SANREM CRSP
LAG-4198-A-00-2017-00
QUARTERLY REPORT
Second Quarter, Year Two
1 November 1993 to 31 January 1994

I. SUMMARY

Introduction:

The second quarter of Year Two of the program (1 November 1993 to 31 January 1994) has been extremely productive, and the project has exceeded all planned objectives for the quarter.

Accomplishments:

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

- Drafted Frame Work Plan for the Burkina Faso site by the National Coordinating Committee
- Conducted Institutional Networking for the Ecuador Site and signing of MOU with FUNDAGRO
- Held Philippines Roundtable for Integration of Philippines Work Plans for Second Phase Implementation
- Initiated Soil Survey Activities at the Philippines Site
- Initiated Weather Station Activities at the Philippines Site
- Held SANREM CRSP Training Workshop, Virginia Polytechnic and State University
- Hosted Indicators of Sustainability Working Group Meeting
- Placement - Site Coordinator, Philippines Site
- Sent team to Morocco to identify areas of interest to be pursued by AID Rabat and National Programs with SANREM and Develop a Preliminary Plan of Work
- Initiated discussion with US AID Cape Verde for collaboration on WARD project
- Developed Preliminary Plan of Work and a Rapid Institutional Analysis and Needs Assessment of INIDA in Cape Verde
- Participated in Meeting at ISNAR
- Initiated Electronic Bulletin Board for Distribution of SANREM NEWS
- Held Orientation Meeting for External Evaluation Panel

- Participated in International Agroforestry Meeting in Burkina Faso
- Participated in the American Society of Agronomy Meetings

Funding Status:

- Funds expended during the second quarter, second year were $355,927.34.

Planned Activities for the Subsequent Quarter:

- Site Identification and Networking Mission to Ecuador
- Work Plan Writing Trip to Honduras
- Participant Training for Philippines
- Implementation of Philippine Work Plans
- Finalization of the Frame Work Plan for Burkina Faso
- Invitation to Work for Burkina Faso
- Development of Scope of Work for Morocco
- Finalization of Scope of Work for Cape Verde

II. Detailed Accomplishments - Planned versus Actual

Planned Accomplishments:

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

- Drafting of Frame Work Plan for the Burkina Faso site by the National Coordinating Committee
- Review of Literature and Institutional Networking for the Ecuador Site - Sign MOU with FUNDAGRO
- Hold Philippines Roundtable for integration of Philippines Work Plans for Second Phase Implementation
- Initiate Soil Survey Activities at the Philippines Site
- Initiate Weather Station Activities at the Philippines Site
- Hold SANREM CRSP Training Workshop, Virginia Polytechnic and State University
- Host Indicators of Sustainability Working Group Meeting
- Place - Site Coordinator, Philippines Site
- Send team to Morocco to identify areas of interest to be pursued by AID Rabat and National Programs with SANREM
- Participate in the American Society of Agronomy Meetings

Actual Accomplishments:

- **Initial Drafting of Frame Work Plan for the Burkina Faso site by the National Coordinating Committee**

  Bill Hargrove, Mudiayi Ngandu and Irma Silva-Barbeau traveled to Burkina Faso November 15-19 to learn the issues and concerns of the SANREM collaborators. Those concerns: lack of participation in organization of the workshop, low per diems, lack of recognition at the workshop, lack of finances to prepare the report, lack of finances to have a coordinating committee meeting and lack of coordination of field activities were discussed and remedies were implemented.

  The writing team met on the second day to outline the Frame Work Plan with major elements of: an introduction, constraints, actions to address the constraints, expected

results and an appendix that would include reports of previous activities. The constraints and actions would be presented in the six themes used at the workshop: water, maintaining soil fertility, management of livestock, management of non-cultivated soil, village participation in natural resource management, and human health and nutrition. A time line was outlined and writing assignments were made.

The University of Georgia group met with Mr. Nitiema on November 19 to discuss the Plan International work plan. The important elements were support for the Boulsa office, support for the in-country committees and the Priming Project. Nitiema agreed to develop a proposal for the Priming Project. **The draft of the Frame Work Plan can be found as Attachment A. The Trip Report can be found as Attachment B.**

- **Institutional Networking for the Ecuador Site and Signing of Memorandum of Understanding with FUNDAGRO**

Bill Hargrove and Constance Neely traveled to Ecuador for meetings on December 9 and 10. Upon arrival they met with Ken Weigand (US AID Quito) to discuss the concerns of the mission in conjunction with SANREM CRSP activities. The mission was clearly supportive of FUNDAGRO and also wanted a tie-in with the ongoing project SUBIR. Due to impending budget cuts on the parts of all concerned, the SANREM team proposed a network of small activities, building on existing projects, that still addressed the cornerstones of the SANREM CRSP, yet had greater focus and quicker impact probability. One such project could be a counterpart to the proposed Indicators of Sustainability program outlined for Honduras.

The next day they met with Julio Chang (Executive Director, FUNDAGRO), Eduardo Sotomayor (Country Director, HPI), and Kris Merschrod (Director, CARE/SUBIR) to discuss possible scenarios and potential project tie-ins. Everyone agreed on the final form of the MOU which identified FUNDAGRO as the coordinating and financial body for the SANREM CRSP in Ecuador. Bill Hargrove and Dr. Chang signed the MOU for the SANREM CRSP and FUNDAGRO respectively. The MOU was signed the next day by Michael Jordan (Acting Mission Director). **The Trip Report can be found as Attachment C.**

- **Held Philippines Roundtable for Integration of Philippines Work Plans for Second Phase Implementation.**

The Philippines Roundtable held December 1 - 3 in Los Baños, was chaired by Drs. Bill Hargrove and Willie Dar (Chairman of the Philippines National Coordinating Committee). In addition to the chairmen, Bill Deutsch, Bob Rhoades, David Midmore, and Constance Neely were present from the Global Technical Committee. The roundtable worked through four focus groups: Soil and Water Issues, Biodiversity, Human Dimensions (formerly Land, Labor, Capitol and Credit), and Community Action/Communications. The focus groups identified the strengths of each proposal and

integrated these with the specific research questions identified in the Invitation to Work. The work plans fell into four capability groupings: a) those that needed considerable revision, b) those that needed combining with other work plans and/or rewriting, c) those that warranted seed monies for planning and a complete reworking of the work plan, and d) those that were rejected. Letters have been written to all of the proponents concerning the outcome and specific recommendations for the work plan. **The Trip Report can be found as Attachment D.**

- **Initiated Soil Survey Activities at the Philippines Site**

Larry West visited Lantapan, Bukidnon, Philippines, from November 18 to December 14, 1993 for the purpose of describing and sampling soils in the SANREM CRSP Philippines research area. Samples from thirteen pedons were air shipped to the SCS Soil Survey Laboratory in Lincoln, Nebraska, and later to the University of Georgia for analysis. Also participating in the survey activities were Ronald Yeck (NSSC, Nebraska), Steve Lawrence (Asst. State Soil Scientist, Georgia), Barbara Bellows (Site Coordinator, SANREM CRSP) and scientists from the Philippine Bureau of Soil Management (Alejandro Micosa, Arturo Dayot, Queruben Navero, Lorenzo Tomas, Elino Bagoso, Ernesto Almendral, Jose Gerpacio, Reynaldo Villanueva and Elmer Ambaya). Assistance was also supplied by Manuel Marquez, Jose Aramces, and Conrado Duque, all from the Central Mindanao University.

Dr. West also visited the offices of the Bureau of Soil and Water Management and found them to be well equipped (including computers and a GIS system) and staffed by well trained workers. He suggested SANREM CRSP should make use of the great amount of expertise in aerial photo interpretation, preparation of land use maps, and laboratory analysis available within the Bureau of Soil and Water Management. **The Trip Report can be found as Attachment E.**

- **Initiated Weather Station Activities at the Philippines Site**

Ian Flitcroft and Galen Harbers of the University of Georgia traveled to the Philippines November 29 to December 15. They attended the SANREM CRSP Roundtable in Manila where they helped develop the work plan. Then they transported the weather station equipment and fencing materials to Lantapan where they installed the stations on property rented for the project from local landowners. Working with them was Theodoro Maribojouc, a technician from Central Mindanao University and weather station site manager. Local observers were hired to read the raingauges. Hourly and daily data gathered by the stations will include air and soil temperatures, humidity, wind speed and direction, solar radiation and rainfall. During the installation procedures they also had meetings with T. Pajaro, Mayor, Cosme Gawigan, Vice Mayor, Julieta Devibarr, Municipal Planning Coordinator, and Jermia Endrina, Vice President of the Barangay Captains Association. After completing the installations, they traveled to the NAPACOR power plant in Maramag and met with Elizabeth Cruz, Watershed

Development Officer. **The Trip Report can be found as Attachment F. An example of initial weather station data can be found at the end of this Trip Report.**

- **SANREM CRSP Training Workshop, Virginia Polytechnic and State University**

The second SANREM CRSP Training Activity was coordinated November 19-22 by the Virginia Tech Office of International Research and Development led by Dr. DeDatta. Cornelia Flora led the training. Other trainers included Irma Silva-Barbeau, Ginny Seitz, Gladys Buenavista, Bob Rhoades, Ron Carroll, Jerry Aaker, Arne Vanderburg, Mary Lou Surgi, Julie Burt, Bill Deutsch, and Constance Neely. There was also a team from the University of Florida Farming Systems Training Group who assisted in evaluation. There were approximately 35 participants, of whom 11 were from Morocco, Honduras, Burkina Faso, the Philippines and Ecuador. Process and content documentaion of the training activity will be forthcoming.

- **Hosted Indicators of Sustainability Working Group Meeting**

The Indicators of Sustainability Working Group met November 1 in Griffin, GA to outline their strategy for an Indicators of Sustainability Workshop scheduled to take place in May. The event was co-chaired by Barbara Bellows and Walt Butcher. In attendance were Bob Hart, Irma Silva-Barbeau, Gladys Buenavista, Bill Hargrove, Constance Neely, Bill Deutsch, Christian Ettema, Ralph Montee and Bob Gurevich. Bob Hart of INFORUM will be responsible for setting up an Indicators of Sustainability "electronic conference" to gather information concerning ongoing activities from around the globe. The workshop will consist of formal presentations followed by a focused "working" activity.

- **Placed - Site Coordinator, Philippines Site**

Gladys Buenavista accepted the position of coordinator for the Philippines Site and will be reporting in February. The site of the SANREM Coordinating Office will be the SHAISI school in Alanib community in the watershed.

- **Trip to Morocco to identify areas of interest to be pursued by AID Rabat and National Programs with SANREM and develop a preliminary Scope of Work**

Ed Kanemasu and Dave Swift met on January 10 with Mohamed Hanafi, Charles Uphaus, Mohamed Kamal (Secretary General of INRA), Abdel Ilah Ambri (INRA Department of Milieu Physique), and El Idrissi (INRA head of cooperation) to discuss areas of interest to be pursued. The discussion centered on the Rif as the primary area with a secondary site in the high Atlas. The following day they visited three major watersheds and weighed the possibilities of each. The next day they compared notes and selected Oued Laou watershed based on the fact that it was the smallest in size and diverse in agriculture, supporting forests and cork oaks, as well as vegetable production.

They explored some possible secondary sites in the Atlas Mountains on January 14-16, and decided the logistics of a mountain site would be too complicated without yielding significant additional benefit. It was agreed the Rif site is sufficiently large and complex enough to engage the capabilities of both the Moroccan and American collaborators.

On January 17 they met with Fouad Rachidi to discuss the organization of the program from the Moroccan end. Rachidi was appointed as the coordinator of the project activities in Morocco by Mohammed Rochdi, director of ENA Meknes. Over the next three days they developed a preliminary work plan which they presented to US AID and conveyed to Charles Uphaus, M'hamed Hanafi, and Mohammed Kamal.

Uphaus said that AID Rabat had agreed to make $150,000 available for furnishing a GIS lab, contingent upon a strong possibility of funding from the World Bank. **The Initial Scope of Work and the Trip Report can be found as Attachment G.**

- **Initiation Trip to Cape Verde**

On their way to Burkina Faso, Bill Hargrove and Irma Silva-Barbeau stopped off in Praia, Cape Verde, November 14-15, to discuss the WARD project with US AID Cape Verde and potential mission buy-in to SANREM CRSP. They met with Steve Dosh (Project Officer, US AID Cape Verde) to review the project description. The WARD project consists of three primary components: a) watershed development, b) agricultural research, and c) training. ACDI, a U.S.-based NGO, will implement the watershed development component and another regional training group will implement the training component. The mission is interested in SANREM for the agricultural research component.

They met with Barbara Kennedy (Mission Director) who requested that SANREM assist INIDA in developing a farmer-driven research agenda through diagnostic activities such as the Participatory Landscape/Lifescape Appraisal and to assist them in designing and implementing an on-farm research program. Funds available to SANREM to do this activity amounts to $820,000 over three years. Local participation will be covered through PL480 funds. The next step would be to develop a Scope of Work if SANREM is interested. **The Trip Report can be found as Attachment H.**

- **Developed Preliminary Plan of Work and a Rapid Insitutional Analysis and Needs Assessment of INIDA in Cape Verde**

Irma Silva-Barbeau traveled to the Republic of the Cape Verde Island January 11-29. In Praia she met Barbara Kennedy (US AID Rep) and Steve Dosh (ADO) and read pertinent reports on the National Institute for Agricultural Research and Development (INIDA) and the WARD project. She travelled to Sa Jorge dos Orgaos to meet with

Eng. Carlos Silva (INIDA vice president), Drs. Jose Levy and Maria Isabel Andrade and other researchers and officials of INIDA. She distributed literature on SANREM CRSP and WARD PP. She interviewed scientists and staff for the purpose of developing a Plan of Work for SANREM CRSP's part of the Cape Verdean WARD project.

While there Dr. Silva-Barbeau also developed a rapid institutional analysis and needs assessment of INIDA at the request of US AID Praia. **The Trip Report, Institutional Assessment, and Draft Work Plan can be found as Attachment I.**

- **Participated in Meeting at ISNAR**

Bill Hargrove and Willie Dar were invited November 20-23 to ISNAR in the Hague to deliver a paper entitled "The SANREM CRSP: A Frame Work for Integration of Systems Analysis Methods in a Sustainable Agriculture and Natural Resource Management Research and Development Agenda". The paper was well received, generating much discussion and many questions. The SANREM model continues to generate much interest in the international research and development arena. A paper will be published from this conference.

- **Initiated Electronic Bulletin Board for Distribution of SANREM NEWS**

The SANREM CRSP initiated an electronic bulletin board with the SANREM NEWS through INFORUM as of January 1. Bullets will be posting to the SANREM NEWS at least every two weeks. You can subscribe to SANREM NEWS by sending an e-mail message where the first line reads: SUBSCRIBE SANREM NEWS to ALMANAC@PARTI.INFORUM.ORG. There will be instructions on SANREM NEWS for registering for the electronic conference on indicators of sustainability.

- **Held External Evaluation Panel Orientation**

The initial External Evaluation Panel met at the Georgia Station in Griffin, GA on January 14 for an orientation. Panel members Grace Goodell (Johns Hopkins University, School of Advanced International Study), Thurman Grove (North Carolina State University, International Programs Agricultural & Life Sciences), Robert Herdt (Rockefeller Foundation, Agricultural Sciences), and Leslie Swindale (University of Hawaii) listened to presentations about SANREM's goals, organizational structure, and current projects.

Jim Bonner reviewed SANREM CRSP/AID's commitment to sustainability, Jerry Arkin explained SANREM's organization and Bill Hargrove presented the Conceptual Frame Work. Constance Nec., Mudiayi Ngandu and Jim Hoey reviewed the projects in the Philippines, Burkina Faso and Latin America, respectively. Cornelia Flora gave an overview of the technical work groups. Bob Gurevich explained NGO and local

participation. Constance Neely presented training and workshop activities. The presentations were interactive with spirited questions from the panel about local participation, defining goals, measurable results, and replication of research.

Future plans call for the External Evaluation Panel to visit the project sites as well as cooperating institutions and to meet periodically with SANREM representatives for comments and review.

- **Participated in the International Agroforestry Meeting in Burkina Faso**

Mr. Chuck Rhoades attended the Parc Agroforestry conference in Ouagadougou along with approximately 200 other participants who are working in semi-arid regions of West and Southern Africa. In addition to attending the conference he met with Rudy Vigil at the US AID mission. He also participated in a half-day field trip to Karite and Acacia albida parklands west of Ouagadougou (Koukoulougou) where the chief is famous for his Karite orchard. He met with Chin Ong, senior scientist from ICRAF, who is proposing to set up a project to examine Parc land management.

He also visited Bunasols, the national soils laboratory in Ouagadougou. A trip to Donsin was organized and led by Laurent Millogo, US AID liaison to SANREM. Also on the trip were Fredrick Kambou (INERA); Sara Workman (Winrock OFPEP Project); Mark Buccovich (USDA-Forest Service International Support Program). **The Trip Report can be found as Attachment J.**

- **Participated in the American Society of Agronomy Meetings**

Bill Hargrove, Constance Neely, and Barbara Bellows gave a series of talks on the activities of the SANREM CRSP at the American Society of Agronomy meetings held in Cincinnati, Ohio, November 7-12. The three papers were followed by a roundtable discussion led by Chuck Francis. S. K. DeDatta (Board of Directors, SANREM CRSP) participated in the discussion as well.

III. Significant Findings and Impacts

- **Soil Characterizations Across the Landscape at the Philippines Site**

During the Period of November 18 to December 14, 1993, a soil characterization of thirteen pedons across the landscape of the municipality of Lantapan were completed. The participants involved in the characterization included personnel from the University of Georgia, the SANREM CRSP, the USDA-Soil Conservation Service, the Philippine Bureau of Soil and Water Management, Central Mindanao University and the local community.

The outcome of the soil characterization was the identification of four broad geomorphic units including: Mountains, Upper Footslope, Lower Footslope, and Collu-Alluvial Terraces. The Soils in the Lantapan area were found to be surprisingly uniform. Soils are in the process of being analyzed.

Because of the participatory nature of the SANREM CRSP, it was important that interaction of the soils specialists and the local community take place during the characterizations. There were two meetings held prior to the charaterizations to discuss the purpose of the soil survey work. These were attended by both community members and the barangay captains of Lantapan. The team dug a pit close to the Municipal Hall for further explanation. A radio program was also put out to clarify the reason for the soil survey. The pits were dug across the landscape which incorporated community participation throughout the watershed. Students at Central Mindanao University also were brought to the field to meet with the soil survey team.

The soil survey team will provide field reports and photographs to the community members immediately. When laboratory data is available, this too will be disseminated. A poster is now being prepared to explain the difference between soil classification and soil fertility work.

The outcome of this activity was several-fold. First, a preliminary evaluation of the soil types across the landscape is now available. Secondly, a collaborative team of U.S. and Filipino soil specialists was formed. Thirdly, there was a good level of community sensitivity and the community was involved in the classification activities although this aspect could be improved upon. This sets the stage for future detailed classification activities - both academic and ethnopedological. A detailed description of the findings is located in the trip report which is presented as **Attachment E.**

- **Weather Stations installed in Manupali Watershed**

As of December, 1993 SANREM CRSP began collecting valuable data on weather patterns in the Philippines' Manupali watershed. Rainfall, air temperature, humidity, solar radiation, soil temperature, and wind speed and direction will be analyzed and used to develop models to address issues such as soil erosion and crop response. Ian Flitcroft and Galen Harbers (University of Georgia) were responsible for the installation of four weather stations in conjunction with local community members, Central Mindanao University, and the local government unit. This activity took place during the same time as the soil survey activity and thus was interactive. Ian Flitcroft explained the purpose of the activity and local community members fully involved. The data is being recorded using data loggers which CMU is responsible for collecting. This information is then downloaded at the University of Georgia, refined, and presented in the vernacular to be housed in the community, the SANREM Office and the Local and Provincial Government offices. Data is already being processed and an example of the output is shown following the Trip Report as **Attachment F.**

- **SANREM CRSP TRAINING ACTIVITIES EXPANDING**

The consortium of the SANREM CRSP has been successful in utilizing participatory methodologies, the landscape ecology approach, and interdisciplinary teams to design research and development programs in sustainability and natural resource management that are holistically structured. Clearly the training component of the SANREM CRSP is having a significant impact on the research and development activities and collaborative efforts of this project. The SANREM CRSP training program has provided participants with tools in innovative research approaches. Because the training program has brought together participants with diverse experience, it has created a forum for knowledge exchange. Training activities have provided an interactive and pragmatic learning experience on substantive issues central to the SANREM CRSP philosophies and technical expertise.

The second SANREM CRSP Training activity entitled Innovative Approaches to Sustainability was held at Virginia Polytechnic Institute and State University during the week of November 19-24. Although held in the United States, 11 participants from 5 SANREM CRSP country sites (Morocco, Honduras, Burkina Faso, the Philippines, and Ecuador) participated. Trainers included Cornelia Flora, Irma Silva-Barbeau, Ginny Seitz, Gladys Buenavista, Bob Rhoades, Ron Carroll, Jerry Aaker, Arne Vanderburg, Mary Lou Surgi, Julie Burt, Bill Deutsch, and Constance Neely. There was also a team from the University of Florida Farming Systems Training who assisted in evaluation. The 35 participants were not limited to SANREM CRSP collaborators and represented host country and U.S. universities, non-government organizations, AID and collaborators from the new IPM CRSP. Community Goal Setting, Landscape Ecology, Farmer Participatory Methodologies, Gender Analysis, Lifescape Interactions, Indicators of Sustainability, and Collaborating with Non-Government Organizations were the key topics of the training workshop. The program was clearly seen as a success and the interaction of collaborators across sites greatly improved the understanding of the entire SANREM CRSP mission. The SANREM party line is spreading.

- **Presentations and Discussions at American Society of Agronomy and International Service for National Agricultural Research (ISNAR) Promote SANREM Process**

Two key presentations were made to professional audiences. These included a domestic meeting of the American Society of Agronomy and an international conference at ISNAR. Each of these presentations focused on the unique process of the SANREM CRSP, utilizing networking, participatory methodologies, and consensus building to develop a farmer driven research agenda. Strong enthusiasm by professionals was prompted and interest was generated in replicating the SANREM approach and participatory methodologies into ongoing programs around the world.

IV. Problems/Issues and Approaches to Resolution

- None

V. Financial Status

SANREM CRSP QUARTERLY EXPENDITURE REPORT — QUARTER ENDING JANUARY 31, 1994
GRANT NO. LAG-4198-A-00-2017-00

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	37,809.76	209,643.22	77,654.78
FRINGE BENEFITS	202,230.00	76,402.00	9,616.16	57,775.50	18,626.50
CONSULTANTS	34,560.00	5,120.00	0.00	0.00	5,120.00
TRAVEL/TRANSPORTATION					
-DOMESTIC	119,659.00	45,994.00	8,261.73	19,204.52	26,789.48
-INTERNATIONAL	152,001.00	63,596.00	13,556.28	28,264.06	35,331.94
OTHER DIRECT COST	78,703.00	34,440.00	74,150.22	160,795.78	(126,355.78)
INDIRECT COST	661,439.00	328,504.00	56,091.72	209,432.22	119,071.78
SUBTOTALS	1,999,110.00	841,354.00	199,485.87	685,115.30	156,238.70
RESEARCH SUBCONTRACTS					
US COLLABORATORS					
UNIVERSITY OF GEORGIA	1,956,548.00	868,828.00	0.00	323,514.09	545,313.91
PVO/UNIVERSITY CENTER	405,568.00	197,050.00	0.00	51,760.00	145,290.00
VIRGINIA TECH UNIVERSITY	417,052.00	179,487.00	82,719.26	82,719.26	96,767.74
UNIVERSITY OF WISCONSIN	664,187.00	190,290.00	27,070.31	27,070.31	163,219.69
COLORADO STATE UNIVERSITY	184,950.00	46,249.00	0.00	0.00	46,249.00
USDA ARS	119,190.00	23,838.00	1,062.00	1,062.00	22,776.00
TUSKEGEE UNIVERSITY	396,629.00	134,325.00	20,138.82	20,138.82	114,186.18
HEIFER PROJECT INTERNATIONAL	240,000.00	203,000.00	0.00	37,728.86	165,271.14
AUBURN UNIVERSITY	499,100.00	154,820.00	803.02	21,484.29	133,335.71
WASHINGTON STATE UNIVERSITY	265,000.00	108,000.00	4,648.06	4,648.06	103,351.94
INTERNATIONAL COLLABORATORS					
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
CIMMYT	126,725.00	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
SITE AND SPECIAL PROGRAMS					
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	126,560.00	0.00	0.00	126,560.00
SUBTOTAL-RESEARCH CONTRACTS	8,000,890.00	2,658,646.00	136,441.47	570,125.69	2,088,520.31
TOTAL AMOUNT	10,000,000.00	3,840,000.00 *	335,927.34	1,255,240.99	2,584,759.01

PARTICIPANT TRAINING EXPENDED TO DATE TOTALS $110,086.27 THESE AMOUNTS ARE INCLUDED IN THE RESEARCH SUBCONTRACTS.

*ADDITONAL $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

- **Burkina Faso Trip Report, October 23-30, 1993**

  Mr. Chuck Rhoades attended the Parc Agroforestry conference in Ouagadougou along with approximately 200 other people who are working in semi-arid regions of West and Southern Africa. Additionally he met with US AID Burkina Faso, visited the National Soils Laboratory, and visited the SANREM site in Donsin.

- **Burkina Faso Trip Report, November 15-19, 1993**

  Bill Hargrove, M. Ngandu and Irma Silva-Barbeau traveled to Burkina Faso November 15-19 to learn the issues and concerns of the SANREM collaborators. The writing team met on the second day to outline the Frame Work Plan. A time line was outlined and writing assignments were made. They met with Nitiema on November 19 to discuss the Plan International work plan.

- **Ecuador Trip Report, December 8-11, 1993**

  Drs. Bill Hargrove and Constance Neely met with Ken Weigand (ADO, US AID Quito) to outline the activities planned for SANREM CRSP in Ecuador and to sign an MOU with FUNDAGRO. They also visited the training dairy farm of Eduardo and Nancy Sotomayor.

- **Philippines Trip Report, November 29-December 4, 1993**

  Bill Hargrove, Bill Deutsch, Bob Rhoades, David Midmore, and Constance Neely traveled to the Philippines to attend the roundtable review process December 1-3 at IRRI in Los Baños. They assisted in the review, integration and revision of the Philippine work plans.

- **Philippines Trip Report, November 18-December 14, 1993**

  Larry West visited Lantapan, Bukidnon, Philippines, for the purpose of describing and sampling soils in the SANREM CRSP Philippines research area. He also examined the offices of the Bureau of Soil and Water Management.

- **Philippines Trip Report, November 29-December 15, 1993**

  Ian Flitcroft and Galen Harbers of the University of Georgia traveled to the Philippines where they attended the SANREM CRSP Roundtable in Manila and helped develop the work plan. Then they transported the weather station equipment and fencing materials to Lantapan where they installed it at the sites. After completing the installations, they traveled to the NAPACOR power plant in Maramag.

- **Morocco Trip Report, January 10-21, 1993**

  Ed Kanemasu and Dave Swift traveled to Morocco to meet with US AID Rabat to discuss areas of interest to be pursued. They selected Oued Laou watershed based on the fact that it was the smallest in size and diverse in agriculture. They met with Fouad Rachidi to discuss the organization of the program from the Moroccan end and developed a proposal (attached) which they transported to US AID and presented to Charles Uphaus, M'hamed Hanafi, and Mohammed Kamal.

  Uphaus said that AID Rabat had agreed to make $150,000 available for furnishing a GIS lab, contingent upon a strong possibility of funding from the World Bank.

- **Cape Verde Trip Report, November 14-15, 1993**

  Bill Hargrove and Irma Silva-Barbeau visited Praia, Cape Verde to discuss the WARD project with US AID Cape Verde and potential mission buy-in to SANREM CRSP. They met with Steve Dosh (Project Officer, US AID Cape Verde) and Barbara Kennedy (AID Rep).

- **Cape Verde Trip Report, January 11-29, 1994**
  Irma Silva-Barbeau traveled to the Republic of the Cape Verde Island to meet with US AID personnel in Praia as well as researchers and officials of the National Institute for Agricultural Research and Development (INIDA) with the purpose of developing a Plan of Work for SANREM CRSP's work with the Cape Verdean WARD project. While there she also conducted a rapid institutional analysis and needs assessment of INIDA at the request of US AID Praia.

VII. Attachments

A. Draft Frame Work Plan - Burkina Faso

B. Trip Report - Burkina Faso

C. Trip Report - Ecuador

D. Trip Report - Philippines / Roundtable

E. Trip Report - Philippines / Soil Survey

F. Trip Report - Philippines / Weather Stations

G. Trip Report - Morocco

H. Trip Report - Cape Verde / Initial Visit

I. Trip Report - Cape Verde / Insitutional Assessment

J. Trip Report - Burkina Faso

K. Acronyms

ATTACHMENT A

AGRICULTURE DURABLE ET GESTION DES RESSOURCES NATURELLES (SANREM CRSP)

Proposition de

PLAN-CADRE

de

RECHERCHE

à

DONSIN

DRAFT

Décembre 1993

INTRODUCTION GENERALE

Le village de Donsin situé à 230 km de Ouagadougou a été retenu pour servir de site de recherche au Projet de Gestion de Ressources Naturelles et d'Agriculture Durable (SANREM CRSP). Plusieurs visites de terrain ont eu lieu afin de permmetre de mieux connaître les contraintes du village. Plus spécialement un diagnostic a été fait lors d'un séjour de quatre (4) jours dans le village par la Méthode Accélérée de Recherche Participative (MARP). Cette démarche visait à identifier les principales contraintes des producteurs avec leur participation dans la perspective d'un atelir tenu du 25 au 28 Mai 1993 à Ouagadougou et qui regroupait toutes les Institutions impliquées dans le Projet (IN.E.R.A., IRBET, IDR, PPI-B et des Universités Américaines), l'Administration locale de Boulsa, les services techniques provinciaux et des représentants des producteurs (trices) de Donsin.

Six (6) commissions ont été constituées pour réfléchir sur les thèmes dégagés à l'issue du diagnostic des contraintes par la MARP, qui sont:

a) l'eau;
b) la restauration et le maintien de la fertilité des sols;
c) la gestion des terres non cultivées;
e) la participation des villageois à la gestion des ressources naturelles et leur adaptation à la dégradation de ces ressources; et,
f) la santé et la nutrition humaines.

En vue de permettre au Projet de pouvoir entamer l'exécution de travaux de recherche sur le terrain dans les meilleurs délais, une commission a été mise sur pied, chargée de la rédaction d'un plan-cadre prenant en compte les conclusions de l'atelier, notamment celles relatives aux six (6) thèmes ci-dessus énumérés. Six (6) sous-équipes ont été constituées, devant chacun rédiger une

proposition de plan-cadre dont l'ossature est l'introduction, les contraintes relatives au thème, les actions à mener pour lever ou alléger ces contraintes et les résultats qui en sont attendus.

Le présent document développe chacun des six (6) en respectant le plan ci-après mentionné dans l'ordre déjà indiqué.

L'équipe de rédaction a tenu à partager avec les producteurs (trices) les propositions d'axes de recherche qu'elle a faites au cours d'une visite organisée dans le village le 16 décembre 1993. La réaction des paysans n'est guère différente de ce qui avait été identifié comme contraintes lors de la MARP et débattues comme telles lors de l'atelier pour dégager les axes de recherche. Le rapport de mission de la commission de rédaction apparaît en annexe de ce document.

I. EAU

1.1. INTRODUCTION

L'eau est indispensable à toute forme de vie:humaine, végétale, animale,... Elle est disponible généralement sous les formes suivantes : eaux de surface (de bas-fonds ou en dehors des bas-fonds) et eaux souterraines.

Le manque ou l'insuffisance d'eau entraîne des conséquences dépressives sur les activités agricoles. De même une gestion inappropriée des ressources hydriques disponibles conduit à une dégradation d'autres ressources comme les sols: érosion hydrique des sols, risque d'inondation des bas-fonds limitant la mise en oeuvre de terres, ...

La disponibilité des eaux et leur gestion constituent des variables essentielles pour le succès des activités agro-pastorales mais aussi pour la santé humaine (eau potable).

Le village de Donsin qui est situé dans une zone à faible pluviométrie (450~ 650 mm) n'est pas à l'abri des conséquences de l'insuffisance ou des difficultés de bien gérer les eaux disponibles. De multiples contraintes existent, qui seront répertoriées dans la section suivante. Les actions à mener pour lever de telles contraintes et les résultats attendus seront présentés dans la troisième section.

1.2. DIAGNOSTIC DES CONTRAINTES

Les contraintes liées à l'eau sont de trois ordres à savoir:

- les contraintes liées à la qualité de l'eau;
- les contraintes liées à la quantité et à la répartition de l'eau; et,
- les contraintes socio-économiques.

1.2.1. Contraintes liées à la quantité de l'eau

- Risques d'inondation des bas-fonds limitant leur mise en exploitation.
- Courte durée de stockage d'eau dans les bas-fonds (trois à quatre mois).
- Nécessité de creuser des puisards dans le bas-fonds pour avoir de l'eau, ce qui limite l'exploitation des bas-fonds qui est une terre à haute potentialité.
- Insuffisance et mauvaise répartition des pluies dont la conséquence est la mortalité des arbres et la disparition de certaines espèces : le karité, le néré, l'andropogon,...
- Insuffisance et faible débit des forages.

1.2.2. Contraintes liées à la qualité de l'eau

- Agressivité des pluies entrainant la baisse de fertilité des sols et la formation de plages nues *(zipélés)*.
- Maladies (ver de guinée, bilharziose, ...) occasionnées par la consommation d'eau non potable (eau de mare).

1.2.3. Contraintes Socio-économiques

- Problème de transport (corvée) de l'eau qui est toujours assuré sur de longues distances par les femmes à l'aide de canaris.
- Préférence de l'eau des mares à celle des forages.

1.3. ACTIONS A MENER - RESULTATS ATTENDUS

Cinq (5) grands thèmes de recherche ont été dégagés permettant de mener des activités concrètes de recherche. Ce sont:

- l'étude de l'impact de l'amélioration des ressources en eau sur la charge et le revenu de la femme;
- l'étude des possibilités de mise en valeur du bas-fond de Donsin;
- le suivi des fluctuations hydriques des eaux souterraines;
- l'étude de techniques de renforcement des aménagements en pierres ou d'autres alternatives durables et peu coûteuses;
- l'étude des techniques culturales de préparation du sol conservant l'eau.

AXES DE RECHERCHE	ACTIONS A MENER	RESULTATS ATTENDUS
ETUDE DE L'IMPACT DE L'AMELIORATION DES RESSOURCES EN EAU SUR LA CHARGE ET LE REVENU DE LA FEMME	- Etudier le rôle de la femme dans les aménagements - Etudier le rôle de la femme dans l'alimentation en eau de la famille - Etudier les activités de la femme dans le bas-fond - Evolution de la situation économique des femmes liée à l'eau	CONNAITRE LES EFFETS DE L'ALIMENATION DES RESSOURCES EN EAU DU VILLAGE DE DONSIN SUR UNE COMPOSANTE IMPORTANTE DE POPULATION : LA FEMME
ETUDE DES POSSIBILITES DE MISE EN VALEUR DU BAS-FOND DE DONSIN	- Caractériser le bassin versant - Identifier le site du barrage et étude géophysique de la cuvette retenue - Etudier les potentialités agro-pastorales du bas-fond	CONNAITRE LES POTENTIALITES DU BAS-FOND DE SONSIN POUR CHOISIR UN TUPE D'AMENAGEMENT APPROPRIE
SUIVI DES FLUCTUATIONS HYDRIQUES DES (EAUX SOUTERAINES ET DE SURFACE)	- Approfondir l'évaluation des eaux souterraines - Mesurer l'impact des aménagements relatifs aux ressources en eau (eaux de surface et souterraines - Etudier les eaux de surface avant toute intervention - Suivre le débit des forages	CONNAITRE LES PERSPECTIVES A LONG TERME DES RESSOURCES EN EAU DU VILLAGE
ETUDE DES TECHNIQUES DE RENFORCEMENT DES AMENAGEMENTS EN PIERRES ET D'AUTRES ALTERNATIVES DURABLES ET PEU COUTEUSES	- Faire le bilan des techniques d'aménagement déjà effectuées ailleurs - Tests d'évaluation de techniques d'aménagement (terroir et parcelle) - Recherche de nouvelles techniques durables et peu coûteuses	MEILLEURE CONNAISSANCE DES TECHNIQUES D'AMENAGEMENT DURABLES ET PEU COUTEUSES
ETUDE DES TECHNIQUES CULTURALES DE PREPARATION DE SOL ET DE CONSERVATION DES SOLS DE DONSIN	- Faire le bilan des techniques culturales manelles et de traction animale - Test d'évaluation de techniques de retenue d'eau en parcelles - Recherche de nouvelles technologies appropriées	MEILLEURE CONNAISSANCE DES TECHNIQUES DE PREPARATION DU SOL ET DE CONSERVATION DES EAUX

II. RESTAURATION ET MAINTIEN DE LA FERTILITE DES SOLS

2.1. INTRODUCTION

Le sol est un facteur essentiel de la production végétale. La quantité ainsi que la qualité des productions agricoles dépendent énormément de la fertilité chimique et physique du sol. Au Burkina Faso en général (Vierch and Stoop, 1990), et à Donsin en particulier, les sols sont caractérisés par un faible niveau de matière organique et d'éléments minéraux. L'acidité plus ou moins marquée contribue considérablement à reduire la capacité d'échange cationique du sol. En dépit de ces observations la gestion des cultures, des résidus de récolte ainsi que la gestion du sol même sont inadéquates et favorisent la dégradation rapide des sols cultivés. La fertilité des sols épuisés était jadis rétablie par la pratique d'une agriculture itinérante caractérisée par des jachères longues de plus de 5 à 10 ans. Cette pratique qui requiert de grandes superficies disponibles n'est plus envisageable de nos jours du fait de la pression démographique de plus en plus marquée sur les terres.

La situation des terres à Donsin en particulier se révèle quelque peu inquiétante. Selon l'INERA (1992) 39,8% du terroir de cette localité sont occupés par les champs et les jachères, 10% par les surfaces dégradées, 11,6% par les surfaces endurées. En 1992, les surfaces en friche couvraient 38,6% du terroir dont environ 8,8% sont constitués de terres à fertilité douteuse. Les superficies dégradées augmentent de 1% par an, ce qui équivaut à une perte annuelle d'environ 64,2 ha de terres cultivables. Dans le même temps le défrichage de nouvelles terres augmente en moyen 1,3% (INERA, 1992). La réduction des superficies cultivables et l'inadéquation des systèmes agricoles en cours invitent les chercheurs, les vulgarisateurs et les paysans à conjuguer leurs efforts afin d'assurer la durabilité de l'agriculture dans la région. Le

plan cadre de recherche relative aux problèmes de sol à Donsin est composé comme suit:

2.2. CONTRAINTES

Les contraintes liées à la baisse de la fertilité des sols à DONSIN sont:

- prédisposition des sols à l'encroutement;
- érosion hydrique et éolienne intense;
- gestion inappropriée des sols, des cultures et des résidus de recolte;
- baisse rapide de la fertilité des sols;
- pression foncière accélérée;
- réduction rapide des superficies cultivées;
- insuffisance en matière de transfert de technologies appropriées.

2.3 ACTIONS A MENER ET RESULTATS ATTENDUS

L'objectif global est de restaurer, relever et maintenir à long terme le niveau de la fertilité des sols pour une production agricole durable.

AXES DE RECHERCHE

Actions à mener	Résultats attendus
1. caractériser les sols sur le plan morphopédologique, évaluer leur fertilité et déterminer leurs vocations agricoles.	augmentation des rendements.
2. déterminer les positions toposéquencielles des aménagements	accroissement des supreficies exploitables.
3. déterminer des méthodes de gestion des résidus de récolte qui assurent une productivité durable des sols.	meilleure prise de conscience de la bonne gestion des sols par par les paysans.
4. investiguer les méthodes locales de fabrication de compost afin d'en déterminer les contraintes et les défaillances pour mieux guider les travaux de recherche et d'amélioration.	amélioration de la technicité des paysans en matière de gestion durable des sols.
5. améliorer les systèmes de compostage et de fabrication des matières organiques améliorantes dans les compostières.	contribution à une production agricole durable.
6. investiguer les systèmes de production à base de légumineuses au Burkina Faso afin de permettre une sélection de systèmes intéressants mais méconnus à Donsin et qui pourraient s'y adapter facilement avec ou sans amélioration.	contribution à une meilleure gestion des ressouces naturelles.
7. étudier et déterminer des systèmes d'association de culture à base anti-érosifs et leurs écartements optimum selon les pentes de terrain. de légumineuses qui puissent assurer une meilleure utilisation du sol ainsi qu'une meilleure sécurité de rendement.	réduction des risques de mouvement des populations vers les régions à conditions pédologiques plus favorables à l'agriculture.
8. étudier les légumineuses locales et introduites pour leur capacité de fixer l'azote atmosphérique et d'améliorer la structure du sol.	
9. améliorer les systèmes de production existantes par l'utilisation de légumineuses.	
10. améliorer la qualité des fourrages par l'utilisation de légumineuses.	
11. améliorer les jachères par l'utilisation de légumineuses à port rampant ayant une production de biomasse élevée (exemple, mucuna, lablab, Dolicos...).	
12. déterminer les systèmes agroforestières selon les zones agro-pédo-climatiques.	
13. déterminer des méthodes rapides de récupération des sols dégradés.	
14. évaluer l'impact socio-économique des terres réhabilitées.	
15. former les paysans de la localité aux techniques récommandées pour la restauration des sols dégradés, le relèvement et le maintien de la fertilité des sols.	
16. assurer le suivi de l'évolution du milieu de Donsin afin de permettre une évaluation de l'impact des recherches agropédolcgiques dans le bassin versant.	

Documents consultés

INERA (Institut d'Etudes et de Recherches Agricoles). 1992. Rapport d'activité.

Rapport de synthèse de l'atelier SANREM tenu en Mai 1993 à Ouagadougou, Burkina Faso.

Vierich, H. I. D. and W. A. Stoop. 1990. Changes in West African Savana Agriculture in Response to Growing Population and Continuing Low Rainfall. Agric. Ecos. Environ. 31: 115-132.

III. LA GESTION DES ANIMAUX

3.1. INTODUCTION

L'élevage constitue la seconde principale activité de la population de Donsin après l'Agriculture.

En effet on y rencontre toutes les espèces de la vollaille à au gros bétail en passant par les petits ruminants; de même chaque famille possède son petit noyeau d'élevage. Mais force est de constater que cet élevage demeure peu rentable pour les propriétaires et surtout destructeur pour l'Environnement. Cela est dû à un certain nombre d'entraves que rencontre cet élevage.

Le présent document fait ressortir les points saillants de ces entraves, les actions à mener et les résultats attendus.

3.2. CONTRAINTES

Les contraintes essentielles liées à la gestion des animaux à Donsin sont les suivantes:

- insuffisance alimentaire (qualitative et quantitative),
- condition sanitaire précaire,
- mode d'élevage inapproprié,
- encadrement technique insuffisant,
- condition de commercialisation difficile.

3.2.1. Alimentation

- Insuffisance d'aires de pature.
- Disparition d'espèce appétées.

- Dégradation (qualité - quantité) du pâturage.
- Utilisation insuffisante des résidus agricoles.
- Non maîtrise des techniques appropriées de conservation-stockage de foin et résidus agricoles.
- Non disponibilité et chèreté de sous- produits agro-industriels (SPAI).
- Non pratique des cultures fourragères.
- Introductions de variétés agricoles précoces ou à résidus peu appétés.
- Insuffisance d'eau d'abreuvement (pas d'eau de surface) entrainant un rationnement en saison sèche et chaude où les besoins sont les plus élevés.
- Qualité médiccre de l'eau.

3.2.2 Santé Animale

Existence de nombreuses maladies causes de nombreuses pertes numériques et économiques.

3.2.3. Mode d'élevage

- Elevage extensif à vocation de caisse d'épargne sans option précise où le nombre prime sur la productivité.
- Non spécialisation de la Production.
- Inexistence d'aucune forme de sélection.
- Refus d'investir dans l'élevage.
- Absence d'abris protecteur pour le bétail.
- Conflits agriculteurs-éleveurs.
- Absence d'option d'où la difficulté d'intensification.

3.2.4. Encadrement

- Appui technique insuffisant des services de l'élevage.

- Méconnaissance des vaccinations et traitements élémentaires.
- Absence d'animation et de formation en techniques de production animale.

3.2.5. La commercialisation

- Commercialisation non planifiée, mévente en période de soudure (rupture de stocks alimentaires).
- Manque d'organisation et de professionalisme dans la commercialisation des produits animaux.

3.3. ACTIONS A MENER ET RESULTATS ATTENDUS

ACTIONS A MENER ALIMENTATION	RESULTATS ATTENDUS
* Identification de méthodes appropriées, simples et moins couteuses de fauche, de conservation et de stockage de foin de résidus agricoles et formation des agro-pasteurs à ces techniques. * Introduction de méthodes d'aménagement des parcours naturels de pâturages avec amélioration de la flore. * Identification et vulgarisation d'espèces fourragères acceptables par la population notamment les espèces à double usage (consommation humaine et animale). Recherche de variétés agricoles à résidus utilisables dans l'alimentation animale.	Eleveurs disposent de méthodes pratiques efficaces de conservation d'aliments de bétail. Mettre à la disposition de producteurs des techniques d'aménagement des parcours pastoraux. Enrichir ces parcours. Mettre à la disposition des producteurs des variétés agricoles à double usage; Meilleure utilisation de résidus agricoles disponibles en quantité dans les champs. Utilisation d'abreuvoirs pour toutes les espèces élevées. Disponibilité d'eau d'abreuvement.

ACTIONS A MENER	RESULTATS ATTENDUS
* Etudier la possibilité d'approvisionner la population de Donsin en sous-produits agro-industriels (SPA) mais réservés (peut-être) aux types d'élevage à option économique (lait, viande, petits etc...). * Augmenter les sources d'abreuvement des animaux; pour cela il faut revoir la répartition des points d'eau permanents. * Identifier et vulgariser du matériel d'abreuvement (abreuvoirs) solides et pratiques, à nettoyage facile surtout pour les élevages optionnels. **SANTE** * Diagnostic exhaustif des différentes maladies animales qui sévissent dans la zone (laboratoire). Apporter un appui technique à la population en matière de santé animale. Recherche sur la pharmacopé vétérinaire. * Etudier les possibilités d'approvisionner Donsin en produits vétérinaires (indispensables pour les éleveurs à option).	Long terme Stockage de foin, de résidus agricoles pour le bétail du village; Pratique courante par les éleveurs de culture four-ragères, d'enrichissement des parcours. Voir les éleveurs valoriser les produits végétaux locaux en le transformant en produits animaux. Les éleveurs sont soucieux d'utiliser de l'eau de bonne qualité et en quantité suffisante pour l'abreuvement des animaux. Court terme Disposer de la liste des maladies courantes du bétail dans la région. Mettre à la disposition du village un appui technique approprié et des produits vétérinaires. Avoir des producteurs formés en soins élémentaires. Long terme Les producteurs sont bien formés en matière de santé animale et protègent correctement leur bétail contre les maladies.

ACTIONS A MENER	RESULTATS ATTENDUS
MODES D'ELEVAGE Toutes les contraintes de l'élevage sont directement liées au mode d'élevage pratiqué. Les actions prioritaires à mener sont: - Identifier des types d'élevage semi-intensifs à intensifs qui correspondent aux besoins de la population et les vulgariser. Des élevages à option productifs viande, lait, petits, oeufs etc Spécialisation de la production qui va remplacer petit à petit l'élevage "caisse d'épargne" où l'investisse est inexistant. - Identifier la possibilité de retirer les animaux de la "divagation" et envisager une claustration semi-permanente à permanente. - Conception d'abris sommaires solides et faciles à réaliser à partir des matériaux locaux pour la protection des animaux surtout si la claustration est adoptée. - Concevoir et exécuter un programme de formation destiné aux producteurs.	Court terme Mettre à la disposition des producteurs des techniques d'élevage amélioré. Former la population à un élevage à court faible de production par utilisation au maximum des matériels locaux. Long terme Aboutir à remplacer un élevage extensif "caisse d'épargne" à grands effectifs par un élevage optionnel, intensif et productif.

ACTIONS A MENER	RESULTATS ATTENDUS
y compris le volet sélection nassale et génétique. Les contraintes tels les conflits agriculteurs-éleveurs sont essentiellement dus à la divagation des animaux. Etudier les possibilités de gestion du terroir sur la base d'aménager des parcours de paturage où les champs seront exclus de ces parcours et où les animaux seront également gardés loin des terrains agricoles en saison de pluies. **ENCADREMENT** * Former certains leaders villageois aux soins élémentaires (vaccination,Déparasitage interne et externe) * Possibilité d'apporter un appui technique en production animale au village * Identifier des méthodes d'animation des producteurs en technique de production animale. * Identifier et exécuter un programme de formation spécifique à la production animale à l'intention des Eleveurs. **LA COMMERCIALISATION** Etude du marché de bétail dans la zone qui devrait permettre d'identifier les produits	Court terme Intensification de la formation des paysans en production animale. Mieux valoriser l'élevage aux yeux des producteurs Long terme Avoir des éleveurs techniquement bien formés, motivés et capable de conduire un élevage rationnel Court terme Avoir la situation sur les potentialités

ACTION A MENER	RESULTATS OBTENUS
animaux les plus demandés et ainsi permettre aux éleveurs de se spécialiser selon les besoins * Identification des professionnels du commerce du bétail, suivie de formation qui devrait impliquer un peu plus les producteurs. * Système de planification par les producteurs qui vendraient leur bétail de façon étalée dans l'année pour éviter la mévente. Les techniques de production devraient également tenir compte de la vente.	d'écoulement des produits animaux. Avoir des paysans informés et formés en matière de vente de bétail. <u>Long terme</u> Avoir des éleveurs planificateurs de vente de bétail, des producteurs bien organisés et assurant eux-même l'écoulement de leurs produits animaux sans difficultés.

IV. GESTION DES TERRES NON CULTIVEES

4.1. INTRODUCTION

On distingue dans le village de Donsin 6 (six) types de terres non cultivées que sont les "tanga" (collines), les "kougri" (versants de collines à pente importante), les "zipélé" (espaces totalement dénudés), les jachères, les "banka" (zones inondées et bas-fonds) et les "rog n mik ziisi " (lieux de culte et cimetières).

Quoique non cultivées, ces terres interdites ou gérées individuellement ou encore collectivement sont le domaine d'expression d'une diversité biologique (animale et végétale). Ces zones sont exploitées par les populations de Donsin et celles des villages environnants. Elles fournissent en effet, du bois de feu et de service, de la paille, des paturâges et des lieux de transit des animaux, des matériaux de construction des sites anti-érosifs, des plantes alimentaires et médicinales etc.

Malheureusement, la gestion anarchique de ces zones, la surexploitation et les feux de brousse figurent parmi les contraintes qui menacent leur diversité biologique et la gestion durable des ressources de ces terres généralement fragiles. Ceci explique la nécessité d'une meilleure connaissance des contraintes qui pèsent sur ces zones, l'identification d'axes de recherches pour contribuer à lever ces contraintes en vue d'une gestion durable de ces terres.

On considèrera d'une part, des axes globaux de recherche qui s'appliquent à l'ensemble de ces terres non cultivées, et des axes de recherche spécifiques liés à chaque type de milieu non cultivé.

4.2. CONTRAINTES A LA GESTION DES TERRES NON CULTIVEES

4.2.1. La diversité biologique

Peu de connaissances sur la diversité biologique et son impact sur la vie des producteurs de Donsin.

4.2.2. Le savoir des producteurs

Connaissances insuffisantes du savoir des producteurs et son importance dans la gestion des ressources naturelles en général, des terres non cultivées en particulier.

4.2.3. Les "Zipélés"

- Carapaces dénudées de toute végétation
- Déficit en eau important
- Progression en superficie

4.2.4. Les "Tanga" ou collines

- Affleurement de cuirasses ou de carapaces
- Profondeur utile faible
- Feux de brousse
- surexploitation de la végétation du "Tanga"

4.2.5. Les "Kougri"

- Position de pente importante
- Affleurement de cuirasses ou de carapaces, graviers, cailloux et blocs
- Profondeur utile faible

4.2.6. Les jachères

- Baisse de la durée des jachères
- Milieux fragiles
- Perte de fertilité

4.2.7. Les "Banka" (zones inondées et bas-fonds)

- Sols argileux hydromorphes inondés (Yaka)
- Excès d'eau
- Régression des zones inondées

DOMAINE CONSIDERE	AXES DE RECHERCHES	RESULTATS ATTENDUS
DIVERSITE BIOLOGIQUE	- Etudier l'évolution et les impacts de biodiversité sur les producteurs - Rechercher les possibilités de nouvelles sources d'énergie - Etudier toutes les Potentialités et les facteurs qui influencent la dynamique de la biodiversité - Rechercher les moyens d'augmenter la biodiversité - Etudier la gestion communautaire des terres non cultivées et son impact sur la durabilité (réalité, avantages, inconveniants et mesures d'amélioration) - Etudier les indices biologiques liés au niveau de fertilité des sols.	- Connaissance plus approfondie de la biodiversité - Augmentation ou amélioration de cette biodiversité - Augmentation de la disponibilité en sources d'énergie, en essences diverses, pour le bois de service, l'alimentation humaine et animale, la pharmacopée traditionnelle - Tout ceci vise à une meilleure contribution de la diversité biologique à l'amélioration des conditions de vie des producteurs de Donsin par une gestion durable.

LE SAVOIR DES PAYSANS	- Etudier le système de gestion traditionnelle des terres non cultivées - Etudier les mécanismes de tansmission du savoir sur les ressources naturelles en milieu traditionnel (mécanismes d'initiation). - Etudier l'approche paysanne de l'écosystème, vocabulaire lié aux végétaux et à leur utilisation. - Etudier l'évolution des règles d'accès aux ressources naturelles à l'interieur des terroirs. - Etudier la compétition pour les ressources naturelles au niveau des terroirs voisins; perception de bon - Etudier l'évolution des règles d'accès aux ressources naturelles à l'intérieur du village	Capitaliser le savoir paysan et en tenir compte dans le choix des solutions préconisables pour une auto-gestion durable des ressources naturelles à Donsin Récupération des "Zipelés" pour les rendre aptes aux activités agropastorales

LES ZIPELES	- Etudier les techniques traditionnelles et modernes de conservation des eaux et des sols de "zipélés" - Identifier les facteurs physiques, biologiques et anthropiques liés à l'exdtension des "zipélés" et les moyens de supprimer sinon de réduire leurs effets - Etudier les tehniques de mise en valeur des "zipélés" à travers une approche communautaire - Etudier les techniques appropriées d'utilisation des termitières dfans l'amélioratiionde la fertilité des sols - Evaluer l'ampleur de la dégradation du milieu à Donsin à travers une étude des états de surface	Récupération des "zipelés" pour les rendre aptes aux activités agro-pastorales

LES TANGA (Collines)	- Etudier l'importance et et le rôle des collines du point de vue social, culturel, économique et du point de vue écologique (biodiversité) - Identifier les potentialités et le seuil d'exploitation des ressources des collines	- Contribution à une meilleure utilisation des ressources des collines dans l'optique d'une gestion durable.
LES KOUGRI (versants de collines)	- Etudier les caractéristiques, les potentialités, et suivre la gestion de ces zones fragiles	Mise en valeur des zones de "Kougri".
LES PUWESSE (Jachères)	- Etudier les techniques paysannes et modernes d'amélioration des jachères en vue d'identifier une méthodologie appropriée et peu coûteuse. - Etudier les indices biologiques liés au niveau de fertilité des sols	Aboutissement à la définition de techniques simples et peu coûteuses favorisant un regain rapide de la fertilité des ols et un accroissement de la productivité
LES BANKA (Zones inondées)	- Etudier les caractéristiques, les potentialités, les moyens de suivi et de mise en valeur ainsi que la gestion des zones inondées et inondables - Etudier les possibilités de mise en valeur des bas-fonds de Donsin (barrage, bas-fond amélioré, possibilité de développement d'activités rénumératrices pour les femmes et leurs contributions à l'amélioration de l'état nutritionnel de la famille, des enfants en	Mise en valeur des zones inondées dans une optique de gestion durable.

V. PARTICIPATION DES VILLAGEOIS A LA GESTION DES RESSOURCES NATURELLES ET LEUR ADAPTATION A LA DEGRADATION DE CES RESSOURCES

5.1. INTRODUCTION

A travers la matrice de critères sur l'utilisation des ressources naturelles, on dégage quatre types de ressources naturelles qui sont la terre, la faune et la flore. La présente étude traitera des trois premières ressources, la ressource eau faisant l'objet d'une autre étude. La gestion de ces ressources a entrainé des contraintes qui compromettent leur utilisation durable. Cette étude comporte deux parties, une relative aux contraintes et l'autre aux actions à mener et aux résultats attendus.

5.2. CONTRAINTES

5.2.1. Contraintes liées à l'élevage

- Dégradation des ressources naturelles
- Maladies
- Moindre participation des femmes à l'élevage
- Insuffisance des aires de pâture
- Conflit Eleveurs-Agriculteurs
- Alimentation
- Ecoulement des produits de l'élevage

5.2.2. Contraintes liées à la flore

- Problème de production et d'entretien
- Approvisionnement en bois
- Rareté de certaines espèces
- Propriété foncière
- Rôle socio-économique des arbres

5.2.3. Contraintes liées au sol

- Tous les exploitants ne sont pas propriétaires des terres
- Difficultés d'accès à la terre par les femmes
- Système traditionnel d'exploitation des sols
- Non identification des limites des actions entreprises pour lutter contre la dégradation des sols
- Pauvreté et dégradation

5.3. ACTIONS A MENER ET RESULTATS ATTENDUS

Les diverses actions à mener et les résultats qui en sont attendus sont consignés dans le tableau ci-après.

RESSOURCES NATURELLES	ACTIONS A MENER	RESULTATS ATTENDUS
ELEVAGE	- Etudier les systèmes d'élevage pratiqués et évaluer leur impact sur l'environnement - Stabulation des animaux - Etudier les méthodes traditionnelles de soins des animaux par les producteurs - Inventorier et réintroduire des plantes médicinales ayant existé dans la zone - Introduire des plantes pouvant être médicinales	Meilleure compréhension du système - Réduction du phénomène de la divagation - Bonne intégration agriculture-élevage - Réduction de la dépendance vis-à-vis des produits pharmaceutiques - Diversification et disponibilité de plantes médicinales; développement de la pharmacopée vétérinaire
	Améliorer le petit élevage au profit de la femme	- Augmentation des capacités financières des femmes - Meilleure participation des femmes à l'agriculture durable
	Etudier les différents sols et les utiliser en fonction de leur vocation	- Augmentation des aires de pâturages; augmentation de la productivité
	Etudier les flux migratoires, et créer des zones pastorales	Suppression ou réduction des risques de conflits
	- Etudier les ligneux fourragers - Créer des banques de fourrages - Introduire des cultures fourragères - Etudier les possibilités de fauchage et de conservation de foin - Etudier le marché d'approvisionnement en SPAI (Sous-produits Agro Industriels)	- Connaissance de tous les ligneux fourragers de Donsin - Réduction du déficit alimentaire en aison sèche - Amélioration du disponible fourrager - Disponibilité permanente de fourrage - Amélioration de la disponibilité en SPAI et réduction des coûts aux producteurs

RESSOURCES NATURELLES	ACTION A MENER	RESULTATS ATTENDUS
ELEVAGE	Etudier le marché	Identification de toutes les contraintes à la vente
ARBRES	- Etudier et évaluer l'efficacité des méthodes existantes de conservation et de régénération. - Identifier les systèmes d'organisation de la communauté - Etudier la dynamique des principales espèces de Donsin - Eutdier le système juridique régissant les arbres - Etudier la participation de l'arbre dans le revenu du paysan	- Appréhension du savoir paysan et du système d'organisation mise en place - Compréhension du système d'approvisionnement en vue d'améliorer cette dynamique - Maîtrise du système qui déterminera les technologies impliquant les arbres - Compréhension du rôle que jouent les arbres surtout dans les champs
SOL	- Etudier l'évolution du système foncier et impact de la réforme agraire et foncière	- Appréhension du problème à la terre à Donsin
	- Etudier le Droit foncier des femmes et leur participation à la gestion des terres	- Développement des stratégies permettant à ces dernières d'avoir facilement accès à la terre
	- Inventorier tous les systèmes traditionnels d'exploitation des terres et celles-ci	- Possibilité de faire des propositions de technologies pouvant anéantir ou ralentir le processus de dégradation
	- Analyser les effets des différentes mesures CES sur la durabilité des R.N.	- Identification des insuffisances des technologies préconisées ou développées par les populations
	Etudier les possibilités d'intégration d'espèce fertilisantes dans le paysage champêtre	- Augmentation du rendement à l'ha et de la biodiversité par un enrichissement du parc
	- Introduire des plantes de couvertures	- Réduction de la durée de la jachère, production de fourrage
	Faire la végétalisation des diguettes déjà installées ou à installer	Stabilisation des diguettes, réduction du temps de travail des agriculteurs
	- Etudier les différents modes d'installation de haies vives isohypses	- Stabilisation des terres de culture par réduction de l'action de l'eau et du vent; réduction de la dépendance vis-à-vis des cailloux sauvages
	- Créer des brise-vent sur la base d'espèces adaptées aux conditions pédoclimatiques	- Réduction de l'effet mécanique du vent, création de micro-climat favorable à un meilleur développement des céréales, production de bois de service, de feu, etc.
	- Etudier et améliorer l'intégration de l'élevage à l'agriculture	- Augmentation de la production agricole
	Réaliser un travail de suivi	- Réaction à l'apparition de prédateurs
	- Faire une étude socio-économique permettant une meilleure caractérisation des exploitants	- Définition d'un niveau d'adoption des technologies à identifier

VI. SANTE ET NUTRITION HUMAINES : ASPECTS ETHNOBOTANIQUES

6.1. INTRODUCTION

La santé et la nutrition humaines constituent des facteurs essentiels du développement au Burkina en général et à Donsin en particulier.

Les maladies qui sévissent dans la région sont saisonnières et liées à l'eau et aux carences alimentaires. Que ce soit des maladies de saison sèche ou de saison froide, les guérisseurs traditionnels y font toujours face par des remèdes à base de plantes.

L'alimentation de la population de Donsin est basée sur les plantes cultivées et spontanées. La richesse de cette alimentation dépend de la disponibilité des plantes.

Ainsi, les plantes interviennent beaucoup dans la vie quotidienne des paysans, aussi bien dans l'alimentation que dans les soins de santé.

La présente étude a pour but d'investiguer sur les méthodes de résolution des problèmes de santé et de nutrition humaines à Donsin. Pour cela, nous allons d'abord diagnostiquer les différentes contraintes, dégager des axes de recherches et la stratégie de mise en oeuvre de ces axes et enfin présenter les résultats attendus.

6.2. CONTRAINTES

6.2.1. Contraintes liées à la santé

- principales maladies liées à l'eau et aux carences alimentaires;
- disponibilité des plantes pour la thérapeutique traditionnelle;
- insuffisance des centres de santé traditionnels et modernes;
- problème de transmission des recettes en pharmacopée.

6.2.2. Contraintes liées à la nutrition

- disponibilité des plantes alimentaires : plantes cultivées, plantes spontanées;
- le régime alimentaire à Donsin
- situation des plantes utilisées en période de soudure : composition des aliments en période de soudure à Donsin

6.2. ACTIONS A MENER

Ce chapitre est présenté sous forme du tableau ci-après.

6.3. RESULTATS ATTENDUS

Les résultats obtenus sont consignés dans le tableau cidessous.

DOMAINE CONSIDERE	ACTIONS A MENER	RESULTATS ATTENDUS
SANTE	- Faire le recensement des tradipraticiens - Inventorier les plantes médicinales de Donsin par enquêtes ethnobotaniques (guide enquêtes/questionnaire) - Etudier les méthodes de séchage et de conservation des plantes médicinales par les herboristes et tradipraticiens et leur influence sur l'efficacité des plantes - Inventorier par des enquêtes des plantes alimentaires de Donsin	- Importance des plantes dans la thérapeutique traditionnelle de Donsin - Liste des plantes médicinales de Donsin - Rapport entre la Médecine et pharmacopée traditionnelle et la Médecine moderne à Donsin - Définition d'une méthode appropriée de séchage et de conservation des plantes médicinales
NUTRITION	- Etudier la disponibilité des plantes spontanées, leur mode de cueillette - Déterminer les modes de cultures et de gestion des plantes cultivées - Domestiquer les espèces spontanées non cultivées - Faire des enquêtes ethnobotaniques sur les plantes de disette de Donsin - Etudier la disponibilité et gestion	- Liste des plantes alimentaires de Donsin

ATTACHMENT B

LES SOUS-EQUIPES POUR LE COMITE DE REDACTION DU P.C.

1. L'eau

Daniel KABORE

2. Maintien de la fertilite des sols

Fredéric KAMBOU
Salibo SOME

3. Gestion des animaux

Ambroise NITIEMA

4. Gestion des terres non cultiviées

Jean-Baptiste ILBOUDO
Abdoul Azziz MAIGA
Mamounata BELEM

5. La participation des villageois à la dégradation des ressources naturelles et leur adaptation à la dégradation de ces ressources.

6. La santé et la nutrition humaines

Bill HARGROVE
Mudiayi NGANDU
Irma SILVA-BARBEAU

en échange avec le département ethno-botanique IRBET. Maiga est le responsable.

7. Documenter l'historique du processus du travail SANREM

Bill HARGROVE
Mudiayi NGANDU
Irma SILVA-BARBEAU

puisque la nature en regorgeait. De nos jours le problème se fait sentir du fait du manque d'eau, de la pression démographique et de l'augmentation des populations animales.

- Les paysans ont été promtes à rejeter l'idée que la femme peu hériter de la terre n'importe où. Elle peut le faire chez ses parents mais pas chez son mari.

5. Gestion des terres non cultivées

Correction du mot kougri = tankougri.

6. Santé et nutrition humaine

- Besoin d'un dispensaire,
- Approvisionnement en médicaments.

Toutes les contraintes retenues et tous les thèmes de recherche exposés par la commission de rédaction ont été adoptés par acclamation par les paysans.

Le coordinateur national du programme a rappelé la philosophie générale du SANREM qui se résume en la collégialité dans la définition des contraintes, la définition des actions à mener pour lever ces contraintes et surtout le travail même de recherche des solutions. Ainsi doc l'adoption de ce rapport sur les contraintes et les actions à mener engage chacun de nous, chercheurs comme paysans.

ATTACHMENT C

RAPPORT DE REUNION SANREM AVEC LES PAYSANS DE DONSIN A DONSIN

Le jeudi 16 décembre 1993 s'est tenue à Donsin sous la direction du coordinateur national du SANREM regroupant la commission de rédaction du plan-cadre du programme SANREM et les paysans de Donsin.

L'ordre du jour était composé des trois points suivants:

1. Rapport de la commission de rédaction.
2. Suggestion de petits projets de développement.
3. Divers.

Rapport de la commission de rédaction

Le rapport de la commission a porté sur six domaines d'activité du SANREM identifiés et ébauchés en thèmes de recherche/vulgarisation. Ces six domaines sont:

1. Eau
2. Maintien de la fertilité des sols
3. Gestion des animaux
4. Gestion des terres non cultivées
5. Participation des villageois à la gestion des ressources naturelles et à leur dégradation
6. Santé et nutrition humaine.

Observations des paysans

1. Eau

- Le problème majeur se rapporte à la quantité d'eau. Les problèmes relatifs à la qualité de l'eau (maladies). pourraient trouver leurs solutions avec les programmes de filtrage en cours. L'augmentation des quantités d'eau pourrait aider à réduire les charges de la femme.

2. Maintien de la fertilité des sols

L'expansion des terres infertiles a résulté de la pratique de l'agriculture itinérente sans minimum mesure conservatoire.

Le développement de l'élevage a aussi contribué à rendre les sols pauvres.

Le point de recherche relatif à l'amélioration du fourrage par la culture de légumineuses a suscité l'inquiétude des éleveurs quant à la sédentarisation de l'élevage.

3. Gestion des animaux

Les paysans reconnaissent le manque total de gestion des animaux et le manque d'une politique de production animale et de commercialisation des produits d'élevage.

Les problèmes d'approvisionnement en produits alimentaires ainsi que les problèmes d'écoulement des produits de l'élevage découragent l'élevage dans le village. Il arrive souvent que les investissements ne soient pas recouvrés;

En tout état de cause les paysans pensent que le problème essentiel est le manque de connaissance des choses et le manque d'information. Les recommandations sont difficiles à suivre mais ils pensent qu'avec l'aide du SANREM ils y arriveront.

4. Participations des populations à la gestion des ressources naturelles et leurs adoptions à la dégradation

- Le problème majeur est la baisse de la pluviométrie. Dans le temps, selon le chef du village, il n'était pas utile pour nos ancêtres de planter ou d'entretenir un arbre

SANREM CRSP TRIP REPORT
BURKINA FASO
15-19 November, 1993

W.L. Hargrove, M. Ngandu, and I. Silva-Barbeau

Monday November 15

Arrival of Dr. Ngandu. Meeting with Laurent Millogo to learn the issues and concerns of the SANREM collaborators. INERA has several concerns that they want to discuss in a meeting with SANREM and USAID. Most of the concerns are procedural.

Tuesday, November 16

Arrival of Drs. Hargrove and Silva-Barbeau.

Wednesday, November 17

0900 Meeting with INERA.

Several concerns were expressed:

- Lack of participation in organization of the workshop
- Low per diems
- Lack of recognition at the workshop
- Lack of finances to type the report
- Lack of finances to have a coordinating committee meeting
- Lack of coordination of field activities

We discussed each of these issues. The issues of finances were remedied by providing funds to Plan International to fund meetings and other activities. We apologized for the lack of participation in the organization of the workshop; time constraints precluded a lot of participation. We also agreed to address the lack of coordination in the field through future meetings.

1500 Meeting with all partners.

We discussed the roles of the National Coordinating Committee and Community Advisory Committee. We also developed an organizational chart for the SANREM CRSP program. We discussed the timeline for SANREM and the composition of the writing team. The writing team agreed to meet the next morning at 0800.

Thursday, November 18

0800 Meeting of the writing team

The writing team consists of:

IRBET - Abdul Azziz Maiga and Mdme. Belem
University - Jean Baptiste Ilboudo and Solibo Some
Plan - Ambroise Nitiema
INERA - Frederic Kambou and Daniel Kabore
U.S. - M. Ngandu, I. Silva-Barbeau, and B. Hargrove

We outlined the Framework Plan. We decided that the major elements would be an Introduction, the Constraints, Actions to address the constraints, Expected results, and an appendix that would include reports of previous activities. The constraints and actions would be presented in the six themes used at the workshop: Water, Maintaining soil fertility, Management of livestock, Managmenet of non-cultivated soils, Village participation in natural resource managment, and human health and nutrition. We divided the writing duties by the themes. Kabore - Water; Kambou and Some - Soil Fertility; Nitiema - Livestock; Ilboudo, Maiga, and Belem - Non-cultivated soils; Belem, Maiga, and Ilboudo - Village participation; and Silva-Barbeau, Ngandu, and Hargrove - Human health and nutrition.

We outlined a timeline for finalizing the Framework Plan:

18 November - Outline and initiate the Framework Plan; Make writing assignments; and decide leadership for writing team
17 December - First draft complete
15 January - Finalize workplan and submission to GTC and NCC
1 February - Issue Invitation to Work
1 April - Submit workplans to NCC
April-May - Evaluate workplans
1 June - Implement workplans

Friday, November 19

0900 Meeting with Plan International

We met with Nitiema to discuss the Plan workplan. The important elements were support for the Boulsa office, support for the in-coountry committees, and the Priming Project.

We agreed to modify the budget to cover soem fo the concerns of Nitiema. Nitiema agreed to develop a proposal for the Priming Project.

2200 Departure

ATTACHMENT D

SANREM CRSP TRIP REPORT
Ecuador
December 8-11, 1993

Report by: Constance Neely **Contract No: LAG-4198-A-00-2017-00**

SANREM Representatives: W. L. Hargrove, University of Georgia
C. L. Neely, University of Georgia

Purpose of Travel:

a) Meet with Ken Wiegand, ADO, USAID/Quito
b) Outline the activities planned for the SANREM CRSP in Ecuador, and
c) To sign an MOU with FUNDAGRO

Wednesday, December 8

13:45 - Depart Atlanta for Quito, Ecuador
23:00 - Arrive Quito, Ecuador

Thursday, December 9

08:00 - 10:00

Contacted AID/Quito, FUNDAGRO, and HPI of arrival. Drafted a scope of work and MOU to discuss with all parties.

10:00 - 12:00

Contact: Ken Wiegand, ADO - AID/Quito.

We met with Ken Wiegand to determine the concerns of the Mission in relation to SANREM CRSP Activities in Ecuador. Ken Wiegand expressed no serious concerns and highly recommended that we work with FUNDAGRO and tie in with SUBIR. We discussed the fact that due to impending budget cuts on the parts of all concerned, another strategy might be a network of small activities, building on existing projects, that still addressed the cornerstones of the SANREM CRSP yet had greater focus and quicker impact probability. One such project could be a counterpart to the proposed Indicators of Sustainability program outlined for Honduras. This was regarded as highly desirable. Fausto Maldonado made us an appointment for Friday Morning to meet with Kris Merschrod, Director of CARE/SUBIR.

13:00 - 14:00

Bill Hargrove and Constance Neely worked on reshaping the Scope of Work and MOU to align with the discussions with AID/Quito before proceeding to discussions with FUNDAGRO.

14:00 - 18:30

Contact: Julio Chang, Executive Director, FUNDAGRO
Eduardo Sotomayor, Country Director, Heifer Project International

We met with Julio Chang (Executive Director, FUNDAGRO) and Eduardo Sotomayor (Country Director, HPI) to discuss the MOU. Everyone was in agreement on the final form of the MOU which identified FUNDAGRO as the coordinating and financial body for the SANREM CRSP in Ecuador. Dr. Hargrove and Dr. Chang signed the MOU for the SANREM CRSP and FUNDAGRO, respectively. Next we discussed the strategy of implementing a network of activities built on existing programs and how to initiate the program over the next 7 months. We discussed the potential sites and programmatic tie-ins which included, but were not limited to the Chimborazo region (working with HPI and FUNDAGRO), the Manabe region (working with FUNDAGRO) and the Baeza region (working with SUBIR and FUNDAGRO). These sites would be investigated and networks would be built with collaborators including Farmers and Farmer Organizations, IARCS, National Programs, Universities, Vo-Technical Schools and NGOs over the next 4 months. Additionally we outlined needed training activities, assessments, sondeos, workshops and work plan development. We also discussed a budget for FUNDAGRO for the implementation. It was determined that Bob Rhoades was willing to commit one to two months in January/February in Ecuador working with the collaborators to finalize the selection of the network of sites.

Friday, December 10

08:30

Contact: Kris Merschrod, Director, CARE/SUBIR
Julio Chang, Executive Director, FUNDAGRO

We met at the AID office in Quito to discuss possible scenarios and potential project tie-ins. Kris told us the status of SUBIR and informed us that they were undergoing an evaluation over the course of the next 3 months. We discussed the possibility of a tie in project on indicators of sustainability with SUBIR in the Baeza region. Kris was very amenable to the idea of this as he felt that work on indicators was a component that they could readily use. He also mentioned a local agro-technical school that would be an excellent tie-in for interested faculty and students. He also mentioned that two of their local collaborators, Ecosciencia and CDC, are doing work with remote sensing and data analysis that would be highly pertinent to the indicators of sustainability aspect.

It was decided that Bob Rhoades would visit SUBIR sites, collaborators and communities during the networking phase on January and February, 1994. This information in conjunction with the information provided from the SUBIR evaluation would be used to determine the best strategy for working with SUBIR.

10:30 - 12:00

Contact: Ken Wiegand - ADO, USAID/Quito
Michael Jordan - Acting Mission Director, USAID/Quito

We met briefly with Ken Wiegand to report the outcome of the meeting with CARE/SUBIR. He was well pleased with the idea of the indicators of sustainability strategy although he cautioned against an MOU with any other effort than FUNDAGRO. We then proceeded to the office of the Acting

Mission Director, Michael Jordan. We discussed the SANREM CRSP, ongoing activities at our other sites, and the proposed plan to work with both FUNDAGRO and SUBIR. We presented Mr. Jordan with the MOU which had been signed the day before by Drs. Hargrove and Chang. He said that he would read it over and sign the MOU based on the letter from John Sanbrailo (Mission Director) to Dr. Hargrove of the intention of the Mission to support this effort.

13:00 - 18:00

Contact: Eduardo and Nancy Sotomayor - HPI, Quito

We went to visit the training dairy farm of Eduardo and Nancy Sotomayor. This is a well thought-out sylvopastoral and dairy operation that can be implemented with very low "external inputs". Eduardo has put together ideas from New Zealand and Israel as well as years of experience to optimize production while minimizing cost and protecting the environment and natural resource base. He uses this farm as a business and as a training center for Campesinos. Some of his successful implementation strategies include: growing Monterey pine (for shade, nutrient and organic matter input, and firewood), mobile grazing of pastures of orchard grass and white clover, and nutritional supplements for the cattle made of brewery waste and bananas. He has proven that in an area of <1000 mm rainfall he can graze 2-3 cows per hectare where others have to have 2 hectares per cow. This will be an excellent place to hold trainings for farmer collaborators in the SANREM CRSP/ Ecuador.

19:00

Contact: Julio Chang - Executive Director, FUNDAGRO

We held one last exit meeting with Julio to discuss the outcome of the days activities and any last concerns. Ken Wiegand had returned the signed MOU to the Hotel and we had accomplished our Ecuador mission in the two day period. We discussed a workplan and budget for FUNDAGRO to implement SANREM activities.

Saturday, December 11

06:00 - Departed Quito for Atlanta.

SANREM CRSP TRIP REPORT
Philippines
November 29 - December 4, 1993

Report by: Constance Neely **Contract No: LAG-4198-A-00-2017-00**

SANREM Representatives: Bill Hargrove, University of Georgia
Constance Neely, University of Georgia
Bill Deutsch, Auburn University
Robert Rhoades, University of Georgia
David Midmore, Asian Vegetable Res & Development Center

Purpose of Travel:

To attend the "roundtable" review process, December 1 to 3 held at IRRI in Los Baños in the Philippines to assist in the review, integration, and revision of Philippine work plans.

Monday, November 29

Depart Atlanta for Manila (0900 hours)

Tuesday, November 30

Arrive Manila (2200 hours). Travel to Los Baños.

Wednesday, December 1 - Thursday, December 2

The Philippines Roundtable was chaired by Drs. Bill Hargrove and Willie Dar (Chairman of the Philippines National Coordinating Committee). The meeting was attended by the SANREM CRSP representatives named above, the Philippines National Coordinating Committee and others including:

Romy Banaynal, Network for Environmental Concerns
Jim Orprecio, Heifer Project International
Marhz Ruscoe, Institute for Soil Environment and Management
Greg Reyes, UPLB
Boy Tan, SHAISI
Bob Zeigler, IRRI
Pat Elliot, IRRI
Sam Fujisaka, IRRI
Joe Magellanes, Central Mindanao University
Mayor Teddy Pajaro, Lantapan
Tony Sumbalan, Governor's Office, Bukidnon
Ronelo Alvarez, Chair, Community Advisory Committee
Gelia Castillo, Outside Reviewer
Barbara Bellows, SANREM CRSP
Rogelio Serrano, PCARRD
Hermie Francisco, UPLB

The roundtable was initiated by a leveling off of what was to be accomplished in the three day period. The group was divided into four focal/working groups including: Soil and Water Issues, Biodiversity, Human Dimensions (formerly Land, Labor, Capitol and Credit) and Community Action/Communications.

The focus groups identified the strengths of each proposal and determined the alignment of these strengths with the specific research questions identified in the Invitation to Work. The work plans fell into four capability groupings. These were: a) those that needed little work, b) those that needed combining with other work plans and revision or rewriting, c) those that warranted seed monies for planning in a complete reworking of the work plan, and d) those that were rejected. Letters have been written to all of the proponents of the outcome and specific recommendations for the work plan.

Friday, December 3

07:15 - Breakfast with Dr. Ken Fischer (Deputy Director General for Research IRRI) and Bob Zeigler, Constance Neely, Bill Hargrove, Willie Dar, and David Midmore.

0830 - 1600

Finalization of roundtable including results of the four groups, integration, recommended action for all proponents. This information is to be put into letter form including recommendations from the Technical Committee, Community Advisory Committee and the Roundtable.

Saturday, December 4

0700 - Depart IRRI for airport and return trip to the U.S.

ATTACHMENT E

SOIL SAMPLING IN SANREM CRSP/PHILIPPINES RESEARCH AREA LANTAPAN, BUKIDNON

Larry T. West

During the period of November 18 to December 14, 1993, I traveled to Lantapan, Bukidnon, Philippines for the purpose of describing and sampling soils in the SANREM CRSP/Philippines research area. Thirteen pedons were sampled during this time, and the samples collected are being air freighted to the SCS Soil Survey Laboratory in Lincoln, NE for analysis. Thin section samples are included in the Lincoln shipment and will be shipped to UGA from Lincoln for micromorphic analysis. In addition, a subsample of each horizon will be shipped to UGA for additional chemical and mineralogical analyses of selected horizons.

Participants

USDA-SCS

Dr. Ronald D. Yeck, Assistant Head, Soil Survey Laboratory, National Soil Survey Center, Lincoln, Nebraska

Mr. Kenneth S. (Steve) Lawrence, Assistant State Soil Scientist, Athens, Georgia

SANREM-CRSP

Dr. Larry T. West, Associate Professor, Dept of Crop and Soil Sciences, University of Georgia, Athens (SANREM-CRSP Consultant)

Dr. Barbara Bellows, Site Coordinator, SANREM-CRSP Project, Cagayan De Oro, Mindanao, Philippines

Philippine Bureau of Soil and Water Management

Mr. Alejandro G. Micosa, Chief, Soil Survey Division, Quezon City

Mr. Arturo A. Dayot, Supervising Agriculturist, Quezon City

Mr. Queruben A. Navero, Supervising Agriculturist, Quezon City

Mr. Lorenzo M. Tomas, Senior Agriculturist, Quezon City

Mr. Elino S. Bagoso, Jr, Agriculturist II, Quezon City

Mr. Ernesto G. Almendral, Agriculturist II, Quezon City

Mr. Jose Gerpacio, Agriculturist II, Quezon City

Mr. Reynaldo R. Villanueva, Cartographer II, Quezon City

Mr. Elmer G. Ambaya, Agriculturist II, Cagayan De Oro

Central Mindanao University

Dr. Manuel L. Marquez, Professor, College of Agriculture, Central Mindanao University, Musuan, Bukidnon

Other Contacts

Dr. Jose B. Aramces, Vice President for Research and Extension, Central Mindanao University, Musuan, Bukidnon

Dr. Conrado M. Duque, Sr., Dean of the Graduate School and Professor of Agriculture, Central Mindanao University, Musuan, Bukidnon

Preliminary Observations of Soil in the Area

Four broad geomorphic units were identified in the Lantapan are based on aerial photo and topographic map interpretation. These were designated as Mountains, Upper Footslope, Lower Footslope, and Collu-Alluvial Terraces. In general, the Mountains included the area with elevations greater that 1400 (southern part) to 1900 m (northern part) and occupy about 38% of the Municipality of Lantapan. The Upper Footslope lies immediately downslope from the Mountains with elevations between 800 m and the lower limit of the Mountains (37% of the Municipality of Lantapan). The Lower Footslope occupies elevations between about 370 and 800 m (21% of Lantapan), and the Collu-Alluvial Terraces occur between the Manupali River and 370 m elevation (4% of Lantapan). The Lower Footslope was further subdivided based on topography into undulating to rolling, gently sloping to undulating, and level to gently sloping. At least one pedon was sampled from each of the physiographic regions, including subdivisions of the Lower Footslope to insure that all soil conditions in the region were represented.

Soils in the Lantapan area of the Manupali Watershed are surprisingly uniform. Colors, textures, and horizonation varied little across the landscape. All soils observed in the region were well drained with no evidence of a water table within 2 to 3 m. Most soils across the region are developed from volcanic ash, either deposited in place or transported from upslope as colluvial or alluvial materials (lahar?). Lack of stones in the soils sampled and observations in road cuts suggest that the ash deposits are several meters thick across most of the region. Only in isolated areas where lava flows occurred during the eruption were rocks observed in upland areas.

The A horizons of soils in the area were 9 to 28 cm thick, dark colored, and have textures of silt loam or loam. Organic matter contents in the surface horizon are 2 to 3% based on limited data from the region collected by Central Mindinao University. The pH of surface horizons ranged from 5.0 to 6.0 by colorimetric measurement in field. The highest surface horizon pH (6.0) was from pedon S93FN725 -03 which was managed under paddy rice.

The A horizons of the pedons sampled all had well expressed granular structure.

Based on texture and structure of the surface horizons, infiltration rates are expected to be high. No evidence of surface crusting was observed in the region, and these soils are not expected to develop surface crusts because of the well expressed structure at the surface.

Subsoil textures ranged from silt loam to silty clay. Colors were brown to yellowish brown. Subsoils had weak to moderate subangular blocky structure. Subsoil horizons are acid with pH's ranging from 4.5 to 6.4 (colorimetric estimates). Only the pedon sampled under paddy rice had subsoil pH's greater that 5.6 which suggests flooding has induced an increase in pH of these horizons.

Saturated hydraulic conductivity of B horizons measured by constant head permeameter ranged from 0.3 to 3.3 cm/hr (Table). No features were observed in any of the pedons that would be expected to restrict movement of water through the profile. Soils in the Lantapan area have a moderate to high capacity to retain water for plant growth based of subsoil textures and soil depths.

Soils in the region appear to be at an intermediate stage of development. Solum thickness ranged from 89 to more than 200 cm. Most of the soils sampled have evidence of translocated clay indicating the presence of a weakly-expressed argillic horizon. Clay translocation has not occurred to the extent that the soils have a large clay increase between A and B horizons, however. Weathering has been sufficient to erase most of the properties associated with young volcanic soils (low bulk density, high amounts of amorphous components).

Mineralogical composition of the ash parent material is not known at this time, but field observations suggest it to have an andesitic to rhyolitic composition (intermediate to high amounts of silica with few base-bearing weatherable minerals). This rock composition coupled with high temperatures and rainfall in the region, free drainage, and the stage of soil development would be expected to yield acid soils with kaolinite or halloysite as the dominant clay mineral. Based on subsoil pH, these soils may also have appreciable amounts of gibbsite and hydroxy-interlayered vermiculite.

Though some soil loss has probably occurred from cropped fields, no strong evidence of severe erosion, such as rilling or gullying, was observed. Ten of the 12 pedons that had been cultivated had A horizon thickness between 9 and 16 cm though slopes ranged from 1 to 60%. Of the two pedons with thicker A horizons, one was under paddy rice and part of the surface of this soil was deposition due to puddling and leveling of the surface. The other was on a 2% slope. The A horizon thickness of the pedon under native forest (S93FN725-09) was 28 cm. It is not clear, however, that thinner surface horizons under cropped conditions than under native forest was due to loss of surface material. Loss of organic matter, structural degradation, and consolidation resulting from plowing may have resulted in decreased thickness of the surface horizon.

The soils managed under paddy rice are not well suited for flooding. Textures range from loam to silty clay. These textures and the morphology suggest relatively rapid movement of water through the profile, especially for flooded agriculture. Thus, flooding is inefficient. The only way flooding is maintained in these soils is by applying water to the surface at a rate faster than it will move through these relatively permeable soils. Layers

deeper than 2 m may be restricting water movement. Pedon S93FN725-13 was sampled in a corn field adjacent to a field of paddy rice. A water table was encountered in this pedon, but the soil had no indication that the water table was natural. It was assumed the water table had resulted from flooding in the adjacent field.

Pedon Locations, Site Characteristics, and Selected Characteristics

Pedon: S93FN725-1 Location: 8° 00' 34.7" N, 125° 01' 04.8" E
Lantapan, Poblacion, Lantapan, Bukidnon
Elevation: 630 M Slope: 1%
Physiographic region: Lower footslope, gently Sloping to Undulating
Hillslope position: Summit (upper part of slight saddle)
Field Classification: fine-silty, mixed, isohyperthermic Oxic Dystropept
Parent Material: Colluvium from andesitic pyroclastic material
Vegetation: Maize (sugarcane, banana, casava, coffee)

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
Ap	0-15	10YR 2/2	l	5.4	
BA	15-37	10YR 3/3	cl	5.4	0.52
Bw1	37-64	10YR 4/3	sicl	5.0	0.66
Bw2	64-94	10YR 4/3	sicl	5.0	
BC	94-130	10YR 4/3	sicl	4.8	
CB1	130-169	10YR 4/4	sil	4.6	
CB2	169-200	10YR 4/4	sil	4.6	

Pedon: S93FN 725-2 Location: 8° 00' 35.1" N, 125° 04' 13.0" E
Bantuanon, Lantapan, Bukidnon

Elevation: 485 M Slope: 8%

Physiographic region: Lower footslope, gently sloping to undulating
Hillslope position: Backslope (mid)
Field Classification: fine-silty, mixed, isohyperthermic Typic Kanhapludult
Parent Material: Colluvium from Andesitic pyroclastic material
Vegetation: Gmelina, Coffee, Cassava, Falcata (sugarcane, corn, banana)

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
Ap	0-12	10YR 3/3	l	5.4	
BA	12-30	7.5YR 4/4	sicl	5.4	
Bt1	30-67	7.5YR 4/6	sicl	5.4	
Bt2	67-106	7.5YR 3/4	sicl	4.8	
Bt3	106-142	10YR 4/4	sicl	4.8	
BC1	142-178	10YR 3/4	sil	4.8	
BC2	178-210	10YR 3/3	sil	4.8	

Pedon: S93FN 725-4 Location: 8° 04' 04.7" N, 124° 51' 08.6" E
Tinusuhan, Basak, Lantapan, Bukidnon

Elevation: 1340 M Slope: 8% (down ridge) 100% (side slopes)

Physiographic region: Mountains (lower part; foothills)

Hillslope position: summit (very narrow ridge crest)

Field Classification: clayey, mixed, isothermic Typic Hapludult

Parent Material: Andesitic pyroclastic material

Vegetation: Labugdi, Gmelina, Ferns, Cogon (fallow corn in area)

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
A	0-14	10YR 3/2	sil	5.5	
BA	14-24	7.5YR 4/4	sicl	5.0	
Bt1	24-53	10YR 4/4	sic	5.2	
Bt2	53-71	7.5YR 4/4	sicl	5.5	
Bt3	71-98	10YR 4/3	sicl	5.5	
BC1	98-110	7.5YR 4/4	sicl	5.4	
BC2	110-123	5YR 4/6	sicl	4.6	
BC3	123-134	10YR 4/3	sicl	4.6	
BC4	134-149	5YR 4/6	sil	4.6	
C	149-200	10YR 4/3	sil	4.6	

ANNEXE

Pedon: S93FN 725-5

Location: 8° 00' 50.2" N, 125° 05' 58.8" E
Valbueco, Cullasihan, Lantapan, Bukidnon

Elevation: 340 M

Slope: 1%

Physiographic region: Collu-alluvial terraces

Hillslope position: backslope

Field Classification: clayey, mixed, isohyperthermic Oxyaquic (Anthraquic?) Hapludalf

Parent Material: Colluvium from andesitic pyroclastic material

Vegetation: Paddy rice (sugarcane, corn)

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
Ap1	0-11	10YR 3/2	sil	6.0	
Ap2	11-22	10YR 2/2	sicl	6.0	
Bt1	22-47	7.5YR 4/4	sil	6.0	
Bt2	47-69	5YR 4/4	sicl	6.4	
Bt3	69-113	5YR 4/6	sicl	6.4	
Bt4	113-140	5YR 4/6	sicl	6.4	

Pedon: S93FN 725-3 Location: 8° 03' 41.1" N, 124° 55' 41.5" E
Bol-ogan, Sungko, Lantapan, Bukidnon

Elevation: 1410 M Slope: 15%

Physiographic region: Upper footslope, undulating to rolling
Hillslope position: backslope
Field Classification: clayey, mixed, isothermic Typic Dystropept
Parent Material: Andesitic pyroclastic material
Vegetation: Grass cover fallow (banana, coffee, potato, corn, cabbage)

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
Ap	0-9	10YR 3/3	cl	5.6	
B/A	9-22	7.5YR 4/6 10YR 3/3	c	5.6	
Bw1	22-41	7.5YR 5/8	c	5.4	0.02
Bw2	41-66	10YR 6/3	c	4.8	
Bw3	66-89	10YR 5/3	cl	4.6	
C1	89-116	7.5YR 5/8 10YR 5/3	sil	5.8	
C2	116-123	10YR 6/8	sl	6.0	
C3	123-190	10YR 6/4 10YR 6/8 10YR 6/3	l	6.0	

Pedon: S93FN 725-6 Location: 8° 03' 34.9" N, 125° 04' 27.4" E
Subsab, Bugco-on, Lantapan, Bukidnon

Elevation: 695 M Slope: 12%

Physiographic region: Lower footslope, undulating to rolling

Hillslope position: backslope

Field Classification: fine-silty, mixed, isohyperthermic Typic Paleudult

Parent Material: andesitic pyroclastic material

Vegetation: Calopegoniuum (legume cover crop), hagonoy (chromolora odorate) (corn, coffee, bamboo)

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
Ap	0-12	10YR 3/2	sil	5.5	
AB	12-24	10YR 4/2	sil	5.2	2.73
Bt1	24-52	10YR 4/3	sicl	5.2	0.25
Bt2	52-104	10YR 4/3	sicl	5.2	
Bt3	104-140	10YR 3/4	sicl	5.2	
Bt4	140-178	10YR 3/4	sicl	5.0	
Bt5	178-195	10YR 3/4	sic	5.0	

Pedon:	S93FN 725-7	Location:	8° 01' 42.3" N, 124° 57' 14.3" E Patag, Alanib, Lantapan, Bukidnon (Australia-Philippines vegetable? project)
Elevation:	925 M	Slope:	2%

Physiographic region: Upper footslope, gently sloping to undulating
Hillslope position: planar backslope
Field Classification: fine-silty, mixed, isothermic Humic Hapludult
Parent Material: consolidated andesitic pyroclastic material (positive reaction in rock for allophane with NaF)
Vegetation: grass in fallow area (maize, sugarcane, peppers in adjacent fields)

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
Ap1	0-15	10YR 2/2	sil	5.0	
Ap2	15-26	10YR 2/2	sil	5.2	
Bt1	26-42	7.5YR 3/2	sicl	5.6	2.40
Bt2	42-71	7.5YR 4/2	sicl	5.6	
Bt3	71-94	7.5YR 3/2	sicl	5.8	
BC	94-122	7.5YR 4/6	sicl	5.8	
Cr/BC	122-150	7.5YR 4/2 7.5YR 5/6	– scl	5.2	

Pedon: S93FN 725-8 Location: 8° 02' 47.3" N, 124° 53' 36.3" E
Kibangay, Lantapan, Bukidnon

Elevation: 1150 M Slope: 10%

Physiographic region: Upper footslope, gently sloping to undulating

Hillslope position: planar backslope

Field Classification: fine-loamy, mixed, isothermic Typic Paleudult

Parent Material: andesitic pyroclastic material

Vegetation: grass in fallow area (maize and cabbage, in adjacent fields)

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
Ap	0-13	10YR 3/2	l	5.4	
BA	13-37	7.5YR 3/4	sicl	5.4	1.54
Bt1	37-79	7.5YR 4/4	sicl	5.4	
Bt2	79-130	7.5YR 4/6	sicl	5.0	0.27
Bt3	130-171	10YR 4/6	sicl	5.0	
BC	171-200	10YR 4/4	sicl	6.0	

Pedon: S93FN 725-9 Location: 8° 03' 37.9" N, 125° 00' 18.3" E
Kaatuan, Lantapan, Bukidnon

Elevation: 1270 M Slope: 15%

Physiographic region: Upper footslope, gently sloping to undulating (upper part)
Hillslope position: lower backslope; nose slope
Field Classification: fine-silty, mixed, isothermic Typic Paleudult
Parent Material: andesitic pyroclastic material
Vegetation: Benguet pine, Ceylon tea, Albacia Falcatta (tree) (corn,

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
A1	0-12	10YR 3/3	l	5.5	
A2	12-28	10YR 3/3	l	5.4	
Bt1	28-67	7.5YR 4/4	sicl	5.5	0.62
Bt2	67-110	7.5YR 4/4	sicl	5.2	0.57
Bt3	110-143	7.5YR 3/4	sic	5.2	
Bt4	143-170	10YR 4/4	sic	5.2	
Bt5	170-190	10YR 3/6	sic	5.2	

Pedon: S93FN 725-10 Location: 8° 02' 23.3" N, 125° 06' 16.4" E
Patpat, Bugcaon, Lantapan, Bukidnon

Elevation: 500 M Slope: 5%

Physiographic region: Lower footslope; level to gently sloping

Hillslope position: backslope (upper 1/3)

Field Classification: fine-silty, mixed, isohyperthermic Rhodic Paleudult

Parent Material: andesitic to basaltic pyroclastic material; colluvial or residual material from lava flow rather than ejecta (positive reaction for allophane in rock with NaF

Vegetation: Rubber plantation

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
Ap	0-14	10YR 3/2	l	5.0	
BA	14-27	7.5YR 3/2	l	4.8	0.49
Bt1	27-60	7.5YR 3/2	sil	5.6	0.34
Bt2	60-104	7.5YR 3/4	sicl	5.8	0.33
Bt3	104-156	10YR 3/4	sil	5.2	
Bt4	156-200	10YR 3/3	sil	5.2	

Pedon: S93FN 725-11 Location: 8° 02' 14.2" N, 125° 01' 31.1" E
Insibay, Poblacion, Lantapan, Bukidnon

Elevation: 900 M Slope: 5%; adjacent sideslopes are 12 to 20%

Physiographic region: Upper footslope; undulating to rolling

Hillslope position: summit of narrow ridge/knob

Field Classification: fine-silty, mixed, isothermic Typic Paleudult

Parent Material: andesitic pyroclastic material (in place)

Vegetation: corn fallow (corn, bamboo, banana, coffee adjacent)

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
Ap	0-16	10YR 3/2	l	5.5	
BA	16-43	7.5YR 3/4	sicl	5.6	1.09
Bt1	43-77	7.5YR 4/4	sicl	5.6	0.64
Bt2	77-106	7.5YR 4/6	sicl	5.5	
Bt3	106-131	10YR 4/3	sicl	5.2	
Bt4	131-160	10YR 4/4	sic	5.0	
Bt5	160-200	10YR 4/4	sic	4.8	

Pedon: S93FN 725-12 Location: 8° 04' 10.2" N, 124° 55' 36.3" E

Bol-ogan, Sungco, Lantapan, Bukidnon

Elevation: 1500 M Slope: 60%

Sitio and Barangay: Physiographic region: Mountains

Hillslope position: backslope (middle 1/3)

Field Classification: fine-loamy, mixed, isothermic Typic Dystropept

Parent Material: andesitic pyroclastic material; appears to be some local colluviation of material on hillslope

Vegetation: corn fallow (gabi, grass, banana, sweet potato, potato, cabbage, coffee, other vegetables)

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
Ap	0-11	10YR 3/2	l	5.4	
AB	11-25	10YR 4/3 10YR 3/3	l	5.4	14.8
Bw1	25-46	7.5YR 3/4	sicl	5.4	
Bw2	46-75	7.5YR 3/2	cl	4.5	0.32
Bw3	75-132	7.5YR 4/2	cl	4.5	
BC1	132-178	7.5YR 4/6 5YR 4/4	sicl	4.5	
BC2	178-200	5YR 4/3	sicl	4.5	

Pedon: S93FN 725-13 Location: 8° 00' 25.0" N, 125° 05' 54.9" E
Katsing, Kulasihan, Lantapan, Bukidnon

Elevation: 370 M Slope: 3%

Physiographic region: Collu-alluvial terraces; old terrace from Manupali river (may be colluvial material rather than stream transport)

Hillslope position: backslope (upper 1/3)

Field Classification: fine-silty, mixed, isohyperthermic Oxyaquic Hapludult (Rhodudult?)

Parent Material: alluvium from andesitic pyroclastic material

Vegetation: corn (paddy rice, sugarcane, banana, pasture)

Horizon	Depth cm	Color	Texture	pH	Ksat cm/hr
Ap	0-13	10YR 2/2	l	5.8	
BA	13-32	7.5YR 3/2	sicl	5.8	0.76
Bt1	32-66	5YR 3/3	sicl	5.4	0.35
Bt2	66-112	5YR 3/2	l	5.8	
Bt3	112-166	7.5YR 4/2	l	5.4	

Suitability of the site for a SCS sponsored International Soil Management Forum

Several of the sites sampled would be suitable for the future forum planned in the Philippines. A full forum representing a broad range of soil conditions could not be effectively planned using only the pedons sampled in the Lantapan area, however. Many of the soils are similar which would limit their usefulness to represent a broad range of conditions. In addition, access to many of the sites by a large group is limited because of poor condition of the roads.

Many soils conditions are represented on Mindanao. Limited observations along roads and discussions with BSWM Soil Scientists suggest soils developed from serpentine, inland Vertisols, aquic soils with plinthite, and Oxisols are available within short driving distances. Soil Scientists from CMU and BSWM could describe and sample pedons additional pedons to expand the range of soil characteristics represented in the Forum. Analyses of these pedons could be done at BSWM laboratories or could be shipped to the SCS lab in Lincoln.

Sites within the Lantapan area should be included. The planned forum could emphasize soil and cropping system management for long-term sustainability as they relate to soil properties and Soil Taxonomy. Even though many of the soils are similar, the pedons sampled in Lantapan, an area of active sustainable development research, provide a unique opportunity to link Soil Taxonomy with sustainability which should be used if at all possible. The Lantapan pedons could provide a framework for discussions of management and application which could be extended to the other sites sampled.

Observations on Bureau of Soils and Water Management Personnel and Facilities

The BSWM Soil Scientists who worked with me during the sampling of the soils are extremely capable and hard working. The BSWM is in the process of making soil surveys of selected parts of the Philippines at a scale of 1:50,000, and because of the interaction between the USDA-Soil Conservation Service and the BSWM, the methodology being used for Philippine soil surveys is similar to that used in the U.S. The BSWM Soil Scientists have a good understanding of soil morphology, soil survey techniques, photo interpretation, and Soil Taxonomy. These scientists are also familiar with geology, cropping systems, vegetation and mapping aids over most of the Philippines which makes them the logical choice for a soil survey of the Lantapan area.

On the trip back to the U.S., I was able to spend one day in the offices of the Bureau of Soil and Water Management in Quezon City. The BSWM facilities are excellent. The building is fairly new, and office and laboratory facilities are good. The labs are well equipped, and people working in the labs seem to be well trained and competent. Computer equipment is available including a GIS system in the cartography section. Efforts should be made to utilize the laboratory facilities of BSWM as well as the soils and cartography sections. A great amount of expertise in aerial photo interpretation, preparation of land use maps, and laboratory analysis of soils is available within the BSWM, and this expertise should be used as much as possible by the SANREM CRSP/Philippines.

There was confusion over the objective of my trip to the Philippines. Instead of the three or four BSWM soil scientists I was expecting to help with the sampling, eight (8) traveled to Lantapan. Mr. Micosa was under the impression that the sampling was to be on a grid (100 ha spacing) as was proposed by BSWM in mid-1993 and that a detailed soil survey was to be completed soon after January 1, 1994. Only after three days of confusion and discussions with Mr. Micosa, did I realize that no one had informed the BSWM that their original proposal for the soil survey and grid sampling was not funded. The large number of BSWM soil scientists in Lantapan was to do both the grid sampling and a large part of the soil mapping. The number of people worked out for the best, however. Because of rain delays, condition of the roads, and difficulty in locating sample sites, the full crew was needed to complete the pedon sampling during the time available. More effort needs to be made to ensure that all parties involved in SANREM/Philippines projects are fully aware of the goals, objectives, and expectations of the project (I did not receive a copy of the revision of the work plan I submitted which included budget revisions before I left for the Philippines. I borrowed Dr. Marquez's copy to see the amounts budgeted for the project).

Facilities in Lantapan

The people whom I interacted with during the soil sampling in the Lantapan area, including the local government, the residents of the area, and Central Mindinao University (CMU) faculty were extremely cooperative, hospitable, and helpful. I felt I was treated extremely well. All of the people I came in contact with did more than was expected to make my stay as comfortable as possible and to help with the work that was done.

During the sampling of soils in the Lantapan area, we (West, SCS personnel, and BSWM personnel) were lodged at an abandoned facility of the Department of Environment and Natural Resources located in Sungco, Lantapan (≈10 km west of Lantapan City). Because of the condition of the roads, travel time from Lantapan to (CMU) is about 1 to 1.5

hours which is not workable if time for field activities is limited. Thus, the decision was made to stay within Lantapan. Arrangements were made for us to use the DEAR facility with much assistance from the Mayor of Lantapan.

If future projects are to require substantial amounts of time in the field, I think these projects will also find lodging at CMU to be unacceptable because of the travel time involved to reach the work site. The DENR facility is not luxurious, but may be an acceptable for lodging those involved in future projects. Sleeping quarters are available, but the beds are plywood sheets mounted to a frame with no mattress. The facility has electricity, cooking facilities, and potable water available. The people who live near the facility were most helpful to us, and a woman was employed as a cook and a man employed as a guide/laborer during our work. The guide/laborer's wife also agreed to do our laundry during our stay.

Limited improvements to the DENR facility would make it more hospitable for those accustomed to western amenities. Mattresses would make the beds more comfortable. I had the advantage of help from the BSWM personnel in planning meals, communicating with the cook, and procuring needed supplies (firewood for cooking, food, etc.), but others may not have a similar situation. It may be worthwhile to try to make more permanent arrangements with the cook and guide we hired in terms of cooking, buying food, etc. for other groups. Both of these people are intelligent, seem willing to learn, and be as helpful as possible. A refrigerator and gas stove at the site would also be helpful for food storage and preparation.

I suggested to Barbara Bellows and will reemphasize here that a packet describing the area and facilities would be extremely useful to other first time visitors. Such a packet could include detailed maps of the area, descriptions of the facilities, and a little about what to expect. People need to know that CMU is 1 to 1.5 hours from most of the work area so they can plan accordingly. First time visitors need to know that the nearest phone and gas station are about 1 hour from the work site.

Information concerning Philippine customs would also be useful. Philippinos prefer not (almost refuse) to work on Sunday, and visitors to the area should not expect work on Sunday. This fact should also be emphasized in the packet for visitors so schedules can be planned accordingly. Information about wage rates, vehicle rental rates, and other prices should also be included.

Transportation is difficult in the area. Most of the roads, other than the main road passing through Lantapan, are not passable without four-wheel drive. This is especially true during and after rains (which are frequent). The character of the soils in the region make the roads extremely slick when they are wet. Even with four-wheel drive, we were stuck or slide into the ditch on more than one occasion. Even if people are willing to work during rains, the condition of the roads may delay the work if access to the site is difficult. The condition of the roads also are damaging to vehicles. Vehicle repair should be expected and time allotted accordingly.

Other General Impressions

My overall impression of the goals and objectives of the SANREM CRSP/Philippines is favorable. Those involved have put much thought and effort into the way the project

needs to be carried out and how the results can be used by the people of the region. I think the methodology can be effective, but I do have some reservations about the end product.

While the local resident's opinions on the problems, both environmental and agricultural, of the area are invaluable, I think opinion and fact need to be brought together more effectively. I had full intention of sampling the soils in each agro-ecosystems outlined in the Participatory Landscape-Lifescape Appraisal, but I could not identify these agro-ecosystems on the ground to use as a base for sampling. The "lowland rice" area was easily identified, but its extent appeared to be based on the availability of water for irrigation rather than any soil or landscape characteristics. Similarly, sugarcane was being grown from the lowest elevations in the Lantapan area to relatively high elevations. Sugarcane production did not appear to be related to a soil or landscape characteristic, but rather to condition of the roads for shipment to the sugar mill. The "grasslands" in the area are not "grasslands" but are cleared forest in fallow between crop cycles (some fallow areas are not in grass but are planted in a legume cover).

Sampling and analysis of the soils in the area should help to alleviate some of the misconceptions regarding the soil resource, but I hope the information is not too late for effective planning of soil-based research projects. As an example, Ms. Li Bin, graduate student from the Asian Institute of Technology, was in the area to gather background information for a land-use map of the area. While the thesis title is changeable and may have little impact on the research comprising the thesis, her project was dealing with "a land-use map on clayey soils on Mindanao" (I did not get the exact title). Soil texture may have little impact on planning a remotely sensed land-use map, but misconceptions regarding the soil resource may result in other research plans that are totally inappropriate for the area. In addition, Ms. Bin had little if any knowledge of BSWM land use maps available for the area that could serve as a basis from which to initiate her research.

As I said, local residents opinions regarding needs and problems for the area are invaluable for planning research but so is a compilation of information concerning the natural resources in the area. Often in the past, the physically-based resource information has been collected and used without local input as to the worthiness of interpretations based on the physical data. SANREM is trying to overcome this problem and devise solutions to locally perceived problems that are acceptable and applicable to the local situation. The solutions must be physically based, however. To only address the local perceptions without considering the physical characteristics of the resource in the area is probably as inefficient as only considering the physical resource without addressing the local peoples needs and desires.

Activities in the Philippines

Date	Activity
11-18-93	Left Atlanta for Manila
11-19-93	Arrive Manila
11-20-93	Travel from Manila to Cagayan de Oro; met by Barbara Bellows and BSWM Soil Scientists
11-21-93	Travel from Manila to Central Mindinao University
11-22-93	Informal meeting with Dr. Manuel L. Marquez, Dr. Jose B. Aramces, and Dr. Conrado M. Duque, Sr.; visited Lantapan and met with Mayor of Lantapan concerning work and lodging arrangements for team
11-23-93	Moved from CMU to DENR facilities in Lantapan; selected first site.
11-24-93	Met with community members to inform them of the purpose of our activities in the area; also met with all Barrio Captians for same purpose
11-25-93	Located sites 2 and 3; described and sampled site 1
11-26-93	Sampled site 2
11-27-93	Located and sampled site 4; located site in mountains
11-28-93	R and R
11-29-93	Located site 5; raining
11-30-93	Raining; sampled sites 5 and 6; soil class from CMU visited and assisted with sampling (10-12 students)
12-1-93	Located and sampled site 7
12-2-93	Located and sampled site 8
12-3-93	Sampled site 9 and located site 10
12-4-93	Sampled site 10
12-5-93	R and R
12-6-93	Sampled site 11
12-7-93	Sampled sites 12 and 13
12-8-93	Packed samples and equipment for shipment; attended farwell party given by Mayor of Lantapan.
12-9-93	Traveled from Lantapan to Cagayan de Oro; met with Barbara Bellows and made arrangements for construction of crates for sample shipment.
12-10-93	Checked on crate construction and sample shipment; R and R
12-11-93	Travel from Cagayan de Oro to Manila; R and R
12-12-93	R and R
12-13-93	Visit to BSWM offices and laboratories
12-14-93	Travel from Manila to Atlanta

ATTACHMENT F

TRIP REPORT

FROM: Ian Flitcroft

TO: The Record

RE: Philippines Weather Station Installation 11/29 - 12/15

Itinerary

11/29 Depart Atlanta

11/30 Arrive Manila, IRRI vehicle to IRRI, Los Banos

12/1 Attended SANREM-CRSP Philippines roundtable discussion to develop work plan.

12/2 Depart for Cagayan de Oro.
Transported weather station equipment, fencing materials, etc. to Municipal Hall, Lantapan. Arranged accommodations at Mulati-Manupali Watershed Development Project in Sungco, sharing space with soil sampling team led by Dr. Larry West.

12/3 Visit CMU and install weather station.

12/4 Continued

12/5 Meetings with local government officials and Barangay captains.

12/6 Further installation

12/7 Arrival of Li Bin from A.I.T. to survey site as part of her master's thesis on land use mapping of the area.

12/8 Installations and reconnaissance

12/9 Continued

12/10 Continued

12/11 Lantapan to NAPACOR power plant, Maramag. Visited Ms. Elizabeth Cruz, watershed development officer.

12/12 Bus from Valencia to Cagayan de Oro. Cagayan to Manila and motor pool ride to IRRI, Los Banos.

12/13 Interview at Los Banos

12/14 Continued

12/15 Manila to Atlanta

Contacts

The following people provided assistance and directions during the installation:

Mayor T. Pajaro

Vice Mayor Cosme Gawingan

Mrs. Julieta Devibar - Municipal planning coordinator

Jerimia Endrina - Vice President of the Barangay Captains Association and Jeepney driver

Theodoro Maribojouc - CMU technician and weather station site manager

Financial Agreements

The attached sheet lists the payments to landowners, raingauge observers and the CMU technician. Payments to the technician is the sum of 300 pesos/day x 2 days employment + 200 pesos travel costs. Payment to the landowners is payable in arrears on the first of each month. Payment to each observer is made on receipt of a raingauge measurements form for the previous month.

Payment for the months of December and January (payable in January and February) has been advanced to the municipal government liason officer, Mrs. Julieta Devibar, who will administer these payments until the SANREM site facilitator is able to take responsibility.

A contract has been signed between each landowner and the SANREM-CRSP ME (a sample copy is attached).

A.W.S. Measurements

Measurement	Site ID		(Measurement height)	
	101	102	103	104
Temperature (°C)	172 cm	✓	202 cm	190 cm
Humidity (%)	172 cm	✓	202 cm	190 cm
Wind speed (mls)	340 cm	✓	340 cm	314 cm
Wind direction (Degrees from Magnche N)	340 cm	-	-	335 cm
Solar radiation (W/m^2)	290 cm	✓	312 cm	274 cm
PAR (micromoles/m^2)	✓	-	-	287 cm
Soil temperature (°C)	5,20,50 cm	5,20, 50 cm	5,20,50 cm	5,20,50 cm
Rainfall (5 minute totals, mm)	122 cm	✓	122 cm	114 cm

✓ present, height not measured

- absent

Weather Station measurements will be logged as hourly and daily values.

Raingauge Network, Lantapon

Site	Observer	Lat/Long	Elev (approx)	Height	Site ID
Kaatuan	Mildred Paje	08° 02'49" N 125° 00'17" E	1150m	30"	11
Baclayon	Leonida Tumanal Burtolome Alinob	08° 00'53" N 125° 00'16" E	825m	30"	12
Bantuanon	Emiliano Villarico	08° 00'55" N 125° 04'18" E	475m	30"	13
Victory	Vincente Durias Jr. Cesar Anke	08° 03'08" N 124° 54'38" E	1300m	30"	14
Basak	Justiniano Salilay Jr.	08° 02'29" N 124° 51'46" E	1250m	30"	15
Kibangay	Aida Cabanez	08° 02'57" N 124° 53'09" E	1250m		16
Songco	Addino Saway Recto Canda	08° 02'39" N 124° 56'26" E	1200m	30"	17
Poblacion	Julieta Devibar	08° 00'03" N 125° 01'10" E	700m	32"	18
Bugcaon	Terencio Taping	08° 02'40" N 125° 06'53" E	500m	31"	19

Automatic Weather Station Sites

Place	Land Owner	Lat (N)	Long (E)	Elev (m) (± 100m)	Site ID
Musuan	CMU	*	*	*	101
Kulasihan	Dominador Ponfarrada	8°01'09"	125°05'59"	400	102
Alanib	Vincent Molina	8°01'40"	124°58'17"	900	103
Sungco	Romy Sawinay	8°03'43"	124°55'43"	1500	104

A.W.S. Instrument Serial Numbers

	Site			
	101	102	103	104
Temperature/ humidity	520030	520101	520104	501963
Anemometer	M1205	M2107	M2142	M2090
Wind Vane	K5070	-	-	K5443
Pyranometer	PY17901	PY17906	PY18027	PY17898
Quantum Sensor	Q16064	-	-	Q16062
Raingauge	11728-393	?	?	11724393
Solar Panel	FW92K1235607	FW92K04350669	FW92K1235261	FWK92A22279810

CONTRACT OF AGREEMENT

BE IT KNOWN TO ALL MEN:

That the municipality of Lantapan, Bukidnon represented by Hon. Teddy M. Pajaro, Municipal Mayor as First Party, the Sustainable Agriculture and Natural Resources Management (SANREM) Philippines represented by Dr. Bill Hargrove, Director as Second Party and Rosario Lanzanada (land owner), owner of the land as Third Party; do hereby come into agreement to contract the land of the latter for the installation of a Weather Station to monitor weather conditions and to support the sustainable projects implemented in the locality;

That said land located at Culaciman Lant. with an area of 20 x 20 square foot will be rented in the amount of Three Hundred Pesos only (P300.00), Philippine Currency, every month;

That said rental will start on December 1993 and will continue until such time as SANREM Phils. stops its operations here in the municipality of Lantapan, Bukidnon or termination may be requested by either party.

That the above stated parties agreed to sign this agreement as approval to all of the agreed conditions.

Signed this 12/6/93 day of December 1993 at Lantapan, Bukidnon, Philippines.

TEDDY M. PAJARO
Municipal Mayor
(First Party)

Ian Flitcroft

pp. DR. BILL HARGROVE, Director
SANREM, PHils.
(Second Party)

Land Owner
(Third Party)

PAYMENT OF RAINGAUGE OBSERVER
AND WEATHER STATION LANDOWNERS

300 pesos per month

LANDOWNERS	JANUARY	FEBRUARY
Kulasihan - Dominador Ponferada	-	
Alanib - Vincent Molina	-	
Songco - Romy Sawin-ay	-	
OBSERVERS		
Kaatuan - Mildred Paje	-	
Baclayon - Leonida Tumana	-	
Bantuanon - Emiliano Villarico	-	
Victory - Vicente Durias	-	
Basac - Justiniano Salilay	-	
Kibangay - Aida Cabañez	-	
Songco - Adolino Saway	-	
Mun. Hall - Julieta Devibar	-	
Bugcaon - Terencio Taping	-	

800 pesos per month

WEATHER STATION MAINTENANCE		
Theodoro Maribojoc (CMU Employee) * Honorarium + Travel Costs	-	

SANREM-Philippines Automated Weather Stations
Station 101 - Central Mindanao University
Musuan - 7°52'00" N, 125°3'30" E

Monthly Summary Data
January 1994

DRAFT

Day of Month	Air Temperature (°C) Max	Air Temperature (°C) Min	Air Temperature (°C) Avg	Humidity (%) Max	Humidity (%) Min	Humidity (%) Avg	Soil Temperature (°C) 5 cm Max	Soil Temperature (°C) 5 cm Min	Soil Temperature (°C) 5 cm Avg	Soil Temperature (°C) 20 cm Max	Soil Temperature (°C) 20 cm Min	Soil Temperature (°C) 20 cm Avg	Soil Temperature (°C) 50 cm Max	Soil Temperature (°C) 50 cm Min	Soil Temperature (°C) 50 cm Avg	Total Solar Radiation (MJ/m²)	Total PAR (moles/m²)	Total Rain (mm)
1	31.67	21.71	25.84	91.30	50.92	73.50	31.57	25.03	27.84	27.98	26.78	27.35	27.32	26.78	27.01	22.43	46.48	0.00
2	30.76	22.16	25.80	87.50	50.67	69.63	29.68	24.74	26.93	27.77	26.65	27.16	27.34	26.81	27.03	16.42	33.96	0.0
3	26.78	21.78	23.59	94.00	68.42	84.20	27.17	24.91	25.96	27.35	26.44	26.75	27.17	26.79	26.97	8.86	18.40	11.1
4	28.76	20.59	23.94	91.50	51.99	77.10	28.22	23.91	25.75	26.65	25.86	26.26	27.18	26.66	26.88	12.88	26.18	0.76
5	31.31	19.75	24.67	96.00	51.44	79.50	30.36	23.84	26.68	27.09	25.81	26.35	27.10	26.51	26.77	17.78	37.32	0.00
6	32.86	20.04	25.85	97.90	48.60	78.40	32.37	24.54	27.84	27.83	26.33	26.97	27.13	26.52	26.75	20.71	43.11	0.00
7	32.50	22.68	27.02	83.10	48.20	68.63	32.05	25.17	28.04	27.98	26.76	27.35	27.16	26.57	26.83	22.63	47.00	0.0
8	32.50	23.08	26.10	87.80	43.64	71.80	31.81	25.54	27.86	27.94	26.95	27.41	27.26	26.64	26.89	18.84	38.97	1.0
9	31.26	20.24	25.77	89.70	46.05	68.26	31.40	24.59	27.48	27.79	26.67	27.22	27.32	26.76	26.97	21.25	44.24	0.0
10	31.96	20.75	25.91	82.60	37.36	64.92	32.64	24.18	27.67	27.90	26.03	27.17	27.50	26.37	26.99	22.95	47.61	0.00
11	32.03	20.35	25.47	86.40	21.76	62.98	32.82	24.65	27.88	28.05	26.68	27.34	27.35	26.78	27.01	23.73	47.17	0.00
12	32.43	17.08	25.09	92.20	42.25	67.25	33.02	23.66	27.79	28.08	26.43	27.23	27.45	26.80	27.06	22.22	45.79	0.00
13	31.47	21.69	25.95	81.70	43.71	66.02	33.42	24.92	28.43	28.33	26.84	27.54	27.36	26.82	27.05	22.97	47.00	0.00
14	33.63	18.37	25.52	93.20	43.77	68.22	33.80	24.60	28.42	28.45	26.85	27.64	27.47	26.84	27.09	21.87	44.41	0.00
15	31.11	19.97	25.09	83.40	43.91	64.80	33.70	24.55	28.39	28.49	26.86	27.67	27.43	26.88	27.09	23.40	47.52	0.00
16	31.08	18.25	24.51	83.60	36.84	61.72	33.45	24.03	28.05	28.38	26.69	27.54	27.42	26.84	27.09	23.79	48.21	0.00
17	31.52	19.24	25.10	76.90	33.53	60.29	33.07	24.01	27.83	28.15	26.51	27.39	27.37	26.83	27.06	22.08	44.58	0.00
18	30.47	21.56	25.59	80.40	44.12	62.65	32.23	24.48	27.93	28.06	26.57	27.36	27.31	26.76	27.01	20.74	42.60	0.00
19	31.55	19.79	25.74	87.20	38.36	65.54	33.79	24.51	28.55	28.43	26.66	27.48	27.28	26.75	26.97	22.00	42.85	0.00
20	29.58	22.35	24.50	93.10	57.28	81.00	28.38	25.71	26.98	28.24	27.05	27.46	27.24	26.74	26.93	11.08	23.16	3.81
21	24.99	21.50	23.38	94.80	74.10	86.90	26.17	24.43	25.43	27.21	26.16	26.53	27.03	26.71	26.88	4.77	10.11	3.81
22	32.18	21.68	24.68	95.20	48.14	82.20	29.39	24.12	26.10	27.11	25.71	26.31	27.11	26.46	26.75	19.80	39.23	9.14
23	29.83	22.06	25.43	92.10	56.09	75.00	28.15	24.28	26.00	26.96	26.05	26.52	26.94	26.47	26.66	16.32	34.13	3.05
24	31.66	21.52	26.34	91.70	46.16	69.22	29.75	24.18	26.60	27.40	26.04	26.64	26.95	26.43	26.66	22.89	46.05	0.00
25	32.03	21.40	25.78	91.90	47.62	74.70	29.94	24.97	27.09	27.72	26.54	27.08	27.02	26.42	26.67	21.96	45.71	4.57
26	28.06	21.20	24.49	95.30	64.31	80.10	27.04	25.10	26.09	27.50	26.53	26.87	26.96	26.51	26.72	10.20	21.51	1.52
27	32.07	18.31	25.92	90.20	45.56	68.62	29.57	23.46	26.24	27.29	25.84	26.51	27.05	26.50	26.75	23.07	47.43	0.00
28	32.18	21.75	26.07	86.10	40.74	68.68	29.58	24.44	26.74	27.42	26.32	26.86	27.01	26.48	26.70	20.51	41.90	0.00
29	31.57	20.21	25.15	90.60	38.62	67.13	29.98	24.19	26.73	27.51	26.32	26.91	27.00	26.47	26.72	24.02	48.38	0.00
30	31.46	22.51	25.18	88.70	50.93	73.60	29.53	25.06	26.75	27.44	26.54	26.98	27.03	26.49	26.73	18.12	38.19	1.02
31	29.98	20.95	25.18	88.40	55.56	73.80	27.35	24.35	25.68	27.17	26.16	26.54	27.02	26.55	26.74	12.41	26.09	0.00
AVERAGE	31.01	20.79	25.31	89.18	47.47	71.50	30.69	24.52	27.15	27.73	26.44	27.04	27.20	26.64	26.88	19.12	39.20	3.99*
TOTALS																592.70	1215.30	39.88

*Average per rain event

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ATTACHMENT G

a wheat breeder with INRA Meknes or Ahmed Driouchi an Ag Economist at ERA Meknes, or BOULIF, a plant pathologist at ERA Meknes.

Ministry of Interior ran the DERRO (Economic level of western Rif) program over 25 years and there is substantial background data from that project, which we need to get a hand on. The man at Interior to contact is Mr. CHBICHEB he is the equivalent of a state representative in the overall hierarchy.

Kamal feels that IAV could and should be involved, but mainly on a person by person basis with control at Meknes. IAV could do irrigation/hydrology and help with GIS. INRA could do (he says) plant breeding and ERA could do agronomy, agrometeorology and plant growth models. They should also play a major role in GIS.

Kamal has a preliminary proposal into the World Bank to get involved in this program. It is an expression of intent.

The proposal which we submit should be in French and be submitted from the Ministry of agriculture to the Ministry of Interior (To Mr. GUESSAB). The proposal should indicate that supporting funds will be sought from AID Morocco, SANREM, ERA, INRA etc. but the amounts should not be specified.

Toward the end of our discussion he allowed as how a site near Azilal in the high Atlas could function as a secondary site, but other than this, he expressed very clearly an interest in having us center our attention on the Rif.

January 11 and 12

Field Trip to the RIF

The purpose was to visit three major watersheds and select a site for our study. The largest was Sebou including the Oued Wargha. It is 26,000 sq km in total and the Wargha is 6-7000. The second was Oued Laou, a watershed running to the Mediterranean of 915 sq km. The third is Oued Loukous (Lekkous) a watershed of 2100 sq km.

The trip included Kanemasu and Swift, Mustapha EL YEUSSOUFI (Range Science/Plant Ecology - ERA), Abdelmalek AZZAOUI (Soil Mapping - INRA), Rachid BOUABID (Soil Science - ERA), and Fouad RACHIDI (Agronomist/Plant ecologist - ERA).We spent the night in Chefchaouene (Chechaouen) a city at about 900 M elevation set against very high peaks. It is the provincial capitol.

All three watersheds are highly erodible and eroded. All contain mixtures of wheat, food legumes, citrus, pine plantations, rangeland, a mixture of terraced and unterraced situations, barley, cork oak, olives, Cannabis, sheep, goats, cattle. Rainfall varies from about 600 to 1200 mm. This is an area of dense rural population and a source of substantial outmigration to Europe and other areas.

We met with Achemlal LAHCEN (La Sen), director of DPA (Direction regional de agricultur) the provincial arm of the Ministry of Agriculture. He indicated a willingness to work with us, to act as entree etc. There are farmers groups within the province that we could work with and he would expect us to get a favorable reception from the farmers. He saw no problem with doing on farm, farmer participatory research. He mentioned two projects that are taking place in the province through DPA. These are a program to grow tea under cork oak and a silk worm program which will involve introduction of mulberry, and a variety of other things as well. Have a reforestation project which provides fruit and nut trees to the farmers, and the demand for these greatly exceeds the supply (by about 10 times). Have a proposal to be submitted to EEC dealing with reduction of Cannabis production. There is a major problem in the province in obtaining credit by farmers. The problem is

that most farmers can not show title to the ground they farm and so have no collateral for a loan. He said if we wanted to put out weather stations, they would need to be on DPA land.

A new dam is being constructed on the Sebou watershed to be completed in 1996. It will be the second largest dam in Africa, after Aswan. There are a lot of resources available in this area from a number of agencies and considerable past study.

A dam has been constructed on the Lekkous, and this area is very well studied, with high levels of previous intervention. Irrigation is well developed here.

A small dam for irrigation and power was built in the Upper Oued Laou by the Spaniards in the '40s. The electric generating station is about 15 km below. It is silting in rapidly, and may have lost 70 percent of its original capacity. This diminished capacity renders it of little value for flood control in the lower reaches, which flood every 6 years or so. A new dam in the gorge north of the old dam may be in the works, but this is not entirely clear.

January 13

Meeting for site selection

We met the morning of the 13th to compare notes and make a selection of the study watershed. In addition to the people on the trip, we were joined by Mohamed BENBELLA, agronomist/plant breeder from ERA Meknes.

We selected Oued Laou watershed, although Fouad felt that the Sebou would be better on the basis of better accessibility primarily. The decision was based on the fact that Oued Laou was the smallest in size, diverse in agriculture from Forests and cork oak down to vegetable production in the lower reaches. It runs all the way to the Sea and so has an impact on the beach areas, and potentially on fishing. It has a gaging station in the gorge at the putative site of the new dam and so the watershed is conveniently divided into an upper and lower section. Accessibility is poor only in the gorge zone which is less than 10 km across and less heavily inhabited. In addition to the upland crops found in the other watersheds, there is considerable truck farming on the flood plain below the gorge. Tourism is important in the town at the mouth of the Oued. It includes the city of Chefchouane and has elevations ranging from sea level to 2100 m, the highest point in any of the three watersheds. It is not entirely within Chefchouan Province, the boundary being the Oued itself, but this is not viewed by our Moroccan collaborators as a big problem (none of the three are entirely within a single province either). There may be less data available for this watershed than the others but no soil map exists for any of them in any event. The area is covered by 1:50,000 topo maps of Moroccan origin and we were told that better maps are available in the U.S. from DOD.

Women play a major role in farming in all of these areas. They are responsible for all of the farming and marketing and have complete control very small animals such as chickens and rabbits. Men presumably work with larger livestock and/or work outside the home (off the farm and perhaps even out of the region). There have been programs for the women in the areas of tiles and goat cheese, and there are some new ones in the works (see above).

A very major issue here is the production and exportation of Cannabis. This has been going on for a long time here even though it is illegal. Our collaborators estimate that the profit from Cannabis is roughly ten times that from wheat or Faba beans on a per area basis. They estimate that *** Ha is in Cannabis each year. Because the production of Cannabis is illegal it is frequently done on a clandestine basis in the more remote portions of the watershed and so leads to extensive deforestation and erosion (due to the steep slopes in those areas). It is also very heavily fertilized and may be a

major contributor of nitrates and phosphates to surface waters. The Moroccan Army is being used to try to interdict the flow of Cannabis to Europe, and is involved in destroying Cannabis in the field. The Cannabis is also largely responsible for a booming tourist industry in the City of Chefchouan. It is reported that Jimmy Hendrix and other rock stars have enjoyed trips here, and indeed, we saw a fairly large number of lost souls wandering through the province.

It is very interesting to have a major problem such as this involved, particularly because of its external social and political ramifications. Clearly it is an issue to be considered by those interested in the effects of policy on land use and issues of sustainability. We must approach this issue with caution for several reasons. First, we do not wish to be seen by the Moroccan government as a solution to this problem - there is no simple agricultural solution to it. Second, we do not wish to be seen by the local people as a Cannabis eradication project - we are not likely to receive local cooperation if we are (remember the revenoors). There are other programs in place dealing with this problem and we can not permit it to take center stage for us.

January 14-16

Trip to Region of the Atlanta Mountains

The purpose of this trip was to look at some possible sites in the Atlas Mountains and to familiarize ourselves with this region and its agricultural problems. We were evaluating the possibility of developing a secondary site for the program in this area. Participants were Kanemasu, Swift, Fouad RACHIDI, Mohammed BEN BELLA(Crop physiology), and Rachid BOUABID.

On Friday we went from Meknes to Azilal, hoping to visit the Ait Bougmaz Valley in the high Atlas. We visited with the DPA office in Azilal (met with ? FADEL head of Agricultural development) and they provided us with two four wheel drive vehicles to use to go tho the valley. Due to the long distance to the valley, and the condition of the roads, we were unable to reach the valley. The valley is at an elevation of 1300 meters. It comprises 2660 Ha of agricultural land in a watershed of 350 km square. Precipitation is 400 mm per year. Population is 11,000 people. Livestock are important (14,00 SHEEP, 9000 GOATS, 4500 HORSES, and 25 camels). Major crops are wheat, barley, corn, alfalfa, vegetables (potatoes, tomatoes and carrots) and 260 Ha of fruit trees. There are 1927 H of irrigated land. Major problems are erosion, deforestation and lack of access. This valley was specifically mentioned in the summary of the World Bank report of November of 93 on the Moroccan program. The valley is roughly a three hour drive from Azilal, and four wheel drive vehicles wold be required unless conditions were dry.

We spent the night in Marrakech. On Saturday we drove from Marrakech toward the Azzaden Valley to the south. No four wheel drive vehicle was available to us here, and one would be required to reach the valley. The valley is about two hours from Marrakech. We met the DPA sup-provincial director at Asni and got some information from him. The valley is at an elevation of 1500-1700 meters, and receives 300 mm of precipitation per year. It is approximately 10,000 hectares with a population of 2318 people. It is irrigated and apples and nuts are grown as well as barley, corn, alfalfa and table vegetables. There are 4-6000 ha of forest and rangeland. Livestock are important. A small reservoir is planned for this valley. The forestry Department has a reforestation program in the valley. Problems are a lack of potable water, need for better adapted goats and alternative crops. This valley was also specifically mentioned in the World Bank report.

The general structure of the area is that there are a series of generally small valleys supporting agriculture imbedded in an extensive matrix of high mountain country used for grazing animals. The human populations are centered in the valleys. Both the Azzaden and the Ait Bougmaz valleys are of this sort.

GG

We returned to Marrakech and were treated to an elaborate and excellent dinner at the home of Fouad Rachidi's parents. On Sunday the 16th we left Marrakech and returned to Meknes, driving through the cedar forests of the Middle Atlas between Khenifra and Azrou. We reached the campus at Meknes at 8:00 P.M.

After our trip through this region, it appears to us that for a variety of reasons we should concentrate our efforts in the Rif. The site selected in the Rif is sufficiently large and complex to engage the capabilities of both the Moroccan and American collaborators. Adding a site in the Atlas would increase the amount of work to be done and would complicate the logistics of the situation very greatly without, we believe, yielding significant additional benefit. If the World Bank feels that it is very important to work in this area, a site could be selected and the methods developed in the Rif applied there. If this were to be done, it would be simpler to work out of Marrakech in the Azzaden Valley than in the Ait Bougmax near Azilal, due to better access to the Azzaden.

January 17

On Monday morning the 17th of January we met with Fouad Rachidi to discuss the organization of the program from the Moroccan end. Rachidi had been appointed as the coordinator of the project activities in Morocco by Mohammed Rochdi, Director of ENA Meknes. This was not entirely in keeping with the expressed desires of Mohammed Kamel, Secretary General of INRA, who seemed more interested in having an older, more administratively inclined person in the role of National Coordinator. USAID Rabat expressed an interest in having us identify a strong scientist at Meknes to fill a leadership role. We feel that it is important that there be a good scientist in a position of authority in the program here that the U.S. collaborators can work with directly. Thus, there seems to be a potential difference of opinion on this point. Rachidi has the backing of the ENA faculty for this position and appears to us (Kanemasu and Swift) to have the requisite scientific and people skills to fill this role. We propose that there be a Moroccan Technical Committee for the project, with an elected or appointed leader to direct the program. This person could serve as National Director for the program, in our opinion, or an additional person could be put into that position,but then serving primarily a management and political role, with the leader of the Technical committee still having primary scientific responsibility for the project. We wish not to get embroiled in the politics of this situation, but wish to ensure that there is a clear, scientifically suitable, contact person on the Moroccan side through whom we can coordinate the American involvement.

ATTACHMENT H

SANREM CRSP TRIP REPORT

CAPE VERDE
14-15 NOVEMBER, 1993

W.L. Hargrove and I. Silva-Barbeau

Objective: To discuss WARD project with USAID/CV and potential Mission buy-in to SANREM CRSP

Saturday, 13 November

Arrival, Praia.

Sunday, 14 November

Mr. Steve Dosh, Project Officer, USAID/CV, delivered a copy of the project description to our hotel for our review. We also had a brief tour of the Santiago Island by Irma's friend and U.S. embassy employee, Jao Martins.

Monday, 15 November

Meeting with Mr. Steve Dosh. The WARD project consists of three primary components: a) watershed development, b) agricultural research, and c) training. A U.S. based NGO, ACDI, will implement the watershed development component and another regional training group will implement the training component. The Mission is interested in SANREM for the agricultural research component. The objectives of the research component are to:

1) strengthen research planning through assistance in defining research objectives based on an analysis of the agronomic and social constraints to agricultural production in Cape Verde

2) imrove the skills of mid-level technicians and administrators

3) provide researchers and administrators with skills in proposal writing, contracting, priority-setting, and other subjects relevant to their particular fields and appropriate to their new role as the agricultural research institution in Cape Verde

4) build INIDA's capacity to conduct on-farm research

These objectives will be met through:

1) long-term technical assistance (two-person years of in-country technical assistance)

2) short-term technical assistance (16 person-months) in project related activities

3) Short-term in-country training (3 person-months)

Steve mentioned that the Mission might be closing at the end of 1996, which

means that the project might have to be completed by that time. He emphasized that the primary goal is training and institutional strengthening. He thought that the strengths of SANREM fit well with respect to training in farmer-participatory approaches and institutional strengthening in research planning based on farmer-identified constraints. The two previous projects funded by the mission were on food crops (University of Arizona) and reforestation (a consulting firm).

We met with Barbara Kennedy, Country Rep, along with Steve Dosh and Jose Barber, the Project Manager for WARD. Ms. Kennedy explained the history of the development of WARD. It was originally planned to be a large project but had to be scaled back due to budget constraints. Another factor in revising the project plan was the reorganization of the government of Cape Verde. They decided to focus WARD on strengthening institutions, but to have a "people-level impact". The life of project was changed from 7 to 3 years. They also wanted to keep a link with U.S. universities. The real aim of the refocussed project, with respect to agricultural research, is to assist INIDA in developing a farmer-driven research agenda and to get their work out "to the people" through an on-farm research program. SANREM would conduct training in farmer-participatory methodologies and assist INIDA in planning and implementing an on-farm research program.

Her questions to us were:

1) Are we interested?
2) Can we assist in the development of the scope of work?
3) When would we be able to get started?

We expressed our keen interest. Irma will serve as the project coordinator on our side. We agreed to return in January to assist with the scope of work, to meet the INIDA administrators, and begin planning.

A major concern of Ms. Kennedy's is contracting. We will discuss with Jim Bonner.

We visited briefly the ACDI office in Praia to introduce ourselves.

Irma will visit ACDI and the AID library to get documents on the past projects.

We departed at noon for Ouagadougou.

ATTACHMENT I

Trip Report

Republic of the Cape Verde Islands
January 11-January 29, 1994

by
Irma Silva-Barbeau, Ph.D.

Purpose: I went to the Republic of the Cape Verde Islands with the following objectives: 1) to meet with USAID Mission personnel in Praia; 2) to meet with researchers and officials of the National Institute for Agricultural Research and Development (INIDA); and 3) to develop a Plan of Work for SANREM CRSP's work with the Cape Verdean WARDS project.

Outputs: A Preliminary Plan of Work was developed with input from the scientists, staff and administrators of INIDA, USAID/Praia and SANREM CRSP ME. In addition, a Rapid institutional analysis and needs assessment of INIDA was developed at the request of USAID/Praia. These two documents are presented in the appendix.

Impact and Follow-up: The above reports will be used by USAID/Praia to develop their work plan and implementation process for the WARD Project. The USAID/Praia representative will travel to Washington, D.C. in February/March 1994 to present this plan. Dr. Bill Hargrove, Director of SANREM CRSP, may need to visit Praia Cape Verde Islands to finalize the buy-in and set in motion the activities for the implementation of SANREM CRSP activities with INIDA through the WARD project.

Schedule of Events

Tuesday, January 11, 1994 -	Leave Blacksburg, Virginia at 8:20 a.m.
Wednesday, January 12, 1994 -	Arrive in Praia, the Republic of Cape Verde Islands at 6:00 p.m.
Thursday, January 13, 1994 -	Visit to USAID/Praia. Briefing with Steve Dosh, ADO, and Barbara Kennedy, USAID representative. Read pertinent reports on INIDA and WARD project
Friday, January 14, 1994 -	Trip to Sao Jorge dos Orgaos, INIDA headquaters. Meeting with INIDA Vice president, Eng. Carlos Silva, and Drs. Jose Levy and Maria Isabel Andrade. The president was travelling in the United States. INIDA officials were not aware of my mission or SANREM's involvement. Nevertheless, the researchers and administrators were very kind and we discussed the projects and I distributed literature on SANREM CRSP and WARD PP amendment. I also received some key literature on the institute. Plans were made for my interviews to begin on Monday, January 17.
Saturday, January 15, -	Read INIDA materials and wrote a SOW for the rest of the TDY.
Sunday, January 16, 1994.	Day of rest
Monday, January 16 -	Wednesday, January 19 - Worked at INIDA Headquaters. I interviewed various scientist and staff. Had a tour of the facilities. A list of people interviewed is found in the appendix.
Thursday, January 20 -	Amilcar Cabral Day, a Cape Verdean Holiday. Worked in my room and began to organize and write the reports.

Friday, January 21 -	Final visit to INIDA. Interviewed the vice president. Finalized first draft of the Preliminary_workplan. Faxed the workplan to Drs. Bill Hargrove and Constance Neely in Georgia for their input.
	Meeting with Steve Dosh and discussed the Preliminary Workplan.
	Telephone conference with Steve Dosh, Bill Hargrove and Constance Neely. Discussed brieftly the workplan and follow up work.
	Burkina Faso leg of the trip postponed.
Sat. Jan.22-Mon. Jan 24 -	Personal Trip to island of Brava
Tues., Jan.25-Thurs.Jan.27-	Praia, waiting for a plane connection to U.S.. Worked on Preliminary Workplan, and drafted the Rapid_institutional analysis_and_needs_assessment paper.
Thrusday, Jan. 27	Left Praia to Sal at 7:00 p.m.
Friday, Jan. 28	Left Sal to N.Y. at 4.00 a.m.
Friday, Jan. 28	Arrive N.Y. at 7:30 a.m. Spent all day in N.Y. waiting on a flight to Washington, D,C. Bad weather, the majority of flights cancelled.
	Arrive Washington Dulles at 7:30 p.m.
	Arrive Roanoke at 11:30 pm.
Saturday, Jan. 29	Arrive Blacksburg at 12:30 am.

Rapid Institutional Analysis and Needs Assessment of INIDA

by
Irma Silva-Barbeau, Ph.D.
January 14-21, 1994

PURPOSE

The purpose of this analysis and need assessment was to better understand the "culture" of SANREM's new collaborative institution and to understand both the institution and the researchers' strengths and constraints.

OBJECTIVES

The specific objectives were to :1) evaluate the current status of INIDA professionals trained under the Food Crops Research Project; 2) determine the training and research needs of INIDA; and 3) to determine the institutional structure and support for research.

METHODS

A questionnaire developed by USAID/Praia entitled "Food Crops Research Project Alumni Questionnaire" (Appendix 1) was distributed to all nationals trained under the project to evaluate their current professional status, the relative relevance of their formal education to their current position, their general satisfaction with their career outlook, and etc. Upon my arrival in Praia, only five questionnaires had been completed and returned to USAID. USAID/Praia asked me to follow-up on these questionnaires as a means of introducing SANREM's work with WARD to the Institute.

I also interviewed at length several researchers and other mid-level staff and the vice-president of INIDA (the president was in the U.S.) on issues relating to INIDA's research strategies and plans; their opinions on INIDA's research priorities; and the Institution's strengths and weaknesses. In preparation for these interviews, several days before, I distributed literature on SANREM CRSP and pages 11-14 of the USAID/Cape Verde WARD PP Amendment. Refer to appendix 2 for list of INIDA personnel interviewed.

I was given a guided tour of the facility. I visited the soils laboratory, plant pathology laboratory, library, the Herbarium, Botanical garden, Center for agro-ecological studies, GIS project office, etc. I did not actually visit the training facility but I was informed of it and its capacity.

MAJOR FINDINGS

I. Food Crops Research Project Alumni Questionnaire.

With the assistance of Drs. José Gabriel Victória Levy and Maria Isabel Vaz Andrade, three additional questionnaires were completed making the final total of eight. Five of these former trainees are still at INIDA. Of the other three, one is employed at EMPA and the other two with TACV. Many other scientist, specially in the area of soils and social sciences have left the Institute. The following are some results from the questionnaires:

- .The five researchers who completed the questionnaire from INIDA worked at INIDA before training and returned to the Institute after their training in the same position and general field.
- .All of the researchers who completed the questionnaire and others voiced some level of dissatisfaction with their professional status and outlook for career development. This "dissatisfaction" seemed to stem from 1) lack of a national research policy; 2) no formal career track for researchers and therefore graduate level scientist are treated the same as Ministry "tecnicos"; 3) promotion is based on length of service rather than expertise or academic degree; and 4) low pay relative to "others" with lower educational level employed elsewhere. This is contributing, in part, to a feeling of lack of appreciation for the scientist by the administrators resulting in lack of "motivation" on the part of the scientists.
- .Four of the five scientists in a five point scale, (1=extremely relevant and 5=not at all relevant), rated their graduate training in the United States as "somewhat relevant" (3). The reason for this was because they returned to the same positions as before. Those who were promoted, were promoted to administrative positions. The relevance of training is reflected on all four graduate level scientist feeling that they use some or little of the knowledge gain from training. Only one person who received short term training felt that she is using all knowledge gained.
- .Major constraints identified by scientists in carrying out their job duties and responsibilities are: 1) lack of equipment and supplies (4/5); lack of qualified staff (5/5); lack of support from superiors (5/5); bureaucratic policies and procedures (3/5); too many administrative duties (4/5); and other (i.e., lack of qualified staff for maintenance of lab equipment, superiors with poor technical skills) (2/5).

II. Interviews and Tour of Facilities

Major findings:

A. Research needs and constraints

According to INIDA researchers, the major areas of research priorities which SANREM CRSP could assist with are the following:

1. Transfer of technology to farmers. It is felt that farmers have been involved very little in the work carried out by the institute. INIDA's research has been done almost exclusively on-station. The Foods Crops Project, through the University of Arizona, had done some "Farming Systems" type studies but this was very limited. INIDA researchers voiced lack of knowledge concerning farmer practices in the area.

2. Strengthen the Linkage with the Extension. Agricultural Extension falls under another institute. There are no formal agreements between INIDA and Extensao Rural. Although INIDA researchers provide periodically technical training to extension agents (education level varies from fourth grade to 10th grade), it is felt that due to the agents' low level of education they don't benefit as much as they could have. Beyond technical knowledge, agents may also lack appropriate extension teaching methods.

   Extension service beyond the island of Santiago is almost non existent. There were two previous sub stations one in the Island of Fogo and the other in the island of Santo Antao. The one in Fogo is no longer in operation and the one in Santo Antao is working at a fifth of its capacity. There needs to be a more formal linkage agreement between research and extension.

3. Strengthen inter-institutional collaboration. Presently inter-institutional collaboration is done only between "friends" therefore there is no commitment to produce high quality work or see the work through its final completion. Further, researchers are not given any encouragement or "credit" for such collaboration.

4. Strengthen interdisciplinary research. There has been very little interdisciplinary research. Interdisciplinary research also is done at basis of friendship. There is no institutional policy that promotes and rewards such research. Greater integration of the social sciences physical/biological research is needed. There is an acute need for an agricultural economist in the institute.

Major constraints

According to INIDA researchers the major constraints in doing on-farm research are:

1. Transportation. The scientists identified transportation as a major contraints. Small things like tires, gasoline and other small repairs of trucks was cited as a major problem. One researcher is afraid that a whole year's work maybe rotting in the field because of lack of transportation.

2. Access to farmers. Farmers in the past have been very receptive to researchers but they added that the type of research done in the past was usually in the nature of introduction of new varieties which farmers clearly understand the value.

3. Farmer's level of literacy. Communication between researchers and farmers is impaired greatly by this factor.

4. Land tenancy. Most farmers cultivate small plots. These small farmers are in the majority sharecroppers and practice mainly rainfed agriculture (corn and beans). This is a major constraint in terms of land improvement, and types of crops that are grown (i.e., don't like to plant fig trees because this is a long term investment).

B. Institutional structure and support for research

According to the researchers interviewed there has been a great loss of personnel from INIDA especially those who were trained under the Food Crops Project. Loss of personnel has been more prominent in the areas of, Agricultural Economics, Nematology, Soil Sciences, Irrigation, etc. All or most of these trainees fulfilled their contracts and moved on to other jobs.

The area of soils have experienced the most acute loss of personnel. This is an irony since the Food Crops Project invested the most in the soil laboratory and training in soil sciences. I toured the soil laboratory and it appears to be well equipped but presently there is only a chemist, a mid-level technician and five assistants working in the laboratory. Only routine analyses are being done. A Ph.D.level soil scientist left the Institute and now works in Praia with Adult Education. An M.S. degree person and two technicians who benefitted from short term training also have left. Most of the equipment seem idle.

The major reasons cited for this is that there is no formal career track for researchers. Presently, graduate level scientist are treated like ministry technician "technicos". Promotion is based on length of service rather than expertise or academic degree.

This problem, however, has been acknowledged by the

government. Presently all ministries are working to develop a plan to consider research careers. Such a document has already gone through the first drafts. Some researchers with whom I spoke, voiced dissatisfaction with it since it still provides opportunities for B.S. level researchers to reach senior researcher and research director level.

According to researchers interviewed, the major weakness of INIDA as research institution is lack of a "research director" who can integrate the departments together with realistic research plans that can be implemented given the technical capability available. There are areas of research such as "corn and beans" but there is no research plan and priorities with realistic means or methodology for implementation.

The government of the Republic of the Cape Verde Islands do not have a research policy. There is a project underway funded by PNUD with collaboration of ISNARD to assist the government in developing a national research plan providing guidelines for individual ministries.

The administrative body of the Institute was cited by researchers interviewed as "weak" and needs management skills. Researchers need to be more autonomous in the administration and implementation of their research projects. One researcher acknowledged the fact that the majority of INIDA researchers are young, recent graduates with no experience in writing and implementing a research program. There is need of senior researchers to serve as mentors.

INIDA publishes a research journal " Journal de Investigacao Agraria" and encourages greater dissipation of its research findings with "Technical Bulletin" which is a more informal means of research dissemination and exchange.

In general the research infrastructure of INIDA as compared with other West African countries appear adequate. Its classrooms, meeting rooms, libraries, research laboratories, research station and training facility appear, on a glance, to be well taken cared of and in some cases in great use. The level of research activities at the different departments appear to be heavily influenced by the presence of a "donor". As for instance, the "Departmento de Ciencias Ambiental" has done a lot of work on agricultural pests, however, level of activity in the laboratory is low due to winding down of funds from GTZ. In contrast, there is a lot of activity in the GIS which is under a two year funding from CEE, and from the "Center for agro-ecological studies". This Center has produced agro-ecological maps of all the islands and some educational materials.

The USAID funded project on "grasshoppers" appear to be viewed with some skepticism by some researchers as being exaggerated and not pertinent to Cape Verde Islands.

There was a feeling expressed by researchers of lack of "involvement" of the national researchers in the identification, designing and planning of research projects by donors. They attribute this lack of involvement as contributing to the "abrupt" halt of the research activities once the donor leaves.

SUMMARY

The general picture of INIDA is one of a young Institute in search of its identity and mission. It is very young as far as a research institutes go. Its major problems stems from: 1) a country which has just undergone political and ideological changes with no past history of "research" policy; 2) a generally "young" cadre of researchers with limited experience; 3) an administrative structure which perhaps does not present the greatest understanding for the demands of "scientific research" and "highly trained" researchers. As one researcher noted "if we are going to say we are a research institute we must differentiate between "scientific" experiments and "routine" laboratory tests."

I believe that INIDA may benefit from a "self" study which will aid it in clarifying its mission, and where it wants to be in the next ten to twenty years. The government's mandate to the ministries to address the career needs of scientific researchers and its plans to develop a national research policy with the assistance of PNUD and ISNARD should be viewed positively and with enthusiasm.

SANREM CRSP is well positioned to assist INIDA, through the WARD project, in doing on-farm research and institutional research management issues.

PRELIMINARY WORK PLAN
The Role of SANREM CRSP in the WARD Project

by
Irma Silva-Barbeau, Ph.D.
January 14-21,1994

INTRODUCTION and BACKGROUND

The Sustainable Agriculture and Natural Resources Management Collaborative Research Support Program (SANREM CRSP) was identified by the USAID/Praia to provide technical assistance to the Watershed Applied Research and Development Project (WARD) through a buy-in. Dr. Bill Hargrove, director of SANREM CRSP accompanied by Dr.Irma Silva-Barbeau, technical consultant to the Program, visited the USAID mission in Praia in November 1993 to discuss the preliminary plans for this buy-in. The buy-in is to provide technical assistance to the National Institute for Agricultural Research and Development (INIDA) in the areas of agricultural research management, research planning, coordination, research staff supervision, technical assistance in the areas of on-farm research, research/extension linkages, sustainable management of fragile lands, and short-term in-country training in various areas as well as long term graduate degree training in the United States.

Dr. Irma Silva-Barbeau made a TDY visit to Cape Verde Islands to work with INIDA staff to prepare a workplan for implementation of the project that conforms with the objectives of WARD, INIDA and SANREM CRSP.

During this TDY, a rapid institutional analysis and a needs assessment was done by Dr. Silva-Barbeau to better understand the "culture" of the collaborative institution as well as to understand both the institutional and researchers' strengths and constraints. This workplan is based on this analysis, discussions with USAID personnel, INIDA administrators and researchers, and SANREM CRSP ME personnel.

RATIONALE and GOALS

The new focus of the USAID/Praia Program strategy, the restructuring of the USAID office in Praia, and changes in the institutional setting in Cape Verde resulted in the redesign of the WARD Project. These events led the USAID/Praia to obtain technical assistance for the research component of this project through a buy-in from a centrally funded project which could function independently after the USAID/Praia mission is phased out in 1995/96. SANREM CRSP meets this requirement and its unique approach to participatory research and development in sustainable agriculture and natural resource management which incorporates farmer participation, landscape ecology and gender is complementary to the WARD project.

The goals of this work are to provide the WARD project technical assistance which will strengthen the administrative

capabilities of INIDA as a semi-autonomous research institution and strengthen its capability in terms participatory research methodologies which will result in greater short term agricultural productivity and long-term agricultural and environmental sustainability.

OBJECTIVES

The specific objectives in the order of priority as identified by INIDA researchers are to:

1. Strengthen the agricultural research management capabilities of the Institute in the areas of research planning, coordination, and research staff supervision

2. Develop a system for continuous evaluation and monitoring of research management activities to include both the administration and actual research.

3. Provide assistance to Institute researchers in the areas of technical transfer to farmers, research/extension linkages, inter-institutional collaboration and interdisciplinary research.

4. Provide in-country training in areas of farmer first, on-farm research and participatory landscape/lifescape approach to agricultural sustainability.

5. Provide short term technical training and technical assistance in various topics to include environmental training and education.

6. Provide long term graduate degree training in the U.S. providing the means for candidates to do research in country.

ACTIVITIES

Objective 1: Strengthen the agricultural research management capabilities of the Institute in the areas of research planning, coordination, and research staff supervision.

SANREM will provide a long term advisor (two years of effort) in agricultural research management. This person will provide assistance to the president of INIDA in the areas of research planning, coordination, and research staff supervision.

INIDA will appoint a Research Director who will be responsible for developing long range research plans which fall within the general national research policies priorities. The Research Director will also develop implementation plans integrating the strengths of all the departments in the institute with realistic goals that can be achieved given the technical

capabilities of the institute. The SANREM long term advisor will assist the research director in these activities.

SANREM's long term advisor will work with the president and the director of research in the development of a system to provide rewards and incentives to INIDA researchers. Lack of incentives and an equitable reward system was cited as a major factor for the pronounced exodus of graduate level researchers from the Institute.

A bi-yearly evaluation process will be put in place to monitor and evaluate this process and make recommendations. This evaluation will be conducted collaboratively by INIDA and SANREM.

SANREM's long term advisor will provide a quarterly progress report to INIDA and to SANREM

Objective 2. Develop a system for continuous evaluation and monitoring of research management activities to include both the administration and actual research.

SANREM CRSP's Monitoring and Evaluation Working Group is presently drafting a proposal to develop a system to be used by project partners. The working group led by Dr. Jim DeVries from Heifer Project International in Little Rock Arkansas, will be meeting next month to finalized the proposal and to make plans for its development and implementation. SANREM Cape Verde could take advantage of such a system and customize it for its specific use.

SANREM long term advisor will be responsible for implementing such a system and work with the president and research director in evaluating it and begin its institutionalization.

Objective 3. Provide assistance to Institute researchers in the areas of technical transfer to farmers, research/extension linkages, inter-institutional collaboration and interdisciplinary research.

Transfer of technology to farmers.

"The approach of the SANREM CRSP is a new paradigm for participatory research and development in sustainable agriculture and natural resource management which incorporates farmer participation, landscape ecology and gender. In this paradigm, farmers, local people and local institutions play an intimate and crucial role in identifying constraints, developing the research agenda and fully participating in implementation. The model encourages people to analyze, understand and manage their environment and overall quality of life through collective decision making and action" (Executive Summary-SANREM CRSP). In this model transfer of technology occurs simultaneously as technology is being developed since farmers themselves will be involved in the generation of the new technology.

Following the SANREM paradigm farmers/users will be kept informed and be involved in several ways.

1. Publications written in a manner and in the language that users understand will be published frequently to keep users abreast of what is taking place within SANREM but also with information regarding new technology.
2. Users will be an important part of the "Local Coordinating Committee" with representatives in the "National Coordinating Committee" which will review and approved all planned research in their watershed.
3. Users will be a part of the research team conducting trial in their fields.
4. Users will be invited and assistance will be provided to them in submitting proposals for research in their fields.
5. SANREM research activities will always begin with a "Participatory Landscape/Lifescape Appraisal" (PLLA) which is a holistic understanding of the watershed from the users' perspective.

Research/extension linkages

The "Extensao Rural" of the Ministry of Agriculture will be invited as a collaborative partner in all the activities in the Watershed. Their involvement will be at several levels.

1. They will be primarily involved in the preparation of publication for users.
2. They will be represented in both the "National Coordinating Committee" and the "Local Coordinating Committee".
3. They will participate in the PLLA
4. They will be invited to participate in research activities in the watershed

Inter-institutional collaboration/Inter-disciplinary research

In the SANREM model the scale of the landscape/lifescape analysis demands the expertise from various disciplines found in different institutions. The Directorate General for Agriculture, Silviculture and Animal Husbandry (DGASP), the Directorate General for the Conservation of Soils, Water, Forests, and Rural Engineering (DGCSAFER), the National Institute for Rural Engineering and Forestry (INERF) and the Ministry of Fisheries, Agriculture and Rural Animation (MPAAR) will be invited as collaborating partners.

It is required under the SANREM model that research proposals be: 1) inter-institutional (within Cape Verde or a mix of Cape Verdean Institutions with some of U.S. institutions members of the SANREM consortium); 2) interdisciplinary, physical, biological and social scientist working collaboratively investigating different aspects of a problem; 3) landscape ecology in scale and ; 4) that is gender sensitive (i.e., uses of natural resources by different people in the watershed as it

relates to class, ethnicity, age, etc. be considered).

Objective 4. Provide in-country training in areas of farmer first, on-farm research and participatory landscape/lifescape approach to agricultural sustainability.

SANREM CRSP will provide INIDA personnel and personnel from other collaborating partners training as follows:

1. All personnel administrators, researchers, graduate students, extension agents,etc. who will be involved in SANREM related research will participate in SANREM training and workshops which will cover the philosophy and approach to research. SANREM conducts these training/workshops periodically to ensure that all new in-coming personnel are knowledgeable of this new approach.
2. Training in Participatory Landscape/Lifescape Appraisal. This training will take place just prior to the actual implementation of a PLLA in the field.
3. Training in the design and implementation of on-farm trials.
4. Training in monitoring and evaluation process

Objective 5. Provide short term technical training and technical assistance in various topics to include environment education and training.

SANREM will provided short term technical training and technical assistance in various areas and topics identified (i.e. GIS, Indicators of sustainability, soil mapping, economic modeling,etc). In addition, SANREM through its Environmental Education and Training Working Group, will work with different local groups and INIDA in conducting educational workshops, developing educational materials based on the SANREM research findings.

Objective 6. Provide long term graduate degree training in the U.S. providing the means for candidates to do research in country.

SANREM will coordinate the placement of students in U.S. universities monitor their educational progress. SANREM in collaboration with INIDA and the other institutions involve will facilitate the implementation of their thesis work in Cape Verde.

SCHEDULE OF EVENTS

A tentative schedule of events is presented in table 1. The events are scheduled in order to fully take advantage of the 1994 rainfed agricultural season which begins around the month of June. Any great delays in this schedule will comprise the extent of the work and the potential impacts that SANREM CRSP could have

in Santiago.

OUTPUTS AND IMPACTS

The major outputs expected from this work are:

1. An accepted working system for research planning, evaluation,monitoring, and research staff supervision.
2. Process documentation document
3. Established and accepted mechanisms for inter-institutional and interdisciplinary research
4. Publication in scientific journals
5. Extension publications for farmers
6. Six Cape Verdian with M.S. degrees with increased capacity to do on-farm research.
7. Trained INIDA and other collaborating institution scientists, administrators and extension agents on participatory farmer first on-farm research
8. Educational materials on environment for primary schools.

The major impacts expected from this work are:

1. Institutionalization of a framework for long term research planning, evaluation and monitoring at INIDA
2. Institutionalization of a framework for evaluation and promotion of researchers based on accomplishments and merit.
3. Greater retention of highly trained researchers at INIDA.
4. Greater emphasis on on-farm agricultural research.
5. Increased technical capacity at INIDA to do on-farm research.
6. Greater emphasis on inter-institutional and interdisciplinary research
7. An established link with the Extension service
8. An established mechanism to work collaboratively with farmers and disseminate information to them.
9. Established trends towards increased short term productivity and long-term sustainability
10. Greater awareness of environmental issues in general by school age children.

Table 1. PROPOSED SCHEDULE OF EVENTS FOR SANREM IN THE REPUBLIC OF THE CAPE VERDE ISLANDS

YEAR 1--1994

January	.Preliminary work plans completed with the visit to the Cape Verde Islands of Dr.Irma Silva-Barbeau, Technical Consultant and Dr. Constance Neely, Assistant Program Director, SANREM CRSP
Feb./	.Review of the Literature .Process Documentation begins
March	.Finalization of buy-in agreement between USAID/Praia and SANREM CRSP.
April	.PLLA .Framework Plan write-up .Selection of M.S. candidates.Process Documentation continues
May	.General Training on Farmer First and Watershed Approach (Most of the INIDA researchers are literate in French this training could be done with training Ouagadougou) .M.S. students enrolled in English language .Begin elaboration of individual work plans .Process Documentation continues
May	.Finalization of the work plans .Review of the work plans by the GTC .Workshop on farm first on-farm trials .Long term advisor in place .Process Documentation continues
June	.Begin implementation on-farm rainfed research .Process Documentation continues
July-Aug	.Monitor and Evaluation Training and Monitoring and Evaluation System in Place .M.S. candidates begin M.S. Programs in the U.S. .Agricultural management progress quarterly report .Process Documentation continues
Sept-Oct.	.Begin implementation on-farm irrigation projects .Process Documentation continues
Nov. Dec.	.Data collection and analysis .Agricultural management progress quarterly report .Six-month evaluation of agricultural planning, .coordination, and research staff supervision .Process Documentation continues

YEAR 2--1995

January	.Data Analysis of previous trials .Write-up of Results and Recommendation .Research on irrigated lands with horticultural crops continue. .Process Documentation continues
February	.Dissemination of results to farmers, other researchers, PVO, etc. .Research on irrigated lands with horticultural crops continue .Process Documentation continues
March	.In-country training activities .Research on irrigated lands with horticultural crops continue .Monitoring and Evaluation of 1994 research .Agricultural management progress quarterly report .Process Documentation continues
April	.Planning of Rainfed agriculture based on the 1994 results .Process Documentation continues
May	.Training/workshop on farmer first on-farm research and SANREM Watershed approach. .Long term trainees arrive in Cape Verde to implement M.S. thesis research. .Process Documentation continues
June	.Begin implementation on-farm rainfed research .Agricultural management progress quarterly report .Bi-yearly evaluation of agricultural planning, coordination and research staff supervision .Process Documentation continues
July-Aug	.Monitor and Evaluation Training and Monitoring Evaluation System in Place .Process Documentation continues
Sept-Oct. Sept.	.Begin implementation on-farm irrigation projects .Agricultural management progress quarterly report .Process Documentation continues
Nov.-Dec. Dec.	.Data collection, and analysis .Agricultural management progress quarterly report .Process Documentation continues

YEAR 3--1996

January	.Data Analysis of previous trials .Write-up of Results and Recommendations .Bi-yearly evaluation of agricultural planning, coordination, and research staff supervision .Research on irrigated lands with horticultural crops continue. .Process Documentation continu s
February	.Dissemination of results to farmers, other researchers, PVO, etc. .Research on irrigated lands with horticultural crops continue .Process Documentation continues
March	.In-country training activities .Agricultural management progress quarterly report .Research on irrigated lands with horticultural crops continue .Process Documentation continues
April/May	.Monitoring and Evaluation of 1994 research .In-country training .Dissemination of results to farmers, other researchers, PVO, etc .Process Documentation continues
June	.Bi-yearly evaluation of agricultural planning, coordination, and research staff supervision .Agricultural management progress quarterly report .Process Documentation continues
July-Aug.	.Monitor and Evaluation Training and Monitoring Evaluation System in Place .Process Documentation continues
Sept-Oct. Sept.	.Begin implementation on-farm irrigation projects .Agricultural management progress quarterly report .Final evaluation of agricultural planning, coordination, and research staff supervision .Process Documentation continues
Nov.- Dec.	.Data collection, and analysis Agricultural management final report .Process Documentation continues

ATTACHMENT J

SANREM CRSP TRIP REPORT
Burkina Faso
October 23-30, 1993

Report by: Chuck Rhoades **Contract No: LAG-4198-A-00-2017-00**

SANREM Representatives: Chuck Rhoades, University of Georgia

Saturday, 23 October
Travel Paris to Ouagadougou

En route met with Mark Buccovich of USDA Forest Service-Forestry Support Program. Mark is travelling to Burkina to attend the symposium. Mark has recently joined the FSP (FSP has actually changed its name to something else). He will be in charge of the African projects.

Sunday, 24 of October
Met with researchers and development workers as they arrived for the symposium.

Monday-Wednesday 25-27
Attended Parc Agroforestry conference in Ouagadougou. The conference was organized by ICRAF, IRBET, LTC, and CILSS. It was held at the of UNEP headquarters in Ouagadougou. The objectives of the conference were to unite researchers and development workers involved in natural resource management projects in semi-arid Africa. The specific objectives were the following:

- to review biophysical and socioeconomic role of trees in cropped fields

- to identify existing management techniques of the parkland systems which could be readily accessible by extension services, development projects, and NGO's

- to identify areas of further research including farming systems research and the need for appropriate policies addressing land/tree tenure and user-rights issues.

Close to 200 people working in Semi-arid regions of West and Southern Africa attended the workshop. The symposium consisted of 3 days of presentations and a half day field trip (see attached schedule). Presentations were divided amongst 3 subgroups: Characterization of agroforestry parklands; Biophysical interactions; Socio-economics and tenure. Keynote papers were "Essentials and cases of wind protection from scattered trees and shelterbelts" by C.J. Stigter (Wageningen) and Tree tenure and farmed parkland agroforestry systems of the Sahel: Constraints and opportunities by M.S. Freudenberger (U of Wisc.). The conference proceedings will be peer-reviewed and published by ICRAF.

Wednesday, 27
Visited the USAID mission. Spoke to Rudy Vigil. He felt that things were moving ahead better for SANREM, now that Laurant was coordinating SANREM activities in Burkina. He also felt that the collaborators needed to see the work plan in order to get a better idea of how they would fit in with the overall project.

Thursday, 28
Field trip for Parc symposium. The 1/2 day field trip visited Karite and Acacia albida parclands west of Ouaga (Koukoulougou). The chief of Koukoulougou is famous in the region for his Karite orchard. He planted the tree 45 years back, in spite of the local belief that he who plants a tree will die before the tree comes to fruiting age. He planted them without any protection from animals, watering or weeding. The trees started producing after around 25 years and now, villagers collect Shea butter nuts from the trees and trade and sell them locally.

Spoke with John Dickey over the phone. We discussed some of his perceptions about how SANREM is getting started. He is concerned that his recommendation to work closely with INERA has been ignored. He described the traditional hierarchy in Burkinabe society and his attitude that SANREM should not expect the type of democratic decision-making structure that may be possible in the US or elsewhere.

Meeting with Chin Ong, senior scientist from ICRAF. Chin is proposing to set up an ICRAF project to examine Parc land management. He has pulled together African and expatriate researchers to investigate different biophysical aspects of the land use system. The proposed study site lies to the south of Ouaga, near Sapone. The site was selected based on potential relation with the NGO, Save the Children, that is working in the area. The connection between the proposed project and currently ongoing ICRAF-SALWA projects in Burkina is unclear.

Visited Bunasols, the national soils laboratory in Ouaga. The laboratory is fairly well equipped, though the equipment appears quite old. Tidani PARE, the director of the lab, gave us a warm welcome and seemed interested in working with SANREM. They are willing to run methods not currently being used in the lab, if the proper equipment and expertise are available. Bunasol has a Skalar autoanalyzer that runs Total and extractable N, Total P, etc. They have a Spectrophotometer (Pye SP6-350), a Flame Photometer (Corning 400), and an AA Spec 2380 (Perkin-Elkin). They run water and soil samples, but no forage samples (ie. no polyphenols or lignin).

Friday, 29
Trip to Donsin with Laurant Millogo, USAID; Fredric Kambou, INERA; Sara Workman, Winrock OFPEP Project (Sara is UGA alumni from Inst of Ecology and an RPCV from Burkina); Mark Buccovich, USDA-Forest Service International Support Program.

The trip was organized and led by USAID liaison to SANREM, Laurant Millogo. The directors of INERA, IDR and IRBET were notified prior to the trip, in order to invite participation from all the collaborators. On arriving in Boulsa, the party stopped by the Plan International compound. Ambroise Nitiema was visiting another Plan village. We communicated our interest in visiting Donsin. No one from Plan was free to accompany us.

The objectives of the trip were to renew contact with the village, to visit RSP research activities at the site, and to take a limited number of soil samples in order to get an idea of the soil conditions in Donsin.

First stop was at the RSP house to look for the RSP extensionist Salif (Salif the magnificent, was a star of the SANREM rapid rural appraisal activity in May), and the Plan extensionist (his house is near the INERA house). From there we stopped by to greet the chief. He seemed to be doing pretty good; Donsin is enjoying a good harvest of sorghum and millet.

RSP researcher, Kambou has set up a very interesting soil reclamation/ mulch management project on the degraded land off the main road into Donsin. They are comparing Zai holes, paillage (straw mulch), Zai and paillage combined, and a no-mulch control. The highest sorghum yields are with the combined Zai and Paillage. There was no clear difference between the Zai and the Paillage treatments. The trial surrounded by a live fence of *Acacia seyal* and *Acacia sieberiana* were planted inside a chain-link fence.. The trees are between 40 and 50cm tall after one season. The mulch systems seem effective at slowing surface water movement, so soil is accumulating on the plots.

We sampled one of the soil pits dug by the RSP team, as well as 4 cropland trees.

Saturday, 30
Coffee with Ed Robbins. He expressed similar views to those of John Dickey, that SANREM must present a clear, coherent project to the national collaborators.

Lunch with John Dickey (RSP), Jean-Marc Boffa (Purdue PhD student), and their families.

Departure from Ouaga.

PROGRAMME DU SYMPOSIUM
SYMPOSIUM PROGRAM SCHEDULE

Lundi/*Monday*, 25 OCT.

09 00 : - Ouverture/*Opening*
- Présentation du programme/*Programme Overview*

09 35 : Communications principales/*Keynote Papers*
Présidence/*Chair* :
Rapporteurs/*Rap.* :

Stuck in Paris
Air France Strike

- 09 35 : Caractérisation des parcs — M. ~~BAUMER~~

- 10 20 : Essentials and cases of wind protection from scattered trees and shelterbelts — C.J. STIGTER

- 11 25 : Tree tenure and farmed parkland Agroforestry systems in the sahel : Constraints and Opportunities — M.S. FREUDENBERGER

- 12 05 : Informations sur les Sessions thématiques *Information on themes sessions* — E.G. BONKOUNGOU

- 12 15 : Suspension/*Break*

- 15 00 : Sessions thématiques/*theme sessions*

Lundi/*Monday* 25 OCT.

Session thématique n° 1 : CARACTERISATION DES PARCS AGROFORESTIERS
Theme session n° 1 : CHARACTERIZATION OF AGROFORESTRY PARKLANDS

Présidence/*Chair* : M. BAUMER
Rapporteur/*Rap.* : 1. J.M. OUADBA
2.
3.

15 : 00	Farmed parkland in the Nigeria Savanna.	S.S. SANUSI
15 : 25	Trees in agricultural production system in the semi-arid zone of Nigeria.	E.N.O. IWUAFOR and A.B.I. IGBOANUGO
15 : 50	Les parcs des monts Mondara (Cameroun) :essai historique.	C. SEIGNOBOS
16 : 15	La palmeraie à Borassus aethiopum Mart., un système agroforestier traditionnel menacé au Sénégal : techniques d'aménagement pour une utilisation durable.	B. SAMBOU
16 : 40	PAUSE/*Coffee break*	
17 : 00	Faidherbia albida parkland in Ethiopia.	A. TESFAYE
17 : 25	Etude historique et géographique de l'évolution des parcs arborés sur un terroir du Nord de la Côte d'Ivoire.	C. BERNARD, R., PELTIER, B. GABORIAU, N. OUATTARA M. OUALBADET
17 : 50	Essai de caractérisation d'un parc à Acacia albida.	I. ALHOUSSEINI

Mardi/*Tuesday*, 26 OCT.

Session thématique n° 1 : CARACTERISATION DES PARCS AGROFORESTIERS (suite)
Theme session n° 1 : CHARACTERIZATION OF AGROFORESTRY PARKLANDS (cont'd)

07 : 30	Farmed parkland agroforestry system in Katsina State of Nigeria.	G.O. OTEGBEYE and J.O. OLUKOSI
07 : 55	Integration of Parkia species in the agro-sylvo-pastoral systems in West Africa.	N.E. SABIITI
08 : 20	La gestion des vergers à Karité et Néré dans la commune rurale de Tanougou, Nord-Ouest, Bénin.	N. SOKPON
08 : 45	Fruit trees in the sorghum-cowpea systems of Kano, Nigeria : Their management, use and agroforestry potential.	I.O.O. AIYELAAGBE
09 : 10	Composition et structure floristique des parcs agroforestiers de Donsin.	P.P. NIKIEMA et G. YAMEOGO
0. .	Distribution spatiale des principales espèces agroforestières dans le système agraire du Bulkiemdé.	B. YELEMOU, I. ZOUNGRANA et F. HIEN
10 : 00	PAUSE/*Coffee break*	
10 : 20	Analyse chronoséquentielle de la gestion de l'arbre dans les parcs à Karité du terroir de Thiougou, province du Zoundweogo, B.F.	J.M. BOFFA et S.J.B. TAONDA
10 : 45	Dynamique et régénération naturelle des parcs arborés en région sahélienne (Passoré, B.F.).	H.J.M. GISS BERS J.J. KESSELER, K.M. KNEBEL et M. SAWADOGO
11 : 10	Annonces/*Annoucements* Suspension/Break	

Lundi/*Monday* 25 OCT.

Session thématique n° 2 : INTERACTIONS BIOPHYSIQUES
Theme session n° 2 : BIOPHYSICAL INTERACTIONS

Présidence/*Chair* : Prof. STIGTER
Rapporteurs/*Rap.* :

15 : 00	L'état des connaissances sur les interactions arbre/herbe dans les zones semi-arides d'Afrique.	M. GROUZIS et L.F. AKPO
15 : 25	Water and energy relations of windbreak trees in the Sahel.	D.M. SMITH, P.G. JARVIS and J.C.W. ODONGO
15 : 50	Root distrib Nutrient and water use by two Sahelian woody species: Acacia seyal and Sclerocarya birrea.	J.J.R. GROOT and A. BURGARE
16 : 15	Effet de la grandeur du tronc sur le gradient de fertilité aux environs de Faidherbia albida.	K.A. MAI MOUSSA, J.H. WILLIAM and R.D. STERN
16 : 40	PAUSE/*Coffee break*	
17 : 00	Evolution de la fertilité d'un sol à parc.	R.D. FALL
17 : 25	Seasonal Patterns of Nitrogen Mineralization and Soil Moisture Beneath Acacia albida (syn. Faidherbia albida) on the Lakeshore Plain of Malawi.	C. RHOADES
17 : 50	Etude des relations Neem-Sol-Sorgho dans les systèmes agroforestiers du Bulkièmdé (Burkina Faso).	I. ZOUNGRANA, B. YELEMOU, et F. HIEN

Mardi/*Tuesday*26 OCT.

Session thématique n° 2 : INTERACTIONS BIOPHYSIQUES (suite)
Theme session n° 2 : BIOPHYSICAL INTERACTIONS (cont'd)

The influence of Karité and Néré trees in parklands on sorghum yields.	J.J. KESSLER
L'arbre dans les systèmes agroforestiers traditionnels de la province du Bazéga : influence du Karité, du Néré et de Acacia albida sur le Sorgho et le Mil.	A.A. MAIGA
The effects of tree densities on sorghum and millet yields. Evidence from two central plateau villages in Burkina Faso.	M.K. BERTHELSEN et D. KABORE
Karité et productions agricoles dans le nord de la Côte d'Ivoire.	D. LOUPPE
Influence du Faidherbia albida sur la production de la culture cotonnière au Nord-Cameroun.	O. EYOG Matig et C. LIBERT
Competition between sorghum and Azadirachta indica, Albizzia lebbeck and Leucaena leucocephala in two agroforestry systems in semi-arid Burkina Faso.	Y. TILANDER, G. OUEDRAOGO and F. YOUGMA

PAUSE/Coffee break

Mardi/*Tuesday*, 26 OCT.

Session thématique n° 2 : **INTERACTIONS BIOPHYSIQUES (suite)**
Theme session n° 2 : BIOPHYSICAL INTERACTIONS (cont'd)

10 : 20	The performance of some agroforestry parkland trees on a sahelian vertic soil.	I. VERINUMBE
10 : 45	Production fruitière de F. albida et effets des insectes spermatophages et du bétail consommateur de gousses sur la régénération de l'espèce à Watinoma.	D. DEPOMMIER
11 : 10	The application of direct seeding techniques in agroforestry parklands in Burkina Faso: Potential and perspectives.	D. A. WARDELL
11 : 35	Propagation trials of some undomesticated indigenous parkland fruit trees in the Semi-Arid zone of Nigeria.	A.B.I. IGBOANUGO

12 : 00 Annonces/*Annoucements*
Suspension/Break

Lundi/*Monday*, 25 OCT.

Session thématique n° 3 : SOCIO-ECONOMIE ET TENURE
Theme session n° 3 : SOCIO-ECONOMY AND TENURE

. Présidence/*Chair* : M.S. FREUDENBERGER
Rapporteurs/*Rap.* :

15 : 00	Importance socio-économique et agrotecthnique de l'arbre dans le système agraire villageois en zones semi-arides.	S. MAHOTIERE, K. COULIBALY, M. SISSOKO, B. LY et A. BERTHE
15 : 25	Socio-economic evaluation of key economic trees in northern Nigeria: Farmers' perspective.	J. O. OLUKOSI
15 : 50	"Socio-economics, land and tree tenure (socio-economic aspects forest laws)".	L. BOJANG
16 : 15	Aspects juridiques de la gestion des parcs agroforestiers.	S. ZEBA
16 : 40	PAUSE/*Coffee break*	
17 : 00	The role of farmed parklands in northern Ghana Agriculture.	H. RUBAT, E. FREY, A.L. NYAMEKPE, C.N. KASEI
17 : 25	Le savoir paysan en contexte : Etude de la dynamique du parc de Dossi, Burkina Faso.	ZOUNGRANA, I., B. YELEMOU et F. HIEN
17 : 50	Perception paysanne du rôle des arbres dans le système de production.	. OUEDRAOGO
18 : 00	Suspension/*Break*	

Mardi/*Tuesday*, 26 OCT.

Session thématique n° 3 : SOCIO-ECONOMIE ET TENURE (suite)
Theme session n° 3 : SOCIO-ECONOMY AND TENURE (cont'd)

07 : 30	Les pratiques et savoirs paysans dans la gestion des parcs au Bulkiemdé-Sanguié.	F.R. YOUGMA
07 : 55	Researching tree management strategies in Thiougou village, Central Plateau, Burkina Faso.	E. ROBINS
08 : 20	Commercialisation des produits forestiers provenant des parcs agroforestiers.	Z.N.R. NIKIEMA
08 : 45	Le Karité et le Néré dans les exploitations agricoles de la région de Sikasso, Rep. du Mali.	A.M. KOUYATE, F. DIAKITE et A. EGLI
09 : 10	Analyse économique de quelques activités des femmes liées à l'utilisation de produits non ligneux des essences forestières locales dans le sud-ouest du Burkina Faso.	A. SIDIBE
09 : 35	"Socio-économique du Karité au Burkina Faso".	T.H. KABORE
10 : 00	PAUSE/*Coffee break*	
10 : 20	Essai d'Interprétation Agronomique des Parcs agroforestiers des savanes africaines.	G. SERPANTIE
10 : 45	Annonces/*Announcements* Suspension/Break	

Mardi/*Tuesday*, 26 OCT.

15 : 00 Groupe de travail/*Working groups* Présidence/*Chair* Rapporteurs/*Rap.*

1. Caractérisation des parcs
   Characterization of parklands

2. Interactions biophysiques
   Biophysical Interactions

3. Socio-économie et tenure
   Socio-economy and tenure

Merdredi/Wednesday, 27 OCT.

10 : 00 Discussion et adoption des conclusions et recommandations du Symposium en plénière/
Discussion and adoption of conclusions and recommendations of the Symposium in plenary session

16 : 00 Clôture/*Closing ceremony*

Jeudi/Thurday, 28 OCT.

07 : 00 - 14 : 00 Visite de terrain/*Field trip*

ATTACHMENT K

ACRONYMS

ACRONYM	MEANING
AARD	Agency for Agricultural Research and Development
ACDI	Agricultural Cooperative Development International
ACIPHIL	Associacion Consultants Independente (Philippines), Inc.
ACORD	Association for Community and Rural Development
ADB	Asian Development Bank
ADRK	Association Pour le Development de Regione de Kaya
AFRD	Agency for Forest Research and Development
AU	Auburn University
AVRDC	Asian Vegetable Research and Development Center
(A)WID	Association for Women in Development
BAND	Bukidnon Association for National Development, Inc.
BHW	Barangay Health Worker
BIDANI	Barangay Integrated Development Approach through Nutritional Improvement
BIOTROP	Center for Tropical Biology
BOD	Board of Directors
BSWM	Bureau of Soil and Water Management
CAC	Community Advisory Council
CC	Coordinating Committee
CFM	Community Forestry Management
CIAT	International Center for Tropical Agriculture
CIMMYT	International Maize and Wheat Improvement Center
CIP	International Potato Center
CLT	Certificate of Land Transfer
CMU	Central Mindanao University
CRPA	Centre Regionale Pour Production Agricole
CSU	Colorado State University
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DECS	Department of Education, Culture, and Sports
DENR	Department of Environment and Natural Resources
DESFIL	Development Strategies for Fragile Lands
DILG	Department of Internal and Local Governments
EAP	Escuela Agricola Panamerica - El Zamorano

ACRONYMS

ACRONYM	MEANING
EDC	Eros Data Center
ERDB	DENR Environmental Research and Development Bureau
FAO-APAN	Foreign Agriculture Organization - Asisan Pacific Agroforestry Network
FSSRI	Farming Systems and Soils Research Institute
FUNDAGRO	Fundacion Para El Desarrollo Agropecuario
GIS	Geographic Information Service
GO	Governmental Organization
GPS	Global Positioning System
GTC	Global Technical Committee
HPI	Heifer Project International
HRD	Human Resource Development
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 Aquatice Resource Management
ICRAF	International Council for Research in Agroforestry
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDR	Institut de Developpement Rural
IESAM	Institute of Environmental Science and Management
IITA	International Institute for Tropical Agriculture
ILCA	International Center for Livestock for Africa
INERA	Institute National Etude et Recherche d'Agricole
INIDA	National Institute for Agricultural Research and Development
INRA	Institut National Pour Recherche Agricole
IPD-AOS	Institut Pan-African Pour Development - Afrique Del Quest Et Sahel
IPM	Integrated Pest Management
IRBET	Institute Recherche Biologie Ecologie Tropical
IRRI	International Rice Research Institute
ISF	Integrated Social Forestry Program
ISNAR	International Service for National Agricultural Research
LASAS	Laboratory for Sustainable Agroecosystems
LGU	Local Government Unit
MIAC	Midwest International Agriculture Consortium

ACRONYMS

ACRONYM	MEANING
MBRLC	Mindanao Baptist Rural Life Center
MMWDP	Muleta-Manupali Watershed Development Program
MUCARD	Muslim-Christian Agency for Rural Development
MUSUAN	Mindanao Upland Stabilization and Utilization Through Proper Agroforestry Networking Program
NAPOCOR	National Power Company
NECI	Network for Environmental Concerns, Incorporated
NFA	National Food Authority
NGO	Non-Governmental Organization
(N)IPAS	(National) Integrated Protected Area Site
NIA	National Irrigation Association
NPA	New People's Army (the Communist rebel army)
NPC	Philippine National Power Corporation
NRDI	Nature's Rehabilitation and Development Concerns
OFPEP	On-Farm Productivity Enhancement Program
ONRAD	Office of Rural and Agricultural Development of USAID
PCARRD	Philippine Council for Agriculture, Forestry, and Natural Resource Research and Development
PLLA	Participatory Landscape-Lifescape Appraisal
PME	Participatory Management and Evaluation
PO	People's Organization
PPAEP	Pilot Provincial Agricultural Extension Project
PPI	Plan International
PVO	Private Voluntary Organization
RRA	Rapid Rural Appraisal
SALT	Sustainable Agricultural Land Technology
SANREM CRSP	Sustainable Agriculture and Natural Resource Management Collaborative Research Support Program
SECAL	Sectoral Adjustment Loan Program (of the DENR)
SHAISI	San Herminiglido Agro-Industrial School Foundation
TC	Technical Committee
TU	Tuskegee University
TOUCH	Technology Outreach and Community Help Foundation, Inc.
UGA	University of Georgia

ACRONYMS

ACRONYM	MEANING
UPLB	University of the Philippines at Los Baños
UPWARD	User's Perspective with Agricultural Research and Development
USAID	United States Agency for International Development
USDA	United Stated Department of Agriculture
VPI	Virginia Polytechnic Institute and State University
VOS	Voluntary Offer of Sale (of land for redistribution under land tenure laws)
WARD	Watershed Applied Research and Development Project
WSU	Washington State University
WWF	World Wildlife Fund
UW	University of Wisconsin