

PROJECT DATA SHEET

L. TRANSACTION CODE

A = Add
C = Change
D = Delete

Amendment Number
6

DOCUMENT CODE
3

COUNTRY/ENTITY

1. PROJECT NUMBER

931-1311

2. PROJECT TITLE (maximum 40 characters)

Soil Management-CRSP

S&T/AGR/RNR

10

6. PROJECT ASSISTANCE COMPLETION DATE (PACD)

MM DD YY
01 9 31 0 9 5

7. ESTIMATED DATE OF OBLIGATION

(Under "L" below, enter 1, 2, 3, or 4)

A. Fiscal FY B. 1 1 2. Quarter 4

C. Fiscal FY 0 4

8. COSTS / \$000 OR EQUIVALENT \$1 =

A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Approved Total	675	75	750	43152	3300	46452
(Grant) S&T/AGR	(675)	(75)	(750)	(34152)	(3300)	(37452)
Mission/Regional Bureaus	()	()	()	(9000)	()	(9000)
Other C.S.						
L. Non-Federal	250		250	7833		7833
Z						
Host Country						
Other Donor(s)						
TOTALS	925	75	1000	50985	3300	54285

9. SCHEDULE OF AID FUNDING (\$000)

A. APPRO. RELATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) ARD	1411	963		21551		5102		37452	
(2)									
(3)									
(4)									
TOTALS				21551		5102		37452	

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 6 positions each)

A. Code
B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To conduct soil research in three agroecological zones: the humid tropics, semi-arid tropics and the tropical acid savannas; to increase productivity of these marginal soils on an agronomically, economically and environmentally sound basis.

14. SCHEDULED EVALUATIONS

15. SOURCE/ORIGIN OF GOODS AND SERVICES

Location MM YY MM YY Fiscal MM YY COO MI Local Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a _____ page PP. (amendment))

Amend the scope of work to include Soil Management Support Services (931-1229) and Technology for Soil Moisture Management (936-4021), and increase the authorized life-of-project cost from \$32,350,000 to \$37,452,000.

1/ Funds to be contributed by mission, regional bureaus and other AID/W offices are authorized under separate project authorizations.

17. APPROVED BY

Signature: David Bathrick
Title: Director, S&T/AGR

Date Signed: 04 DD YY
10 21 91

18. DATE DOCUMENT RECEIVED BY AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION

MM DD YY
| | | | |

PROJECT AUTHORIZATION AMENDMENT NUMBER 6

Name of Project: Soil Management CRSP

Number of Project: 931-1311

Country: Worldwide

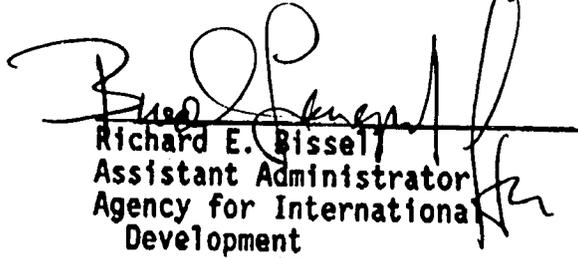
1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, the Soil Management CRSP project was authorized on September 15, 1981, and amended on June 15, 1982, November 18, 1985, May 9, 1986, May 24, 1989 and June 26, 1989. That authorization is hereby further amended as follows:

a. Amend the scope of work to include soil management support services and technology for soil moisture management.

b. The authorized centrally-funded life-of-project funding is increased from \$32,350,000 to \$37,452,000.

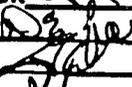
c. A new total of up to \$46,452,000 of A.I.D appropriated funds is approved for use in this project.

2. The authorization cited above remains in force except as hereby amended.


Richard E. Bissell
Assistant Administrator
Agency for International
Development

Date: JUN 27 1991

Clearances:

S&T/AGR, DBathrick  Date 6/20/91
S&T/PO:DSheldon  Date 6/27/91
GC/CP:GWinter  Date 6/20/91
AA/S&T:BLangmaid  Date _____

S&T/AGR:JMalcolm/BBeckett 6/10/91Wang#8390e

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR BUREAU FOR
SCIENCE AND TECHNOLOGY

THRU: DAA/S&T, Bradshaw Langmaid

FROM: S&T/AGR, David Bathrick

SUBJECT: Project authorization amendment #6 for the Soil
Management CRSP (TropSoils) Project #931-1311 (Doc #13113)

PROBLEM: The centrally-funded Soil Management CRSP project 931-1311 was authorized on September 15, 1981. Your authorization is requested to amend the project as specified below:

- a. Amend the scope of work to include soil management support services, and technology for soil moisture management activities.
- b. Increase the authorized centrally-funded life of project (LOP) from \$32,350,000 to \$37,452,000 from the Section 103 (ARDN) account.

The current final year of obligation, FY 1994, and Project Assistance Completion Date (PACD), September 30, 1995, remain unchanged by this amendment.

BACKGROUND: For a considerable time the Office, as it focuses its program more on sustainable agriculture, has been trying to coordinate the various soil projects within the portfolio. In order to make more efficient use of our programs and USDA staff resources and to create a structure from which services to Missions could be facilitated, we made extensive efforts this year to bring within the Soil Management CRSP, the critical elements of the USDA Soil Conservation Service, Agriculture Research Service and Economic Research Service and the Biological Nitrogen Fixation project with the University of Hawaii. From a conceptual perspective, it was envisioned that the structure would create a unique US focal point to better address the increased concerns associated with natural resource degradation throughout the world's poorer countries.

DISCUSSION: This initiative builds on the realization that the USDA and Hawaii projects had complementary activities which directly support the three thrusts of the current five year global plan of the Soils Management CRSP. After preliminary preparations and two workshops held earlier this year, an operational framework for proceeding was developed.

The proposed expansion of TropSoils was presented to the JCARD. The proposal was reported favorably to BIFADEC and accepted. JCARD expressed no reservations but did request that progress with the consolidation and research achievements under the expanded program be reported from time to time.

Participation of USDA in a CRSP is provided for in the CRSP guidelines. Several precedents exist for funding USDA activities through a grant to a university or a PVO. North Carolina State University will not collect overhead on the money passed through to the USDA. The USDA has unique capability in soil resources, particularly at the level of national planning, which will be important in affecting LDC natural resource policies. A brief discussion regarding the USDA elements of the expanded program follows.

Both the support services and moisture management programs were developed under separate interagency agreements (PASAs) with the U.S. Department of Agriculture. The Soil Management Support Services project (SMSS)(931-1229) was successful in promoting U.S. Soil Taxonomy as the world standard classification system and assisted many countries with establishing their own soil surveys. The scientists working in SMSS have established a worldwide data bank of typical soils useful as a reference for classifiers and to guide research and practical recommendations on land and soil management. They will provide the bridge to carry detailed on-site research to extension workers and farmers obviating a lot of preliminary site specific research. The most recent team evaluation strongly recommended more integration of SMSS activities into other S&T/AGR projects.

The Technology of Soil Moisture Management project (TSMM) (936-4021) has focussed on the semi-arid tropics, actively cooperating with TropSoils in the Sahel. It brings successful experience with management of natural rainfall in dry regions with careful analysis of the economic factors controlling adoption and use of advanced management methods. It has conducted major research in the Mediterranean climatic zone as well as in the Sahel but has been constrained by a lack of resources in fertility management. This deficiency will be remedied through fusion with TropSoils. The external evaluation team specifically recommended merger of TSMM with TropSoils.

Both the current PASAs expire this year. Both programs were judged outstanding in their final evaluations. Continuation was recommended in both cases. The efforts were judged to be best continued as integrated activities under unified management. The experience of the two PASAs will bring a strong outreach capability to TropSoils.

During the next three years a new management structure for the CRSP, consistent with the CRSP guidelines and providing adequate representation for all parties will be developed. In addition, means to incorporate the work in biological nitrogen fixation at the University of Hawaii will be sought so that one unified program in soil management may be offered when the CRSP authorization is renewed in FY 1994, reducing the administrative overhead even more.

In that regard, N.P. Kefford, Dean of the University of Hawaii at Manoa, has stated in a letter to you, dated May 9, 1991, that "We plan to work enthusiastically over the next three years to study and develop options

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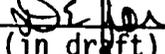
for incorporating NIFTAL into a CRSP framework, and if deemed most desirable by all parties, to be incorporated into the next Global Plan of the Soils Management CRSP. In cooperation with the TropSoils Management Entity, we will explore means of addressing all scientific, technical, and logistical obstacles to development of a truly collaborative and synergistic relationship with the CRSP organization."

The proposed consolidation of the soil and natural resource management portfolio will free both technical and program officers in the Bureau for Science and Technology from duplicative administrative tasks. The first step at consolidation will reduce the number of separate projects in the office and limit the administrative oversight required at all levels. Time will be freed for technical interaction and to acquaint other elements in A.I.D. with the information, assistance and training which are available through TropSoils.

An additional \$1,455,000 will be put into the TropSoils grant this fiscal year. The USDA elements will be added beginning July 26, 1991 when the PASAs expire. The funding period will be extended to May 12, 1992. The target rates of funding are \$2,520,000 per year for the original CRSP, \$600,000 for SMSS and \$720,000 for TSM. A supplemental \$200,000 is provided to cover expanded management and administrative service to be provided by the Management Entity. The actual amounts required for each element of the CRSP, for the period April 16, 1991 to May 12, 1992, are shown in Attachment #4 but based on the budgets proposed in Attachment #3.

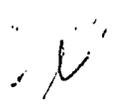
Funding of \$2,300,000 is programmed in the FY 1991 Congressional Presentation. A Technical Notification has been submitted. The FY-91 OYB contains \$3,975,000 for this project and will support activities through May 12, 1992.

RECOMMENDATION: That you sign the attached Project Amendment Number #6.

Clearances:
S&T/AGR/RNR: JMalcolm  date 6/20/91
S&T/AGR: ECarter  date 6/24/91
S&T/PO: DSheldon  date 6/27/91
GC/CP: GWinter (in draft) date 6/20/91


Attachments:

1. Project Data Sheet
2. Project Authorization Amendment Sheet
3. Proposed Amendment to Grant
4. Revised Budget

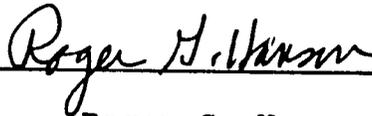


A PROPOSAL TO THE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D. C.

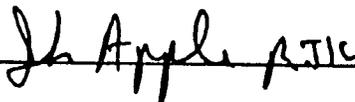
AMENDMENT TO GRANT DAN-1311-G-SS-6018-00,
THE SOIL MANAGEMENT CRSP

Covering the period from July 26, 1991, to September 24, 1994
Requesting Support in the Amount of \$4,672,600

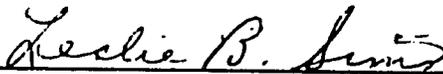
Submitted by



Roger G. Hanson
Principal Investigator
Director of the Management Entity Office

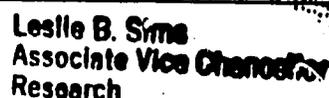


J. L. Apple
Coordinator, University International Programs



Research Administration
North Carolina State University
Raleigh, North Carolina

Date Submitted
MAY 21 1991


Leslie B. Sims
Associate Vice Chancellor
Research

AMENDMENT TO GRANT DAN-1311-G-SS-6018-00,
THE SOIL MANAGEMENT CRSP

I. INTRODUCTION

Natural resources, with soils at the foundation, are the long-term capital on which nations build and grow. Every country has a natural endowment of soil, water, mineral, plant, and animal resources. If the quality of life of its inhabitants is to be improved and sustained, they must be good stewards of these resources. Catastrophic consequences have beset those prior civilizations that allowed degradation of their natural resources beyond the levels capable to sustain them. Similar processes are in progress today in many parts of the world.

Because capital inputs are strongly limiting in underdeveloped and developing countries, the nature, quality, and distribution of land resources strongly govern their utilization for agricultural production. For this reason, the efficient integration of indigenous farmer knowledge into research programs is via a knowledge of the constraints and potentials of soil resources as perceived by farmers. Subsequent cataloguing of this information with baseline soil characterization and classification systems provide a viable avenue for rapid assimilation of new technology by farmers. This integrated approach to technology assimilation for transfer on a Land Management Unit basis also serves for extrapolation of this information to other developing regions having similar soils and socio-economic conditions.

With soils as the basic entity to resource management, sustainable agriculture and issues of climatic stability is becoming a major global concern. The challenge is great, resources limited and interdisciplinary demands almost never ending. These demands will necessitate the strengthening of the Researcher-Policy Makers-Users continuum in the natural resource setting. There are three (3) AID/S&T/RNRM natural resource management programs with focus on systems approach to soil and water management for sustainable agriculture: 1) Soil Management Support Services (SMSS), 2) Technology for Soil Moisture Management (TSMM); and 3) Soil Management Collaborative Research Support Program (TropSoils). The proposed merger of three¹ of these programs, SMSS, TSMM and TropSoils, together into an institutional global plan focus is intended to strengthen the substantive components of this continuum and to enhance the productivity of the program. To enable maximum continuity of these strong programs and to permit the development of a unified global action plan necessitate that this transition take place in stages. The purpose of this amendment to the Soil Management

¹NIFTAL is not included in the funding provision of this amendment.

Collaborative Research Support Program Grant (AID Reference No. DAN-1311-G-SS-6018-00) is to initiate this transition process.

II. BRIEF DESCRIPTIONS OF THEIR PRESENT PROGRAMS

A. Soil Management Support Services (SMSS)

The major areas of activity will focus on: 1) utilization of soil resources information in policy formulation, economic planning and alternative attenuations to global warming; 2) global soil data base development to support modelling activities, farming systems and quantification of soil resources degradation; 3) soil and site characterization to enhance the process of technology transfer; 4) technical support to developing soil and environmental monitoring and strategies and resource management; and 5) outreach activities through organized workshops, field tours, training forums, publications and development of media aids.

The Soil Conservation Services (SCS) of the United States Department of Agriculture (USDA) provides the broad-based technical leadership to this project. Through established networks, International Research Centers and cooperative agreements with Title XII universities technical assistance on soil resource inventories, soil and water management for sustainable agriculture production is provided. Scientific linkages with other USDA-SCS program and their facilities made available from this program to service TropSoils and strengthen InterCRSP activities.

B. Technology For Soil Moisture Management (TSMM)

The project provides research and technical assistance for improving investment decisions in the development of dryland and rainfed agriculture. Over 60 scientists with long-term experience in dryland agriculture research are available to provide short- and long-term technical support. The overall objective is to maintain and improve the soil and water resource base for short-term and long-term utilization and to improve output and income in crop and livestock production systems. The major thrust is to integrate agroclimatic, soil and water management, agronomic and economic data for assessment and analysis of economically, technically and environmentally viable agriculture systems and related policy and program planning options and improve scientist linkages between U.S., developing country and international scientists. The project provides technical backstopping and outreach leadership in the Land Management approach to developing sustainable agriculture production and enhancing natural resource management to greatly improve overcoming desertification problems in the semi-arid tropics. Leadership in verification and quantification studies on short- and long-term socio-economic impacts and improvements

from process and developmental research can also be provided through the expertise in this program.

The Agricultural Research Service (ARS) and Economic Research Service (ERS) of the United States Department of Agriculture (USDA) provide the broad-based technical support and expertise to this project. Through cooperative arrangements with Title XII universities involved in bilateral projects in developing countries, networks are developed for collaborative research and exchange of information on dryland agriculture systems management. Scientific linkages are established with ongoing TropSoils activities, International Institutions and other programs to initiate research on water and wind erosion, potential control interventions and quantification of environmental and socio-economic impacts.

C. Integration of SMSS and TSMM Activities with TropSoils

The goal of the Soil Management CRSP is to develop and adapt improved soil-management technologies that are agronomically, ecologically and economically sound for developing countries in the tropics. To accomplish this goal the Soil Management CRSP has focused its research thrusts on the major constraints to: 1) Sustainable Agriculture Production; 2) Natural Resource Management; and 3) Outreach. A brief, but complete description of the Soil Management CRSP global plan is attached in Appendix III. The following are activities within the Soil Management CRSP global plan for which the program activities of SMSS and TSMM offer the greatest opportunity for integration and strengthening of soil management activities during this three year merger period.

1. Sustainable Agriculture Production - The successful management of resources for agriculture to satisfy changing human needs while maintaining or enhancing the natural-resource base and avoiding environmental degradation.

a. Nutrient Deficiencies and Losses - Soils in the tropics are often low in organic matter, low and deficient in one or more primary and secondary plant nutrients. Low crop yields attributable to poor plant nutrition and accelerating soil degradation are major contributors to land abandonment, continuous destruction of tropical rainforests and desert encroachment in the semi-arid regions. TropSoils research has focused on processes of nutrient deficiencies and plant requirements in site specific dynamics of rejuvenation of tropical soils. The SMSS and TSMM programs will incorporate these TropSoils research activities into the International Soil Taxonomy data base to facilitate collaborative research networking over larger segments of the major agroecological zones. TropSoils network strength is in Central and South

America whereas SMSS and TSMM have network strengths in Africa and Asia.

b. Soil Physical Limitations - Soils of the tropics are characteristically highly weathered and, because of climate and other natural factors, are often low and variable in organic matter. The overuse of traditional management systems leads to reduction in organic matter, soil physical degradation, water and/or wind erosion and loss of productivity all contributing to shifting cultivation. The TropSoils and TSMM will bring together strong physical, chemical and economic programs focused on understanding processes on physical degradation of tropical soils and the micro and macro-economic impacts of rejuvenation. The similar program interest in Mali, Burkina Faso and Niger are targeted as the initial countries to develop complementary programs.

c. Topographic Limitations - Landscape configurations impose special challenges in the development of appropriate soil management technologies. Soils of the steep lands are especially vulnerable to degradation as a result of water erosion. Selection of crops, cultivars, cropping mixtures and sequences and other farm enterprises without considering landscape configurations and the human resource element often results in rapid soil degradation and loss in production of food, fuel, fiber and basic materials for construction. Some landscapes should not be disturbed while others necessitate management as complete units. TropSoils has initiated an Integrated Management of an Agricultural Watershed project in Niger addressing soil systems with topographic limitations. The SMSS program can assist with the physical characterization and selection of appropriate interventions. The TSMM program will provide base-line economic assessment to facilitate the quantification of the monetary returns and the physical-social enhancement benefits to the resource base. Methodologies developed in this model program will serve to strengthen the TSMM dryland network.

d. Water Stress - Moisture stress, natural or imposed, may result from either excessive or inadequate amounts of water. The TSMM expertise in efficient water utilization, water harvesting technologies and soil-plant-water modeling in dryland areas will bring strong components to outreach activities. This linked with SMSS soil characterization activities and TropSoils research activities in humid, savanna and semi-arid areas will provide the strong technical base to formulate long-term land use policies for tropical agriculture.

2. Natural Resource Management - The management, conservation, and enhancement of those natural resources which are most critical to meeting food, fiber, fuel and shelter

material requirements, as well as preserving genetic diversity and attenuating climatic change.

a. Land-Clearing Pressure - Population growth in the tropics places extreme pressure on the soil resources. As the number of farms increases, fallow periods are shorter, productivity reduced and farmers must clear more land to harvest the same quantity of production. The Soil Management CRSP research has focused on developing soil management options for sustainable production systems appropriate to the soil resource base. The Soil Management CRSP, SMSS and TSMM programs will focus on soil resource characterization, increased productivity of the potentially most productive soils, land carrying capacities and short and long-term socio-economic implications of these research technologies.

b. Inadequate Resource Information - Soil resources are the foundation on which sustainable agriculture production programs must be built. Policies to achieve sustainable agriculture production must be based on adequate technical assessment of the natural resource inventory. These inventories are often incomplete or not available. Almost no reliable information exists on how forest conversion effects soil dynamics and production sustainability. The SMSS program will provide technical support to developing technical soil resource inventory needed to formulate sustainable agriculture production policies. The TropSoils and TSMM programs will work together to develop the soil management and socio-economic resource information needed for rational formulation of land use policies.

c. Production Demand Pressures - Population growth, accompanied by increased demand for food, fiber, fuel and construction materials, places extreme pressure on soil resources. Larger populations often impose increased demands on foreign exchange earnings needed for importation of basic industrial materials. Often this can only be supplied from export of agricultural commodities placing additional demands on the soil resource base. TropSoils, SMSS and TSMM will work collaboratively to develop cost effective options assessments to meet internal basic human needs and commodity selection for export that provide an economic competitive advantage to enhance foreign exchange earnings.

3. Outreach - Those extrapolations, communications, training, networking, and decision-support activities which translate research into useful knowledge.

a. Number And Diversity Of Users - People throughout the developing countries lack adequate soil-management technologies. They are diverse in their needs, languages, and cultures. Extension and communication systems in most developing countries are rudimentary, ethnic, cultural, and have linguistic

barriers. The strong outreach components to the SMSS and TSMM programs will offer leadership to the quantification of these diversities and the formulation of culturally sensitive needs for soil management technologies.

b. Number and Diversity of Soils - To be effective, soil management practices for sustainable production must accommodate a range of conditions including soil chemical and physical processes, crop selections and cultivars, climate and landscape, and social and economic conditions. While certain soil-management problems are common to many sites, solutions appropriate for one location may be inappropriate for another. The SMSS program can provide the soil taxonomic bases for transfer of appropriate soil management technologies to soils within similar characterization units. These services will provide the strong base upon which TropSoils and TSMM can provide leadership in developing and training in research based soil management decision support systems.

c. Information Knowledge Gaps - Transfer of soil management technologies is often delayed because of the gap between researcher, policy maker and the ultimate user. This gap is difficult to bridge even with the use of Decision Support Systems and Geographic Information Systems because of the differences among the Soil Taxonomic and Land Use Assessment Units presently available. The SMSS program will provide leadership in inter-taxonomy-land use interpretations to assist TropSoils and TSMM input into developing activities to narrow this knowledge gap.

d. Lack of Skills and Research Capability - A constraint to Sustainable Agriculture Production and Natural Resource Management is the shortage of trained professionals to implement appropriate policies and programs. The Soil Management CRSP has the institutional strength to provide education, training, and technical backstopping in soil management to sound natural resource management and sustainable agriculture production. The TSMM and SMSS programs will provide workshop, forums and short-term training in support of long-term human resource development to new and emerging institutions in the tropics.

While developing countries in the tropics share similar constraints to Sustainable Agriculture Production, Natural Resource Management and Outreach, the resolving of these constraints must be ecologically, culturally and economically sensitive. Therefore, the operational strategy will be formulated with these sensitivities in their proper perspective.

III. PROGRAM MERGER PROCESSES - CALENDAR AND EVENTS

A. Management During Merger Period (9/91 - 9/94)

The Soil Management Collaborative Research Support Program (TropSoils) grant will be amended to merge the Soil Management Support Services (SMSS) and the Technology for Soil Moisture Management (TSMM) programs into a single administrative unit. The time from 9/91-9/94 (end of TropSoils present grant) shall be referred to as the merger period. During this three (3) year merger period, the SMSS and TSMM plans of work, included as appendix to this document, shall be funded by this grant amendment from AID/S&T to TropSoils as earmarked funds that will in turn be subgranted, or other administrative instrument, through USDA to support these program activities of ARS, ERS and SCS.

The funds as received from AID shall be transferred by subgrant or other suitable instrument from the Soil Management CRSP Management Entity to the subgrantee institution, USDA. The TropSoils Management Entity Office shall be responsible for preparing the necessary subgranting instrument and transfer of funds in accordance to institutional policies and level of approved budgets. In addition, the TropSoils program activities will need to be continued and administered under their separate funding as outlined in their global plan approved by JCARD and BIFAD in the 1989-1994 grant extension document.

The present organizational structures for SMSS, TSMM and TropSoils will need to be maintained throughout much of the merger period because the funding mechanism so dictates. This will be necessary to also insure continuity of program activities and will place additional demands on the principal investigators. To provide for a broader programmatic and organization representation, a new organizational structure will need to be developed and necessary adjustments made during the 9/91 - 9/94 merger period so that the merger is complete at the time the 1994-1999 grant period starts. This will necessitate additional administrative expenses, included as part of this subgrant, to insure continuity of present programs and equitable representation in the new administrative structure.

The participating programs and/or institutions will be responsible for providing necessary reports and accountability of funds in line with the original Soil Management CRSP grant or as this amendment will address this operational monitoring.

B. Reorganization of the Administrative Structure

1. The Present CRSP Structure

The present administrative structure of the Soil Management CRSP encompasses: 1) Director of the Management Entity Office; 2) Board of Directors, one from each participating U. S. university; 3) Advisory Council, one representative from each participating institution; 3) Program Coordinators, composed of U.S. and host/participating country research coordinators; 4) Technical Committee, one representative from each U.S. university; and 5) External Evaluation Panel, (three members) approved by the Technical Committee, Board of Directors, AID, JCARD and BIFAD. Their responsibilities are defined in the Soil Management CRSP By-Laws.

2. Organization of the New Structure

It is proposed that by February-March 1992, the policies and processes for the new administrative structure be formulated although membership selection and operations would not necessarily need to be completed by this time. This would include, but not necessarily be restricted to revising of the present Soil Management CRSP by-laws to set the framework for the new administrative structure, policies and responsibilities of the various structural units.

3. Forward Planning Steering Committee

The forward planning activities, unlike the 1991-94 operations during this period, will need to include scientists and representatives from the centrally funded project, Nitrogen Fixation of Tropical Agricultural Legumes, NifTAL. To accomplish these ends, a working group (Forward Steering Committee) composed of representation from the Advisory Council, Technical Committee and External Evaluation Panel from TropSoils, and representation selected by SMSS, TSMM, and NifTAL and at least two (2) members outside the participating institutions. This process will be coordinated by the Office of Management Entity of TropSoils in close partnership with USDA, and consultation from AID/S&T/RNRM. The final By-Laws and organization structure will guide the development of the 1994-99 Global Plan and Grant document that will need to pass JCARD and BIFAD approval in accordance to CRSP Guidelines.

C. Preparation of 1994-99 Global Plan and Grant

As stated in Section III.A., the period 9/91 - 9/94 shall be considered the transitional period to develop the procedures and complete the program merger processes. In addition to the reorganization of the administrative structure, workshop activities and mechanisms that will lead to the

development of the Global Plan, Research Programs, Activities and Budget formation for the 1994-99 grant will need to be put into motion. Because of the breadth of these four (4) programs, it will be necessary to organize Orientation Workshops for the participating scientists to bring about total programmatic understanding and develop scientist interactions to identify and prioritize research needs of common interest that can lead to strengthening of research activities. This will be accomplished through group workshops and small working groups of the principal investigators. In addition, it will be necessary to bring into the planning activities for the new global plan the host country coordinators and Board members as representatives to focus on the research program activity needs of the host country principal investigators.

1. Annual Information Exchange Workshops

If not all, most of the scientists participating in NIFTAL, SMSS, TSMM and TropSoils also actively participate in the annual American Society of Agronomy Meetings. More of the programs and sessions invite and receive volunteer papers in the socio-economic-anthropological sciences. This is especially true with the initiation of natural resource and agroecological approach to sustainable agricultural research and outreach.

For the calendar years, 1991, 1992 and 1993, a two-to-three-day information exchange workshop will be conducted prior to the beginning of the ASA meetings. The dates and locations of the Society meetings and approximate dates of the information exchange workshop would be as follows:

a. 1991 Denver, Colorado

- ASA Meetings, 27 October - 1 November
- Workshop Meetings, 25-27 October

b. 1992 Minneapolis, Minnesota

- ASA Meetings 1-6 November
- Workshop Meetings, 30 October - 1 November

c. 1993 Cincinnati Ohio

- ASA Meetings, 7-12 November
- Workshop Meetings, 5-7 November

The first such meeting was conducted by TropSoils during the 1990 meetings in San Antonio, Texas. This proved to be very successful because it provided a forum for graduate students and principal investigators from all four TropSoils Institutions, scientists from some international agricultural

centers and non-government organizations attending the society meetings.

2. Forward Planning Group Workshops

To initiate the merger process, the Forward Planning Steering Committee (III, B. 3.) will be expected to provide much of the program planning guidance. Their role will be to serve as the organizational body until the new board takes up this role either in the FY 1993-94 (final year of merger process) or the start of the 1994-1999 grant period. The following are a number of tasks to be charged to this Steering Committee:

a. Organize scientific discipline focused workshops for principal investigators and potential principal investigators to facilitate moving through the process of: 1) researchable constraints identification; 2) review of programs underway and general state of the art; and 3) identify some general and specific soil and water research needs. Broad research and outreach activities in soil and water management that are germane to natural resource management and sustainable agriculture production could be selected and organized from the following potential cluster groups:

- Soil resources classification and characterization
- Soil physical and chemical degradation and rejuvenation
- Soil organic matter and biological processes
- Integrated nutrient supply and management
- Soil productivity assessments and characterizations
- Soil and water conservation and management
- Integrated watershed characterization and management
- Biological nitrogen fixation and soil biology
- Methodology development for natural resource management impact assessment
- Socio-economic impact assessments of soil management technologies on sustainable agriculture production and natural resource management
- Soil management based land-use resource policy decision foundation development
- Outreach and communications

It should follow that the technical coordinators for the new CRSP would be those elected from the chairs of the respective cluster groups.

b. In early 1993, a forward planning workshop will be organized to bring together collaborators from the host countries and the host institutions to present research achievements, progress and focus planning the priority research necessities for the 1994-1999 Global Plan. This workshop would require outside support from both the USAID/missions to pay for the travel expenses for the host country scientists and a special workshop grant to underwrite organizational expenses. The product of this workshop is to build the framework on which the 1994-1999 global plan will be developed. Therefore, this workshop will need to complete the following tasks: 1) identify the program thrusts; 2) identify the constraints within each thrust; and 3) prioritize the programmatic needs within each constraint. This will provide the foundation for which call for proposals will be formulated and released.

3. Proposed Calendar of Events 1991-94

<u>Event</u>	<u>Approximate Date</u>
CRSP Information Workshops	ASA Meetings 1991, 92, 93
Steering Planning Committee Meetings	Semi-Annual, 1992, 93, 94
PI Planning Workshops	August 1992-December 1992
Global Plan Outlined	January 1993
- Program thrusts identified	
- Constraints in thrusts identified	
- Program focus identified	
Call For Program Proposals	February 1993
Proposals Received	July 1993
Proposal Distributed For Evaluation	July 1993
Proposals Received From Evaluators	August 1993
Programmatic Activities Selected	September 1993
Visits To Participating Institution	November 1993
Global Plan Prepared	January 1994
Global Plan Presented-JCARD & BIFAD	February 1994
Global Plan Approved	February 1994
Funds Authorized	April 1994

Funds Obligated

July 1994

Activities Under New Grant Initiated October 1994

IV. BUDGET STRUCTURE

This amendment to the Soil Management Collaborative Research Support Program (CRSP) Grant No. DAN-1311-G-SS-6018-00, will need to be increased from the present ceiling to accommodate the: 1) subgrants to the Soil Management Support Systems (SMSS); 2) Technology for Soil Moisture Management (TSMM); and 3) administrative cost incurred by the Soil Management CRSP Office of the Management Entity. The projected budget period is estimated to be from 26 July 1991 through 24 September 1994. The following are the respective budgets for these three programs during this three-year period.

<u>Program</u>	<u>7/26/91-</u> <u>9/24/91</u>	<u>9/24/91-</u> <u>9/25/92</u>	<u>9/24/92-</u> <u>9/25/93</u>	<u>9/24/93-</u> <u>9/25/94</u>	<u>Total</u>
SMSS	88,040	578,840	540,000	540,000	1,746,880
TSMM	108,170	720,000	720,000	720,000	2,268,170
TropSoils (ME) ¹	33,550	200,000	200,000	200,000	633,550
NCSU Overhead ²	24,000				24,000
Totals	253,760	1,498,840	1,460,000	1,460,000	4,672,600

¹Details of the Soil Management CRSP (TropSoils) ME Budget are presented in detail in the APPENDIX Section B.

²Represents overhead charges by NCSU of 48 percent of the first \$25,000 on the subgrants if these are separate subgrants.

V. POTENTIAL EQUIPMENT LIST FOR BLANKET APPROVAL

The following equipment purchases in support of research, training and outreach activities is anticipated during the period of this grant amendment:

<u>No.</u>	<u>Equipment</u>	<u>Estimated Cost</u>
1	Xerox or equal quality copier	3,500
3	COMPUADD 325 PC computers with 5.25" floppy drive, 110 MD drive, DVGA, 4MB RAM	9,000
1	Polaroid Palette II digital image-to-slide converter with camera body and cables	4,587
2	Block digestors	8,000
1	Atomic Absorption Spectrometer	15,000
1	Colorimeter	4,000
1	Forced air dryer for plant samples	3,000
3	IBM PS/2 computer w/fixed disk and high-resolution monitor	14,000

2	Hewlett Packard laser printer w/postscript resident	10,000
1	Centrifuge	9,000
1	Spectrophotometer	7,000
1	Plant tissue grinder	6,000
1	Leaf area meter	7,000
1	Electric generator 20KW, 29KWA 120/240V	4,000
1	Microunit for rapid distillation	1,425
2	Zenith Laptop Turbos Port 386 Personal Computers with portable printer and portable power source. Zenith Package Number ZTC-3034-MO	13,000

APPENDIX I

Work Plans And Budget

Soil Management Support Services (SMSS)

GLOBAL THRUST: Natural Resource Management
Outreach

CONSTRAINTS: Inadequate Resource Information
Number and Diversity of Soils
Lack of Local Expertise, Information
Number and Diversity of Users

PROBLEM STATEMENT, OBJECTIVES AND JUSTIFICATION

Problem Statement

Basic soil resource information is not utilized adequately to provide the basis for environmental assessment or monitoring, and for planning appropriate country policies for sustainable land management. Information currently available is fragmentary, of questionable quality, and/or not in a format readily useable by national planners and other clients such as extension workers for assisting farmers in land management.

Objectives

1. To improve the utilization and dissemination of soil resource information necessary to implement land management in the developing countries.
2. To develop a coherent, comprehensive, and interactive data base on soils and climate to serve as inputs for Global Climate Change (GCC) and Sustainable Land Management (SLM) activities, and to improve the reliability, usefulness, and availability of soils data for production systems (IARCs, CRSPs, NARS, IBSRAM).
3. To assist in developing strategies to monitor soil degradation through the use of remote sensing techniques and through land management research, the latter in collaboration with IBSRAM, ICRISAT and other IARCs.
4. To conduct training courses and workshops, and initiate publications to enhance information dissemination for the judicious use of the soil resource.

Justification

An inventory of soil resources is necessary for country, regional, and farm level planning for agriculture. A knowledge of soil resource characteristics is fundamental for optimal selection of sites and research, experimental station setting, interpretation of research results, and technology transfer. Soil resource inventories and characterization databases serve as the only meaningful basis for linkage among IARCS, NARS, Crop and Livestock CRSPs, and the Soils CRSP.

Soil resource information provides the basis for integrating agronomic management, socioeconomic context, and socio political reality into sustainable agricultural systems. This same information on a global basis is completely essential to the prediction of response to interventions for production, of climate change response, and influence of soil degradation. Principles of applications are site-specific and dependent on soil resource information.

There is a need to work more closely with the IARCs, CRSPs, NARS and other regional and international groups to obtain more detailed mapping and soil characterization of their research sites for more effective agrotechnology transfer and to make the resultant information more available globally.

There is a need to provide assistance and training to developing country scientists and planners and their institutions in obtaining and utilizing land and soil resource information for inventories and maps to enable more appropriate policy decisions, and for the design and implementation of development programs.

There is a need to develop greater access and commonality among the various international soils databases developed by institutions in their national and international work. There is a need to obtain more information on the existing soils databases to make the total agronomic information more useful for input into production systems analyses and global change scenarios.

Activity Areas

With the completion of the current project at the end of FY 91, SMSS is in the process of developing new activities in Sustainable Land management and Global Climate change in addition to refining some of its previous activities. Major areas of activity include:

1. Technical assistance to support utilization of soil resource information in policy and planning initiatives (USAID and CDSSs) for integrated economic development, and alternatives associated with global climate change;

2. Worldwide soil database development to backstop modelling (soil, weather, crops, farming systems, water management, erosion and other forms of soil degradation, etc.);
3. Soil and site characterization of important field research sites and tension zones to provide a consistent set of values, with proper classification, to promote and facilitate technology transfer that is soil/land based;
4. Assistance with soil and environmental monitoring techniques and strategies for resource assessment;
5. Information dissemination and training through organized workshops, field tours, training forums, publications, and presentations in other media (GIS, CD Roms, and videos, etc.).

The Soil Conservation Service (SCS) of the United States Department of Agriculture (USDA) will implement the project. Fiscal and general program management and policy guidance is provided by the Office of International Cooperation and Development (OICD) of USDA.

PRINCIPAL INVESTIGATORS:

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COLLABORATORS AND INSTITUTIONS:

Dr. Marc Latham	Director, International Board for Soil Research and Management, Bangkok, Thailand
Dr. Michael Walsh	SACCAR Food Security Program of SADCC, Natural Resources Unit
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Dr. Jagtap Singh	IITA, Nigeria

Dr. Upender Singh	IFDC, Muscle Shoals
Dr. Goro Uehara	IBSNAT, Hawaii
Dr. Stanley Buol	North Carolina State University
Dr. Larry Wilding	Texas A&M University

PLANNED ACTIVITIES FOR FY 1992:

1. Workshops/Planning Meetings

SEMAP Planning Meeting

Initial planning meeting to discuss and formulate Soil Environmental Monitoring and Assessment Program (SEMAP). Depending on funding level, this will be a regional or international level.

Argentina Workshop

This workshop, scheduled for April 1992, addresses the subject of soil resources for sustainable agriculture.

West US Workshop

Organized by SCS, the workshop addresses the subject of utilization of soil survey information.

2. Training

A training workshop on "Utilization of GIS for resource data manipulation" is planned for Philippines (planning costs).

In collaboration with IBSRAM and TropSoils, training on detailed grid sampling and soil characterization for SEMAP project.

3. Documentation

The following current activities will yield products for publication in 1992:

1:30,000,000 map and report on Major Soil Regions of the World.

1:5,000,000 map and report on Major Soil Regions of Asia.

1:10,000,000 map and report of "Soil Moisture and Temperature Regimes of the World."

4. New Activities Initiated

1:1,000,000 soil maps: data compiled for Czechoslovakia, Hungary, and Bulgaria. Requires site visits and sampling of benchmark pedons.

Major Land Resource Area (MLRA): data compiled for one or two African countries. Requires site visits and sampling of benchmark pedons.

In collaboration with IBSRAM and TropSoils, utilize their networks for monitoring carbon and other soil properties in their network experiments, for studies on soil degradation in the context of Global Climate Change (SEMAP effort).

Characterization of TropSoils experimental sites including detailed grid sampling as in the IBSRAM sites for monitoring purposes (SEMAP effort).

5. Backstop USAID Mission Projects

This technical assistance is always on request and funds must be available to respond at short notice. Occasionally Missions request characterization of their experimental sites.

6. Staff Participation in International Workshops and Co-Sponsoring Those Workshops that Further the Objectives of SMSS

SMSS has traditionally co-sponsored and helped organize important workshops by providing seed money.

BUDGET (July 26, 1991--September 24, 1994)
(\$1000)

<u>Object</u>	<u>CRSP</u>	<u>External</u>	<u>Host^a</u>	<u>Total</u>
Salaries	350	100		450
Fringe Benefits	49	10		59
Workshops	500	100		600
Soils Analyses	150	50		200
Travel, US	20	5		25
Travel, INT	230	-		230
Supplies	25	10		35
Equipment	15	5		20
Communications	10	5		15
Publications	15	5		20
Indirect Costs	371	-		371
NCSU Overhead ¹	12	-		12
Total	1,747	290		2,037

^aTo be determined

¹Represents overhead charges by NCSU of 48 percent on the first \$25,000 on the subgrant if this is separate subgrant.

APPENDIX II

Work Plans and Budget

Technology for Soil Moisture Management (TSMM)

A. Economic Component

GLOBAL THRUST: Natural Resource Management

CONSTRAINTS: Landscape restrictions
Climatic variability
Production-demand pressure
Inadequate resource information

PROBLEM STATEMENT, OBJECTIVES AND JUSTIFICATION

Problem Statement

In the vast majority of cases in developing countries where rainfed agriculture predominates, crop yields are extremely low and generally insufficient to provide nutritional requirements of rural farm families. Animal productivity is also low. Low crop and livestock productivity in turn means that cash income is low and farm families are unable to purchase the food, clothing, medical care, and other necessary goods and services. Standards of living are declining. Moreover, high population growth and reduced productivity has set in motion a trend of increasingly intensive cultivation leading to serious negative consequences on the environment. The result is growing uncertainty regarding the long run sustainability of these agricultural systems.

Objectives

The overall goal of this project is to identify farm technologies and farm management practices that will improve income, food production and consumption, and the long-term productive capacity of agriculture in the semi-arid and humid tropics.

1. To develop multi-disciplinary analytical methodologies effectively integrating soils, agronomic, agroclimatic, and economic data for accurate assessment of farm production technologies.

2. To assemble baseline and response data suitable for use in the methods and procedures of Item 1.

3. To identify sustainable farm production systems through socio-economic analyses of soil, water and related crop/livestock management technologies.

4. To evaluate economic policies for stimulating adoption and diffusion of improved resource management technologies.

Justification

Evidence indicates that the key to increase and sustainable food and fiber, fuel and shelter materials production in the tropics is improved management of the soil resource base including on-farm water conservation and proper cropping systems for efficient utilization of available precipitation. An extensive scientific data base on the principals of soil and water management exists, but the development of sustainable technologies compatible with local farming systems and economic settings is less advanced. Thus, the potential for lasting productivity gains exists, but realization of this potential has been slow.

There is a need to determine what soil and water resource management practices are technically feasible, economically sound and environmentally safe within different soil, agroclimatic and social systems. Also needed is better understanding of policy measures which can effectively stimulate widespread adoption of beneficial technologies.

This work will focus on the economics of alternative technologies and farm management options for sustainability. The importance of indigenous knowledge of farming systems is to be stressed. In that framework, examination of traditional systems and incremental adjustments based on emerging technologies will be the basic perspective for this program of work.

Farming systems research currently underway in Jordan will continue, as will ongoing effort to develop new programs of work in Burkina Faso and Mali. Special emphasis, however, will be given to socio-economic analyses of resource management in the context of an agricultural watershed in Niger. In this effort, through collaboration with Texas A&M, an integrated program of various upstream land and water management techniques, common-ground grazing practices, and on-farm soil, water, crop and livestock management options will be examined.

Throughout this project collaborative research with TropSoils scientists will be pursued. In FY 1991-92 specific research plans involving Washington State, Purdue, and Texas A&M will be developed. Planning discussions with Cornell, Hawaii and NCSU are also expected to take place.

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A. S. R. Juo	TAMU-TAES
K. Savadogo	University of Ouagadougou, Burkina Faso
Goro Uehara	University of Hawaii

RESEARCH SITES: Jordan; Hamdallaye, Niger; Mali; Burkina Faso; Cameroon.

B. Integrated Research Component

GLOBAL THRUST: Sustainable Agriculture Production and Outreach

CONSTRAINTS: Soil physical limitations
Water stress
Nutrient deficiencies and losses
Information knowledge gap

PROBLEM STATEMENT, OBJECTIVES AND JUSTIFICATION

Problem Statement

Dryland agriculture is a rainfed crop production system in which a major limiting factor is water. In addition to erratic and limited rainfall, many dryland areas of developing countries also have severe soil quality problems. These include low water-holding capacity; soil crusting and compacting; low water infiltration rates and excessive nutrient runoff losses; excessive soil erosion by wind and water; coarse-textured and shallow-depth soils; and low soil organic matter levels. Intensive cultivation of these marginal soils has led to an alarming decline in soil productivity.

One key to increasing the productivity of soils in the arid and semiarid regions is through the proper and regular additions of organic amendments, primarily crop residues. Yet in most cases such materials are not available because of competitive uses as forage, fuel, fiber and building materials. The agronomic and economic value of crop residues in the drylands of developing countries, in most cases, has not been determined. Consequently, there is little incentive to explore possible trade-offs that would allow some residue return to cropland.

Objectives

The overall goals of TSM are to increase the productivity and long-term sustainability of rainfed/dryland agricultural systems in developing countries while maintaining or enhancing the natural resource base, specifically the soil and water resources, and to improve output and income in crop and livestock production systems.

1. To assist in the assessment of soil, water and crop/livestock management systems under dryland or rainfed conditions;
2. To develop effective strategies and approaches for increasing dryland and rainfed agricultural productivity through research and technology transfer;
3. To strengthen the capability of developing country scientists and institutions for conducting research that would lead to more effective and efficient management systems for dryland and rainfed agriculture.

Justification

For more than 50 years, U.S. scientists and particularly the ARS have conducted research throughout the U.S. Great Plains to deal with the extreme soil and agroclimatic problems and constraints to the development of sustainable dryland farming systems. Many of these same problems must now be dealt with by national scientists in the arid and semiarid regions. The most successful "international efforts" to develop effective soil, water and crop management systems in these regions has been through the establishment of scientist-to-scientist linkages. Agency-to-agency initiatives alone are seldom successful in developing meaningful and relevant research projects and, therefore, the need to focus more on individual scientists and linkages with other scientists.

In our linkages with scientists in the semiarid regions, we need to establish a better understanding of dryland resources, the production potentials of those resources, and the scientific and socioeconomic systems within which they operate. In achieving

these goals, the basic approach of this project will involve the following:

1. Compile data bases or compendia of research data and information in countries of a particular region that is relevant to dryland or rainfed agriculture. The best and most logical approach in agricultural development initiatives is to determine what has already been done, where it was done and under what conditions. Results obtained, conclusions drawn and whether or not the technology was transferred to the farmer, and if so, was it adopted. Failure to compile such information usually leads to a costly duplication of effort.
2. Conduct workshops to assess and discuss the database findings and to establish research needs and priorities. A data base establishes what has been done, but at the same time it identifies knowledge and information gaps that must be dealt with. The workshop also helps to identify key scientists to be involved in future research activities.
3. Develop regional research networks in which scientists are linked by common research projects, objectives and methodology. Ideally, these projects should be conducted in both developing and developed countries with scientist-to-scientist linkages. This can greatly enhance mutual understanding and transfer of results and technologies to the farmer.
4. Conduct on-farm research using whole-farm analysis (agronomic and socio-economic parameters) and model watersheds which should provide a more realistic and meaningful development or more sustainable farming systems in accordance with specific agroclimatic conditions and the individual farmer's interests, goals and capabilities. This approach would also enhance the conservation of the natural resource base. The Integrated Management of Agricultural Watersheds (IMAW) program now in its initial planning stages by TropSoils in Niger offers an excellent opportunity to evaluate the effectiveness (both short-term and long-term impacts) to using a watershed development approach involving whole-farm and village analysis methods.

Ideally, this stepwise method of assessing knowledge, identifying problems, and mobilizing available resources for developing acceptable solutions will serve as a model for other countries within each region.

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A. S. R. Juo	TAMU-TAES
M. L. Kyomo	Southern African Center for Cooperation in Agricultural Research (SACCAR)
J. H. Thomas	USDA-OICD, Far Eastern Regional Research Office (FERRO)
Susan Riha	Cornell University
W. R. Butcher	Washington State University, Pullman

RESEARCH SITES: Jordan, Thailand, Malaysia, India, Niger, Sri Lanka

C. TSM Budget (1991-1994):
(\$1000)

<u>Object</u>	<u>CRSP</u>	<u>External</u>	<u>Host^a</u>	<u>Total</u>
Salaries	720	50		770
Fringe Benefits	87	14		101
Cooperative Agreements	598	229		827
Workshops	50	-		50
Travel, US	30	-		30
Travel, INT	99	5		104
Supplies	15	6		21
Equipment	25	7		32
Communications	9	6		15
Training	10	-		10
Publications	14	-		14
Indirect Costs	599	-		599
NCSU Overhead ¹	12	-		12
Total	2,268	317		2,585

^aTo be determined

¹Represents overhead charges by NCSU of 48 percent on the first \$25,000 on the subgrant if this is a separate subgrant.

HUMAN RESOURCE COMMITMENT:

<u>Institution</u>	<u>Full Time Equivalents (FTE)</u>				<u>Total</u>
	<u>Senior Sc.</u>	<u>Junior Sc.</u>	<u>Tech.</u>	<u>Admin.</u>	
US	1.75	4.0	1.0	.5	7.25
Host	2.0		3.0		5.0
Other					
Total	3.75	4.0	4.0	.5	12.25

DATE INITIATED: July 26, 1991

EXPECTED COMPLETION: September 24, 1994

APPENDIX III

The Soil Management CRSP (TropSoils)

A. Organizational Structure

The institutions participating in the Soil Management CRSP (TropSoils) are Cornell University, University of Hawaii, North Carolina State University and Texas A&M University. The Soil Management CRSP funded through the Agency for International Development (AID) as authorized under Title XII of the International Development and Food Assistance Act of 1975 to provide assistance in support of long-term collaborative university research on food production, distribution, storage, marketing and consumption, including support of research projects identified for specific problem solving needs. The Soil Management CRSP is structured in accordance with the guidelines for Collaborative Research Support Program, BIFAD/AID, June 21, 1985.

1. Board of Directors

The Board consists of a representative from each of the lead universities. The program director of the Management Entity serves as ex-officio members of the Board. Each host-country agency that collaborates with TropSoils has a Board representative, but lack of travel funds restricts their contribution. Board members from the U.S. universities serve as an executive committee of the full Board and carry out its functions. The chair is elected by the members of the Board. The Board deals with policy issues, reviews and passes on plans and proposed budgets, assesses programs, suggests program principles, and advises the management Entity on these and other matters.

2. Technical Committee

This committee is composed of the five program coordinators from the participating universities. The Management Entity director and the AID program manager serve as ex-officio members of the committee. The Technical Committee sets priorities for research, develops work plans, formulates budgets, reviews technical progress of the total research program, coordinates networking and training activities, proposes modifications in technical aspects of the program, and recommends allocations of funds. Special projects and programs are proposed and developed by the Technical Committee, within the available budget, in concordance with the Board of Directors and the Management Entity.

3. In-Country Technical Committee

For each new initiative developed as a buy-in or with non-CRSP funding, an in-country technical committee will be organized. This committee will be composed of the U.S. program coordinator, the host-country coordinator, and participating faculty. The committee will set research priorities, formulate programs, and develop and submit projects for funding.

4. External Evaluation Panel

The External Evaluation Panel is composed of three senior scientists recognized for their in-depth knowledge of a research discipline in tropical soil management, as well as for their experience in research and administration. The panel conducts evaluations and develops recommendations with respect to status, funding, progress, plans and prospects of the research activities of the TropSoils CRSP. External consultants are employed when additional expertise as considered necessary. Reviews are conducted in accordance with AID/S&T CRSP guidelines and are based on the stage of development of the program, concerns on progress or funding status, and research objectives. The External Evaluation Panel reports are submitted to the Management Entity for appropriate action and distribution.

5. Management Entity

The Management Entity, based at North Carolina State University, is charged with program and fiscal management. It enters into subgrant agreements with the participating U. S. universities, host-country institutions, and other collaborating institutions as necessary to carry out the program. Responsibilities of the Management Entity include implementation of the program, coordination, and leadership in the development of annual budgets and work plans.

The Management Entity has established a system to facilitate the necessary administrative actions for the participating universities via a manual, "Policies and Procedures for the Soil Management CRSP," developed from published AID policies and procedures. The Management Entity reports on the program and represents the TropSoils CRSP in dealings with AID/W, USAID missions, international centers, host countries, and other entities. Its goal in these interactions is to sustain program productivity in concert with the global plan, the Board of Directors, Technical Committee, and External Evaluation Panel.

B. The Soil Management CRSP Goal

The goal of the Soil Management CRSP is to develop and adapt improved soil-management technologies that are agronomically, ecologically and economically sound for developing countries in

the tropics. To accomplish this goal the Soil Management CRSP has focused its research thrusts on the major constraints to sound Natural Resource Management, Sustainable Agriculture Production and Outreach. As the process research has progressed by generating appropriate technology for Natural Resource Management and Sustainable Agricultural Production, the Outreach thrust serves as the transfer activity working integratively on basic Land Management Units.

C. The Soil Management CRSP Global Program

1. SUSTAINABLE AGRICULTURE PRODUCTION - The successful management of resources for agriculture to satisfy changing human needs while maintaining or enhancing the natural-resource base and avoiding environmental degradation.

a. Soil Acidity - Most soils in the humid tropics are very acid, low in exchangeable bases, and high in exchangeable aluminum. The acidity and toxicity of these soils constrains agricultural productivity in several ways. Sensitivity of plant species and cultivars to soil acidity and associated problems limits crop production. Technologies to ameliorate soil acidity are paramount on most tropical soils.

b. Nutrient Deficiencies and Losses - Soils in the humid tropics are often low or deficient in one or more primary and secondary plant nutrients. Low crop yields attributable to poor nutrition and accelerating soil degradation are major contributors to land abandonment and continuous rainforest destruction. Biological perspectives and nutrient cycling knowledge is necessary for sustainable systems.

c. Soil Physical Limitations - Soils of the tropics are characteristically highly weathered and, because of climate and other natural factors, are variable in organic matter. The overuse of traditional management systems often leads to soil physical degradation, land abandonment and rainforest encroachment.

d. Topographic Limitations - Landscape configurations impose special challenges in the development of appropriate soil-management technologies. Humid tropical soils of the steep lands are especially vulnerable to degradation as a result of water erosion. Selection of crops, cultivars, cropping sequences, and crop mixtures without considering landscape configurations often results in a loss of food and fuel production. Some landscape should best not be disturbed.

e. Water Stress - Moisture stress, natural or imposed, may result from either excessive or inadequate amounts of water. Selections of the best ecologically adaptable and socially acceptable combination of crop, plant species,

cultivars, and cropping sequences are necessary for production management and must be decisions tempered by experience, financial constraints, and risk assessments.

2. **NATURAL RESOURCE MANAGEMENT** - The management, conservation, and enhancement of those natural resources which are most critical to meeting food, fiber, fuel and shelter requirements, as well as preserving genetic diversity and attenuating climatic change.

a. Land-Clearing Pressure - Population growth in the tropics places extreme pressure on the soil resources. As the number of farms increases, fallow periods are shorter, and vital nutrients are lost from the soil. Farmers must clear more land to grow the same amount of food. Countries with high populations have little under-used land available.

b. Landscape Restrictions - Even on rolling and gently sloping tropical landscapes, wind and water erosion may be common. Without reliable information about natural processes, it is impossible to formulate sound management practices.

c. Climate Variability - In regions where rainfall or temperature are extreme, climate can be a major factor in soil management. Climate influences the physical, chemical and biological properties of soils, as well as the choice of cropping system.

d. Inadequate Resource Information - Policies to achieve sustainable agriculture production must be based on an adequate technical assessment of natural resource inventory. These inventories are often incomplete or not available. Almost no reliable information exists on how forest conversion affects soil dynamics. Inventory of indigenous technologies should be included with physical inventories.

e. Production--Demand Pressure - Population growth, accompanied by increased demand for food, fiber, fuel and shelter materials, places extreme pressure on the soil resources. Larger and larger areas must be brought into production to meet the demands for food and exports. Soil resource inventories are needed to plan and develop export crop policies.

3. **OUTREACH** - Those extrapolations, communications, training, networking, and decision-support activities which translate research into useful knowledge.

a. Number and Diversity of Users - People throughout the developing world lack appropriate soil-management technologies. They are diverse in their needs, languages, and cultures. Extension and communication channels in developing

countries are rudimentary; ethnic, cultural, and linguistic barriers are common.

b. Number and Diversity of Soils - To be effective, soil-management practices must accommodate a range of conditions, including soil chemical and physical processes and crop and cultivar; climate and landscape; and social and economic conditions. While certain soil-management problems are common to many sites, solutions appropriate for one location may be inappropriate for another.

c. Lack of local Expertise, Information - The lack of trained soil scientists, agronomists, educators, and communicators in developing countries impedes the transfer and adoption of new agricultural technologies. Training and education provided by the Soil Management CRSP degree programs, workshops, and field projects contribute significantly to the base of soil-management expertise in the developing countries.

d. Information Knowledge Gap - Traditionally, research results become scientific knowledge through a lengthy process of consensus-building that includes peer review, publishing, public comment and application. In developing countries with degraded and degrading soils rapid application is important to stabilize the natural resource base while developing sustainable agriculture production. Decision Support Systems and Geographic Information Systems offer effective means to capture new technologies that can be integrated with indigenous technologies for transfer onto small watersheds or Land Management Units.

e. Lack of Skills & Research Capability - A constraint to Natural Resource Management and Sustainable Agriculture Production in developing countries is the shortage of trained professionals to implement appropriate policies and programs. The Soil Management CRSP has the Institutional strength to provide education, training, backstopping and broad based support to Natural Resource Management and Sustainable Agriculture Production.

D. Soil Management CRSP Operational Strategy

While developing nations in the tropics share common constraints to Natural Resource Management, Sustainable Agriculture Production and Outreach, these constraints manifest themselves in varying ways from region to region. The operational strategy employed is to structure the operations along the following agroecological zones.

1. Humid Tropics - This is the portion of the tropics where there is no more than a three-month dry season and temperature is not a limiting factor to plant growth. The native

vegetation is tropical rainforest. Soil Acidity and nutrient deficiencies are common chemical constraints to crop production.

2. Semiarid Tropics - This zone is characterized by a protracted dry season of six to nine months. Erratic precipitation, wind and water erosion, desertification, soil acidity and nutrient deficiency are major constraints to crop production.

3. Savannas - This portion of the tropics is characterized by a strong dry season of four to six months, savanna vegetation and predominantly acid soils with inherently low nutrient levels but generally good physical conditions. Temperature is not a limiting factor to plant growth.

E. Portfolio of Soil Management Programs

Scientists in the Soil Management CRSP have developed collaborative research activities in the following key program areas:

- low-input management systems
- soil characterization
- soil variability and acidity
- green manures & nitrogen management
- soil-water-plant-nutrient relationship
- soil-water management
- land reclamation and conservation
- continuous cultivation of food crops
- agroforestry systems and soil conservation systems
- improved sustainable pastures
- paddy-rice production
- selection and use of indigenous plant species
- indigenous technologies and socioeconomic impacts

The technologies generated by the Soil Management CRSP funnel into developed Decision Support and Geological Information Systems to systemize transfer and serve to identify gaps in the technology base.

APPENDIX IV

Soil Management CRSP (TropSoils) Management Entity Budget

1. Table 1. TROPISOILS MANAGEMENT BUDGET FOR PERIOD 9/25/91-9/24/94.

(See Table 1)

2. The Breakdown of TropSoils Management Budget

a. SALARIES AND BENEFITS

a.1. Project Associate: This position would filled as a part-time or a full-time pre- or post-doctoral position to assist in the coordination of activities with the USDA program leaders and the USDA and AID administration.

a.2. Secretary: Provide support to the Project Associate and the office of Management Entity. This position is presently open within the TropSoils Office of the ME and would be filled to expedite this program merger.

b. TRAVEL AND RELATED EXPENSES

b.1. Project Associate:

1- Annual Information Exchange Workshop @ \$1,000	=	\$1,000	
2- Steering Committee Meetings @ \$1,000	=	2,000	
1- Principal Investigators Workshop @ \$1,000	=	1,000	
4- Program Visits to USDA and AID @ \$500	=	<u>2,000</u>	
			\$ 6,000

b.2. Steering Committee (8 - members)

1- Annual Information Exchange Workshop @ \$1,000	=	\$8,000	
2- Steering Committee Meetings @ (average) \$ 800	=	12,800	
1- Visit to participating institutions @ \$900	=	<u>7,200</u>	
			\$28,000

b.3. Principal Investigator Workshops:

21- Principal Investigators Workshop @ \$1,000	=	<u>\$21,000</u>	
			\$21,000

Table 1. TropSoils Management Budget for 7/26/91-9/24/94.

	<u>7/26/91-</u> <u>9/24/91</u>	<u>9/25/91-</u> <u>9/24/92</u>	<u>9/25/92-</u> <u>9/24/93</u>	<u>9/25/93-</u> <u>9/24/94</u>	<u>TOTALS</u>
I. SALARIES AND BENEFITS					
A. Salaries					
Project Associate	\$ 4,000	\$ 25,000	\$ 28,000	\$ 30,200	\$ 87,200
Secretary	<u>1,500</u>	<u>18,000</u>	<u>19,500</u>	<u>21,000</u>	<u>60,000</u>
	\$ 5,500	\$ 43,000	\$ 47,500	\$ 51,200	\$147,200
B. Benefits (24%)					
Project Associate	\$ 960	\$ 6,000	\$ 6,720	\$ 7,250	\$ 20,930
Secretary	<u>360</u>	<u>4,320</u>	<u>4,680</u>	<u>5,050</u>	<u>14,410</u>
	\$ 1,320	\$ 10,320	\$ 11,400	\$ 12,300	\$ 35,340
II. OPERATIONS					
A. Telephone/FAX/E-Mail	\$ 120	\$ 2,000	\$ 2,000	\$ 2,000	\$ 6,120
B. Postage--Mailings	120	1,000	1,500	1,500	4,120
C. Supplies	240	2,000	2,000	2,000	6,240
D. Equipment	<u>550</u>	<u>11,680</u>	<u>8,600</u>	<u>2,000</u>	<u>\$ 22,830</u>
	\$ 1,030	\$ 16,680	\$ 14,100	\$ 7,500	\$ 39,310
III. TRAVEL AND RELATED EXPENSES					
A. Project Associate	\$ 1,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 19,000
B. Steering Committee	8,000	28,000	24,000	24,000	84,000
C. PI Workshops	2,000	21,000	21,000	21,000	65,000
D. Director of ME	2,000	5,000	5,000	5,000	17,000
E. External Panel	<u>2,000</u>	<u>9,000</u>	<u>9,000</u>	<u>9,000</u>	<u>29,000</u>
	\$15,000	\$ 69,000	\$ 65,000	\$ 65,000	\$214,000
IV. INDIRECT COSTS	<u>\$10,700</u>	<u>\$ 61,000</u>	<u>\$ 62,000</u>	<u>\$ 64,000</u>	<u>\$197,700</u>
	\$10,700	\$ 61,000	\$ 62,000	\$ 64,000	\$197,700
TOTAL	\$33,550	\$200,000	\$200,000	\$200,000	\$633,550

b.4. Director of the Office of the ME

1- Information Exchange Workshop @ \$1,000	= \$ 1,000	
2- Steering Committee Meetings @ \$1,000	= 2,000	
1- Principal Investigator Workshop @ \$1,000	= 1,000	
2- Visits to USDA and AID Administration @ \$500	= <u>1,000</u>	\$ 5,000

b.5. External Panel (2 members)

1- Steering Committee Meeting @ \$1,000	= \$ 2,000	
1- Visit to participating Institutions @ \$1,000	= 2,000	
1- Principal Investigators Workshop @ \$1,000	= 2,000	
10.5- Days of Consulting Services @ \$285/day	= <u>3,000</u>	\$ 9,000
	TOTAL	\$69,000

NOTE: Fiscal years 1992-93 and 1993-94 were calculated to have lower travel budgets for the Steering Committee because at this time it might be possible to reduce this working committee to six (6), but still maintaining the two (2) external members.

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CERTIFICATION REGARDING DRUG-FREE WORKPLACE REQUIREMENTS

This certification is required by the regulations implementing the Drug-Free Workplace Act of 1988, Public Law 100-690, Title V, Subtitle D, 34 CFR Part 85, Subpart F. The regulations, published in the January 31, 1989 Federal Register, require certification by the organizational applicant, prior to award, that it will maintain a drug-free workplace. The certification set out below is a material representation of fact upon which reliance will be placed when the agency determines to award the project funding. False certification or violation of the certification shall be grounds for suspension of payments, suspension or termination of grants, or governmentwide suspension or debarment (see CFR Part 85, Sections 85.615 and 85.620).

The organizational applicant certifies that it will provide a drug-free workplace by:

- (a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the applicant's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
- (b) Establishing a drug-free awareness program to inform employees about -
 - (1) The dangers of drug abuse in the workplace;
 - (2) The applicant's policy of maintaining a drug-free workplace;
 - (3) Any available drug counseling, rehabilitation, and employee assistance programs; and
 - (4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;
- (c) Making it a requirement that each employee to be engaged in the performance of the project be given a copy of the statement required by paragraph (a);
- (d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the project, the employee will -
 - (1) Abide by the terms of the statement; and
 - (2) Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after such conviction;
- (e) Notifying the agency within ten days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction;
- (f) Taking one of the following actions, within 30 days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted -
 - (1) Taking appropriate personnel action against such an employee, up to and including termination; or
 - (2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;
- (g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a), (b), (c), (d), (e) and (f).

The applicant shall insert in the space provided below the site(s) for the performance of work done in connection with the specific project: Place of Performance (Street address, City, County, State, Zip Code)

NORTH CAROLINA STATE UNIVERSITY PULLEN ROAD RALEIGH, NC 27695

This assurance is given in connection with any and all financial assistance after the date this form is signed. This includes payments after such date for financial assistance approved before such date. The applicant recognizes and agrees that any such assistance will be extended in reliance on the representations and agreements made in this assurance. In the event applicant has knowingly rendered a false certification or otherwise violates the requirements of the Drug-Free Workplace Act, the Federal government may seek any remedies to which it is entitled under the Act or other laws of the United States. This assurance is binding on the applicant, its successors, transferees, and assignees, and has been signed on behalf of the applicant by the authorized official whose signature appears below.

Title/Identification of Applicable Proposal:

AMENDMENT TO GRANT DAN-1311-G-SS-6018-00, THE SOIL MANAGEMENT CRSP

CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Certified by:

Grant Proposal Number:

Leslie B. Sims MAY 21 1991
Signature Date

Leslie B. Sims
Associate Vice Chancellor
Title Research

NC STATE UNIVERSITY
Institution

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OVERHEAD STATEMENT

Predetermined overhead rate accepted 07/01/89 for the period
07/01/89 to 06/30/91.

HANDICAP STATEMENT

NCSU does not discriminate on the basis of sex, race, or
handicap and is an affirmative action, equal employment
institution.

CIVIL RIGHTS STATEMENT

No person will on the grounds of race, color or national origin
be excluded from participation in, be denied the benefits of, or
be subjected to discrimination under this program.

Project Number: 931-1711

Project Title: Soil Management CPSP

Grant Number: DAN-1311-6-00-6018-00

	Original CPSP April 16, 1991 to April 16, 1992	Original CPSP April 16, 1991 to May 12, 1992	SCS July 26, 1991 to May 12, 1992	ERS/ARS July 26, 1991 to May 12, 1992	NGT ENTITY April 16, 1991 to May 12, 1992	AMENDMENT TOTAL April 16, 1991 to May 12, 1992
Salaries	979,200	1,051,976	95,676	114,449	49,922	1,312,224
Benefits	191,923	206,187	13,423	17,294	11,985	248,890
Allowances	168,000	180,486	0	0	0	180,486
Cooperative Agreements	0	0	0	190,748	0	190,748
Workshops	0	0	136,968	38,150	0	175,118
Soil Analyses	0	0	41,090	0	0	41,090
Travel	235,200	252,680	68,484	41,965	72,577	435,706
Supplies	52,111	55,924	10,136	5,595	2,116	73,831
Equipment	74,400	79,930	4,109	5,087	7,743	96,868
Other Direct Costs	233,604	250,566	6,848	6,613	3,473	267,900
Indirect Costs	585,562	629,082	101,620	154,379	67,049	952,139
Totals	2,520,000	2,707,291	478,566	574,279	214,864	3,975,000
Reserved	2,520,000					2,520,000
Obligated	537,548	0	0	0	0	0
Balance required for this PIG/T						1,455,000

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