutrients."

His interest at the school is to "cultivate the human farm". He wants to help farmers get and apply knowledge. He gives a 60-hr intensive training in one week (6 days). Each day there is 10 hrs of field work and training and each night, 2 hrs of reflection. During the 2 hrs of reflection, the farmers are encouraged to discuss what has been learned and how it could be applied to their farm. He brings the entire family to the training, not just the men. They started doing this in 1990, and learned that when the women participated, there was a 90-95% adoption rate of the technologies taught during the training. They bring 15 couples at a time for training and someone is hired to take care of the children. The reason for the high adoption when wives participated is that the wives "bring pressure".

During the training, Elias tries to teach new concepts about soil. He uses the "theology of farming". "We are made from dead soil. The blowing of God when he created the first man is the power of thought. We have to use the power of God." One of the first things he does is to demonstrate planting in soil (with organic matter) compared to planting in sand or gravel. In the gravel, the seeds germinate but do not grow well. He also talks about the Mayan heritage and their respect for the soil. He compares the soil to humans. "The real person is the soul, not the body. It is the same with the soil. The real soul of the soil is the life. The inorganic part is the body."

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During the training, he focuses on eight principles:

- 1) Do it yourself first.
- 2) Respect human dignity (socio-cultural heritage).
- 3) Start small with innovations.
- 4) Strive for low cost innovations (both socially and financially).
- 5) Conduct yourself with a high degree of responsibility.
- 6) Share what you have been learning (not because you are a good guy, but because it is good business).
- 7) What you do must provide personal satisfaction and collective satisfaction.
- 8) Any innovation must be supported by the laws of Nature.

He teaches the course in 5 modules. The first is a basic course in organic production. He now focuses more on practices than principles, but he is trying to go to teaching principles with a set of practices.

He makes follow-up visits to farms of the trainees to see the applications. Vince asked about any special training for women. Elias said that in addition to participating in some of the basic training, they give special training to the women in chicken production, improved baking ingredients and methods, and improved nutrition.

Elias says we all have to be concerned about the environment. "The whole planet is our womb. If we damage it, we will die."

He also teaches diversification during the training. He teaches other skills and crafts besides farming such as carving, etc. Part of the training is to "eliminate the status quo". "Just like a computer, sometimes we have to eliminate some memory to accept innovation."

Generally NGOs or Kellogg pays the cost of training which is 100 L/day. This includes food, dormitory, instruction, training materials, and a field trip to other nearby farms.

He likes organic matter so much that he has the nickname of "shitter", because he will stop his car to pick up horse manure beside the road.

Paul McKay (World Neighbors) has been sending students and others from Bethel College in Kansas for training.

With respect to technology transfer, he uses the analogy of a complete fertilizer. Not only is the technical portion needed, but also the human component. "Technology transfer cannot be done by a recipe. It is not linear. We need human transformation. Farmers must adapt, not adopt. People are asking for interactive technology transfer. The Bible speaks of interactive technology transfer. Farmers don't want top-down information."

"Humans have three pieces of land at their disposal:

1. Knowledge that produces ideas
2. Technology that produces skills
3. Values that produce attitudes

God created us with 5 senses. These 5 senses are the windows for information to get into the brain. Traditional teaching is ineffective because it uses only seeing and hearing. We need to use also smell, touch, and taste."

We then toured his farm. We saw the following activities.

- 1) Earthworm farming done in used tires (turned inside out) filled with manure and straw.
- 2) Traditional sugarcane varieties that have a soft stem and are good for chewing, but not as strong a stalk for standing in the field.
- 3) Lettuce growing on terraces. Compost is hauled to the fields. Compost is chicken manure, household waste, and straw, grasses, and other vegetative matter.
- 4) Marigolds planted amongst the lettuce to control insects.
- 5) Sheets of yellow plastic with sticky stuff painted on it to catch insects. Many insects are attracted to bright yellow color.
- 6) Bannanas planted in gullies to renovate them. They collect the sediment.
- 7) The terraces were stabilized by grass planted on the banks.
- 8) Some Glyricidia planted on terraces. He uses the ground leaves to make a tea and spray it on plants as an insecticide.
- 9) He also had some plantings of a plant he called "white leaves". It is a medicinal plant, good for pain.
- 10) He said that he promotes the concept of "forestal windows". As he puts new land into production, he saves the trees and plants among the trees.
- 11) He plants trees in gullies in a triangular pattern to catch sediment. He uses bannana primarily but also Leucaena, Glyricidia, or Albizia. (Elias thinks that Albizia also has the same insecticidal properties as Glyricidia.)
- 12) We saw beans and corn planted on one-row terraces amongst trees, even pine. Elias said that there is plenty of light. He has grown corn year round, planting every week.
- 13) He was growing vegetables in scattered areas in small beds or in used tires (turned inside out).
- 14) On some of the poorest soil he was using a system similar to zai in Burkina Faso. He made holes on about a one-ft square and filled it with organic matter. Then he planted high value crops.
- 15) Near the dormitory he showed us where he constructed a waterfalls on the stream. He said "This is the music for the farmers".

Before we left, Elias told us of another activity in which he was involved. He said "There is a Fourth World; people from the Third World living in the First World". He was speaking of people from Latin America living in the U.S. "We are trying to develop them too." He is working with a consulting firm in Florida to assist Latin American immigrants. The firm is ConAg in Dade City, Florida.

We discussed opportunities for collaborating with SANREM. Elias said that he would be willing to work with us. He was willing to do training of farmers from the U.S., or to work with us on

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training or research activities on indicators of sustainability. We parted at 3:00 pm.

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ATTACHMENT E

SANREM CRSP TRIP REPORT
Morocco
September 27 - October 1, 1993

Report by: Bill Hargrove

Contract No: LAG-4198-A-00-2017-00

Participants: W. L. Hargrove, Program Director, University of Georgia
J. M. Bonner, Program Officer, US AID/Washington
B. L. Duncan, Auburn University
D. M. Swift, Colorado State University
E. T. Kanemasu, University of Georgia

Objectives

- 1) Further identify the research priorities and interests of INRA/Settat, IAV/Rabat, and ENA/Meknes;
- 2) Identify a network of potential collaborators;
- 3) Evaluate potential sites with respect to sustainability, natural resource issues, landscape linkages, and farmer-first approaches;
- 4) Develop a plan for proceeding to be considered by AID/Morocco, SANREM, and the Moroccan institutions.

Activities

Sunday, September 26

Arrival, Rabat. Met at the airport by Dr. Tom Gillard-Byers.

Monday, September 27

7:00 am Breakfast meeting of the SANREM team. The team discussed some general guidelines or principles for designing a SANREM activity in Morocco. These included the following "Do's and Don'ts":

Don'ts

- 1) Propose a big activity/presence
- 2) Design a follow-on activity to MIAC
- 3) Be in competition with TROP SOILS

Do's

- 1) Design a collaborative project with Moroccan institutions in which they take the lead and SANREM plays a supporting role
- 2) Propose a focussed activity within the general theme of "decreasing vulnerability to drought"

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- 3) Capitalize on SANREM's unique skills and approach
- 4) Link Moroccans to other SANREM sites and/or activities
- 5) Link with John Day's economics project

9:00 am Meeting at USAID/Morocco. Attending the meeting were John Mullenax and Jeff Allen (USAID/Morocco), John Day and Daniel Debye (TSMM), Tom Gillard-Byers (MIAC Team Leader), and Bill Hargrove, Jim Bonner, Bryan Duncan, and Dave Swift (SANREM).

John Day gave a summary of the proposed TSMM activity. He emphasized that they would be taking an economic approach to natural resource management. Working with INRA/Settat near Settat and IAV/Rabat near Meknes, they will be evaluating such practices as crop rotation, crop residue management, water harvesting, livestock integration, and institutional and policy issues from both a farming systems perspective and a watershed level. They hope to use models for evaluation on a watershed level. Their economic models will possibly be linked with crop/soil water balance models.

Bill Hargrove summarized the backdrop on the SANREM visit and shared the list of do's and don'ts listed above.

John Mullenax expressed a concern for the projects designed by TSMM and TROPISOILS to "pull together" and be coordinated with SANREM. He also wants to make sure that both SANREM and TSMM result in a "useable product".

Jim Bonner made the following points:

- 1) We look at activities of other CRSPs as a resource.
- 2) The Moroccans should be looked at as a resource, not only as a recipient.

Tom Gillard-Byers made the following points:

- 1) They are looking for a collaborative mode, for complementarity.
- 2) MIAC does not view the proposed SANREM activity as a follow-on to their activity.

At this point, John Day and Daniel Debye left the meeting to attend another meeting.

John Mullenax made the following additional points:

- 1) With respect to economics, don't be afraid to address it. There are no pre-set rules; propose whatever makes sense technically.
- 2) His major concern is lack of focus; we need concrete output, a useable product.
- 3) He recommended that we get a good handle on the Moroccan institutions; look carefully at their depth and commitment.
- 4) From the IAV evaluation, they are involved in many broad-based activities; they need focus.

Other AID/Morocco activities include the Tadla Natural Resources Management Project. This is starting this year. It is a large irrigation scheme north of Marrakesh and east of Settat. A major objective is to improve water use efficiency on-farm. It also has a component of organizing the private sector to achieve better marketing and system management. It is in the same ecological zone as where we are looking.

Jeff Allen suggested that we identify the Mission's strategic objectives and mesh that with the objectives of the Moroccan institutions. He also emphasized that we need concrete specific

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objectives. Jeff manages the Moroccan Agribusiness Promotion Project (MAP). It is primarily a marketing project. The primary goal is to increase the export of high value crops.

John suggested that we get a copy of the project paper on the Tadla Natural Resources Management Project at AID/W. He also added that the Morocco Mission Director is keen to follow-up with people that they have trained, i.e. to nourish the effort put into training people at IAV and INRA. He also expressed approval of us visiting with Meknes.

John's expectations are not that we would propose a large activity such as we have in the Philippines, but he also does not want a series of small projects with no cohesive focus. He likes the original ideas put down in our original planning document. INRA needs help in moving their work out to farmers. The research needs to be built around farmer needs. For example, their no-till research is good but needs to be moved out to farmers. Any project proposed by SANREM needs focus, form, cohesiveness. INRA/Settat would benefit from more farmer-first approaches. TSMM plans to exchange scientists between sites and programs of INRA and IAV.

We departed AID and departed Rabat for Settat.

3:00 pm Meeting with Tom Gillard-Byers and Keith Moore, MIAC. Tom explained some of the history of the MIAC project. The first segment developed on-station research capabilities. More recently, they have been working on research agenda development and monitoring and evaluation. They have also tried to improve technology transfer. Everyone at the Center has a technology transfer responsibility, but there is also a special unit for technology transfer.

There are eight subprograms: cereal breeding, cereal production, soil management, crop management, ag mechanization, forages, food legumes, and rural sociology. SRD is the Service for Rural Development. Much of the research is farmer-driven, but they want to develop the monitoring and impact assessment component more. MIAC has had a major impact on how Moroccan institutions do research. It is difficult to quantify, but it has been a major impact.

Tom outlined some of the problems that SANREM could address:

- 1) Supplemental irrigation
- 2) No-till
- 3) Systems research
- 4) Assistance with Sondeos
- 5) Soil management/erosion
- 6) Water draw-down
- 7) Farming on sloping land
- 8) Land fragmentation through inheritance
- 9) Work with provincial government and chamber of agriculture
- 10) Work with DPA, the extension service

He thought that SANREM could have the biggest impact through GIS and agrometeorology approaches predicting impact of drought.

John Mullenax emphasized that our approach is important, and that it might be enough that we work with Moroccan institutions to include our approach. The emphasis should not be just on specific technologies.

He also suggested that we formulate some scenarios, rather than a single proposal for an activity. In other words we could propose several scenarios for SANREM with the resources required for

each. AID/Morocco will eventually need a scope of work. We ended our discussion by reviewing the itinerary for tomorrow.

7:00 pm We met briefly with Dr. El Mourid, the Center Director, as he had to go to Rabat for the day on Tuesday. He was very open to SANREM collaboration and said to discuss whatever we wanted to do with the research scientists.

Tuesday, September 28

8:00 am Field trip, guided by Dr. Mohammad El Gharous, Leader of Soils Program (Trained in soil fertility with Bob Westerman at Oklahoma State), and Haddou Bouksirat (soil physics and pedology).

We took a riding tour of some of the area around Settat where INRA is working. Most of the area is dryland production; only 1-2% is irrigated. About 10-15% of the area is sloping land.

We stopped first at Oulad Said ("Sons of Said"). In this area the soils are shallow and there is much erosion. FAO estimates are 20 T/ha/yr up to 50 T/ha/yr. Most of the erosion occurs from November until March. Bouksirat said that soil, topography, and vegetation maps are being done of this area. The soil texture is generally clay loam. There is a hydroelectric dam nearby. The capacity of the dam has been reduced over the past 10 years due to sedimentation. Wind erosion is also a problem, especially in the summer months.

The common rotations are wheat-fallow, wheat-legume (chickpea, lentils, or faba bean), or wheat-corn. The biggest limitation to crop production is water. The second is nitrogen. Soil P is building as a result of use of N-P fertilizers to provide N. Common fertilizer is 18-36-0. Potassium is generally no problem. Many farmers use fertilizer, but many do not. Animal manures are collected and spread on fields near the households.

Crop residues are removed and used for forage. Soil organic matter is only about 1 to 2%. Wheat straw is sometimes more valuable than grain. It is baled and stored until used. At this time baled wheat straw is 35 D/bale (about \$3.75). It is normally about 5 D/bale.

We saw several groves of olive trees and small irrigated areas near streams or wells. These irrigated areas were used to grow vegetables. Very few trees or any vegetation except near water. Sheep were grazing the fields, but there was very little to graze except the dried crowns of plants. Olive trees produce for about 10 years after they are about 4 years old.

We visited two wells. The first was in a low-lying area and the water level was only about 10 m below the soil surface. The farmer drawing water said that it was one of the best in the area. It was an open well with a stone casing. The second was next to a school. It had a solar-powered pump to pump water into a tank, but the pump was not working. The water level there was about 12 m deep.

We visited a small watershed, Bogorgoh. It has an ephemeral stream, much sloping land, and a diverse agriculture including a small irrigated area. INRA/Settat did a socioeconomic study there using rapid rural appraisal techniques. They had planned to do additional work, but they did not have enough resources.

We returned to the MIAC Guesthouse about 1:00 pm.

3:00 pm Meeting with INRA/Settat subprogram leaders. Mustapha El Bouhssini, cereal entomologist, was the moderator. Other participants included Mohamed El Gharous, soil scientist, Haddou Bouksirat, soil scientist, Mohamed Karrou, crop physiologist, Mohamad Mazhar, forage scientist, El Houssin El Mzouri, forage scientist, Fatima Nassif, rural sociologist, and Mohamed Moussaoui rural economist.

Bill Hargrove gave an overview of SANREM using slides. Moustapha El Bouhssini gave an overview of INRA/Settat using slides. Moustapha gave some of their perspectives on sustainability. These included the following needs: soil erosion control, preservation of genetic resources, water economy, increased farmer revenues, flexible and adaptive systems, and information dissemination.

The big questions in their minds were what does SANREM have to offer and how does SANREM work with institutions. Bill Hargrove described the institutional relationships in Burkina Faso as an example. All of the U.S. team made input into what we had to offer including a farmer-first approach, a landscape approach, and GIS and modelling expertise.

Some of the problems discussed by the Moroccans included:

- 1) A need for agroclimatological approaches
- 2) Soil erosion control (mentioned more than once)
- 3) Use of mulch
- 4) Water harvesting (mentioned more than once)
- 5) Water quality (especially salt problems)
- 6) Supplemental irrigation
- 7) A need for farmer-first approaches
- 8) Integration of livestock, forage, and cropping

We identified four areas of potential collaboration of high interest to both SANREM and INRA/Settat:

- 1) A farmer-first approach to erosion control problems
- 2) A farmer-first approach to water harvesting techniques
- 3) A broad-based program in agrometeorology/GIS/modelling
- 4) A farmer-first program in integration of livestock/forage/crop production

We adjourned and took a brief tour of the facilities. We returned to Rabat.

Wednesday, September 29

Morning - no official program. Jim Bonner departed. We worked on the trip report and arranged for meetings in the afternoon at IAV.

3:00 pm - Meeting at IAV. Present was Dr. El Debbarh, Dr. Mhamed Oussible (Head of Agronomy), and Dr. Mhamed Tayaa.

Dr. El Debbarh said that they were ready to work with us; we only need to decide on one or two objectives. They have been hosting the University of Minnesota review team and the closing ceremony for the 25-yr project.

Mhammed Tayaa explained his research interests. He is interested in erosion control, but they don't know the most effective methods of control. They have worked with technologies such as

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planting fruit trees on the contour on hillsides and bench terraces. He has worked also with EPAT on policy and institutional issues with the University of Arizona and University of Minnesota. He is also interested in water harvesting.

Dr. Oussible is the Agronomy Department Head. Agronomy has 13 faculty, 4 plant breeders and 9 agronomists with broad interests. One of their particular interests include water use efficiency at the farm level. His interest is in soil tillage and soil compaction. They have a lot of contact with farmers. Their work always starts with farmer surveys.

They also have interdisciplinary groups including groups on: 1) grain storage, 2) environment, and 3) range management.

The range management group has had a successful project in the Middle Atlas area on range management. It was farmer-driven. A second successful project was a sociology project in which community development was promoted on the train line between Marrakesh and Agadir.

The University of Minnesota project was an institutional strengthening project over 25 years. They have also collaborated with many international organizations and have many connections with Francophone African countries. For example, they have worked on a project in northern Mali and Niger using low technology to pump groundwater for irrigation.

They have one graduate from the University of Georgia, Khalid Benabdeljelil in Poultry Science, and several graduates from Kansas State and Colorado State.

They have capability in GIS and remote sensing. They have access to a Sun work station and a GIS laboratory in the Soil Science unit. Dr. Merzouk from the soil science group showed us the laboratory. The GIS and image analysis system was PC-based. The software was ARC/INFO.

Dr. Merzouk said that only 11% of Morocco is mapped with respect to soils. He is combining GIS with remotely sensed data and models to develop watershed level land management systems. He is doing this work on the largest watershed in Morocco near Tangiers in the province of Sidi Kacem, and in a watershed near Settat. The largest is in the Rift Mountains, which occupies 6% of the land area but contributes 60% of the sediment leaving the coast of Morocco. The watershed has the second largest reservoir in it (second to the Aswan). It is an area of intense erosion; the reservoir is filling with sediment. He is very interested in including the social aspects into his work. He is a part of the UNEP network working on watersheds. He first presented some results from this watershed at the ASA meetings in 1979 in Fort Collins. The watershed is 632,000 ha. About 60% of the area is in cultivation. Much of the forest has been cleared. Environmental degradation is a problem. Much baseline data has been collected. It seems that it would be an interesting place for SANREM to work on mitigation strategies. Dr. Merzouk is open to collaboration. A Canadian team is flying part of the watershed with a radar to map the area for soil, topography, and vegetation.

The IAV faculty seemed well-trained and well-equipped. They were enthusiastic and willing to pursue mutual research interests. Their depth and commitment needs to be further evaluated. The site near Tangiers is particularly interesting as it contains mountains, forests, agriculture, a degrading environment, and a large reservoir whose life is threatened by siltation. It would make a very interesting SANREM site.

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Thursday, September 30

9:00 am Depart for Meknes.

11:30 am Meeting with ENA Director, Dr. Mohammed Rochdi, and Secretary General of INRA, Dr. Mohamed Kamel. Bill Hargrove explained SANREM and the mission of the visit. Dr. Rochdi explained that they wanted a partnership, and that ENA would "cost share" on any project. He said to discuss the details with the faculty.

Dr. Kamel explained that INRA/Settat actually had more interaction with ENA/Meknes than with IAV/Hassan II. He said that there were good opportunities for ENA and INRA to work together at Meknes. INRA is building a new facility on the campus of Meknes. ENA and INRA have a MOU to share facilities. Also, they are bringing in DPA and farmer associations to collaborate on projects. "Here we must do something for the farmers. Service to the farmers is demanded." With INRA, ENA, and DPA, a sort of research, teaching, extension model like the Land Grant system can be implemented. INRA/Meknes covers 5 provinces, but also has a national mandate. INRA has developed a proposal to the Ministry of Agriculture for development of the Rif. Dr. Kamel thinks that the Rif is perfect for SANREM. He said that "if Morocco had designed a SANREM, it would have been in the Rif".

ENA has about 75 faculty and 500 students, all in a six year program. INRA/Meknes will have about 50 scientists. We toured the audio-visual lab and extension center. It is a state-of-the-art facility with television cameras, satellite links, equipment for converting slides or film to video cassettes, etc. The lab is used for training extension personnel.

Noon Lunch in the school cafeteria.

3:00 pm Meeting with the faculty. The following faculty met with us:

Mohamed Mounsif, Plant Ecology & Range Science
Abdelwahed Maataoui, Agronomy & Plant Breeding
Abdelwaliab Filali, Agricultural & Irrigation Engineering
Mohamed Benbella, Agronomy & Plant Breeding
Mustapha El Youssef, Plant Ecology & Range Science
Abdellah Aboudrare, Agricultural Mechanization
Fouad Rachidi, Crop Physiology

Bill Hargrove explained SANREM and the purpose of our visit.

The Plant Ecology Department has groups that deal with GIS, sustainability, gender/user participation, education and training. They have a project in oasis agriculture in the Sahara. They are very interested in techniques in remote sensing and GIS. The Ministry of Agriculture has a remote sensing laboratory in Rabat. Sustainability is a major concern of the government. Of particular interest is the Rif. They have one linkage with Montana State that might promote GIS. The rangeland group's work in natural resource management is recent. Their original work was to assess the carrying capacity of land. They have also sent a proposal to the Ministry of Agriculture on collecting native plants that are more drought resistant. They want to do some ET work on comparing ET from rangeland species. They also want to do some crop residue work. They have a program in brush and weed control.

The Ministry of Agriculture has a facility at Tetouan to address sustainability in the Rif.

In Ag Engineering, they are concerned with irrigation. On a large-scale level, the approach is a modeling one. On a small-scale level, they are working with farmers. Of the small-scale systems, 90% are drip irrigation; 90% of the big systems are surface water (flood or sprinkler).

Dr. Kamel thought that soil and water conservation could be a major theme for emphasis and a good theme for collaboration between SANREM, ENA, INRA, and IAV. The advantages for centering the SANREM activity at Meknes include: 1) Both INRA and ENA are on the site, facilitating collaboration. 2) There are important opportunities for linking research, teaching, and extension. 3) The Rif development project targets the same issues as SANREM. 4) Collaboration with the private sector will be facilitated because the private sector and farmers are organized in the Meknes area.

In INRA, there will be three groups for integrated research: land management, climate, and irrigation. The station at Tetouan could serve as the logistical center for the project. The government is planning to put 5 billion dollars into the Rif.

The machinery department has a big program on no-tillage. They are concentrating on water conservation and weed control.

Mustapha summarized by saying that the Rif Mountains is the most serious erosion problem in the world. The rainfall is mostly in the range of 500-700 mm.

In the Agronomy Department, there are programs in cereals, general management, legumes, forages, genetic resources, drought resistance, weed control, and water conservation. The big constraints to crop production include water, management (esp. planting and fertilization timing), and weeds.

5:00 pm We visited the Rural Economy group. Present were Ahmed Driouche, Ait El Mekki Akka, and Khalil Allali. They have an emphasis on natural resources. They are quantifying the effects of natural resource management, including: 1) quantifying degradation, 2) quantifying effects on herders, 3) forest economics, especially expressing reforestation in economics terms, 4) quantifying fisheries resources, and 5) farming systems in the Rif.

The issues in the Rif are soil erosion, overgrazing, and devegetation. There was a project in the 1960's conducted by the Ministry of Interior in the Rif: Development of the Occidental Rif (DERRO). At one time there were grapes, figs, and large numbers of livestock in the Rif. Now, they have all disappeared. Driouchi thinks that this is due to erosion, but also to migration of people. The economics group was anxious to collaborate. The sociology group was occupied with oral exams and could not meet with us.

Friday, October 1

7:00 am Field trip. We drove on the road through Fez and on towards Tassa. We got into the pre-Rif and could view the Rif mountains. Our time was short and we could not take a close look, only a windshield approach. Following are a few observations. The deforestation is a result of the need for fuelwood and for forage for animals. Traditional range management systems are important and should be studied. The interest in GIS and modelling approaches is high amongst the ENA scientists. They also said that it will be very important to coordinate with the DPA. The Agronomy Department has some collaboration in legume breeding with ICARDA. There are vertisols in the Meknes area. We returned to Meknes by a southern route and drove through a significant oak forest.

1:00 pm Lunch in the school cafeteria.

2:00 pm Return to Rabat.

4:20 pm USAiD/Morocco. Meeting with Charles Uphaus, John Mullenax, and Mohamed Hanafi. Bill Hargrove gave a summary and analysis of the week. A summary of the SANREM team's analysis and recommendations is given in an attached document. Charles Uphaus liked scenario #2, but wanted to know what the Moroccan institutions will contribute. Hanafi suggested that we send a letter to the Director of ENA immediately and ask him to estimate what they can contribute. Charles asked that we provide a trip report, a proposal with the identified scenarios, and a letter asking them to respond with respect to a follow-up trip. He also asked that we copy them in on correspondence to the Moroccans, and to identify the resources that would be provided by the Moroccan institutions. We agreed to provide these things as soon as possible, and to propose a site selection trip in the timeframe of November-January.

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Fouad Rachidi, Crop Physiology
Ahmed Driouche, Agricultural and Applied Economics
Ait El Mekki Akka, Agricultural and Applied Economics
Khalil Allali, Natural Resource Management

ATTACHMENT F

"Vision and Mission", from page 1.

These two ingredients, the landscape and people-first, make the Landscape Approach to Sustainability in the Tropics (LAST) strategy for the SANREM CRSP's novel, a cutting-edge approach that holds much promise for reaching environmental, social, and economic goals that will lead to sustainability.

But, there are special requirements of this approach. These special requirements include integrating scientific disciplines more fully than traditional approaches and inclusion and integration of not only farmers but also farmer groups, other users and user groups, and service groups such as NGOs into the research process.

To meet these challenges, we have brought a unique group here to this place today. A group of 100 people that contains an array of scientific disciplines including agricultural sciences, ecological sciences, and social sciences, and broad participation from government agencies, universities, international research centers, NGOs, local communities, and farmers. You represent a broad array of people with diverse interests, but I believe that you are in this room today because we share a common goal: the development of a new model for research and development in agriculture and natural resource management that will result in food sufficiency and economic stability while protecting the environment. It is a model that includes an integrated, interdisciplinary approach to research, training, and farmer adoption activities focused on

people and an improved understanding of the landscape/lifescape. This is the vision of the SANREM CRSP and the promise of LAST.

To realize this vision, we will implement a comprehensive farmer-participatory, interdisciplinary research, training, and information exchange program that will shed new light on sustainability and how we can feed a growing population, while protecting the environment and the natural resource base upon which food production depends.

However, let us be clear on this mission. I will repeat—we are implementing a research, training, and information exchange program. Our capital is human expertise and knowledge; our currency is information. We are not here to build physical infrastructure for communities nor research institutes. Therefore, we cannot build roads, buildings, or dams.

We are here to build knowledge, to build human institutional capacity, and to develop new technologies that will lead to sustainability and improved natural resource management.

The rewards to be had from achieving this mission are many:

- For the farmers, improved technologies for food production that will lead to long-term economic and environmental stability and overall improvement in quality of life;
- For local communities, government agencies, and NGOs, training and information exchange in improved natural resource management

and increased capacity to support and promote sustainable agriculture and improved natural resource management;

- For universities and private and government research organizations, institutional strengthening through training, networking, and collaborative research;
- And, for scientists, improved research methodologies and an improved understanding and appreciation for real problems in a landscape setting.

in spite of the promise of our innovative, cutting-edge approach, we have our limitations. Financial resources are limited. LAST is a global program with four sites planned, one each in South-east Asia, West Africa, South America, and Central America. The Philippines is the South-east Asia site and the first to be implemented. With the wide range and large number of participants, resources will have to be spread thin to do the job. The proposed budget will only allow for about 0.5 million dollars to be spent on the Philippines site annually. Personal commitment will be required to get the job done on these limited resources.

However, I know from our experience in working together so far, that our wealth is in abundant technical skills, commitment to the LAST ideals, and a willingness and ability to cooperate. We are rich in spirit. As the world's population continues to grow and the natural resource base continues to deteriorate, our future is at stake. We must work together. We are the world. We must succeed.

SANREM Timescape

DECEMBER 1992

JANUARY 1993

FEBRUARY 1993

November 2 - December 11, 1992: Philippines Site Reconnaissance team composed of members from US collaborators meet with USAID/Manila, **Philippine** government, Philippine NGOs, local US PVOs, research institutions, Filipino universities, and end-user groups. The team conducted a "Participatory Landscape/Lifescape Appraisal" (PLLA), a participatory appraisal process, to collect biophysical, socioeconomic, and cultural information.

January 25-29, 1993: SANREM CRSP Philippine Workshop takes place at Central Mindanao University in Musuan. The workshop brings the US collaborators and reconnaissance participants back together to review the PLLA findings and to develop a Work plan for the **Philippines**. The workshop breaks out into focus groups. Each focus group identifies research questions, potential solutions, and participants, forming a basis for the workplan.

MARCH 1993

APRIL 1993

March : Reconnaissance Team for the **Burkina Faso** Site conduct the first phase of the Reconnaissance. The team builds a network of American and Burkinabé researchers with common interests in the village of Donsin and the Donsin Watershed area, Boulsa region, the **Burkina Faso** project site. In addition, the team met with local and international non-governmental organizations (NGOs) to discuss development in the Boulsa region.

April: Philippine Site Office set up and staffed.

April 14-30: The Burkina Faso Reconnaissance Team, composed of five US collaborators and six Burkinabé researchers, perform PLLA in the Donsin Watershed area. The PLLA is based on the Philippine model.

MAY 1993

May 17-21: Work Plan Writing Team meets in Tagaytay, **Philippines** to compose the SANREM CRSP **Philippine** Site Work Plan. The team is composed of US collaborators and **Philippine** Site partners, following up reports developed by focal groups at the workshop in January.

May 24-27. Burkina Faso Site Workshop conducted in Ouagadougou, Burkina Faso. The participants review the PLLA and begin to discuss the research agenda in small groups as used in the Philippine Workshop.

Where in the World is SANREM?

As SANREM CRSP looks at commonalities of several tropical ecosystems, it will eventually have project sites in Southeast Asia, Africa, Central and South America. Start up of SANREM activities are staggered, one site seeing implementation of SANREM programs at a time. This

scheme of site scheduling is used because SANREM's participatory and comprehensive approach requires developing a new model for development and learning new management strategies. By bringing each site on-line one at a time, lessons learned from the first site can be used

to improve the implementation of the next site.

To date, SANREM' has begun work at its first site, the Manupali Watershed on the island of Mindanao, The Philippines, and its second site, the Donsin watershed area, Boulsa

Continued on page 8

NECI's Silent Entry Methodology

By Romy A. Banaynal, Coordinator, NECI

Since 1989, the Philippines Department of Environment and Natural Resources (DENR) has promoted the Community Forestry Programs (CFP) to address the deforestation of the uplands. CFP allow forest dwellers and farmers to extract, process, and sell forest products in exchange for protection and stewardship of remaining lands. The Network for Environmental Concerns, Inc. (NECI) is an organization of development professionals and NGOs promoting environmental awareness at the grassroots level.

In the Mt. Carmel area of Mindanao, The Philippines, illegal logging activity was the major economic activity of the tribal groups and new settlers. These people saw how foreign loggers took away the best trees a few years back. From this the local people learned to cut trees for income. Businessmen, financiers, politicians, insurgents and other powerful groups supported this fast money-making activity. Trucks loaded with illegally-cut logs travelled the major routes. Conflicts arising from this activity became common among tribal groups, community members, community residents, and financiers. Cultivation of the cleared area for food became second only to timber harvesting.

The Community Forestry Project (CFP) program of the government was engaged to transfer the rights and privileges of forest conservation, management and utilization to worthy communities. Seeing an opportunity to realize its vision of an empowered community coexisting in harmony with a healthy environment, the Network for Environmental Concerns, Inc. (NECI) agreed to the task of social preparation of the Mt. Carmel communities.

NECI, a network organization of experienced developmental practitioners and NGOs, is dedicated to promoting envi-

ronmental awareness in society, while attaining a balanced ecology, capable of promoting, nurturing, and sustaining human life. Based in Cagayan de Oro City and operating in the geographical area of Northern Mindanao, NECI's management and activities are governed by a five member Board of Directors. Financial support for NECI is made possible by project funds along with generous donations, contributions, and support from members, staff, volunteers, and consultants. NECI maintains a highly capable contingent of institutional and technical operations personnel and consultants representing diverse disciplines in areas directed to integrated development programs.

Maintaining a low profile, the Project Team started immersing and integrating with the community asking and learning the people's situation, its culture, and all its attributes. The team started where the people were, not trying to intervene in the regular activities of the community. They lived in the area and immersed themselves in what the community members were doing. The community was not told to stop logging activities, rather NECI made the community more aware of the environmental situation logging causes, using social development activities such as value forma-

tion, community organization, and trainings. The community's concerns grew, and, soon, the community expressed sadness and apprehension for the illegal logging.

After a few months, farmers were responding to the issues. More importantly, the farmers began formulating their own plans based on available knowledge. At this point, NECI began planning with the community the steps needed to undertake a socioeconomic and biophysical diagnosis of the area. Information will soon be presented to the members of the community so they may choose their own farming system with technical assistance from the staff. This process known as community-based resource management planning (CBRMP) will make a socially-acceptable and technically-sound community plan for the Mt. Carmel Community. Today, many of the former illegal loggers have become cooperators in NECI's Agroforestry program. Many things remain to be addressed in this social preparation activity, but it's worthwhile to note that the silent entry and CBRMP method opened the community gently, yet effectively.

The Tala-andig Landscape

By Barbara Bellows, SANREM Facilitator for the Philippines and
Mahz Ruscos, Institute of Environmental Science & Management (IESAM)

The Tala-andig are the indigenous people of the Manupali Watershed area. Currently, the Tala-andig represent approximately 50% of the population in the upland areas of Lantapan. In the lowland barangays, the Tala-andig have been assimilated, culturally and linguistically, into the dominant Cebuano culture. Members of the different ethnic groups commonly intermarry in this area. In contrast, in the outlying districts of the upland barangays, the Tala-andig continue to use Binukid as their primary language.

In the traditional view of the Tala-andig landscape, land is classified according to land use. The location of each classification tends to follow the natural high to low elevations. The Tala-andig views of land use may provide a good conceptual basis for more sustainable methods of high-land agriculture.

Hinlalaw : sacred ground; people are prohibited from cultivating this area. For instance, the peak of Mt. Kitanglad is often called "Lalaw"; this is where Apo Agbiblin, the father of all Tala-andig, found refuge during the Great Flood of Tala-andig tradition.

Bila: the protected area below Hinlalaw. Balbal (a witch), a giant, and a snake protect this area. (A forest buffer zone?)

Pangasiwa : an area where the Tala-andig traditionally prohibited cultivation, particularly

kaingin (slash and burn) operations.

Pangalincuta : an area where cutting trees was prohibited, particularly trees that bore nectar-rich flowers that attracted honey bees. In fact, trees that supported honey bees as well as certain birds were considered sacred.

Pangumaha : an area that permitted kaingin or bukid (upland) cultivation by the Tala-andig. However, in order to allow the land to regenerate following the cropping cycle, tree and shrub root mats were not disturbed and certain trees were left standing.

Talauwa : a small area that served as a refuge in times of want where one would find a small nipa (thatch hut). Cultivation was permitted here.

The most influential of the tribal leaders, the **Babaylanon**, determined planting times by reading the stars and listening to song birds. (In addition to agricultural decision making, Babaylanon were sensitive to personalities and group dynamics, so determined who would work together and who would marry.) Prior to planting, rituals were addressed to Thabasak, the spirit of the land, Bulalakaw, the spirit of the water, and the spirits of the wind, the rain, the wood, the voice, and the soul. By listening to all the spirits, the traditional Tala-andig farmer assessed and planned agri-

culture in order to fulfill livelihood needs and maintain the resources of the environment.

Each farmer hand planted a quarter of a hectare. Traditional crops included: sweet potato, yams, taro root, corn, ginger, herbal plants, and abaca (for rope and mat).

The Tala-andig system of agriculture, which is really inseparable from the Tala-andig culture and identity, has been challenged. People from Luzon and the Vizayas began migrating into the area at the turn of the century; however, immigration rose sharply between the 1950's and 1970's. The outsiders brought new technologies and new markets, promoting changes of the traditional Tala-andig ways.

Tala-andig leaders are striving to instill its traditional values into the younger generation. Tribal leaders, both Datus (men) and Baye (women), are planning to implement a number of projects within the next two years to include: developing organizational guidelines for the Tala-andig organization; building a Tala-andig education and training center; conducting meetings on tribal politics; conducting a land claim survey of ancestral lands; conducting training programs on agroforestry, backyard gardening, and reforestation; and developing a garden of herbal medicines.

Agro-ecological Systems Across the Manupali Watershed

I. Lasang Taas

(Primary Forest, "mossy")

Katanglad Range 1800 +m
Kalatungan Range 1700 +m

II. Lasang Ubos

(Forest Margin)

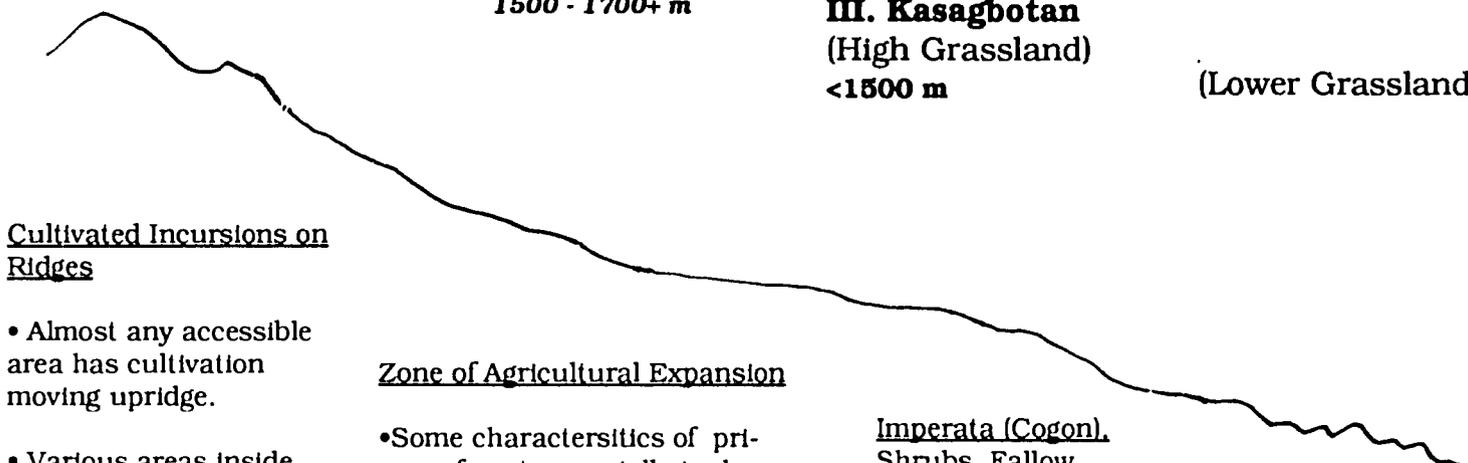
1500 - 1700+ m

III. Kasagbotan

(High Grassland)

<1500 m

(Lower Grassland)



Cultivated Incursions on Ridges

- Almost any accessible area has cultivation moving upridge.
- Various areas inside mossy forest being cleared/cultivated -- "breaking".
- High value cash crops: potato, cabbage, other vegetables.
- Maize, cassava, camote, gabi, some coffee, castor beans, fruit trees.

Zone of Agricultural Expansion

- Some characteristics of primary forest, especially in deep ravines with secondary growth being cultivated. Rotation and "breaking".
- Occasional trees planted by individual farmers bordering fields/houses. Some plantation of *Eucalyptus*, *Acacia mangium*, *Falcata* by Watershed Project.
- High value cash crops: potato, cabbage, other vegetables. Other crops include: maize, cassava, camote, gabi, some coffee, castor beans, fruit trees.

Imperata (Cogon), Shrubs, Fallow, with 20% Cultivation

- Limited tree planting by Watershed Project observable. Some individual tree planting by farmers.
- Some potatoes, cabbage, vegetables, coffee, castor beans, maize, cassava, camote, gabi.

Rolling to Steeply Rolling

- Rotation, "breakdown"
- Some potatoes, cabbage, other vegetables, maize, cassava, camote, gabi, some coffee.
- Irrigated vegetable cabbage, pepper, tomato, lettuce, corn



Increasingly in the higher elevations, forest is being cleared and burned to prepare land for the cultivation of potatoes and other vegetables.

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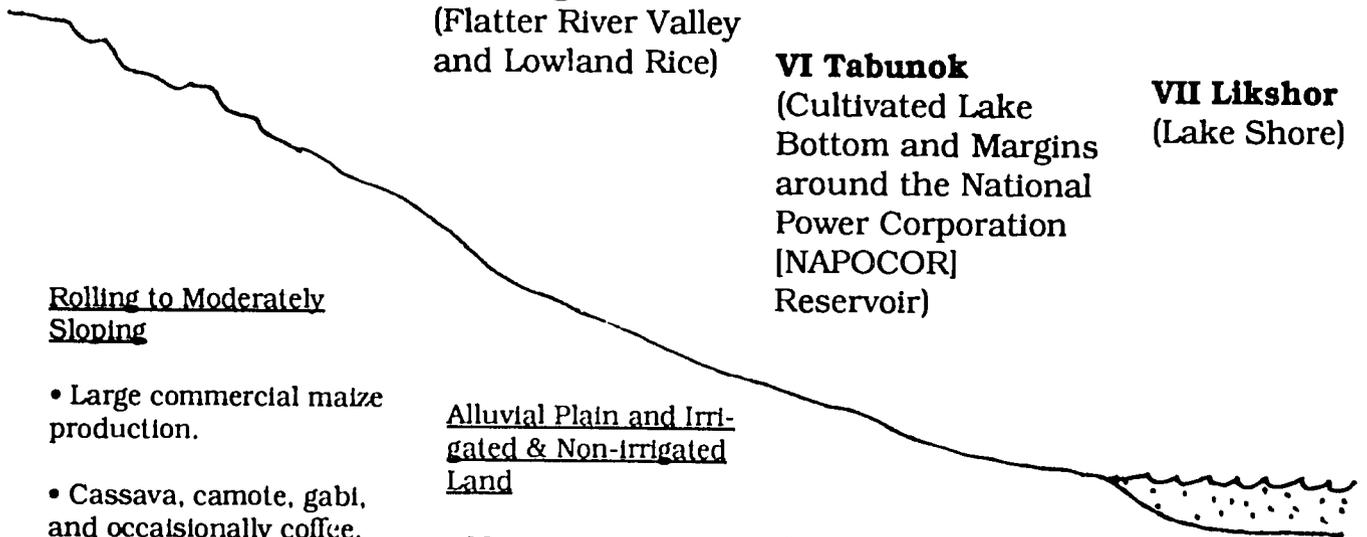
Fields of maize, mostly grown for cash crops, are found throughout the Kamaisan area of the Manupali Watershed.

IV. Kamaisan
(Permanently Sloping
Maize Lands)

V. Patag/Basakan
(Flatter River Valley
and Lowland Rice)

VI Tabunok
(Cultivated Lake
Bottom and Margins
around the National
Power Corporation
[NAPOCOR]
Reservoir)

VII Likshor
(Lake Shore)



Rolling to Moderately
Sloping

- Large commercial maize production.
- Cassava, camote, gabi, and occasionally coffee.

Alluvial Plain and Irrigated & Non-irrigated Land

- Maize, sugar cane., and irrigated rice.

"Bottom"

- Sugar cane, maize, grazing.

"Upper Margins"

- Sugar cane, maize, rice.

Settlements Around Lake Shore

- Fishing
- Maize and irrigated rice
- Drift wood gathering.



Paddy rice production is a leading agricultural activity in the lower elevations.

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"Where in the World is Sanrem? ", from page 3.

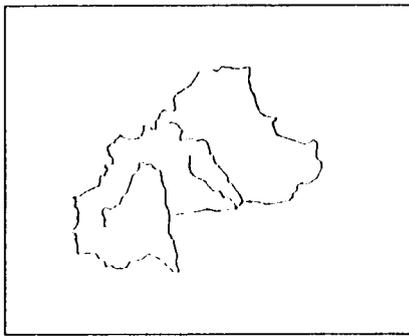
region, Burkina Faso. The sites in Central and South America will be forthcoming.



The Manupali Watershed site is located on north-central Mindanao, 20 Km south of Malaybalay and 85 Km south of Cagayan De Oro City. This watershed drains 80,000 hectares via the Manupali, a tributary of the Pulangi River Basin. The Manupali Watershed begins in the relatively unpopulated higher elevations (Mount Kitanglad is a bioserve) and descends down moderate to steep slopes to the heavier populated areas of the Manupali River and Pulangi IV River reservoir.

The humid tropic watershed receives around 2,200 mm of rainfall during its rainy season from May through December. Agriculture ranges from diverse family farms in the higher elevations to larger commercial operations in the lower elevations. (See **Agroecological Systems Across the Manupali Watershed**, p. 6-7).

The Tala-andig are the largest indigenous group. However, people from other areas of the Philippines have been migrating into the area since the turn of the century. The Tala-andig have a rich culture and folklore and are more heavily concentrated in the uplands.



Donsin is located 100 km northeast of Ouagadougou, the capital of Burkina Faso, a country in West Africa. The village population is about 1550, mostly the More speaking Mossi people. About half the people are Muslims and the other half are evenly-divided between Christians and Animists.

There is a primary school in Donsin with about 80 students, 12 of which are girls. There are also adult literacy classes with about 30-60 students per year, and also a Koranic school. There is no health center in the village, residents must travel three to four kilometers to a neighboring village.

The staple foods are millet and sorghum with sauces made from okra, traditional eggplant, tree leaves or tree fruits. During the dry season they eat only dried leaves in sauces with staple grains.

The Donsin watershed sits in the sudano-sahelian zone at 12° 45' N latitude, 0° 39' W longitude. Average elevation is 320 meters with the hills rising about 100 meters. Watershed elevation changes less than 20 meters from hills to watercourses. It drains approximately 7000 hectares through approximately 12 km of branching ephemeral

streams which encircle the village's northern end. No other surface water exists naturally. Watershed boundaries run from escarpments in the south, to eastern and western escarpments, to a seasonal river in the north. Its approximately 7000 hectares encompasses the village of Donsin.

Average rainfall is between 600 and 900 mm annually during the three to four month rainy season, June-September. However, wide fluctuations are common. In 1990, the average rainfall in Boulsa (provincial capital) was 534 mm, while in 1991, 900 mm of rain fell. Often all annual rain falls in several downpours with unpredictable timing.

Daytime air temperatures can exceed 40° C during the hot dry season which lasts from about March through May. During the colder dry season, November through February, temperatures range between 18 and 25° C during the day. Night temperatures fall low enough during this season to necessitate collection of wood for heating. Average yearly temperature is 33° C.

Donsin has a small market every 3 days, the neighboring market at Bonam (about 17 km) has imported items not available in Donsin. Livestock from Donsin may be traded as far away as the Ivory Coast.

SANREM Builds Linkages in Burkina Faso

By Mary Lou Surgl, PVO/University Center

The SANREM CRSP is built upon a process of looking at questions and problems in broad ways. This includes a different way of seeing the landscape. Rather than looking at it only through our own eyes, we must look at it also from our colleagues' different backgrounds and experiences. In order to do this, we, the farmers, the researchers, the government staff, and the non-governmental organizations who are all looking at the same landscape and seeing different things, must come together to build linkages.

The workshop held to discuss the results of the Participatory Rapid Appraisal ("MARF" as it is known by its French acronym) in Donsin village provided an opportunity for people from very different backgrounds to come together—to build those linkages. (The MARF is equivalent to the PLLA conducted in the Philippines.) They came for many reasons—some came to learn about the experiences of MARF team members, others came to hear about the MARF results, some came to learn about development activities in the Donsin area, some probably came because they were told to!—but all came away with at least two things in common: a better understanding of what the SANREM CRSP is and a few new friends!

Participants came from many places: men and women farmers (with several of their

young children) from the village of Donsin, local government officials from Boulssa, staff from several International PVO's, representatives from Burkina Faso's University and Research Institutions, and several members of the US-based SANREM CRSP team. (A little humor was injected in the workshop when one of the American visitors was introduced as a VIP (Very Important Person) rather than from VPI (Virginia Polytechnic Institute)!

Though most of the participants were working in Burkina Faso, and even Donsin, many of them had never met each other before. Thus the workshop, and in a larger sense, the SANREM CRSP, is acting as a mechanism to bring together people with complementary

interests and experiences to focus on one goal: developing a new model for sustainable agriculture and natural resources management research. The model will be developed and tested in a unique partnership between academic and research institutions, governmental and non-governmental groups, and professionals, especially farmers; interrelations that have not formally taken place.

This interdisciplinary working group can only function well together and achieve its goal if it continually and consistently follows a participatory process. This idea—a major theme of the SANREM CRSP worldwide—generated much discussion after a presentation on the topic by Peter Gubbels of World Neighbors.

Continued on page 14.



Workshop participants broke out into small groups to identify issues and problems, as well as, potential solutions and sources for finding answers.

Towards a User-Participatory Process Across the Landscape

By Ralph B. Montee, PVO/University Center

An Evolving Process

Integrating the two vital elements of the SANREM strategy for developing a new methodology for applied research in sustainable agriculture and natural resource management—the landscape ecology approach, with its emphasis on interactions and linkages, and the focus on user participation, with users as central to the research process—is both the challenge and the promise of SANREM. The two must be held together in the mind at all times as a whole.

As stated by Bill Hargrove and Constance Neely in their vision and mission statement for SANREM, this is uncharted territory. Neither the landscape ecology nor appropriate interactive user-participatory techniques have sprung full blown either as a concept or a practical implementation methodology in SANREM. Rather, they are part of an evolutionary process, something we are developing as we experience and learn together—scientists, users (farmers, other producers, processors, marketers, etc., user organizations, community groups), PVOs/NGOs, government agencies, and our AID partners.

Although there are useful guidelines and experience to draw upon in the farmer first research approaches pioneered through the efforts of Chambers, Rhoades, and others, in the work of numerous organizations in developing countries, and from

participatory rural appraisal techniques, there is no completed road map, no recipe to follow. We are all of us learners. We seek to find answers. We will make mistakes, but if we are truly committed to a new kind of partnership with the users and the grassroots we will learn.

This article will consider the evolution of the user-participatory process to date in SANREM, keeping in mind its ties to the landscape-lifescape. First, the overall planning for an interactive user-participatory process will be discussed. Second, its implementation in the SANREM sites in the Philippines and Burkina Faso will be reviewed. Third, questions and issues needing resolution if the full integration of user-participatory processes with the landscape ecology approach are to be realized will be discussed. The term user or endusers will be employed throughout to refer to users (farmers and others in the production, processing, and marketing of products derived from the management of natural resources), user groups, and community groups.

Overall Planning and Training

Preparation for the implementation of the global SANREM project included several meetings of the full consortium of U.S. participants. A User-Gender Analysis Working Group was one of four established to explore specific issues. In addition, the user participation process was reviewed and discussed by the SANREM Technical Committee.

A process schematic for an iterative end-user dialogue process that pulled together the thinking of SANREM collaborators was developed by the Center for PVO/University Collaboration in Development. The process underscored the emphasis SANREM planners placed on the in-country networks of collaborators/cooperators and end-users as the focus of information gathering activities, problem identification, design efforts, and implementation. The key roles of users and PVO/NGOs in the reconnaissance and their inclusion in the workshops that would analyze problems and begin to identify research issues was stressed. A feedback and monitoring component to ensure user and PVO/NGO input on the applicability of research activities to users and local problems was to be built into several stages in the research agenda setting and implementation process.

Through dialogue in planning and training sessions, the site reconnaissance or survey activities came to be seen as an iterative diagnostic process. Accordingly, the entire diagnostic effort would involve successive stages of collecting and analyzing data and "focusing in" on problems through interaction with all SANREM participants but especially users.

User Participation in Site Implementation

The basic steps for establishing and implementing user-participation in the Philippines and Burkina Faso were the same,

with slight variations in outcome reflecting local conditions and collaborators. They included:

In-Country Networking and Organizational Preparation to build strong networks with effective representation and participation of researchers and scientists from universities, national and international research centers; PVOs, NGOs, NGO consortia; community and local organizations; and government agencies in order to gather information, seek advice, identify potential collaborators, provide information on SANREM, and conduct team building.

Reconnaissance Surveys at Project Sites, with significant user and PVO/NGO participation, to identify physical conditions, key problems in the landscape, and major socioeconomic issues. Interdisciplinary teams of biophysical and social scientists, community development and organization specialists, and representatives of local organizations employed a modified participatory rapid rural appraisal which came to be known as the Participatory Landscape-Landscape Appraisal or the PLLA. The PLLA utilized:

- open-ended interviews with male and female farmers, community leaders, local government officials, tribal leaders, storekeepers, and market vendors to gather data. Plants, soil characteristics, water resources, land use practices, and labor and health issues, etc., were defined by users in their terms and recorded in the vernacular.

- daily team meetings to compare and contrast the areas in the landscape in

terms of biophysical characteristics, species and varieties of crops grown, input use practices, land use, and perceived problems. This was used to develop a preliminary landscape characterization according to agroecological zones.

- focus groups to carry out more detailed studies in each agroecological zone using semi-structured interviews with users to refine, clarify, and substantiate the preliminary problem and landscape characterization developed from the initial interviews. (A preliminary characterization into eight agroecological zones was developed in the Philippines.)

- community verification with community members was carried out using simple representations (maps, charts, etc.) to review the landscape characterization (of the total watershed area), the village or site map, timelines showing land use practices, social maps, critical problems, etc. Community members were asked to develop maps or make modifications, corrections, or additions as necessary.

Meetings with local government officials to review and discuss reconnaissance information, including the community verification, and to seek local government views.

Other Meetings with provincial or regional government officials, national government agencies, SANREM collaborators, and AID Mission staff, concerned with SANREM activities, to review and discuss SANREM reconnaissance findings and proposed next steps were part of SANREM site implementation activities.

Workshops continued the work of formulating the research questions to be addressed at the project sites. They involved both plenary sessions and small group discussions designed to deal with specific problems and issues identified in the reconnaissance. It is noteworthy that in both workshops the combined user and PVO/NGO representation (34% in the Philippines or 34 of 100) and 31% in Burkina Faso (21 of 67) bringing the users' and grassroots' perspective to the proceedings was unusually strong for a meeting involving scientists and researchers. Although scientists were the largest category of attendees (48% in the Philippines and 43% in Burkina Faso respectively), users, PVOs and NGOs were the next largest group. Selection of user representatives to attend the workshop was the responsibility of PVO and NGO collaborators and was a follow-up activity to the reconnaissance. Farmers and users played key roles in the working group sessions as sources of information, reality checks, and in helping to define the research issues and priorities for action. Especially in the Philippines, user representatives led some of the working groups and often spoke forcefully in the plenary sessions. The discussion on organizational structure, in particular, benefitted from the comments of users and tribal leaders, resulting in modifications of the structure initially proposed to include more representation for users and grassroots participants.

At the Philippine workshop, one of the *datus* (tribal and religious leader) of the Tala-andig tribe observed that the workshop participants had come together with a wide vision of the whole globe. His words were strikingly eloquent:

What is important is that we have shared ideas and what we are putting together will someday become a reality. When a generation passes, its ideas and work may be rejected. That is like a dream fading. When these ideas and work are accepted, however, it is a dream kept alive; it is life reconstructed and renewed.

In-Country Organizational Structure

The organizational structure resulting from the workshop and follow-up discussions in the Philippines consisted of a National Coordinating Committee (NCC) and a Community Advisory Committee (CAC). A similar structure was adopted in Burkina Faso with a Local Committee being the equivalent of the CAC. This structure emphasized the integration and representation of users in both committees and their participation in the decision-making and review process that determines research priorities and activities.

In the Philippines NCC, six out of the twelve members represent PVOs/NGOs and local government. Although the chairman of the CAC, the Development Officer of the Municipality of Lantapan, is on the NCC, there is no direct participation of the users in this body. However, this has been compensated for in a stronger overall CAC, by more involvement of the users in various stages of the proposal development and

review process that decides on research activities, and in helping to review and approve workplans.

In the NCC in Burkina Faso, three of the seven representatives are from local government (2) and PVOs (1) with two from national research centers, one from the university, and one from AID/Burkina. The Local Committee has two district government representatives and six members from the village of Donsin. The role of the Local Committee in Burkina Faso includes advising on and approving the workplan.

Monitoring

Monitoring of user and PVO/NGO participation in the research and implementation process is built into SANREM. A system to assess the degree and characteristics of such participation is being developed in cooperation with SANREM collaborators. The system will provide feedback and assessment by PVOs/NGOs, users, and other SANREM collaborators on the research process, understanding of the landscape approach, and relevance of SANREM activities to user and community needs, priorities, and problems through: (a) periodic reports from users, PVOs, and NGOs; (b) reports and observations from SANREM site researchers and other collaborators; (c) periodic site visits by Management Entity and PVO/University Center staff.

Likely indicators will include the degree and characteristics of user and PVO/NGO involvement and participation in: networking; reconnaissance activities; workshops; the organizational structure for implementing SANREM site activities; decision-making in the review process for identification and selection of research questions and priorities; assisting and implementing

research activities; training activities; monitoring; efficacy of feedback in modifying research and implementation when necessary to ensure its relevance to user needs and problems; and evaluation. Taken together, all of the above indicate a growth in individual and community capacity for problem solving, increased ability to deal with researchers and others on matters affecting their interests, and expansion in knowledge and skills related to sustainable agriculture and natural resource management.

Questions to Ask Ourselves/ Issues to Resolve

In developing and attempting to implement a user-participatory approach thus far in SANREM, there are a number of important questions and issues that have arisen. These suggest problems that must be resolved. They need discussion.

Given the newness and complexity of the landscape ecology approach, it is unlikely that farmer-first methodologies in themselves can generate the knowledge base which the approach requires and which users and communities will need to understand and utilize landscape concepts in natural resource management. Accordingly, scientists, researchers, PVOs/NGOs, and development agencies must interact with users and rural communities in new ways. SANREM's task is to discover, test, and refine these new ways and processes.

While not all research activities will be possible to implement with the same degree of user participation, SANREM is committed to developing and supporting user-participatory methods of analysis, planning,

implementation, and evaluation adapted to the landscape-lifescape approach. Peter Gubbels of World Neighbors, who participated in the Burkina Faso workshop, brings an experienced and important perspective to the analysis of user-participatory processes. He has posed some serious questions/issues aimed at clarifying what is meant by participation. They are worthy of discussion at some length.

Control: To what degree will users control and actively participate in the research process? SANREM must help activate them to undertake analysis, diagnosis, make informed choices on research questions and priorities, implement research activities, and determine evaluation criteria. At the same time, SANREM researchers—essentially outsiders to the community—must guard against the tendency to control the research, to view farmers/users simply as informants, thus retaining decision-making on research questions, priorities, experiments, and evaluation. The need for both users and scientists to be both learners and mentors needs to be accepted by both.

Integrating Modern Scientific Knowledge and Indigenous Knowledge: How can modern scientific knowledge and external technical assistance and indigenous knowledge be effectively combined in a farmer/user-scientist partnership?

Increasing the Innovative Capacity of Resource Poor Farmers: How can the innovative capacity of resource poor farmers be significantly enhanced? What specific knowledge, skills, and processes will improve existing innovative capacity?

Capacity Building and Empowerment: How can the capacity of users and rural

communities be enhanced? They must learn not only how to analyze their agricultural and environmental situation in a landscape sense but also how to develop skills that will increase their abilities to participate in and control problem-solving processes exemplified in SANREM. The ultimate goal of SANREM is to help generate knowledge with the participation of users that can make them more self-reliant so they can chart their own course of action through community-based natural resource management planning processes.

Negotiation: To overcome the differences between user/local communities, outside researchers, government officials, and others which can result in the misunderstanding, conflict, and poor communication that can compromise efforts to achieve a genuine partnership agenda, Gubbels recommends a process of negotiation. SANREM has recognized the necessity of a negotiating process to reduce and resolve conflict as an essential management strategy in the operation of its Board of Directors. A similar strategy could be used to: a) reduce the distorting effects on communication of unequal power between users/rural communities and outside groups; b) help bridge the gap in effective dialogue occasioned by differences in knowledge systems, world views, and perceptions; (c) improve understanding by outsiders of the heterogeneity of rural communities in terms of wealth, gender, age, and by political power and their potential effects on communication and agenda setting.

Such a negotiating strategy recognizes that part of

SANREM's responsibility is to help users and rural communities gain the "skills" needed to participate as full partners, to better "negotiate their interests" with outsiders who have more power than they do.

The training and skill development of users and rural communities is central to genuine participation. SANREM resources, collaborators, and activities need to be employed in ways which ensure that they have opportunities to attain and utilize these skills effectively. As Dr. Gelta Castillo of the University of the Philippines at Los Banos observed during the Philippine workshop:

Participation must go beyond rhetoric... in the final analysis, did SANREM benefit someone besides us (the researchers)? What did the farmer-user get in return?

"...Linkages in Burkina Faso". from page 9.

In coming years, SANREM will be addressing questions such as:

- How to insure the participation of all the different interest groups in a community?

- How to develop a real community?

- How to deal with the situation when the objectives of the farmers may not be the same as the researchers?

- How to change the attitude of researchers who do not respect the participatory process and indigenous knowledge of the farmers?, and of course,

- How do we do all this without costing a fortune?

The process of building linkages went on throughout the entire workshop, especially during the two days of meetings in interdisciplinary work groups. Each work group consisted of farmers, social scientists, physical scientists, PVO representatives, government staff and more. The goals of the groups were to identify major research themes and questions based on the areas of concern identified during the MARP: Water, Soil, Animal Management, Non-cultivable Lands, Participation of villagers in Natural Resource Management, and Human Health and

Nutrition. Attempts were made to reach consensus based on the individual perspectives within each group. Some groups were more successful than others.

During the last day of the workshop the six workgroups came together to report on the results of their work. It was obvious that a great deal of cross-disciplinary and cross-cultural learning had taken place, while broad themes were elaborated. But more importantly, the answers to the question, "What is SANREM?" were becoming a little clearer. The importance of this understanding was stated by one of the farmers from Donsin when he said: *Our feet are on solid ground when we understand; when we don't understand—we are afraid.*

LETTERS TO SANREM

SANREM needs your voice. The SANREM Ecolinks newsletter invites you to write in your opinions, comments, suggestions, concerns, and what you would like to see addressed in the newsletter. Besides seeking to share as many of your letters as possible in SANREM Ecolinks, we hope to have more direction from you as to the type of features and information you wish to have in the newsletter. Please write: The Editor, SANREM Ecolinks, Bird Building, Western Carolina University, Cullowhee, North Carolina, 28723-9056, USA.

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ATTACHMENT G

ACRONYMS

ACRONYM	MEANING
AARD	Agency for Agricultural Research and Development
ACIPHIL	Association Consultants Independente (Philippines), Inc. - Cebu City, Philippines (private consulting firm)
ACORD	Association for Community and Rural Development - Cagayan de Oro, Philippines (NGO)
ADB	Asian Development Bank
ADO	Agricultural Development Officer (of USAID Missions)
ADRK	Association Pour le Developement de Region de Kaya
AFRD	Agency for Forest Research and Development - Indonesia
AID	Agency for International Development
AU	Auburn University - Auburn AL
AVRDC	Asian Vegetable Research and Development Center - Taiwan (IARC)
(A)WID	Association for Women in Development
BAND	Bukidnon Association for National Development, Inc. - Malaybalay, Bukidnon, Philippines (NGO)
BIDANI	Barangay Integrated Development Approach through Nutritional Improvement - a program of Central Mindanao University, Musuan. Bukidnon. Philippines

ACRONYMS

ACRONYM	MEANING
BIOTROP	Center for Tropical Biology
BHW	Barangay Health Worker - Philippines (local health worker)
BOD	Board of Directors
BSONG	- Burkina Faso (GO coordinating organization for NGOs)
BSWM	Bureau of Soil and Water Management - Philippines (GO)
CAC	Community Advisory Committee - SANREM CRSP community-based coordinating organization
CARL	Comprehensive Agrarian Reform Law - Agricultural reform law in the Philippines
CFM	Community Forestry Management - Philippines (DENR development program for the uplands)
CIAT	International Center for Tropical Agriculture - Cali, Colombia (IARC)
CILSS	Comite Intertats pour le Lutte contra s Sacheresse dans la Sahel - Burkina Faso (NGO)
CIMMYT	International Maize and Wheat Improvement Center - Mexico City, Mexico (IARC)

ACRONYMS

ACRONYM	MEANING
CIP	International Potato Center - Lima, Peru (IARC)
CLT	Certificate of Land Transfer - Land reform document developed under CARL
CMU	Central Mindanao University - Musuan, Bukidnon, Philippines
CRPA	Centre Regionale Pour Production Agricole - Burkina Faso
CRSP	Collaborative Research Support Program
CSU	Colorado State University - Fort Collins, CO
DA	Department of Agriculture - Philippines (GO)
DAR	Department of Agrarian Reform - Philippines (GO)
DECS	Department of Education, Culture, and Sports - Philippines (GO)
DENR	Department of Environment and Natural Resources - Philippines (GO)
DESFIL	Development Strategies for Fragile Lands - Washington, D.C. (Development Organization)

ACRONYMS

ACRONYM	MEANING
DILG	Department of Internal and Local Governments - Philippines (local government unit)
DNGO	Developmental Non-Government Organization
EAP	Escuela Agricola Panamericana - Zamorano, Honduras
EDC	Eros Data Center - Sioux Falls, SD
ERDB	DENR Environmental Research and Development Bureau - Philippines (GO)
FAO-APAN	Foreign Agriculture Organization - Asian Pacific Agroforestry Network
FUNDAGRO	Fundacion Agricole
FSSRI	Farming Systems and Soils Research Institute - Institute at UPLB (university research institute)
GIS	Geographic Information Service
GO	Governmental Organization
GPS	Global Positioning System
GTC	Global Technical Committee - SANREM CRSP global technical advisory organization
HPI	Heifer Project International - Little Rock, AK (PVO)
HRD	Human Resource Development

ACRONYMS

ACRONYM	MEANING
HYV	High Yielding Variety - (nitrogen responsive grain varieties)
IARC	International Agricultural Research Center
IAV	Institut de Agriculture et Veterinaire
ICAAE	International Center for Aquaculture and Aquatic Environments
ICLARM	International Center for Living Aquatic Resource Management - Manila, Philippines (IARC)
ICRAF	International Council for Research in Agroforestry - Nairobi, Kenya (IARC)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics - Niamey, Niger (IARC)
IDR	Institut pour Developpment Rurale - University of Ougadougou, Burkina Faso
IESAM	Institute of Environmental Science and Management - Institute at UPLB (university research institute)
IITA	International Institute for Tropical Agriculture - Ibadan, Nigeria (IARC)
ILCA	International Center for Livestock for Africa - Ethiopia (IARC)
INADES-FORM	Institut Africain pour le Developpement Economique et Social
INERA	Institut National por Etude et Recherche Agricole
INLAP	Instituto Nacional de Investigaciones Agropecuarias - ** location

ACRONYMS

ACRONYM	MEANING
INRA	Institut National Pour Recherche Agricole - Burkina Faso (GO)
IPD-AOS	Institut Pan-African Pour Development - Afrique Del Quest Et Sahel
IPM	Integrated Pest Management
IRBET	Integrated Recherche Biologie et Ecologie Tropical
IRRI	International Rice Research Institute - Manila, Philippines (IARC)
ISF	Integrated Social Forestry Program - Philippines (DENR development program for the uplands)
ISNAR	International Service for National Agricultural Research
LASAS	Laboratory for Sustainable Agroecosystems - Griffin, GA (university research program)
LGU	Local Government Unit
MARP	Method Accelere de Recherche Participative - Philippines (local government offices)
MIAC	Midwest International Agriculture Consortium
MBRLC	Mindanao Baptist Rural Life Center - Kinukusan, Bansalan, Davao del Sur, Philippines (NGO)
MMWDP	Muleta-Manupali Watershed Development Program - Philippines (ADB-funded development program coordinated by DENR)
MUCARD	Muslim-Christian Agency for Rural Development - Cagayan de Oro, Philippines (NGO)
MUSUAN	Mindanao Upland Stabilization and Utilization Through Proper

ACRONYMS

ACRONYM	MEANING
	Agroforestry Networking Program - a program of Central Mindanao University, Musuan, Bukidnon, Philippines
NAPOCOR	National Power Company (also abbreviated NPC) - Philippines (GO)
NCC	National Coordinating Committee - SANREM CRSP national based coordinating organization
NECI	Network for Environment Concerns, Incorporated - Cagayan de Oro, Philippines (NGO)
NFA	National Food Authority - Philippines (GO)
NGO	Non-Governmental Organization
(N)IPAS	(National) Integrated Protected Area Site - Philippines (Government program)
NIA	National Irrigation Association - Philippines (GO)
NPC	National Power Corporation (also abbreviated NAPOCOR) - Philippines (GO)
NRDI	Nature's Rehabilitation and Development Concerns - Cagayan de Oro, Philippines (NGO)
ONRAD	Office of Rural and Agricultural Development of USAID
PATECORE	German-funded (GTZ) community-participatory development program focusing on soil and water conservation - Burkina Faso (NGO)

ACRONYMS

ACRONYM	MEANING
PCARRD	Philippine Council for Agriculture, Forestry, and Natural Resource Research and Development - Los Baños, Philippines (GO)
PLLA	Participatory Landscape-Lifescape Appraisal
PME	Participatory Management and Evaluation
PNGT	Proget National de Getion Terroir - Burkina Faso
PO	People's Organization
PPAEP	Pilot Provincial Agricultural Extension Project - Philippines (Australian funded development program)
PPI	Plan du Parronage International - Burkina Faso
PRA	Participatory Research Appraisal
PVO	Private Voluntary Organization
RRA	Rapid Rural Appraisal
SALT	Sustainable Agricultural Land Technology - agroforestry technology originally promoted by MBRLC
SANREM CRSP	Sustainable Agriculture and Natural Resource Management Collaborative Research Support Program
SECAL	Sectoral Adjustment Loan Program - Philippines (program of the DENR)
SHAISI	San Herminiglido Agro-Industrial School Foundation - Lantapan, Bukidnon, Philippines (NGO)

ACRONYMS

ACRONYM	MEANING
SUBIR	Sustainable Utilization of Biological Resources
TU	Tuskegee University - Tuskegee, AL
TOUCH	Technology Outreach and Community Help Foundation, Inc. - Cagayan de Oro, Philippines (NGO)
UGA	University of Georgia - Athens, GA
UPLB	University of the Philippines at Los Baños - Los Baños, Philippines
UPWARD	User's Perspective with Agricultural Research and Development - Los Baños, Philippines (IARC)
USAID	United States Agency for International Development
USDA	United States Department of Agriculture

ACRONYMS

ACRONYM	MEANING
VITA	Volunteers in Technical Assistance - Washington D.C. (PVO)
VPI(SU)	Virginia Polytechnic Institute and State University - Blacksburg, VA
VOS	Voluntary Offer of Sale - Philippines (program for land redistribution under CARL)
WSU	Washington State University - Pullman, WA
WWF	World Wildlife Fund - Washington, D.C. (PVO)
UW	University of Wisconsin - Madison, WI