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WATER MANAGEMENT SYNTHESIS II  
CID/AID-DAN-4127-C-00-2086-00  
4TH QUARTERLY REPORT  
July 1, 1985 to September 30, 1985

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July 1, 1985 to September 30, 1985

Submitted by:  
The Consortium for  
International Development

TABLE OF CONTENTS

Water Management Synthesis II Project

Quarterly Report Covering Period July 1, 1985 - September 30, 1985

	Page
I. INTRODUCTION . . . . .	I.
II. SPECIAL FOCUS . . . . .	II.
A. Colorado State University . . . . .	II.1
B. Cornell University . . . . .	II.11
C. Utah State University . . . . .	II.13
III. STATUS OF PROGRAMMED ACTIVITIES . . . . .	III.
IV. ACTIVITIES . . . . .	IV.
A. FY84 . . . . .	IV.1
A.1 Technical Assistance Activities . . . . .	IV.1
A.2 Training and Technology Transfer . . . . .	IV.9
A.3 Special Studies . . . . .	IV.16
A.6 Summary . . . . .	IV.17
B. FY85 . . . . .	IV.19
B.1 Technical Assistance Activities . . . . .	IV.19
B.2 Training and Technology . . . . .	IV.28
B.3 Special Studies . . . . .	IV.33
B.4 Administrative Staff . . . . .	IV.42
B.5 Overall Administration . . . . .	IV.47
B.6 Summary . . . . .	IV.50
V. FINISHED ACTIVITIES . . . . .	V.
A. Technical Assistance Activities . . . . .	V.1
B. Training and Technology . . . . .	V.23
C. Special Studies . . . . .	V.28
VI. COMMITTEES . . . . .	VI.
VII. ROSTER UPDATE . . . . .	VII.
VIII. FINANCIAL REPORT . . . . .	VIII.

# WATER MANAGEMENT SYNTHESIS II PROJECT

## QUARTERLY REPORT COVERING PERIOD

JULY 1, 1985

TO

SEPTEMBER 30, 1985

### 1. INTRODUCTION

#### A. General

This report summarizes the activities of the Water Management Synthesis II Project for the fourth quarter of FY85, covering the period July 1, 1985 to September 30, 1985. This report includes information relative to current activities, roster summary and finished activities as well as university highlights.

The central purpose of WMS II is to develop and disseminate (in AID-assisted countries) more efficient water management technologies and practices to increase agricultural production and rural equity. The WMS II program is a joint project of S&T/AGR, S&T/MD, and the Asia Bureau of AID. These offices contribute funds and participate in the development, approval, and execution of project activities. The Consortium for International Development (CID) is the Prime Contractor for WMS II. Cornell University, Utah State University and Colorado State University, through the Consortium for International Development, share the lead university responsibilities for the Water Management Synthesis II Project.

#### B . A Summary of Significant Project Accomplishments

By the end of the reporting period (30 September, 1985 ) we had completed the "first edition" of the FY86-FY87 Workplan, moved closer to the development of a mutually acceptable workplan for the work to be funded by the Africa Bureau (this objective was achieved in October, 1985) and continued a busy schedule involving the regular on-going work of WMS II which is reported on in the main body of this report.

1. Workplan Development: The CPMT met in Denver in early July, 1985 and considered proposed university initiated activities for FY86-FY87 which had been submitted earlier for review by members of CPMT. On the last day of the meeting, Worth Fitzgerald (WMS II AID Project Manager) joined in the discussion of the proposals. As the result of this meeting, activities involving about one third of the initial budget request for Core Funds were dropped by the CPMT to bring the requests into line with what was believed at that time to be a reasonable estimate of the Core Funds which would be available for FY86-FY87. By the time of the JPMT meeting which was held in Logan, Utah in late August, the estimate of the Core Funds

which would be available was considerably reduced and the estimated budget ceiling available for Buy-in activities was increased. Once the JPMT had reached a working agreement on the CORE Funds which would be available, university initiated requests for Core Funds had to again be cut by one third. The process of reaching agreement on the funds available by various categories was painful, but once a mutually acceptable agreement was reached, it was possible to move ahead rapidly and meet some very tight deadlines. Some of the main points with regards to the agreement reached on the FY85-FY86 Workplan are discussed below.

a. It was agreed that the Workplan would be for the last two fiscal years of the project. It was agreed that a two year workplan would lead to both more responsible financial planning and a more integrated plan of work. It was also agreed that a series of "editions" of the workplan would be developed and only those activities would be included in the Approved Workplan which had developed to a stage where a mutually agreed upon scope of work and the resulting budget could be generated. After the major portion of the workplan had been developed, (this occurred after the "second edition") any additions to the Approved Workplan would only involve (1) development of a mutually agreed upon scope of work for the activity which was to be either added or modified, (2) development of an acceptable budget corresponding to that scope of work and (3) updated financial summary tables generated by the WMS II computer based Tracking System.

b. A set of working totals for budget categories are presented in Schedule C which is reproduced from the "second edition" of the FY86-FY87 workplan. The five budget categories are (1) University Initiated Core Funded Activities, (2) Buy-ins, (3) AID Initiated Core Funded Activities, (4) Administration/Support, and (5) Africa Bureau Funded Activities.

2. Financial Status of WMS II. The budget ceiling for the project was set at \$19,645,933. The total expenditures thru September 30, 1985 are \$10,868,136 (see table below).

WMS II EXPENDITURES thru September 30, 1985

	Budgets	Expenditures	Balance
FY85 Activities	8,603,824	5,016,754	3,587,070
Prior Yr. Activities Not Closed Out	4,612,370	4,018,508	593,862
Closed Out Activities	<u>1,832,874</u>	<u>1,832,874</u>	<u>0.0</u>
Total	15,049,068	10,868,136	951,932

The approved budgets for workplans prior to FY86-FY87 includes activities which will not be initiated, in part because the scope of work for some of the activities were never developed to a stage where the activity could be implemented. The approved budget totals are therefore not a useful figure in estimating financial commitments. It is hoped that the procedures used in developing the FY86-FY87 Workplan will permit the use of approved budget totals as a basis for financial planning.

The expenditures for FY85-IV are \$1,308,591, for FY85-III - \$1,292,728, for FY85-II - \$1,085,997, for FY85-I - \$961,366 and the average quarterly expenditures for the first three years of the project are \$905,678. The unexpended portion of the budget ceiling is \$8,777,797; this would allow an average expenditure for the remainder of the project of \$1,097,225, if all expenditures were recorded by the end of the project - 30 September, 1987.

This simplistic analysis of the financial status of WMS II can be used to highlight three issues which must be considered if the financial aspects of the project are to be handled in a responsible way so that so that the contract ceiling will not be exceeded and plans can be made so that the remaining project financial resources can be used as productively as possible. (1) Funds to permit expenditures to equal the budget ceiling will not be available unless buy-ins equal the figure presented above and AID funding levels permit allocation of Core Funds at the levels implied above. (2) The quarter during which commitments are made for some expenditures lags the quarter during which expenditures are reported. Therefore, if the project is to simultaneously make full use of the financial resources which can be made available and not exceed the contract ceiling on expenditures, it will be necessary to develop an accrual accounting system which permits reasonable estimates of expenditure commitments which are not yet recorded. Work will begin on the development of such a system during FY86. (3) Allowing for the fact that project expenditures will tend to decrease as the project winds down, the general level of expenditures can be sustained. With a modicum of financial planning, the project personnel should be able to complete the project work in a responsible and effective manner.

SCHEDULE C

SUMMARY OF ALLOCATION  
AND APPROVAL OF FY86-FY87 FUNDS  
FOR BUDGETS AS OF 21 OCTOBER, 1985

	Project Total	CSU	CU	USU
Allocated for University Initiated "New" Core Funded Activities	\$1,755,000	\$ 585,000	\$ 585,000	\$ 585,000
Approved Budget FY86		1,062,693	1,096,209	725,181
Approved Budget FY87		125,623	79,565	246,269
Total Approved Budget	3,934,522	1,188,316	1,175,774	971,450
<u>Less</u>				
Admin/Support	-879,572	-246,600	-208,073	-233,089
Buy-In	-136,501	- 56,725	- 79,776	- 0.0
AID Init. Core (Sched.B)	-292,605	- 91,782	- 72,440	-128,383
Carry-Over (Sched. A)	-316,203	-108,998	-131,541	- 75,664
Africa Bureau	-800,000	-120,654	-149,474	-124,700
Reserve TRIAD Phase II	+ 80,000	0.0	+ 40,000	+ 40,000
Approved for University Initiated "New" Core Funded Activities	1,586,591	563,557	574,420	449,614
Allocated But Not Approved-University Initiated "New" Core Funded Activities	167,359	21,443	10,530	135,386
Allocated for Buy-ins	1,822,660			
Approved for Buy-ins	136,501			
Balance	1,686,159			
Allocated for AID Initiated Core Funded Approved (Sched.B)	800,000			
Balance	267,605			
	532,395			
Allocated for Admin/Support	1,800,000			
Approved	879,572			
Balance	920,428			
Allocated for Africa Bureau Activities	800,000			
Approved	800,000			
Balance	0.0			

- a) Includes \$598,982 in EPD-all but Admin/Support related to Africa Bureau funded activities.
- b) Includes EPD Admin/Support-\$191,310
- c) \$40,002 Carry-Over from India Handbook FY85

## II. SPECIAL FOCUS

In this section of the report, each university presents an in-depth report of current work undertaken by that university.

- A. Colorado State University
- B. Cornell University
- C. Utah State University

A.

## COLORADO STATE UNIVERSITY SPECIAL FOCUS

### INTRODUCTION

Since 1982, the Water Management Synthesis Project has conducted a series of training programs in India, Sri Lanka, Bangladesh, Nepal, and Pakistan. Irrigation and agriculture officials have been trained in interdisciplinary techniques for analyzing irrigation system performance.

One of the Water Management Synthesis Project's goals is to improve the training capabilities of institutions and individuals involved in irrigation management. To this end, the Project conducted a Training of Trainers workshop at Colorado State University from August 19 to 21, 1985. The objectives of this workshop were to discuss and develop ways to improve the structure and processes of irrigation training workshops, and to improve the training skills of the workshop participants.

A three person staff from the Water Management Synthesis Project coordinated the workshop, assisted by two consultants from World Education, Inc., of Boston, Massachusetts. Twenty training and irrigation management professionals were participants in the workshop, representing the disciplines of agronomy, agricultural economics, cultural geography, engineering, rural sociology, and adult education.

The workshop was heavily oriented towards a participatory learning approach. For half of the workshop, the 20 participants were divided into three smaller interdisciplinary working groups. Though the workshop staff and World Education consultants did deliver a few lectures, most of the workshop emphasized large and small group deliberations and discussions. Brainstorming, critical incidents, and other gaming techniques were used throughout the workshop. Employing these techniques, the staff asked the participants to define critical training issues, and then to develop some specific guidelines for implementing these issues in a training program.

The following focuses on only one aspect of the training workshop - a report on the three-phased training approach. The entire training workshop report is being sent to the Joint Project Management Team, however.

### THREE-PHASED TRAINING APPROACH

To conduct a successful training program, it is important for the training institute to use a systematic approach to get organized for training. In this workshop, a three-phased approach -- pre-training, training, and post-training -- was introduced and discussed. In the following sections, we will discuss the approach and the major tasks related to each training phase in detail.

#### A. Pre-Training Phase

In the pre-training phase, the various partners in a training effort (the participants' work organization, the training institution and the funding agency) are linked together in building a picture of what training is to be, what resources will be necessary and how participants will be trained. The

success of a training program is often determined during the pre-training or planning phase as each partner's role is defined.

In the pre-training phase, our attention focuses on

- \* establishing and clarifying training goals
- \* defining training requirements and settings
- \* developing relationships with training organizations
- \* organizing training inputs
- \* selecting a training strategy

### Establishing and Clarifying Training Goals

The framework used for examining the elements which comprise the pre-training phase is a general one which is the basis for many training programs similar to the Diagnostic Analysis. Developing a viable training strategy depends in large part on the training organization's (in this case, WMSII) ability to clarify both training objectives and the means for carrying out the training and to relate the two. The end results of this part of the training process are clear indications of each part of the training task, including full knowledge of the resources of time, skills and the necessary facilities.

Four questions dominate this process. The first two constitute what is often referred to as the external strategy, that is, establishing training goals and defining training requirements. The other two questions are outcomes of an internal strategy: organizing training inputs and improving the training institution's ability to respond to specific training needs and objectives.

In the external strategy, the concern is with questions of:

- \* what are the training goals (what changes are to be effected)? and
- \* what numbers of people need to be trained and what are the resources required to do the training?

It is at this early point that much training fails. This is often not because of the efforts of the training institution, but rather it is due to lack of precision in specifying training goals on the part of the participants' work organization or the organization sponsoring the training activity. Goals for change (or training goals) must be precisely defined at this point to provide the training institution with guidelines for developing the training program and to enable the work or sponsoring organization to measure participants' progress. In training of the nature of the DA workshop, the training institution does not set the goals for change. National and organizational policies set these goals. The training institution has the task of responding to those goals by developing a training program which is responsive and realistic. A critical part of the training institution's task is that of clearly defining for the work organization the part that training can play in the achievement of goals for change.

## Defining Training Specifications

Responsibilities change when it comes to defining training specifications. Issues related to how training goals can be attained and what training methods and materials could best be used are the business of the training institution. The training institution brings its accumulated knowledge and experience to bear on deciding the "how?," the "how long?," and the "when?" of training inputs. The training institution also needs to state precisely the contributions that other agencies will need to make to the training. In instances like the DA workshop, where the focus is on detailed field studies, identification of outside training inputs is critical. In addition to establishing the contributions to be made by other agencies, the training institution must identify the minimum concentrations of trained personnel required to bring about the change goals decided upon by the work or sponsoring organization.

## Developing Relationships with Work Organizations

The success of the pre-training phase depends on the kinds and levels of relationships which are established between the training institution and host country government and participants' work organization. There are at least eight steps which bring the organization sponsoring the training and the training institution into a closer working relationships during the initial stages of the pre-training phase. These steps are described in Table I.

## Organizing Training Inputs

Once training goals have been established and training specifications have been met, the internal strategy for training focuses on two further considerations:

- \* how to organize various training inputs for maximum effectiveness; and
- \* the adaptation of the training institution's abilities to respond to training goals/objectives.

At this point, the training institution combines its resources into meaningful outputs. Training settings are analyzed. Those which are deemed most beneficial for participants are selected for use in the training program. Likewise, training methods and materials are chosen which are consistent with training goals and which have the potential for maximum impact in the training setting. At the same time, a solid system of formative evaluation is designed to provide trainers and the training institution with data on whether the training being delivered is in keeping with the goals of the work or sponsoring organization.

## Selecting a Training Strategy

Selecting a training strategy (methods and materials) is directly related to the objectives of the training to be delivered. One training strategy is usually not appropriate for all settings, especially when objectives change from workshop to workshop. There are at least six training strategies that can be used to meet the training needs as shown in Table II. A detailed discussion of these training strategies are presented in Appendix C.

Table I

External Strategy: Five Steps Prior to Training\*

Training Institution	The Work Organization (or organization sponsoring the training)
2. Responds with explanation of which new knowledge, skills and understanding can be acquired through training.	1. Decides on change. Specifies inputs required, including new knowledge, skills and understanding.
4. Offers help in working out minimum concentrations of trained personnel required for desired change.	3. Studies what is involved, such as numbers and levels, and when, in relation to financial and organizational inputs necessary for the training.
5. Defines and communicates training specifications, i.e., kinds and duration of training, sequences, necessary follow-up, and contributions required from work or sponsoring organizations/other agencies.	6. Decides whether or not to proceed.
7. Collaborates with work/sponsoring organization in drawing up training plans for implementation.	
8. Collaborates in selecting individuals for training.	

\* Modified from Lynton and Pareek, Training for Development, Kumarian Press, West Hartford, Connecticut, 1978, pp. 40ff.

Table II  
Training Strategy: Six Alternatives\*

CONTENT

- |                      |                      |
|----------------------|----------------------|
| 1. Academic Strategy | 3. Activity Strategy |
|                      | 4. Action Strategy   |

CONCEPT \_\_\_\_\_ JOB/  
ORGANIZATION

- |                        |   |
|------------------------|---|
| 2. Laboratory Strategy | 5. Person-<br>Development Strategy      |
|                        | 6. Organization<br>Development Strategy |

PROCESS

\*Modified from that provided by Lynton and Pareek, op. cit. p. 40)

## B. The Training Phase

There are several important issues that trainers must address during the training phase. Among them are:

- \* establishing common goals
- \* developing norms of behavior
- \* building realistic relationships
- \* setting a climate for training
- \* delivering quality training activities
- \* carrying out formative evaluation.

### Establishing Common Goals

It is critical for trainers and participants to establish common goals from the outset of the training activity. Although the training organization may have stated its objectives for a training activity at the time the training was announced, it should not assume that all participants share in those objectives. It is likely that each participant will arrive with his or her expectations and objectives for participating in the training. Common goals can be established through initial training exercises which ask each participant to state and discuss his or her expectations of the training, or his objectives for participation in the training. Once expectations and objectives are noted, the list can be posted for future reference. If trainers find that participants' objectives are quite different from those established for the training, efforts must be made to reconcile the differences.

### Developing Norms for Behavior

Trainers and participants in activities like the DA workshop bring a variety of standards of behavior to the training. Some of these behaviors may be shared, while others may not. Trainers must be very clear as to what kinds of behaviors they expect from participants, and whether those expected behaviors are realistic given the cultural and social context in which the training is to take place. While some norms for behavior can be stated when a training activity is announced, others cannot. Trainers should be prepared to help participants decide on and set norms for the group rather than imposing norms on the participants. Trainers' actions will also help set norms for the group as many participants will expect trainers to know what standards are appropriate for group behavior.

### Building Realistic Relationships

The size of the training group, the role of the trainers, and the general approach taken to training all play an important role in defining the development of realistic relationship within a group. For maximum interaction, a training group should be manageable in size. Flexible room arrangement, participatory patterns of decision-making, and communication at both the group and individual level all foster the development of positive group interaction.

Through involving participants in defining expectations and objectives and sorting out appropriate behaviors, group development is accelerated.

### Setting a Climate for Training

Setting a positive atmosphere for the training involves getting to know participants as people, carrying about their learning (and social) needs, and accepting them as valuable resources in the training activity. A trainer should invite participant involvement in designing and implementing the training activity. A favorable climate for training leads to free and open discussion and has positive benefits in the form of increased collaboration between participants and trainers, a sense of ownership of the activity and the information being presented, and a general feeling of trust.

### Delivering Quality Training Activities

A trainer who pays close attention to the expectations and expressed needs of program participants is well on the road to responding with quality training activities. Content should be presented using a variety of methods, each of which should grow out of the situation, changing as the situation changes. The lecture method is important in that people do learn from listening to others, but adults learn best through participation. Lectures should be interspersed with question and answer sessions, group discussions, demonstrations and illustrations. Both large and small group discussions can be used effectively in training situations, as can role plays, games and simulations. No trainer should decide for himself or herself that an activity is inappropriate without first getting to know the group with which he or she is working. Trainers should remember to use all resources available, including participants.

### Carrying Out Formative Evaluation

Formative, or in-course, evaluation is essential in helping trainers and participants gauge the effectiveness of individual presentations and the training course as a whole. During the training phase of a program like the DA, several key events should be monitored through a formative evaluation system. These include:

- \* Orientation for participants during the first day of training
- \* Daily staff meetings for training staff
- \* Individual training activities
- \* Incorporation of feedback into program improvement
- \* Training team responsibility for orientation issues, daily planning, logistical issues, and liaison with local officials
- \* Equipment use and availability, transportation, food, lodging and participant morale.

### C. Post-Training Phase

Two major concerns emerge during the post-training phase of programs like the Diagnostic Analysis workshops. The training institution and the work organization are concerned about providing support to participants as they return to their jobs and put to use what they have learned. Funders and organizers are interested in the eventual impact of the training on the long-term and daily performance of participants.

Participants bring one set of behaviors to the training with them and, if training is successful, take another set away. Some would argue that training fails if it does not enable participants by equipping them for reintegration into their jobs. The success of their reintegration to their jobs may signal basic design problems in the two earlier phases of the program -- pretraining and training. Was adequate effort expended on defining training objectives and training specifications? Was the training strategy the correct one? Was the mix of content and activities appropriate for what was hoped for as outcomes? Were the materials used the most adequate? Were participants properly chosen?

In the post-training phase, we must address the two important issues:

- \* providing support after training
- \* support for application of training to work

#### Providing Support After Training

In the post-training or follow-up phase, organizers and the training institution find themselves first faced not with support or evaluation issues. Rather, at this point in the chronology of training, they must often deal with what Miles[1] calls redressing the imbalance of the training program. These are:

- \* input overload: Trainers may have attempted to include too much information and activity in the program or, training tasks may have been scheduled at the end of the course without giving trainees time to "wind down" before leaving the training site. Reports on field work often fall into this latter category. As a result, trainees can feel exhausted and discouraged over what they have not learned. Or, another behavior often exhibited is that participants return to their jobs unable to comfortably move back into their work.
- \* unrealistic goals: Often, participants and trainers set unrealistic goals at the outset of a training course. Further, they fail to alter them during training when it becomes obvious that the goals are unrealistic given participants' skills. As a result,

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1. Matthew B. Miles. "On Temporary Systems." In Matthew B. Miles (ed.) Innovation in Education. New York: Teachers College, Columbia University, 1964, pp. 437-90.

trainees can return to their job sites with a feeling that their superiors need to be trained in order to understand them, or they return to work unclear as to what they can apply from their recent experience. In short, the value of the training is placed in question by those closest to it -- the participants.

- \* alienation: Participants form new reference groups during training thus moving away from previously held ones based on their job sites. This gap often occurs in programs which stress new attitudes or values, or new approaches to the work tasks, and are especially noticeable when attempts to apply program learnings are frustrated by a nonresponsive job environment.
- \* linkage failure: Effectively linking training with work depends on the work organization's involvement in the design of the program and establishment of training specifications. The work organization must be prepared not only to allow participants to leave for training but also for their return.

These four imbalances and the problems associated with them can and should provide the impetus for change in future training programs. An organization's ability to correct these imbalances in future programs will depend on the evaluation system it has in place and that system's ability to "sent up the flags" at the appropriate moments. An evaluation system which is formative in nature rather than summative allows the training institution to learn while experiencing, not just learning from experience.

#### Support for Application of Training to Work

Training is effective when participants (and their work colleagues) proceed with sharing of information about the training, evaluating the ideas (or change) proposed by the training, and trying out those ideas in actual work settings. In the ideal, the workshop participant becomes a "trainer" at his or her job site. This is possible only when the participant was provided with and involved in training exercises which viewed him as a change agent.

These points stress the need for the work organization's active participation during the pre-training phase especially if it is interested in change. Contact with the work organization during training can be used to maintain interest in initially agreed upon objectives.

Contact also needs to continue after the training as well. When newly learned skills are applied they may, in turn, generate new training or information needs. The training institution can provide much needed support by:

- \* pursuing joint activities on the job with the work organization, thus directly reinforcing training content;
- \* maintaining contact with participants from a distance through correspondence, newsletters or intermediaries such as funding agencies; or

- \* providing refresher and further in-service training courses either at the work organization or the training institution.

Although these three levels of contact form a logical approach to follow-up or support, there is wide agreement that these are rarely carried out in a systematic manner. Many training institutions view the development of post-training contacts as part of their primary tasks. As the maintenance of post-training contacts has economic ramifications, the approach chosen should be clearly outlined with program objectives and goals precisely defined.

B.

CORNELL UNIVERSITY  
MEETING RECURRENT COSTS OF IRRIGATION SYSTEMS--A SYSTEMATIC  
ASSEMBLY AND SYNTHESIS OF WHAT IS KNOWN

The problem of recurrent costs for irrigation agencies for operation and maintenance activities has become increasingly important for project planners for several reasons. In many countries, neglect of O&M has resulted in the rapid depreciation of investments in irrigation infrastructure and a noncommittant reduction in command area served. Given rising costs of project development and the lack of fiscal resources available to international donors as well as governments in the developing world, the costs of system maintenance are an important policy concern.

WMS-II has undertaken a two-pronged effort to address these issues. The first part of the effort consists of a study which focuses on (a) review of the literature dealing with the financing of recurrent costs of irrigation programs in developing countries, (b) case studies of current policies and practices regarding water pricing and the collection of irrigation fees in Nepal, Sri Lanka, India, and the Philippines, and (c) an analysis and synthesis of the findings. This part of the activity has been subcontracted to the University of Minnesota, under the direction of K. William Easter, Professor of Agricultural Economics.

The four case studies examined such factors as the organization and management of national entities responsible for irrigation systems operation, maintenance and rehabilitation. They also address the capacity of water user organizations to carry out these functions. Finally they look at the structure of water fee and fee collection processes to see how these two factors influence capacity to raise funds for O&M.

On the basis of these four studies, Easter concludes that a basic constraint to adequate O&M in Asia is a lack of resources, which in turn is at least in part attributable to the failure of agencies to take a system approach to irrigation and to plan for O&M until after construction is completed. For this reason water pricing policy and fee collection capacity are by and large inadequate to meet recurrent costs. Other factors contributing to this problem are national budget constraints, new project emphasis, lack of interest in O&M on the part of donor agencies, and the low status of O&M in irrigation departments.

A number of suggested strategies for increasing resources available for O&M entail increased fee collection from farmers. Easter lists six conditions to be met if collections are to be significantly increased: (1) an up-to-date information system on those who receive water; (2) a reasonably dependable delivery system; (3) an agency willing and able (with adequate staffing and funding) to collect fees; (4) use of fees to improve or maintain system; (5) the imposition of a fee collection system when a system is new or just rehabilitated; and (6) penalties for non-payment. Easter suggests that if any of the first four conditions do not hold, it would be unrealistic to expect to collect fees, and that it would be preferable to rely on a general land or

product tax. He concludes that governments are not likely to be able to collect the same level of fees from all projects and that fees should not be expected to cover O&M costs in all projects.

As alternatives to fee collection he suggests the devolution of responsibility for O&M to water user organizations. He also suggests that increased government or donor agency investments in rehabilitation and maintenance may be a prerequisite for enhanced fee collection and that donor agencies should address O&M capacity before turning over irrigation projects to government agencies. Easter's analysis will be circulated for comments as a WMS-II working paper. A limited number of copies of the case studies on which it is based are available from AID/Washington. Cornell also expects to reproduce the annotated bibliography as a working paper.

The second part of the study was the preparation of a paper at Cornell University for ARDO Conference Workshop on Irrigation Management, held at the International Rice Research Institute, Los Banos, the Philippines, in April, 1985. The paper was prepared by E. Walter Coward, Jr., Professor of Rural Sociology, and Norman Uphoff, Professor of Political Science, both at Cornell University. The paper grew out of a series of discussion sessions with the Irrigation Studies Group.

Coward and Uphoff found that policies that encourage farmers to mobilize their own resources for irrigation O&M are feasible and are likely to reduce agency recurrent costs. Such policies would allow for considerable farmer involvement in system operation and responsibility for maintenance. They suggest that to achieve fuller participation more attention be directed to design and construction of appropriate physical facilities, to increased farmer involvement in management and decisionmaking and management, to strengthening local irrigation organizations, and to creating new financial arrangements for O&M expenditures and fee collection. They concluded that such a shift in irrigation development strategies will require fundamental changes in both agency behavior and in the design and construction of irrigation facilities.

### C. UTAH STATE UNIVERSITY SPECIAL FOCUS

#### India Irrigation Sector Evaluation and Strategy Review

##### Program and Project Development

There is a serious need for longer lead times and more background studies and preparation for future projects. Both GOI and AID/W policies apparently will preclude any significant increase in direct hire staff. Moreover, there are significant disadvantages in always having to work through short-term expatriate planning teams.

An alternative is to develop long-term relationships with key Indian institutions that have the capacity to conduct background research, explore possible program lines and otherwise participate with USAID in the conceptualization and initial planning of new program areas, and in the further implementation of current projects, particularly IM&T. Such national institutions could play a role in the implementation stage projects, often working with and through State-level institutions for various project activities. This arrangement with key Indian institutions would allow a logical point of contact between any U.S. expertise involved in the project planning and development stage in addition to the linkage that such consultants would have with AID staff.

#### GEOGRAPHIC CONCENTRATION

The present portfolio of irrigation projects already involves USAID with six different State governments as well as the Center. Geographic concentration would not only have a positive impact on practical matters of travel and logistics, but allow Mission staff and staff from the key Indian institutions working with USAID to become familiar with and known to the important irrigation policy makers and implementors in those States. Therefore, in planning future irrigation activities such as those discussed below, USAID should first consider the option of implementing these activities in one or more of these six States. However, given the extreme poverty and good irrigation potential in Eastern India, USAID should cautiously look at possibilities in that region, particularly as they relate to groundwater development.

#### Specific Program/Project Models

The Team proposes looking at a few new program/project areas or models. These are:

1. Direct assistance with canal irrigation system operation, management and maintenance. This would fit nicely as a project in the current USAID irrigation program;

2. Direct assistance to local sector irrigation which involves the rather large set of small irrigation projects accounting for approximately 5 percent of all irrigation in India, but which generally falls outside of the jurisdiction of the State IDs;

3. Development and testing of a model of improved system management through rehabilitation and disaggregation of a major canal reservoir irrigation system, plus ongoing management assistance; and

4. Commercial groundwater development with a focus not only on well development, but also on technical assistance with pumpsets, improved application systems and marketing.

#### Ongoing Program

None of the subprojects under the two medium irrigation projects will likely be fully completed including chak development by the project assistance completion date. Considering that USAID will have gained a great deal of locale-specific expertise with these projects, they could be interesting candidates for incorporating the Irrigation System Management Model. USAID should consider continuing support for their completion so that they could be effectively phased into the OM&M stage. For the in-service and University training and the Hill Area Development programs, the Team recommends that decisions be left open pending appropriate evaluations.

### III. STATUS OF PROGRAMMED ACTIVITIES

The activities of the WMS II originate from three sources: (1) Mission initiated technical assistance and training; (2) University initiated special studies and training programs; and (3) AID/Washington initiated activities. The following listed activities were requests received by the WMS II Project Management from the beginning of the project up to and including September 30, 1985. Activities are categorized according to lead university as well as country.

The terms listed below are used to indicate activity status:

- Preliminary - denotes a request that requires further clarification (scope of work and/or dates are incomplete or are missing) before it can become a formal request.
- Formal - denotes a request for which all major details have been clarified and formal addition to the Workplan has been requested through the Overall Administration Office.
- Approved - denotes an activity that has been approved by the CPMT and AID/Washington and added to the Workplan through a request of the Overall Administration Office as of September 30, 1985.
- Initiated - denotes an approved activity that has been initiated and is currently ongoing.
- Finished - denotes an activity for which all technical responsibilities, including report writing, have been fulfilled.
- Completed - denotes an activity for which all technical and fiscal responsibilities have been fulfilled as of September 30, 1985.
- Pending - denotes a non-approved request for which addition to the Workplan has not been sought and/or approved even though clarification of major details has been obtained.
- Postponed - denotes an approved activity to be carried out in the following fiscal year. Reasons for postponement may be lack of host country approval, inability to identify personnel, scheduling conflicts, etc. The budget of such an activity shall be removed from the current fiscal year Workplan and included in an appendix to the one in which the work is to be done and expenditures made. The monies shall not be reallocated and reapproval will not be necessary for one fiscal year.

- Dropped - denotes a non-approved request dropped from further consideration.
- Cancelled - denotes an approved, yet uninitiated activity deleted from the Workplan and dropped from further consideration in the near future.
- Terminated - denotes an activity that has been initiated (expenditures charged against it), but then for some reason the decision is made to stop and further work. A new budget covering incurred expenses shall be submitted through the Overall Administration Office to AID/Washington and the status considered the same as completed.

The source of each activity is indicated by the following designations:

- UNIV - University initiated
- USAID - Mission initiated
- AID/WASH - AID Washington initiated

Colorado State University Activities FY 83 (9-30-85)

COUNTRY	ACTIVITY	CODE	STATUS	SOURCE
Bangladesh	TA-Curricula Dev. (BAU)	1-03-030-82	Completed	USAID
	TA-Consultant, Legal	1-03-029-82	Completed	USAID
	TA-Scope of Work	1-02-006-82	Completed	USAID
	T-DA Workshop	2-02-007-82	Completed	USAID
India	TT-Watercourse Hdbks.	2-13-025-82	Completed	USAID
	TA-Water Mgmt & Trng.	1-02-020-82a	Completed	USAID
	T-Meas. for Sys. Mgmt.	2-07-026-82	Completed	USAID
	TA-Evans Proj. Prep.	1-02-033-83	Completed	USAID
	TA-Clyma's TDY	1-02-035-83	Completed	USAID
	DA Workshop Planning Development of Solutions	1-02-044-83 1-02-024-82	Completed Completed	
Indonesia	TA-Oad's TDY	1-02-030-83	Completed	USAID
Pakistan	TA-WM (CWM) Meeting	1-02-029-83b	Completed	USAID
	TA-Clyma's TDY	1-02-031-83	Completed	USAID
Sri Lanka	T-DA Workshop	2-02-028-83	Completed	USAID
	WID-DA Workshop	2-02-034-83	Completed	
Worldwide	TT-Brochures;Newsltrs, Pub.	2-12-018-83	Completed	Univ
	TT-Survey&Str. for Trng.	2-09-019-83	Completed	Univ
	TT-Videotape Modules	2-03-021-83	Completed	Univ
	TT-Computer Applications	2-10-022-83	Completed	Univ
	T-Wkshop(Tech.& Soc.)	2-04-023-83	Completed	Univ
	SS-Comm. for Tech. Tran.	3-04-024-83	Completed	Univ
	SS-Irig. Systems Mgmt.	3-04-025-83	Completed	Univ
	TA-Water Resource Econ. CSU Administration	1-02-042-83 0-02-998-83	Completed Completed	AID/Wash

Colorado State University Activities FY 84 (9-30-85)

COUNTRY	ACTIVITY	CODE	STATUS	SOURCE
Africa	TR--Africa Workshop	2-14-113-84	Completed	Univ.
Dominican Rep.	TA--Reconnaissance Team	1-02-110-84	Completed	
India	TA-Rajasthan MIP-Cad.	1-02-026-84	Cancelled	USAID
	TR-DA Workshop M.P.	2-02-031-84	Completed	USAID
	Curriculum Development	1-02-094-84	Completed	
Indonesia	TA-Long Term WM Spec.	1-01-008-84	Cancelled	USAID
	TR-DA Workshop	2-04-010-84	Terminated	USAID
Nepal	TR-DA Workshop Planning	2-02-003-84	Completed	USAID
Pakistan	TR-Sr. Off. Workshop	2-04-019-84	Initiated	USAID
	TA-Command Water Mgmt	1-02-114-84	Initiated	USAID
Sri Lanka	TR-DA Workshop	2-02-006-84	Cancelled	USAID
	TA-WM Central Support	1-02-022-84	Finished	USAID
	TA-Design Team	1-02-102-84	Finished	USAID
	TA-Long-Term WM Spec.	1-01-109-84	Initiated	USAID
Worldwide	TR-Professional Visitors & Networking	2-11-039-84	Initiated	Univ.
	TR-DA Trainers Workshop	2-08-040-84	Initiated	Univ.
	TT-Instructor's Guide DA	2-13-042-84	Initiated	Univ.
	TT-Brochures, Newsletter, Pubs.	2-12-044-84	Initiated	Univ.
	TT-ICID Senior Off. Wkshop	2-04-048-84	Completed	USAID
	TT-Survey & Strategy	2-09-049-84	Initiated	Univ.
	TR-Workshop; Soc & Tech.	2-04-050-84	Completed	Univ.
	TT-Microcomputers	2-10-051-84	Initiated	Univ.
CSU Administration	0-02-998-84	Completed	Univ.	

Overall Activities FY 84 (9-30-85)

COUNTRY	ACTIVITY	CODE	STATUS	SOURCE
Worldwide	Administration	0-01-999-84	Completed	Univ.

Colorado State University Activities FY 85 (9-30-85)

COUNTRY	ACTIVITY	CODE	STATUS	SOURCE
Egypt	TA-Eval. of IMS	1-02-072-85	Formal	USAID
El Salvador	TA-PID Preparation	1-02-059-85	Finished	USAID
India	TT-Dev. of Handbooks	2-13-027-85	Initiated	USAID
	TT-Technology Transfer	2-06-022-85	Cancelled	USAID
	TT-Training Materials	2-13-020-85	Cancelled	USAID
	TR-Training of Trainers	2-14-019-85	Cancelled	USAID
	TA-Priority Research	1-02-014-85	Cancelled	USAID
Indonesia	TA-Cost Recovery Study	1-02-074-85	Finished	USAID
Nepal	TR-DA Workshop	2-02-031-85	Initiated	USAID
	Rapid Appraisal	1-02-087-85	Initiated	USAID
Pakistan	TR-Mgmt Off. Trng.-Planning	2-01-065-85	Initiated	USAID
	TA-Cur. Development	1-02-071-85	Initiated	USAID
	Baseline Survey	2-04-083-85	Initiated	USAID
	Key Officials	2-04-080-85	Initiated	USAID
Sri Lanka	SS-Landsat 85	3-04-038-85	Finished	Univ.
	SS-Interfacing OFWM	3-04-036B85	Initiated	Univ.
	TA-Central Support-85	1-02-003-85	Initiated	USAID
Swaziland	TA-Irrig. Priorities	1-02-069-85	Finished	USAID
Worldwide	TR-Seminar on System Rehab. Phase I	2-05-033-85	Finished	Univ.
	TR-Microcomputer Workshop	2-14-032-85	Initiated	Univ.
	SS-Interfacing OFWM Backstopping	3-04-036A85	Finished	Univ.
	CSU Administration	0-02-998-85	Initiated	

CORNELL UNIVERSITY ACTIVITIES FY-84

COUNTRY	ACTIVITY	CODE	STATUS	SOURCE
India	SS-Community Kuhls in Himachal Pradesh	3-04-099-84	Cancelled	UNIV
Indonesia	TA-Small-Scale Irrigation and Management Project	1-02-011-84	Completed	USAID
Niger	SS-Small-Scale Irrigation in Niger, Preliminary	3-04-098-84	Completed	UNIV
	SS-Traditional and Developed Small-Scale Irrigation Study	3-04-111-84	Initiated	UNIV
Sri Lanka	TA-Farmer Organization Program	1-02-007-84	Completed	USAID
	SS-Impact of Physical and Operational Rehabilitation	3-04-097-84	Initiated	UNIV
Worldwide	TR-Main System Irrig.Task Force	2-06-077-84	Completed	AID/W
	TR-FAO/AID Expert: Indonesia	2-14-067-84	Completed	AID/W
	TT-Small-Scale Irrig.Task Force	2-14-065-84	Initiated	AID/W
	TT-Professional Visitors	2-11-068-84	Initiated	UNIV
	TT-Current Research Seminar "Planning"	2-14-075-84	Completed	UNIV
	SS-Small-Scale Completion	3-04-069-84	Initiated	UNIV
	SS-Analysis of Participation Completion (FY-83)	3-04-070-84	Initiated	UNIV
	SS-Management Intensities	3-04-096-84	Initiated	UNIV

CORNELL UNIVERSITY ACTIVITIES FY-85

COUNTRY	ACTIVITY	CODE	STATUS	SOURCE
Haiti	Cayes Plain		Initiated	USAID
India	TR-Farmer Organization Workshop	2-14-017-85	Cancelled	UNIV
Indonesia	TA-SSI Workshop	1-02-009-85	Initiated	USAID
Mauritania	TA-Peace Corps Assistance	1-02-061-85	Cancelled	USAID
Niger	SS-Traditional and Developed SSI	3-04-052-85	Initiated	UNIV
Pakistan	TR-Extension Training Recon.	2-06-063-85	Cancelled	USAID
Sri Lanka	TA-Socioeconomic Studies	1-02-004-85	Initiated	USAID
Worldwide	TA-Recurrent Costs	1-02-062-85	Initiated	AID/W
	TR-Rehabilitation Game	2-13-048-85	Initiated	UNIV
	TR-Lessons Learned Workshop	2-14-049-85	Approved	UNIV
	TR-Current Research Seminar	2-14-050-85	Finished	UNIV
	SS-Indirect Investment Phase I	3-04-053-85	Finished	UNIV
	SS-Indirect Investment Phase II	3-04-054-85	Initiated	UNIV
	SS-Rural Employment	3-04-055-85	Initiated	UNIV
	SS-Management Intensities	3-04-056-85	Initiated	UNIV

Utah State University Activities

FY 83

COUNTRY	ACTIVITY	CODE	STATUS	SOURCE
Africa	SS-Dev. of Social Parameters	3-04-057-83	Finished	UNIV
Dominican Republic	TA-Project PID	1-02-010-82	Completed	USAID
	TA-Project Paper (OFWM)	1-02-009-83	Completed	USAID
Ecuador	TT-Ecuavir Video	2-03-054-83	Initiated	UNIV/USAID
Haiti	TA-Irrigation Project Eval.	1-02-039-83	Completed	USAID
India	TA-Water Mgmt. & Training and Water Management CWM	1-02-020-82B)	Completed	USAID
		1-02-029-83 )		
	TA-Olsen's TDY	1-02-037-83	Completed	USAID
	TA-Institutional Analysis	1-02-053-83	Finished	AID/WASH
Jordan	TA-Review of Curriculum	1-02-041-82	Completed	USAID
Mali	TA-OFWM Specialist	1-02-006-83	Completed	USAID
Pakistan	TA-Mayfield's TDY	1-02-040-83	Completed	USAID
Peru	TA-Special Study	1-04-027-82A	Finished	USAID
West Africa	SS-Small-Scale Irrigation	3-04-036-83	Completed	UNIV
Worldwide	TT-Start-up Workshop	2-14-055-83	Completed	UNIV
	TT-Short-term Nondegree	2-08-056-83	Completed	UNIV
	SS-On-Farm Irr. Sys. Selection	3-04-058-83	Completed	UNIV
	SS-Main Sys. Mgmt. & Rehab. and Action Research	3-04-059-83) 3-04-060-83)	Initiated	UNIV

Utah State University Activities

FY 84

COUNTRY	ACTIVITY	CODE	STATUS	SOURCE
Africa	TA-African Irrigation Overview	1-02-108-84	Initiated	AID/WASH
Chile	TT-Conference	2-14-058-84	Completed	AID/WASH
Dominican Republic	TA-Weed Control Specialist	1-02-091-84	Finished	USAID
Ecuador	TT-Finishing Original Modules	2-03-054-84	Initiated	USAID
	TT-Instructional Manual	2-03-055-84	Cancelled	UNIV
Haiti	TA-Irrigation Sector Survey	1-04-017-84	Finished	USAID
India	TA-Short Course	1-02-100-84	Finished	USAID
	TA-Maharashtra MIP	1-02-018-84	Finished	USAID
	SS-Irrig. Project Monitoring	3-04-020-84	Cancelled	UNIV
	TA-Maharashtra IT&M	1-01-021-84	Finished	USAID
	TA-Soc/Tech Feas. Study	1-02-023-84	Approved	USAID
	TA-Madhya Pradesh MIP	1-01-025-84	Cancelled	USAID
	TT-Senior Officer's Workshop	2-04-053-84	Initiated	UNIV/USAID
	TA-Irr. Eval. & Strategy Review	1-02-103-84	Finished	USAID
Jordan	TA-Irrigation Sector Survey	1-04-013-84	Finished	USAID
	TA-WM Specialist (TDY)	1-02-014-84	Initiated	USAID
	TT-On-Farm Water Management	2-01-015-84	Cancelled	USAID
Pakistan	TA-Irrigation Policies	1-02-101-84	Finished	USAID
	TA-Command Water Management	1-02-106-84	Finished	USAID
Peru	TA-Small & Med. Irri. Systems	1-02-035-84	Finished	USAID
	TA-Plan MERIS	1-01-112-84	Initiated	USAID
Senegal	TA-Bakel Irr. Per. Assist.	1-02-033-84	Approved	USAID
Swaziland	TA-Irri. System Monitoring	1-02-063-84	Pending	USAID
Tanzania	TA-Irrigation Study	1-02-082-84	Finished	USAID
Worldwide	TT-French Language Training	2-11-059-84	Initiated	UNIV
	TT-Irr. Sys. Mgmt. Task Force	2-14-060-84	Initiated	UNIV
	SS-Main Sys. Des. Mgmt., Rehab.	3-04-061-84	Initiated	UNIV
	SS-Selection of Irrig. Tech.	3-04-062-84	Completed	UNIV

Utah State University Activities

FY 85

COUNTRY	ACTIVITY	CODE	STATUS	SOURCE
Bolivia	TT-Small-Scale Course	2-14-010-85	Finished	USAID
	TT-On-Farm Water Mgmt. Course	2-14-011-85	Approved	USAID
Dominican Republic	TT-On-Farm Water Mgmt. Course	2-14-030-85	Cancelled	USAID
Chad	TA-Irrigated Agric. Assessment	1-02-073-85	Initiated	USAID
Egypt	TA-Water Use Project Evaluation	1-02-066-85	Finished	USAID
El Salvador	TA-Project Paper	1-02-077-85	Finished	USAID
Honduras	TA-Irrigation Development	1-02-060-85	Finished	USAID
India	TA-Water Balance	1-02-023-85	Formal	USAID
	TA-Hydraulic Conductivity	1-02-024-85	Formal	USAID
	TA-Reservoir Operation	1-02-025-85	Deleted	USAID
	TA-University Curricula	1-02-013-85	Finished	USAID
	TT-Rapid Appraisal	2-14-016-85	Formal	USAID
	TT-Innovative Teaching	2-03-012-85	Formal	USAID
	TT-Main Systems Training	2-14-015-85	Deleted	USAID
	TT-Computer Assisted ISM	2-14-040-85	Deleted	USAID
	TT-Video Modules	2-14-075-85	Initiated	USAID
Jamaica	TA-Planning Activities	1-02-007-85	Approved	USAID
	TA-System Study	1-02-008-85	Approved	USAID
Jordan	TA-Advisory Service	1-02-028-85	Approved	USAID
Mauritania	TA-Plan of Action	1-02-076-85	Finished	USAID
Morocco	TA-PID Development	1-02-002-85	Initiated	USAID
Nepal	TA-Small- & Medium-Scale Irrig.	1-02-067-85	Finished	USAID
Sri Lanka	TA-Model Calibration	1-02-005-85	Initiated	USAID
Swaziland	TA-Irrigation Assistance	1-02-029-85	Approved	USAID
Thailand	TT-Maintenance Workshop	2-14-088-85	Approved	USAID
Worldwide	TT-Lessons Learned	2-14-039-85	Initiated	UNIV
	TT-French Language Training	2-11-041-85	Initiated	UNIV
	SS-Main Systems-Remote Sensing	3-04-042-85	Initiated	UNIV
Main Systems	SS-ISM Development	3-04-043A85	Initiated	UNIV
	SS-Thailand Case Study	3-04-043B85	Initiated	UNIV
	SS-Morocco Case Study	3-04-043C85	Initiated	UNIV
	SS-India Case Study	3-04-043D85	Deleted	UNIV
	SS-Interdisciplinary Workshop	3-04-043E85	Approved	UNIV

#### IV. ACTIVITIES

This section is a summary of the status of each activity under the WMSII Project. The review includes a synopsis of the purpose and status of each activity, the participants, and the time spent by each individual.

In order to clarify the project activities, this section has been divided into two sections, FY84 and FY85; FY84 and FY85 are divided into the following categories: Technical Assistance, Training and Technology, Special Studies and Administration.

A. FY84

A.1 Technical Assistance Activities

1. AFRICA - African Irrigation Overview

Code Number: 1-02-108-84

Status: Initiated

Lead University: Utah State University

Summary of Work: Work on the report (Volume 1) of the African Irrigation Overview has progressed slowly. Presently all chapters, with the exception of the chapter on Economic Aspects are in rough draft form and have been distributed for review and criticism. Volume 2, An Annotated Bibliography, has been published and is presently being distributed. Jon Moris was invited in September 1985 to FAO by Peter Dielman in the Land and Water Division, to assist in the preparation of a position paper and help plan a conference on African Irrigation to be held in 1986. Derrick Thom participated in a planning session on Pump Irrigation in Africa for a conference sponsored by AID in 1986.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Jon Moris	0.00 ppm	5.00 ppm	USU	Sociology
Derrick Thom	0.00 ppm	2.00 ppm	USU	History and Geog.
Ed Sparling	0.00 ppm	0.25 ppm	CSU	Ag. Economics
T. Podmore	0.00 ppm	0.25 ppm	CSU	Soil Science
Mary Tiffen	0.00 ppm	1.00 ppm	Consultant	Social Science
Peter Stern	0.00 ppm	1.00 ppm	Consultant	Civil Engineering
Don Humpal	0.00 ppm	1.00 ppm	DAI	Agronomy
Linden Vincent	0.00 ppm	1.00 ppm	Consultant	Social Science
Fred Weber	0.00 ppm	1.00 ppm	Consultant	Forestry Engineer
Philippe Zgheib	0.00 gpm	3.00 gpm	USU	Civil Engineering
Janet Chambers	0.00 spm	1.50 spm	USU	Typing

2. PAKISTAN - CWM Officials Workshop

Code: 2-04-019-84

Status: Initiated                      Lead University: Colorado State University

Summary of Work: This activity has been rescheduled. Plans for the activity now include the irrigation tours of India and Sri Lanka

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Ramchand Oad	0.00 ppm	2.25 ppm	CSU	Agricultural Engr.
Mohammed Haider	0.00 ppm	0.50 ppm	CSU	Economics
Wayne Clyma	0.00 ppm	1.14 ppm	CSU	Agricultural Engr.
Robby Laitos	0.00 ppm	0.25 ppm	CSU	Sociology

3. PAKISTAN - Command Water Management Planning

Code Number: 1-02-114-84

Status: Initiated

Lead University: Colorado State University

Summary of Work: The Diagnostic Analysis part of this activity was completed this quarter. Dr. Shafique stayed in Pakistan to coordinate the on-site training at the seven subproject areas. The rest of the team returned home prior to returning to Pakistan in October-November for the on-site training. Sritharan has been working on the management plan with the assistance of Mohammed Haider, Ed Shinn, Ralph Luebs, and Jim Warner. Paul Wattenberger assisted with the computer programming prior to going to Pakistan in October.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Mohammed Haider	3.00 ppm	9.00 ppm	CSU	Economics
Wayne Clyma	2.00 ppm	6.55 ppm	CSU	Agricultural Engr.
S. Sritharan	2.33 ppm	13.03 ppm	CSU	Civil Engr.
Ed Shinn	3.00 ppm	13.20 ppm	CSU	Sociology
M. Shafique	3.00 ppm	12.70 ppm	CSU	Agricultural Engr.
S. Karaki	0.00 ppm	0.80 ppm	CSU	Civil Engr.
Ralph Luebs	3.00 ppm	4.25 ppm	Consultant	Agronomy
J. Warner	2.00 ppm	2.91 ppm	CSU	Civil Engr.
Tom Sheng	0.00 ppm	1.75 ppm	CSU	Civil Engr.
Oguz Nayman	0.00 ppm	0.67 ppm	CSU	Tech. Journalism
Max Donkor	0.50 gpm	5.67 gpm	CSU	Agricultural Engr.
Paul Wattenberger	2.00 ppm	2.00 ppm	CSU	Agricultural Engr.
Support Staff	0.00 ppm	1.40 ppm	CSU	Support Staff

#### 4. PERU - Plan MERIS

Code Number: 1-01-112-84

Status: Initiated

Lead University: Utah State University

Summary of Work: Research - A total of 135 research field plots have been established in two areas, LaHuaylla on the left bank and Huayobamba on the right bank of the San Marcos sub-project of Plan MERIS I. The research includes irrigation rate and frequency, soil fertility management, crop types and varieties, with the experiments designed in such a way as to elaborate the interactions between two or more crop growth factors. Eight different crops are included. One of the five planned satellite projects was transferred to lower Huayobamba involving an area affected by high water table. A network of piezometer wells has been installed and seasonal fluctuations of water table have been recorded. Data will lead to identification of water source and to recommendations for control or elimination of the problem.

Extension - Excellent demonstrations are proceeding on 21 farms in the project area which covers some 23 hectares. A total of 11 crops are involved. Demonstrations include improved irrigation management, soil fertility, pest control and crop varieties. The Plan of Work called for the purchase and installation of gated pipe and sprinkle irrigation systems to be operated by gravity-driven pressure. This system has not yet arrived at site, but in its place the technicians installed an ingenious system of drop structures which take water down the steep slopes without any soil erosion. Water is siphoned to contour furrows from the drop structures using plastic tubes.

Economics - All collaborating farmers in Plan Piloto have been characterized as to size of land holding, farm management practices and economic inputs and outputs prior to Plan Piloto. Data generated by the demonstration-research will be evaluated economically in terms of input costs, changes in production efficiency and changes in economic potential resulting from improved irrigated crop production technology.

Sociology - Notable progress has been recorded in the study of community structure and stability, with emphasis on the irrigation subproject. Included in the study is the level of farmer's participation in irrigation system maintenance and management. Also, surveys have been carried out to determine sources and amounts of family income, farm work distribution within the family, and the use of production credit and marketing channels. This work is concentrated in the Plan Piloto community but one satellite project at Santa Rita has also been implemented.

Farm Credit Program - The logical framework of a small farm credit program, developed in Lima as an adjunct to Plan Piloto, is now being applied to an undeveloped area adjacent to and above Plan Piloto. The feasibility study is now moving forward with surveys for topographic maps and land title

status of the farmers involved. The area includes some 400 hectares and 500 families. All farmers in the area have responded spontaneously with a signed petition that the proposed subproject get underway immediately. If the program goes forward as envisioned, the irrigation system infrastructure will be installed entirely on the basis of farmer loans from the agricultural credit bank. The bank has the funds and is ready to sign the credit agreement as soon as the feasibility study is complete. This is an immediate spin-off of Plan Piloto and provides one other evidence of its success.

Training - A total of 28 technicians in Plan Piloto and Plan MERIS I have participated in day-long weekly or monthly training sessions during the period November '84 to September '85. A total of 54 farmers within the San Marcos subproject area plus 35 farmers in other subprojects received training. The farmer training consisted of weekly two-hour sessions for a period of two months.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
R. Kern Stutler	0.75 ppm	3.50 ppm	USU	Irrig. Engineering
Bill Farnsworth	0.00 ppm	1.78 ppm	USU	Ag. Extension
David James	0.71 ppm	2.24 ppm	USU	Soil Science
Mark Lusk	0.00 ppm	1.00 ppm	USU	Sociology
Larry Bond	0.00 ppm	1.00 ppm	USU	Ag. Economics
Barbara Lynch	0.00 ppm	1.78 ppm	Cornell	Anthropology
Dale Allred	1.50 ppm	1.50 ppm	Consultant	Engineering
Bruce Anderson	0.00 ppm	3.12 ppm	Consultant	Irrig. Engineering
Ivan Corbridge	0.00 ppm	7.97 ppm	Consultant	Ag. Economics
Mark Anderson	0.00 ppm	1.19 ppm	Consultant	Irrig. Engineering
Renato Rossi	0.00 ppm	7.00 ppm	Consultant	Irrig. Engineering
Don C. Kidman	0.00 ppm	1.50 ppm	Consultant	Agronomy
Luis Barrios	3.00 ppm	9.00 ppm	Consultant	Extension
Julio Guerra	3.00 ppm	9.00 ppm	Consultant	Administration
Jose Luis Villaran	3.00 ppm	9.00 ppm	Consultant	Sociology
Carlos Villanueva	3.00 ppm	9.00 ppm	Consultant	Ag. Economics
Carlos Nonone	3.00 ppm	9.00 ppm	Consultant	Agronomy

5. SRI LANKA - Long-Term WM Specialist

Code Number: 1-01-109-84

Status: Initiated                      Lead University: Colorado State University

Summary of Work: Larry Nelson began work on reports from the diagnostic analyses that have been going on at the four tank sites in Polonnarwa during Yala season. He continues to have difficulty with getting counterpart assistance when he needs it. All of the counterpart discipline leaders are assigned on a part-time basis.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Larry Nelson	3.00 ppm	18.00 ppm	CSU	Agronomy

A. FY84

A.2 Training and Technology Transfer Activities

1. WORLDWIDE - DA Trainers Workshop

Code Number: 2-08-040-84

Status: Initiated

Lead University: Colorado State University

Summary of Work: A workshop emphasizing training of trainers was held at CSU August 19-21. Dr. David Kohler and Dr. John Commings along with CSU professors Dr. Robby Laitos and Dr. Tom Sheng were the workshop coordinators. Attendance was 25 including representatives from CSU, USU, and Cornell. See CSU Special Focus.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Ramchand Oad	0.00 ppm	1.50 ppm	CSU	Agricultural Engr.
Robby Laitos	1.00 ppm	2.00 ppm	CSU	Sociology
Oguz Nayman	0.00 ppm	0.42 ppm	CSU	Tech. Journalism
Vicki Duneman	0.34 ppm	0.67 ppm	CSU	Tech. Journalism
D. Fowler	0.50 ppm	0.50 ppm	CSU	Tech. Journalism

2. WORLDWIDE - Survey of Training

Code Number: 2-09-049-84

Status: Formal

Lead University: Colorado State University

Summary of Work: A training strategies workshop was held October 3-4, 1985, at CSU with 18 participants. The workshop dealt with key training issues including intercultural communication and management. Dr. James King from the University of Nebraska and Eugene Martin from the University of Maryland management consulting group were the guest leaders. Al Madsen planned and directed the workshop.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Lynn Gibson	0.00 gpm	3.00 gpm	CSU	Economics
Al Madsen	0.00 ppm	1.31 ppm	CSU	Economics

3. WORLDWIDE - Brochures, Newsletters, Publications

Code Number: 2-12-044-84

Status: Initiated                      Lead University: Colorado State University

Summary of Work: Ms. Fowler completed the first project newsletter, the 16-page Water Management Review.

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Darlene Fowler	2.50 ppm	9.43 ppm	CSU	Tech. Journalism

4. WORLDWIDE - Instructor's Guide for DA

Code Number: 2-13-042-84

Status: Initiated                      Lead University: Colorado State University

Summary of Work: A draft copy of the guide was completed. It will be circulated for comments and then revised before printing.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Larry Nelson	0.00 ppm	2.25 ppm	CSU	Agronomy
Robby Laitos	0.00 ppm	1.00 ppm	CSU	Sociologist
Ramchand Oad	0.00 ppm	0.88 ppm	CSU	Agricultural Engr.
Mohammed Haider	0.00 ppm	1.00 ppm	CSU	Economics

5. WORLDWIDE - Professional Visitors & Networking

Code Number: 2-11-039-84

Status: Initiated      Lead University: Colorado State University

Summary of Work: Several visitors came to CSU during this quarter including eight Pakistanis on one tour and Mr. Amin Chaudhrey, Secretary of Agriculture for the Punjab, and Mustaque Gill, Director of the On-Farm Water Management Training Institute in Lahore, Pakistan.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Oguz Nayman	0.00 ppm	0.67 ppm	CSU	Tech. Journalism

A. FY84

A.3 Special Studies

1. SRI LANKA Impact of Physical and Operational Rehabilitation on Equity of Water Distribution and Performance of Farmer Organizations

Code Number: 3-04-097-84

Status: Initiated Lead University: Cornell University

Summary of Work: This study assesses experience in the Left Bank/Gal Oya, Sri Lanka in shifting and sharing responsibilities for main system management, with a focus on activities such as measuring and monitoring water deliveries with farmer participation. Zolezzi has completed a draft final report which has been returned with comments.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Hammond Murray-Rust	0.0 ppm	1.0 ppm	Cornell	Irri. Engineering
Oscar Zolezzi	0.0 gsm	4.5 gsm	Cornell	Irri. Engineering

2. WORLDWIDE Comparative Analysis of Farmer Participation

Code Number: 3-04-070-84

Status: Initiated

Lead University: Cornell University

Summary of Work: Work on a state-of-the-art paper continues, with publication planned in 1986. A draft working paper was prepared by Uphoff, edited by Gerard Finnan and was circulated for comments.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Norman Uphoff	0.5 ppm	3.5 ppm	Cornell	Political Science
Nancy St. Julien	0.0 ppm	10.0 gsm	Cornell	City & Regional Planning
Bryan Bruns	0.0 gsm	3.0 gsm	Cornell	Rural Sociology
Ruth Meinzen-Dick	0.0 gsm	5.0 gsm	Cornell	Rural Sociology
Gerard Finnan	2.25 gsm	2.25 gsm	Cornell	City & Regional Planning

3. WORLDWIDE Small-Scale Irrigation Systems Study Completion

Code Number: 3-04-069-84

Status: Initiated

Lead University: Cornell University

Summary of Work: E. Walter Coward, Jr.'s paper, "Improving Policies and Programs for the Development of Small-Scale Irrigation Systems," was published in September 1984 as Water Management Synthesis Report Number 27. "Small-Scale Irrigation: An Examination of Critical Design Issues" (Wensley, Norman, Merrill and Walter) and Agency Capacities in Small-Scale Irrigation Development" (E.W. Coward, Jr. and Susan Turnquist) are being prepared for publication. "Community Participation and Local Organization for Small-Scale Irrigation" (Barbara D. Lynch) has been published as Water Management Synthesis Report Number 34. James Nickum began redrafting paper on Investment Strategies for SSI.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
E. Walter Coward, Jr.	0.0 ppm	3.1 ppm	Cornell	Rural Sociology
Michael Walter	0.0 ppm	3.1 ppm	Cornell	Agri. Engineering
James Nickum	0.0 ppm	6.0 ppm	Cornell	Economics
Barbara D. Lynch	0.0 ppm	7.5 ppm	Cornell	Rural Sociology
Beth Rose	0.0 ppm	2.4 ppm	Cornell	Editing
Ray Norman	0.0 gsm	12.0 gsm	Cornell	Agri. Engineering
Susan Turnquist	0.0 gsm	12.0 gsm	Cornell	Rural Sociology
Luin Goldring	0.0 gsm	0.1 gsm	Cornell	Rural Sociology

A. FY84

A.6 Summary FY84

## A.6 Summary FY84

A review of the activity categories of technical assistance, training and technology, and special studies shows the following profile relative to institutional status and specialization areas of persons employed in each activity. This summary does not include administrative activities.

TABLE I. Amount of Employment Time Relative to Organizational Affiliations

<u>AFFILIATIONS:</u>	<u>QUARTERLY EMPLOYMENT TIME:</u>
Colorado State University	24.67
Colorado State Graduate Students	.50
Cornell University	.50
Cornell University Graduate Students	2.25
Utah State University	1.46
Utah State Graduate Students	.00
Independent Consultants	16.50

One important objective and activity of the WMSII project is that of increasing the quality and expanding the pool of expertise in water management. The universities are fulfilling this objective by involving professionals from other institutions in activities, employing persons who are not affiliated with any institutions, and by incorporating graduate students whenever appropriate.

The employment profile for the project activities of Utah State University, Colorado State University, and Cornell University, is shown on Tables II, III, and IV. These figures do not include administrative activities.

<u>SOURCE OF PERSONNEL:</u>	<u>QUARTERLY EMPLOYMENT TIME:</u>
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TABLE II. Colorado State University Employment Profile

Colorado State University	24.67
Colorado State Graduate Students	.50
Independent Consultants	3.00

TABLE III. Cornell University Employment Profile

Cornell University	.50
Cornell Graduate Students	2.25

TABLE IV. Utah State University Employment Profile

Utah State University	1.46
Utah State Graduate Students	.00
Independent Consultants	16.50

B. FY85

B.1 Technical Assistance

1. CHAD - Irrigated Agricultural Assessment

Code Number: 1-02-073-85

Status: Initiated

Lead University: Utah State University

Summary of Work: The Chad Team produced a draft report which was reviewed by the Mission, and a number of changes and additions were suggested. Thomas Weaver, the Team Leader, has been working on developing a second draft, taking into account the Mission's recommendations and various requests. Milton Barnett has been assisting in this effort. The second draft, which will include the Mission's requested recommendations and additions, will be completed near the end of October.

A seminar with the Team, Africa Bureau, Chad Mission and other interested personnel is being scheduled for some time in November to hold discussions covering the Team's recommendations and conclusions.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Jack Keller	0.00 ppm	0.00 ppm	USU	Irri. Engineering
Milton Barnett	0.75 ppm	1.00 ppm	Cornell	Sociology
Thomas Weaver	0.75 ppm	1.00 ppm	Consultant	Ag. Economics
Donald Humpal	0.75 ppm	1.00 ppm	DAI	Agronomy
Abraham Waldstein	0.75 ppm	1.00 ppm	AID/Washington	Sociology
Jean-Louis Balbo	0.75 ppm	1.00 ppm	Consultant	Ag. Engineering
Djime D. Adoum	1.25 ppm	1.50 ppm	Consultant	Agronomy
Madelise Blumenroeder	0.00 ppm	0.00 ppm	Consultant	Translation

2. HAITI Cayes Plain—Distribution of Benefits from Irrigation Development

Code Number: 1-02-084-85

Status: Initiated Lead University: Cornell University

Summary of Work: Laura Reynolds, Rural Sociology graduate student, travelled to Haiti. She spent approximately one month learning Creole, then relocated in the Cayes Plain area and began a study focusing on the impacts of irrigation development on land values, land sales, and land consolidation in the project area.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Laura Reynolds	2.5 gsm	2.5 gsm	Cornell	Rural Sociology

3. INDONESIA Small-Scale Irrigation Workshop and Other Technical Assistance

Code Number: 1-02-009-85

Status: Initiated

Lead University: Cornell University

Summary of Work: This activity consists of a series of efforts in support of irrigation development in Indonesia including technical assistance in analysis of irrigation regulation and water disputes, engineering assistance to various small-scale irrigation projects, and a workshop for selected Indonesian government officials from West Java, NTB and NTT. Jeff Brewer has been compiling and editing the final report for this activity.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Loren Parks	0.0 ppm	1.0 ppm	University of California (Davis)	Economics
Ramchand Oad	0.0 ppm	1.0 ppm	CSU	Engineering
Andrew Keller	0.0 ppm	1.0 ppm	USU	Irri. Engineering
Jeff Brewer	0.0 ppm	1.25 ppm	CSU	Anthropology

4. Country: Morocco - PID Development

Code Number: 1-02-002-85

Status: Initiated

Lead University: Utah State University

Summary of Work: A team consisting of Professors Skogerboe, Walker, Robson and LeBaron went to Morocco during the period of September 2-17, 1985 and prepared a draft PID for the "Agricultural Management and Productivity Project," a \$10 million grant to the Ministry of Agriculture and Agrarian Reform. The draft PID was attached to the Team's trip report. Final presentation of the draft was in general favorably received, but the Mission needed to formulate a clearer strategy for how they would include the proposals made in the PID in their current agriculture development strategy. The concept of the PID involved four integrated activities aimed at strengthening regional agricultural management and seemed to fit most of the ideas expressed by USAID/Morocco and the other donors currently assisting Morocco.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Gaylord Skogerboe	0.50 ppm	.50 ppm	USU	Irrig. Engineering
Wynn Walker	1.75 ppm	1.75 ppm	USU	Irrig. Engineering
Ross Robson	0.50 ppm	0.50 ppm	USU	Management Specialist
Allen LeBaron	0.50 ppm	0.50 ppm	USU	Ag. Economics

5. NEPAL - Rapid Appraisal

Code Number: 1-02-087-85

Status: Initiated                      Lead University: Colorado State University

Summary of Work: Dr. Alan Early and Dr. Robby Laitos initiated a rapid appraisal of irrigation projects in Nepal looking for project sites for a major USAID irrigation project.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Robby Laitos	0.50 ppm	0.50 ppm	CSU	Sociology
Al Early	0.40 ppm	0.40 ppm	CSU	Agricultural Engr.

6. Sri Lanka - Model Calibration

Code Number: 1-02-005-85

Status: Initiated

Lead University: Utah State University

Summary of Work: Willem Vlotman with counterpart, A.M. Jabir and Technical Assistant, B.L. Karunatilaka determined the hydraulic dimensions of regulating structures, installed stilling wells and gauges, and calibrated the regulating structures for the purpose of determining the channel losses in the left bank canal system of the Gal Oya Irrigation Project. After the first phase of calibrating the necessary structures with current metering and checking the year-old ratings of staff gauges in the canals, data were collected along the eight reaches for which channel losses were to be determined. Three computer programs were written to aid in the analyses of ratings and the determination of the losses. By the middle of August the irrigation system was shut down and analyses of the channel loss data commenced. On departure, a first draft of the report was left, covering the subjects of the important hydraulic dimensions of the regulating structures, the hydraulic theory of the various structures, methods of interpreting field-collected discharge data, by graphical means and/or with rating programs developed for radial gates and trapezoidal broad crested weirs, determination of channel losses and the preliminary results of the study. The final report will be completed in October and expanded to include an algorithm to convert field determined channel losses to ones that can be used with the steady-state computer model of the Gal Oya Irrigation Project.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Raylord Skogerboe	0.15 ppm	0.90 ppm	USU	Irrig. Engineering
Willem Vlotman	3.00 ppm	4.00 ppm	USU	Irrig. Engineering

7. SRI LANKA Socioeconomics Studies for Rehabilitation

Code Number: 1-02-004-85

Status: Initiated Lead University: Cornell University

Summary of Work: Norman Uphoff returned to Sri Lanka to review the Institutional Organizer/Farmer Organizer program in Ampare. He traveled to Galgamuwa (GITI) and returned to Ampare to participate in the training program for a new batch of Sinhala speaking IOs. In addition he consulted with mission and ARTI personnel in Colombo.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Norman Uphoff	1.25 ppm	2.25 ppm	Cornell	Political Science

8. SRI LANKA - Central Support

Code Number: 1-02-003-85

Status: Initiated Lead University: Colorado State University

Summary of Work: Dr. Reddy, Haider, and Sheng assisted Larry Nelson in setting up data gathering for Yala season.

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Mohan Reddy Junna	1.42 ppm	1.42 ppm	CSU	Ag. Engineer
Mohammed Haider	1.50 ppm	1.50 ppm	CSU	Economics
Tom Sheng	2.00 ppm	2.00 ppm	CSU	Civil Engineer

CSU said some costs were mis-classified, and this will be straightened out by the next Quarterly Report. There should be no budget over expenditures.

9. WORLDWIDE Meeting Recurrent Costs of Irrigation Systems—A Systematic Assembly and Synthesis of What is Known

Code Number: 1-02-062-85

Status: Initiated Lead University: Cornell University

Summary of Work: This activity consists of a subcontract to the University of Minnesota to support the research of K.W. Easter and a graduate student on financing recurrent costs of irrigation programs in developing countries. A literature review, four case studies, and an analysis and synthesis of findings by Easter have been completed. In addition, Coward and Uphoff have prepared a complementary paper entitled O&M Costs in Irrigation: Reappraising Government and Farmer Responsibilities and Rights. This paper considers strategies for enabling farmer organizations to assume control of O&M activities on large as well as small-scale systems. It was delivered by Uphoff at the ARDO Workshop held April 22-26, Los Banos, the Philippines. The four case studies on India, Nepal, Sri Lanka and the Philippines are available. The Easter synthesis is being prepared for publication.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
K. William Easter	0.6 ppm	2.4 ppm	U. Minnesota	Agri. Economist
E.W. Coward, Jr.	.25 ppm	.50 ppm	Cornell	Rural Sociology
Norman Uphoff	.25 ppm	.50 ppm	Cornell	Political Science
Graduate Student	1.5 gsm	6.0 gsm	U. Minnesota	Agri. Economist

B. FY85

B.2 Training and Technology Transfer

1. INDIA - Video Modules

Code Number: 2-03-075-85

Status: Initiated

Lead University: Utah State University

Summary of Work: The modules group continued meeting with the members of the Main Systems Team on an individual and group basis and completed formation of the content. This means the content outlines, scripts and storyboards are complete. Also at this time 80 percent of the computer graphics for the six programs are complete along with all outside video scenes recorded. Program #1 was edited and used for demonstration purposes, which gave us a chance to receive input and make revisions. Program #1 will be revised and #2 through #6 edited by the end of October.

Bonnie Reid and Elaine Campanella worked on content-organization and computer graphics during the quarter, while Tom Cronkite dealt with content organization, video and audio recording.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Tom Cronkite	3.00 ppm	4.00 ppm	USU	Instructional Developing
Bonnie Reid	3.00 ppm	4.00 ppm	USU	Instructional Dev. Spec.
Elaine Campanella	3.00 ppm	4.00 ppm	USU	Instructional Dev. Spec.
Kern Stutler	0.00 ppm	0.00 ppm	USU	Ag. Engineering
Gary Merkley	0.00 ppm	1.00 ppm	USU	Ag. Engineering

2. INDIA - Development of Handbooks

Code Number: 2-13-027-85

Status: Initiated                      Lead University: Colorado State University

Summary of Work: This activity was terminated because India could not get approval for travel for A. R. Robinson. The remaining money will be transferred to the CSU Triad Synthesis Activity for FY86-87.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
A. R. Robinson	0.00 ppm	0.62 ppm	Consultant	Agricultural Engr.
Ramchand Oad	0.00 ppm	1.10 ppm	CSU	Agricultural Engr.
Mel Skold	0.00 ppm	1.00 ppm	CSU	Economics
William Laitos	0.00 ppm	0.25 ppm	CSU	Sociologist
Darlene Fowler	0.00 ppm	1.50 ppm	CSU	Tech. Journalism

3. NEPAL - DA Workshop

Code Number: 2-02-031-85

Status: Initiated                      Lead University: Colorado State University

Summary of Work: The revised draft of the technical report was sent to Nepal for any changes. Technical editing was completed on the report, and it was sent to the printer to be published.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
William Laitos	0.80 ppm	4.45 ppm	CSU	Sociology
Oguz Nayman	0.00 ppm	3.25 ppm	CSU	Tech. Journalism
Tom Sheng	0.00 ppm	2.50 ppm	CSU	Civil Engineer
Al Early	0.00 ppm	1.40 ppm	CSU	Agricultural Engr.
Duane Johnson	0.00 ppm	2.00 ppm	CSU	Agronomy

4. PAKISTAN - Key Officials

Code Number: 2-04-080-85

Status: Initiated

Lead University: Colorado State University

Summary of Work: Dr. Clyma and Dr. Shafique traveled to the Command Water Management subproject sites to assist key subproject officials in planning their on-site studies.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Wayne Clyma	0.50 ppm	0.50 ppm	CSU	Ag. Engineer

5. PAKISTAN - Baseline Survey

Code Number: 2-04-083-85

Status: Initiated

Lead University: Colorado State University

Summary of Work: Dr. Norm Evans and Dr. Norm Landgren assisted Pakistani water management professionals in setting up a baseline survey before the Command Water Management project begins.

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Norm Evans	1.00 ppm	1.00 ppm	CSU	Ag. Engineer
Norm Landgren	1.00 ppm	1.00 ppm	CSU	Ag. Economist

6. WORLDWIDE - Microcomputer Workshop

Code Number: 2-14-032-85

Status: Initiated

Lead University: Colorado State University

Summary of Work: Interest in the microcomputer workshop was expressed by Sri Lanka, Pakistan and India. Dr. Tom Sheng is presently negotiating with each mission for a workshop in each country. Pakistan has committed to at least one and will probably have two in early 1986. The workshop informational brochure was completed and printed to give missions/host countries information about the proposed workshop and to see if one of them would like to host it. Copies of this brochure have been distributed to mission/host countries. Several irrigation automation videotapes were shot on location in Arizona and California for preparation of a videotape for the workshop.

PERSON Quart.	Cum.	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
John Webb		1.00 ppm	2.25 ppm	Consultant	Tech. Journalism
Tom Sheng		3.00 ppm	3.25 ppm	CSU	Civil Engr.

7. WORLDWIDE - Lessons Learned: Irrigation Systems Management

Code Number: 2-14-039-85

Status: Initiated

Lead University: Utah State University

Summary of Work: Work began during the quarter on lessons learned by Allen LeBaron visiting Rome and England on the way back from a PID effort in Morocco. He examined potential sources of information and conducted preliminary interviews with several individuals in England who have extensive experience in water management. Bryant Smith also read background materials in institutional issues relative to the activity.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Allen LeBaron	0.25 ppm	0.25 ppm	USU	Ag. Economics
Bryant Smith	1.00 ppm	2.00 ppm	USU	Law/Institutions

B. FY85

B.3 Special Studies

1. MOROCCO - Case Study

Code Number: 3-04-043C85

Status: Initiated

Lead University: Utah State University

Summary of Work: In June-July 1985, Dr. Walker, Dr. Robson and Mr. Andrew Keller visited USAID/Rabat and personnel with the Institute of Agronomy and Veterinary Medicine. The purpose of the visit was to explore the possibility of an ISM Case Study in Morocco and initiate it if possible. Visits were made to several irrigation projects to determine feasible sites. After discussions with USAID/Rabat, it became clear that the ISM Case Study as anticipated, would require modification. The ISM Case Study had targeted the management institution (ORMVA's) in Morocco that administer irrigation projects as the focus of the case study. However, the Team learned that both USAID/Rabat and World Bank were developing large-scale assistance and loan packages directed at the same institutions. Since the USAID/Rabat Project, "Agricultural Management and Productivity Project" will be set in motion with a possible contribution from the ISM activity, it was decided to propose an alternative case study of limited scale, i.e., to examine several unit command areas and attempt to verify the ISM models. This will require follow-up discussions with both WMS and USAID/Rabat administrative personnel as well as specific budget approval.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Wynn Walker	0.25 ppm	0.50 ppm	USU	Irrig. Engineering
Ross Robson	0.50 ppm	1.25 ppm	USU	Human Resources Mgmt.
Andrew Keller	0.50 gpm	1.25 gpm	USU	Graduate Student

2. NIGER Traditional and Developed Small-Scale Irrigation Study

Code Number: 3-04-052-85 (formerly 3-04-111-84)

Status: Initiated Lead University: Cornell University

Summary of Work: W. Ray Norman has established research sites at Moullela and Guidan-Magagi, two ONAHA perimeters in the Maggia Valley and at Koumassa, a traditional onion gardening site. Data collected include plot measurements and mapping, plant density counts, timing of furrow and basin wetting, infiltration rates, soil moisture monitoring. Norman has been interviewing farmers to gather data outside of the research sites with Nigerien assistants. In addition, at the request of AID/Niamey, Norman has consulted with other groups in Niger who have an interest in small-scale irrigation. Tammo Steenhuis, Agricultural Engineering visited Niger to consult with Norman in the field. Norman's data collection activities were hampered by flooding in several perimeters under study.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Ray Norman	3.0 gsm	12.5 gsm	Cornell	Agri. Engineering
Mike Walter	0.0 ppm	0.75 ppm	Cornell, AID/Delhi	"
John Wells	0.0 gsm	3.5 gsm	Cornell	"
Tammo Steenhuis	0.5 ppm	0.5 ppm	Cornell	"

3. SRI LANKA - SS-Interfacing On-Farm Water Management

Code Number: 3-04-036B-85

Status: Initiated

Lead University: Colorado State University

Summary of Work: Ramchand Oad was in Sri Lanka to assist Larry Nelson with counterpart training and engineering data collection for Yala season. Pat and John Wilkins-Wells continued work at the Parakrama Samudra Scheme. They are supervising data collection by host country counterparts.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Pat Wilkins-Wells	2.25 ppm	4.50 ppm	CSU	Sociology
John Wilkins-Wells	2.25 ppm	4.50 ppm	CSU	Sociology
Mohammed Haider	0.00 ppm	0.25 ppm	CSU	Economics
Tom Sheng	0.00 ppm	0.50 ppm	CSU	Civil Engineer
Ramchand Oad	2.00 ppm	2.00 ppm	CSU	Ag. Engineer

4. THAILAND - Case Study

Code Number: 3-04-043B85

Status: Initiated

Lead University: Utah State University

Summary of Work: The activity continued with increased participation of the two RID engineers with other ISM personnel as well as personnel in the International Irrigation Center. The computer needed to transport WMS software to the Thai projects with the return of the trainees is awaiting PIO/T issuance from Bangkok, but appears to be too late for any meaningful use by the engineers while at USU. Other acquisition alternatives are being pursued.

Mr. Kawsard continued the development of the Hui Aeng case study and Mr. Pajsoontorn worked on the Lam Nam Don study.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Wynn Walker	0.00 ppm	1.58 ppm	USU	Irrig. Engineering
Gaylord Skogerboe	0.20 ppm	0.20 ppm	USU	Irrig. Engineering
Kanching Kawsard	3.00 gpm	7.50 gpm	USU	Irrig. Engineering
Charoon Pajsoontorn	3.00 gpm	4.25 gpm	USU	Irrig. Engineering

5. WORLDWIDE Phase II: Comparative Analysis of Indirect Investment Strategies for Development of Small-Scale Irrigation Works

Code Number: 3-04-054-85

Status: Initiated Lead University: Cornell University

Summary of Work: Graduate assistants Wensley and Goldring revised a draft paper prepared on indirect investments in US Irrigation by the Soil Conservation Service, the Bureau of Reclamation, the Army Corps of Engineers, and the states. This paper includes an extensive literature review, analysis of indirect investment strategies in the US, and their application to Third World situations. Plans were made to select sites for field studies in Indonesia, Africa, and Andean South America.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
E. Walter Coward, Jr.	0.0 ppm	0.25 ppm	Cornell	Rural Sociology
Chris Wensley	0.0 gsm	5.0 gsm	Cornell	Agri. Engineering
Luin Goldring	1.0 gsm	4.0 gsm	Cornell	Rural Sociology

6. WORLDWIDE Rural Employment and Irrigation System Performance

Code Number: 3-04-055-85

Status: Initiated Lead University: Cornell University

Summary of Work: Graduate assistant Ruth Meinzen-Dick is completing a literature search and review of materials dealing with the relationships between employment and irrigation development. Not only will research literature be reviewed, but project evaluation documents and knowledgeable individuals will also be consulted.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Ruth Meinzen-Dick	0.0 gsm	9.0 gsm	Cornell	Rural Sociology
E. Walter Coward, Jr.	0.25 ppm	0.25 ppm	Cornell	Rural Sociology

7. WORLDWIDE Irrigation Systems Performance as Affected by Management Intensities

Code Number: 3-04-056-85 (formerly 3-04-096-84)

Status: Initiated Lead University: Cornell University

Summary of Work: Bob Yoder and Ed Martin have completed dissertations on the performance of farmer-managed irrigation in two small-scale systems with different supply constraints. Carol Ferguson is analyzing data from her research in the Philippines. Tammo Steenhuis and Randy Barker have been supervising the graduate students' research. The group also began work on a final report for AID distilling the research results.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Randolph Barker	0.25 ppm	3.25 ppm	Cornell	Agri. Economics
Edward Martin	3.0 gsm	16.5 gsm	Cornell	Agri. Economics
Robert Yoder	2.0 gsm	19.5 gsm	Cornell	Agri. Engineering
Fred Valera	0.0 gsm	9.0 gsm	Cornell	Agri. Engineering
Carol Ferguson	0.0 gsm	2.5 gsm	Cornell	Agri. Economics
Tammo Steenhuis	0.5 ppm	2.5 ppm	Cornell	Agri. Engineering

8. Worldwide - Irrigation Systems Modeling Workshop

Code Number: 3-04-043E85

Status: Initiated

Lead University: Utah State University

Summary of Work: This ISM activity was held at Utah State University, August 21, 22, and 23, 1985. Following suggestions from WMS/USU Management the participation was limited to three outside consultants (Dr. Jim Loftis of Colorado State University, Dr. David Manz of the University of Calgary, and Dr. Sam Johnson of the University of Illinois). Dr. Richard McConnen of CID, and Dr. Keller, Dr. Smith, Dr. Walker, Dr. Peterson, Dr. LeBaron and Professor Skogerboe of Utah State University were also present. The ISM Team presented the program to Dr. Worth Fitzgerald on August 29, 1985.

The workshop actually functioned as an in-depth review of the ISM work to date and its proposed two-year future. The three outside consultants met individually with the ISM Team and reviewed technical approaches and progress during the mornings and then participated with everyone during the afternoon overview sessions. Several suggestions for clarifying and strengthening the work were made and will be incorporated.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Jack Keller	0.10 ppm	0.10 ppm	USU	Irri. Engineering
Bryant Smith	0.10 ppm	0.10 ppm	USU	Law/Institutional
Wynn Walker	0.10 ppm	0.10 ppm	USU	Irri. Engineering
Dean F. Peterson	0.10 ppm	0.10 ppm	USU	Civil Engineering
Allen LeBaron	0.10 ppm	0.10 ppm	USU	Ag. Economics
Gaylord Skogerboe	0.10 ppm	0.10 ppm	USU	Ag. Engineering
Richard McConnen	0.10 ppm	0.10 ppm	CID	Ag. Economics
James Loftis	0.10 ppm	0.10 ppm	CSU	Systems Operation
David Manz	0.10 ppm	0.10 ppm	U of Calgary	Ag. Economics
Sam Johnson	0.10 ppm	0.10 ppm	U of Illinois	Civil Engineering

9. Worldwide - Irrigation Systems Modeling Development

Code Number: 3-04-043A85

Status: Initiated

Lead University: Utah State University

Summary of Work: Most efforts of the base team are being applied to the development and testing of software. At present the UCA and Main System Hydraulic Simulation models are operational and being improved and refined. The Main System Allocation Model is progressing slowly. The Reservoir and Watershed Models are moving ahead under programs outside of WMS II, but with careful coordination. A new phase of the modeling being called the "framework analyses" was re-initiated. Its purpose is to provide a coordination-configuration capability for the entire software package in order to perform a variety of modeling analyses.

The first Ph.D dissertation was presented in September and successfully defended. It covers the first phase of the UCA models development and was developed by Mr. Rachid Abdellaoui of Morocco. Upon final revisions, it will be reproduced and submitted to WMS II.

Mr. Merkley and Mr. Gichuki worked on the Main System hydraulic model with particular emphasis on its gate stroking capability. Mr. Keller continued the final developments for the Unit Command Area model; and Mr. Eisele continued the initial development of the Framework model.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Wynn Walker	0.75 ppm	0.75 ppm	USU	Irrig. Engineering
Gary Merkley	3.00 ppm	5.00 ppm	USU	Irrig. Engineering
Trevor Hughes	0.00 ppm	1.25 ppm	USU	Irrig. Engineering
Andrew Keller	2.00 gpm	3.25 gpm	USU	Irrig. Engineering
W.F. Vlotman	0.00 gpm	1.00 gpm	USU	Irrig. Engineering
F.N. Gichuki	2.80 gpm	4.80 gpm	USU	Irrig. Engineering
H. Eisele	3.00 gpm	3.00 gpm	USU	Irrig. Engineering

10. WORLDWIDE - Rapid Irrigation Project Appraisal Using Remote Sensing Systems

Code Number: 3-04-042-85

Status: Initiated

Lead University: Utah State University

Summary of Work: Work on this activity proceeded on two fronts. On the first, IRIS International completed the initial analyses of two LANDSAT scenes for the Gal Oya system and sent computer generated images to USU for review. One 1985 scene was identified and ordered from the Bangkok downlink station but has as yet to arrive. The project will therefore need to continue into FY 86 in order to complete the analyses.

The second emphasis was the collection of ground truth. Mr. Amala Jayesakara was at the Gal Oya site during the quarter collecting aerial photos and establishing benchmark sites. She was assisted by Mr. Vlotman and Professor Skogerboe who were working on the calibration study of activity #1-02-005-85, Sri Lanka Model Calibration.

The final phase of the work will be initiated when the 1985 scene arrives. Mrs. Jayesakara and IRIS will then combine the field data with the LANDSAT analyses to evaluate the rapid appraisal capability of the technology.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Amala Jayasakaran	0.00 gpm	0.50 gpm	USU	Irrig. Engineering

B. FY85

B.4 Administration

Administration

CSU Administration FY 85 0-02-998-85

NAME	QUARTERLY 7/1/85-9/30/85	CUMULATIVE 9/30/85
Armentrout, Janelle	2.20 ppm	6.25 ppm
Clyma, Wayne	0.00 ppm	1.27 ppm
Fowler, Darlene	0.00 ppm	1.00 ppm
Freeman, Dave	0.00 ppm	1.00 ppm
Kelly, Don	0.00 ppm	4.00 ppm
Lattimore, Dan	1.66 ppm	5.22 ppm
Lindburg, Mary	3.00 ppm	10.31 ppm
Madsen, Al	0.00 ppm	1.00 ppm
Meyer, Beverly	3.00 ppm	7.00 ppm
Podmore, Terry	0.00 ppm	1.00 ppm
Schmehl, W.	0.00 ppm	0.50 ppm
Sheng, Tom	0.00 ppm	1.00 ppm
Wunch, Sandra	0.00 ppm	4.78 ppm
Sunada, Dan	0.50 ppm	0.50 ppm

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
E. Walter Coward, Jr.	1.00 ppm	2.75 ppm	Cornell	Rural Sociology
Barbara D. Lynch	3.0 ppm	10.0 ppm	Cornell	Rural Sociology
Fua M. Hazelman	3.0 ppm	12.0 ppm	Cornell	Secretarial
Beth Rose	0.25 ppm	2.75 ppm	Cornell	Editing
Betty Van Amburg	0.75 ppm	3.00 ppm	Cornell	Secretarial
Grace Saatman	1.5 ppm	6.00 ppm	Cornell	Accounts Coordinating
Debbie Ostrander	0.75 ppm	1.50 ppm	Cornell	Secretarial

WORLDWIDE - Administration

Code Number: 0-02-997-85

Status: Initiated

Lead University: Utah State University

Summary of Work: A wide variety of activities were carried out during this quarter to support the general administration as well as specific subactivities of the Project. These included: (1) organization of technical assistance teams and arrangements for their travel; (2) intellectual conceptualization of work activities and new subprojects; (3) accounting services; and (4) the preparation of reports, correspondence, and financial statements for the Project.

A number of reports were prepared and distributed during the quarter, including trip reports for Peru Plan MERIS; Sri Lanka Model Calibration; Morocco Main Systems; and Morocco PID Development. Project papers for El Salvador, Mauritania and Sri Lanka were completed as were the WMS II Report 35 on India and the Annotated Bibliography on Africa WMS II Report 37. The WMS II quarterly report was also completed. A consulting agreement was prepared for Dale Allred and amendments to consulting agreements were drawn up for Julio Guerra, Carlos Nonone, Carlos Villanueva, Jose Luis Villaran and Luis Barrios for Plan MERIS. Amendments to subcontracts were prepared for SRD Research Group, Inc. for El Salvador and DAI for the Chad activity. Consulting agreement amendments were prepared for Thomas Weaver and Djime Adoum for the Chad activity.

The University-initiated activities of Utah State University were prepared and reviewed by Bryant Smith, Jack Keller and the Administrative Staff. An extensive review of the annexes of the El Salvador Project Paper was carried out. This included a review of the marketing activities, extension activities and institutional analysis by Bryant Smith; and Jack Keller reviewed the technical irrigation analysis. A visit was made and meetings were setup with Mr. Jalil Ahmed to discuss irrigation system management, likewise meetings were held with Jeff Brewer and the Team leader of the Louis Berger long-term team to Pakistan to investigate various WMS II programs that could be involved in this Pakistan project.

Extensive conversations through telexes were carried on with the USAID/India Mission with regard to the India Demonstration Workshop. Various proposals and counter-proposals were exchanged in the process of trying to better understand mission desires relative to this activity.

Travel arrangements including tickets, per diem advances, travel expense clearance, visas, etc. were made for Dale Allred and David James to Peru; Wynn Walker, Ross Robson, Allen LeBaron and Gaylord Skogerboe to Morocco on the PID Development. In-country travel included trips for Jack Keller to Washington, D.C. to discuss African activities; and Arizona on the Triad Synthesis activity; Bryant Smith and JoAnn Biery to Denver, Colorado for the CPMT meeting; Gary Merkley, Francis Gichuki, Charoon Pojsoontorn and Kanching Kawsard to New Mexico for Main Systems ISM Development; Derrick Thom and Gaylord Skogerboe to Washington, D.C. to work with the Africa Bureau of AID.

Rudget revisions were made for the India Demonstration Workshop; Thailand Maintenance Workshop activity and the FY 86 Workplan. General correspondence was prepared between USU and the other participating universities, CID, and the AID project management team.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
<u>Professional:</u>				
Jack Keller	1.25 ppm	4.00 ppm	USU	Irri. Engineering Institutional
Bryant Smith	2.00 ppm	11.00 ppm	USU	
<u>Support Staff:</u>				
JoAnn Biery	3.00 spm	12.00 spm	USU	Secretarial
Jo L. Egelund	1.50 spm	6.00 spm	USU	Accounting
Linda Fields	1.50 spm	6.00 spm	USU	Secretarial
Donna Gossner	3.00 spm	4.50 spm	USU	Secretarial
Karen Hammer	0.00 spm	2.64 spm	USU	Production Typing
Camille Loveland	0.50 spm	0.50 spm	USU	Secretarial
Lorraine Walker	0.00 spm	0.76 spm	USU	Procurement
<u>Graduate Students:</u>				
N. Adams	0.00 gpm	0.50 gpm	USU	Irri. Engineering Ag. Economics
D. Robinson	0.00 gpm	1.75 gpm	USU	

B. FY85

B.5 Overall Administration--FY85

Administration

CSU Administration FY 85 0-02-998-85

NAME	QUARTERLY 7/1/85-9/30/85	CUMULATIVE 9/30/85
Armentrout, Janelle	2.20 ppm	6.25 ppm
Clyma, Wayne	0.00 ppm	1.27 ppm
Fowler, Darlene	0.00 ppm	1.00 ppm
Freeman, Dave	0.00 ppm	1.00 ppm
Kelly, Don	0.00 ppm	4.00 ppm
Lattimore, Dan	1.66 ppm	5.22 ppm
Lindburg, Mary	3.00 ppm	10.31 ppm
Madsen, Al	0.00 ppm	1.00 ppm
Meyer, Beverly	3.00 ppm	7.00 ppm
Podmore, Terry	0.00 ppm	1.00 ppm
Schmehl, W.	0.00 ppm	0.50 ppm
Sheng, Tom	0.00 ppm	1.00 ppm
Wunch, Sandra	0.00 ppm	4.78 ppm
Sunada, Dan	0.50 ppm	0.50 ppm

Overall Administration FY 85 0-01-999-85

NAME	QUARTERLY 7/1/85-9/30/85	CUMULATIVE 9/30/85
Janelle Armentrout	0.00 ppm	1.35 ppm
Don Kelly	0.00 ppm	4.00 ppm
Beverly Meyer	0.00 ppm	4.00 ppm
Sandra Wunch	0.00 ppm	0.78 ppm

CSU PPM on Other Institution's Activities

Cornell-Indonesia Assessment Team 1-02-009-85

Jeffery Brewer	0.00 ppm	1.50 ppm
Ramchand Oad	0.00 ppm	2.20 ppm

Utah State University-Nepal 1-02-067-85

Robby Laitos	0.00 ppm	1.35 ppm
A1 Early	0.00 ppm	0.87 ppm

Cornell University-Current Research 2-14-050-85

A1 Early	0.00 ppm	0.25 ppm
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B. FY85

B.6 Summary FY85



## V. FINISHED ACTIVITIES

The information contained in this section refers solely to finished activities. When activities appear in this section, the specific work has been finalized and reports have been distributed. After an activity has appeared in this section of the quarterly report, it will not be included again until a final abulation of funding has been completed. At that time, it will appear as a completed activity in the financial section.

FINISHED ACTIVITIES

A. Technical Assistance Activities

Country: El Salvador

Title of Activity: PID Preparation

Code Number of Activity: 1-02-059-85      Finished Date: September 30, 1985

Lead University: Colorado State University

Description of Activity: To assist the El Salvador mission staff prepare a Project Identification Document (PID) for an on-farm management project.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Mohan Junna	CSU	Agricultural Engr
Darlene Fowler	CSU	Tech. Journalism
Richard Butler	Consultant	Social Scientist

Significant Findings and Results:

The team was instructed on arrival to develop a project on irrigation and on farm water management. In the initial meeting, the project was broadened extensively to include water planning for human consumption, industrial use as well as irrigation.

The project that was presented to the deputy director of AID consisted primarily of numerous training components for extension agents, Salvadoran training institutions, and on farm training. The RDO officer removed all irrigation construction monies.

Discussion focused on the various economic benefits of irrigation and the reasons why the coops and other farmers were not utilizing the credit available to them for improving their situations.

The deputy director raised questions about the economics of the training program and even about the irrigation prospects for the country. He seemed more interested in a project that would produce more immediate results than in a long-term one. The meeting ended with the RDO officer making numerous notes for additional work that he and the staff needed to do in order to satisfy the deputy director.

The following outline was developed for the PID. Because the mission staff had not made some critical decisions prior to the term's arrival, not all sections for the PID could be completed.

## PROJECT IDENTIFICATION OUTLINE

- I. Introduction and Project Summary
    - A. The Problem
    - B. Summary Project Description
  - II. Project Background and Rationale
    - A. Economic Context
    - B. Water Management Analysis and Constraints
    - C. Current Remedial Efforts
    - D. Project Rationale
      - 1. Project Strategy
      - 2. Relationship to CDSS and AID Policies
      - 3. Relationship to Current Mission Program
  - III. Project Description
    - A. Goal and Purposes
    - B. Grantee/Implementing Entity
    - C. Project Activities
    - D. Anticipated End of Project Conditions
    - E. Preliminary Financial Plan
  - IV. Factors Affecting Project Feasibility and Further Development
    - A. Technical Analysis
    - B. Economic Analysis
    - C. Social Analysis
    - D. Financial Analysis
    - E. Institutional Analysis
    - F. Environmental Analysis
  - V. Project Paper Development Strategy
    - A. Schedule
    - B. Assistance Required for Project Design
    - C. Project Development Committee
  - VI. Issues
- Annexes
- I. Preliminary Logical Framework
  - II. Initial Environment Examination

### Reports/Documents

### Completion Date

### Distribution

TDY Report-Reddy-Butler

April 17, 1985

JPMT

Country: El Salvador

Title of Activity: Design of Water Management Project

Code Number of Activity: 1-02-077-85

Completion Date: 9/85

Lead University: Utah State University

Description of Activity: Dr. Samuel R. Daines, SRD Research Group Inc., undertook this activity with the help of George H. Hargreaves, USU, and Stephen Brower, Carlton Infanger, Bruce Brower and Wade Andrews, SRD, and David Daines, USU. The team prepared a study leading to the recommendation of an \$18.7 million grant for the support of a program of activities for diversification of agriculture for export through irrigation to be carried out by the private and public sectors of El Salvador. The total proposed project cost is \$25.2 million, of which the major portion is for the private sector component.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
George H. Hargreaves	USU	Agricultural Engineering
David R. Daines	USU	Water Law
Samuel R. Daines	Consultant	Institutional
Stephen Brower	Consultant	Mgmt-Training Analysis
Carlton Infanger	Consultant	Ag. Economics
Bruce Brower	Consultant	Irrigation Ex. Training
Wade Andrews	Consultant	Sociology

Significant Findings and Results: Unemployment is a major problem in El Salvador. There had been a five year decline in GDP and in 1984 the increase of 1.5 percent was much less than the 3.5 percent estimated population growth. Agricultural output fell 19 percent between 1980 and 1983. Public Sector Irrigation has contributed little to economic growth and there is little research and extension capability.

An analysis of these and other problems lead to the conclusions that unemployment could best be solved by agricultural diversification and the promotion of high labor crops and that these crops would require dependable, owner managed and scheduled, precision irrigation. Investment is required, not only in irrigation, but in market facilities, development of export markets and in promotion of exports. Liberal credit and the reduction of risk in agriculture and in marketing are also required.

Reports/Documents

Completion Date

Distribution

Project Paper and Annex's 1-16

9/85

USAID/El Salvador  
CSU, CU.

Country: Haiti

Title of Activity: Irrigation Sector Assessment

Code Number of Activity: 1-04-017-84

Completion Date: 4/85

Lead University: Utah State University

Description of Activity: This sector review was an extension of an earlier (1983) WMS II evaluation of the specific, current USAID/Haiti financed program in medium sized irrigation (under 2000 ha). As such, the aim was to take a broader look at the whole irrigation scene, with a view to identifying or demarcating a subsector that USAID/Haiti might evolve for the future. The Government of Haiti, which requested the assessment had particular irrigation investments that it wanted financed and hoped that the study would be supportive of those objectives.

The attempt to somewhat accommodate these possibly divergent points of view is reflected in the scope of the findings and recommendations of the study team.

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Allen LeBaron	USU	Resource Economics
Robert W. Hill	USU	Irrigation Engineering
Anwar Batikhi	USU	Agronomy

Significant Findings and Results: A considerable part of Haiti's agricultural history is conditioned by irrigation's role as a supplement to natural rainfall. Over time an extensive system of hydraulic works and water conveyance features have been put into place, used, refurbished or sometimes abandoned. Today important segments of this system are troubled to varying degrees by three interrelated negative forces: quality of upkeep; watershed conditions; and supply management. Rural income and employment levels are below what they might be, and hoped-for benefits from expensive programs of renovation are problematical.

These negative forms are alluded to in a mass of literature dissecting and analyzing the recent history of agriculture development in Haiti; population growth/exploitation of hillsides; growth of food output/domestic food needs; performance of existing irrigation systems/potential for increasing irrigated area; absolute amount of GOH resource commitment to agriculture sector institutional capacity of the technocracy; and, most of all, security of land tenure/peasant initiatives. On-site visits to a large number of projects and conversations with knowledgeable persons confirmed the broad outlines of the situation and many of the specific points made in the cited sources.

The subsector picture, however, is not as negative as most of the literature suggests. Some irrigation systems work quite well. They may be

and both inside and outside the Irrigation Districts, but tend to be small enough to allow user equity considerations to be resolved internally. It is unlikely that all such systems appear on the usual inventory lists.

Such successes dramatize the failures in the larger more complex systems. The latter seem to suffer to a greater or lesser degree from the effects of lack of trained personnel, lack of maintenance, design flaws, unfair water distribution and poor on-farm management technique. As near as can be ascertained, many technical assistance devices have been tried, usually more than once, but subsequent evaluations disclose the same pattern of weak performance. In the opinion of the WMS II Team, nothing that donors can do in terms of new subsector investment, Ministry reshuffling, more farmer level technical assistance, etc., will be cost-effective until two things happen: water users must have more say in the operation and maintenance of the systems (and shoulder far larger percentages of the fiscal burdens), and order must be imposed upon utilization of all water by unbiased application of up-to-date laws and rules.

The WMS II Team recommendations fall into several categories:

Subsector Planning - requires much better data base; for example, land capability studies; adequacy of water supply; revised project ranking criteria.

Subsector Institutions - existing supply arrangements do not eliminate uncertainty and inequity in water delivery, adherence to comprehensive system of water law, based upon scientific information; idea of "state engineer."

Operation, Maintenance and Cost Recovery - owner operated systems should be encouraged; O&M budgets must be increased; right for groups to tax themselves; get rid of subsidy.

Agronomy On-Farm Water Management Skills Vary - little technique to extend in this area; need adaptive research correlated with current initiatives in rainfed research; correlation with earlier on-farm water management research.

Watershed Management - rehabilitation is very expensive in money and human terms; no real way to get irrigators to pay for the rehabilitation; if farmers can be forced off the steep slopes (at acceptable social cost), they should be; the long-run development goal for rural Haiti must involve a great many more persons (percentage) living in cities.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Trip Report	9/84	AID/Washington
Trip Report	6/85	CID, CSU
WMS Report 36, "Haiti Irrigation Sector Assessment"	9/85	USAID/Haiti CID, CSU

Country: India

Title of Activity: Irrigation Sector Evaluation and Strategy Review

Code Number of Activity: 1-02-103-84

Completion Date: 9/85

Lead University: Utah State University

Description of Activity: A multidisciplinary team conducted an irrigation sector evaluation and strategy review of three states in India. Jack Keller, E. Walter Coward, Samuel Daines, Dean F. Peterson, Elisabeth Sims and Carl Gotch were the main participants in the review. The Team reviewed the irrigation portfolio of the Mission, examined the start-up of those activities which were beginning to become operational, and evaluated the effectiveness of the Mission program. Then the Team made recommendations for the strengthening of irrigation strategy for the Mission.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Jack Keller	USU	Irrig. Engineering
E. Walter Coward	Cornell	Sociology
Samuel Daines	Consultant	Ag. Economics
Dean F. Peterson	Consultant	Civil Engineering
Carl Gotch	Stanford	Ag. Economics
Elisabeth Sims	Consultant	Sociology

Significant Findings and Results: India is approaching self-sufficiency in gains in the aggregate and there is a need to increase fruit and vegetable production. Groundwater plays an important part in the private sector which AID could take advantage of in terms of technology transfer in a potentially more flexible institutional environment. Such dialogue is more difficult in canal irrigation because of the very large momentum and sensitivity of GOI policy there. Also, the use of extensive irrigation in India constrains the productivity and equity impact of surface irrigation to the point that AID participation may not be justifiable. Budget levels for irrigation might have to be reduced on the basis of options the team sees. Long and short-term assistance needs will have to have a significant input of Indian consultants, with emphasis of short-term TA from outside the country of world class engineers.

AID might have a greater role in the East agro-hydrological region of India to assist in tapping its large untapped groundwater reserves. It is important to continue with medium irrigation subprojects. The success of future training programs will depend upon what structural and procedural arrangements can be made. There is a need to become increasingly involved with local institutions which will require a longer lead time for AID for project development and implementation.

Major problems are related to IDs assuming too many of the institutional development activities themselves and failing to develop a network of resource organizations to work with them. While all USAID projects call for attention to water user associations, little has been accomplished on this matter. AID needs to demonstrate the importance it places on farmer organizations. There should be at least key Indian partner who has experience with farmer organizations. AID should set the target of establishing one world class pilot effort with organizing water user organizations on at least one canal irrigation project.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Irrigation Sector Strategy Review and Annexes	8/85	USAID/India

Country: India

Title of Activity: Maharashtra I T & M Project

Code Number of Activity: 1-01-021-84

Completion Date: 7/85

Lead University: Utah State University

Description of Activity: Consult with the Departments of Irrigation and Agriculture in the States of Maharashtra and Madhya Pradesh relative to water management and various aspects of irrigation system design, construction, operation and management.

Arrange in-service training within India for project design and field technicians in areas such as planning and design of irrigation distribution networks, construction and quality water use. Work with GOM and GOMP to define training requirements, prepare course outlines and arrange for or carry out such training.

Identify short-term courses and arrange for short-term U.S. training for technician engineers, economists and agronomists responsible for investigation, design, construction, operation and evaluation of irrigation systems as required by the two state governments and approved by the Government of India and USAID.

Assist the GOM and GOMP in identifying key problem areas which appear to be responsible for inefficient use of irrigation systems. These problem areas are to be used as bases for conducting field studies for which scopes of work are developed and organizations identified for conducting the activities.

Work with the GOM and GOMP in identifying specific requirements for short-term technical assistance from the U.S.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Edwin C. Olsen	USU	Irri. Engineering

Significant Findings and Results:

1. In-Service Training:

Thirteen topics were identified for the MIT&M Project for which 32 sessions were given or scheduled for various durations to train a total of about 794 persons through 1985, (about 25 persons per session).

The MPMIS identified 18 topics for which 83 sessions were given or scheduled. The total number to be trained being about 1702 persons through 1985/86 (about 20 persons per session).

## 2. U.S. Training:

Eight areas of training were identified for the MIT&M Project and a schedule was developed to combine short-course study at various institutions with on-the-job practical experience in the area of study with working organizations to train 41 persons during a two-year period.

A similar program was developed for the MPMIS in nine study areas to train 40 persons over a three year period.

## 3. Field Studies:

Work plans were developed with personnel of the MIT&M Project for 15 topics of field studies and data collection and the executing organizations were identified. Further refinement of the work plans was then made by the executing organizations and approved by the GOM/ID and USAID. The studies are in various stages of implementation, progress and/or completion.

A similar effort was made in the MPMIS for 13 different study topics. These studies are also in various stages of implementation, progress, and/or completion according to the type of study required, the arrival of special equipment, or the stage of project construction to which some studies are tied.

## 4. Technical Assistance:

During the term of this activity neither the GOM, the GOMP, nor the GOI felt that outside technical assistance was required for the better completion of any training or field studies conducted during this activity. Therefore, no short-term technical assistance was ever requested from the U.S.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Work Plan	4/84	USAID, USU
Quarterly Reports	Variable	USAID
Financial Statements	Monthly	USU
Trip Reports	Quarterly	USAID
Irrigation Portfolio Training	Variable	USAID, IDs
Analysis for USAID/India	3/85	USAID
Irrigation Network Planning Manual	7/85	USAID, IDs

Country: Indonesia

Title of Activity: Cost Recovery Study Finished Date: September 30, 1985

Code Number of Activity: 1-02-074-85

Lead University: Colorado State University

Description of Activity: Dr. Ramchand Oad was asked to participate in a Indonesia Case Study for a larger AID project.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Ramchand Oad	CSU	Agricultural Engr.

Significant Findings and Results:

Dr. Oad analyzed the relationship between the physical infrastructure, the irrigation system operation and farmer involvement. He examined water control, water reliability, water use efficiency and equity of water distribution.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Section of Report	April 1985	Consulting firm to compile into larger report.

Country: Mauritania

Title of Activity: Prefeasibility Study of Irrigation Development in Mauritania

Code Number of Activity: 1-02-076-85

Completion Date: 7/85

Lead University: Utah State University

Description of Activity: The goal of this activity was to investigate the potential and desirability of promoting irrigation as a long-term strategy in Mauritania. An overview of irrigation was presented and after field investigations, a recommendation was made to proceed with a feasibility/design study for enhanced recession cultivation on the Dirol Plain of the Senegal River Valley of Mauritania. A scope of work was prepared for the feasibility/design team.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Derrick J. Thom	Utah State University	Geography
Donald C. Slack	University of Arizona	Engineering
Mark B. Lynham	University of Arizona	Ag. Economics

Significant Findings and Results: The prefeasibility study Team was required to investigate the feasibility of USAID investing in an irrigation project on the Dirol Plain located on the Mauritanian side of the Senegal Development Office of AID, Dakar for enhanced recession irrigation. The proposal proposed the construction of a 13m high 14km long dike and a dam at the mouth of the Dirol Creek. The total cost of this proposal was \$6 million and would provide greater security for recession cultivation during dry years. AID/Washington had questioned the viability of the proposal; consequently, the WMS II Prefeasibility Team was to investigate and make recommendations.

After investigation the WMS II Team recommended:

1. The need to proceed with a plan for enhanced recession irrigation given the prevailing attitude of the inhabitants against irrigation perimeters.
2. A redesign of the proposed RBDO plan by using the natural lay of the land, construction of dam/weir and submersible dikes. Estimated costs would be reduced by more than 50 percent with the same results.
3. The WMS II Team identified several gaps in information that is needed in order that a feasibility/design Team can make accurate decisions on the proposed project.

- (a) A topographic map at a scale of 1:10,000 needs to be prepared.
- (b) Additional soil information needs to be available.
- (c) Additional hydrological information is needed.
- (d) The land tenure situation needs to be assessed.
- (e) Additional socio-economic data need to be available.

A scope of work and terms of reference were prepared for a feasibility/design team composed of an Engineer, Soil Scientist, Agronomist, Agricultural Economist, Range Ecologist and Social Scientist.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Trip Report Prefeasibility Study of Irrigation Development in Mauritania	7/85	USAID/Mauritania USAID/Washington WMS II

Country: Pakistan

Title of Activity: Curriculum Development

Code Number of Activity: 1-02-071-85      Finished Date: September 30, 1985

Lead University: Colorado State University

Description of Activity: Dr. Wayne Clyma, Dr. Dick McConnen, Dr. Jeff Brewer and Dr. Shafique went to Pakistan to negotiate and define workplan for the Pakistan Command Water Management training activities.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Wayne Clyma	CSU	Agricultural Engr.
M. Shafique	CSU	Agricultural Engr.
Richard McConnen	MSU	Economics
Jeffery Brewer	Consultant	Anthropology

Significant Findings and Results:

The attached table was the overall plan for the CWM training program.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Management Training for CWM Personnel	April 26, 1985	Worth Fitzgerald Dick McConnen

TRAINING PROGRAMS FOR COMMAND WATER MANAGEMENT

Programs	Objectives	Participants	Duration	Date	Location	Responsibility
<b>Management Training</b>						
A) Key Officials Seminar	Enhance the understanding of the CWM concepts and the management process required to achieve CWM objectives and the roles which must be taken by the SPM.	PPC, SPM, DSPM & FC	1 day 4 times	ASAP	4 Provincial Capitals	WMSII-CSU
B) Management Concepts	General principles of management (emphasizing planning and decision analyses) needed by managers and relationship to CWM. Presentation overview of DA.	SPM, DSPM & FC	5 days	6 July 1985	DA site	SRP & WMSII-CSU
C) Management Skills	Upgrade management skills of CWM personnel: (1) participative management (2) communication (3) meeting techniques (4) time management (5) and (6) planning, app. of app. application.	SPM, DSPM	2 weeks	After Jan. 1985	Open	SRP & WMSII-CSU
<b>Management Planning (Local Training)</b>						
A) Diagnostic Analysis	1. Train participants in DA concepts, principles and skills. 2. Understand system, operation and identify system constraints.	TIL team, Prv. SHO Team	5 weeks	July 13, 1985	TIL & Niazbeg	WMSII-CSU
E) Management Plan Training	Train provincial SHO - teams in the development of a preliminary management plan for Niazbeg subproject area.	TIL team, Prv. SHO Team	1 week	Aug. 17, 1985	TIL	WMS II-CSU
<b>On-Site Training</b>						
A) Diagnostic Analysis SHO	1. Do a DA study of each subproject area by the SHO team. 2. Understand system, operation and identify system constraints.	SHO Team in each Prov.	2 months	Sept. 1 1985	On-Site	SHOs/WMSII
b) Management Plan SHO	Develop a management plan for each subproject area by the SHO team.	SHO Team in each Prov.	1 month	Nov. 1 1985	On-Site	SHOs/WMSII
C) Seminar Review of SHO Mgmt. Plan	Review system constraints and management plan for each subproject area.	SPM, DSPM & FC Staff	1 week 4 times	After SPO-MP	Each Province	WMSII-CSU
<b>W. Info. System</b>						
A) On-the-Job	Provide on-job training as needed to deal with collection and analysis of information required for management of CWM Projects.	SPO-M&E Unit relevant line agy. per	2-1 week periods 4 times	1st Yr. of SPO-MP	On-Site	WMSII-CSU
B) Workshops	Identify problems common to one or more SPOs which can best be dealt with in formal workshops. Possible subjects: computer analysis of M&E data; survey; range losses; reliable yield estimate.	SPO-M&E Unit & relevant line agy. per	Up to 3 weeks	1 Yr. of SPO-MP	Open	WMSII-CSU
<b>Training Program or Phase Line Survey</b>	1. Review survey questionnaire and format for base line data collection. 2. Advise on org. arrangements on-the-job training program for implementation.	Prov. Off. FC and USAID	Intermittent	June 1985	4 Provs. & Isl.	WMSII-CSU
<b>Extension &amp; DA Training</b>						
Workshop on Ext. and KUAs in CWM	Determine water management extension needs and needs for strengthening and determine how the CWM project can help satisfy those needs.	PDE, SPM, FC DTIL, PEUAF, CUUAF, PDMM	3 days	Late Aug.	Open	WMSII-CU
<b>Extension Curriculum Assistance</b>	To assist in the water management extension curriculum to meet the needs of CWM Project.	TIL, UAF	3 weeks 1st 6A	Follow- ing SPO-MP	TIL, UAF	WMSII-CU
<b>Extension Key Tour</b>	Review water management extension and KUA programs in Philippines and Sri Lanka.	PDE, PDMM, SPM, FC	3 weeks	Nov. 1985	Pak., Sri Lanka, and Philippines	WMSII-CU
<b>Key Officials</b>	Provide review of integrated approaches to irrigated agriculture in India, Sri Lanka, and Pakistan.	SPM, PPC, FC	3 weeks	Sept. 15 1985	Pak., India & Sri Lanka	WMSII-CSU
<b>Foundations</b>						
Management On-Site Conference	Review and reinforce management training of SPO personnel and use of management training in achieving CWM objectives.	SPM, DSPM, & other SPO PER	2-3 days 2x/year	After Imp. of SPO-MP	On-Site	WMSII-CSU & SRP
SRP-CWM Exchange	Develop in depth management capability of CWM personnel.	SHO Teams from each Prov.	1 week	Dec. 9 1985	U.S. & Pakistan	SRP
Seminar on KUAs for Field Officers	Discuss ways that field officers can strengthen KUAs.	Up to 30 Trainees per Prov.	1 week for each Prov.	Open	Open	WMSII-CU USAID Soc. Sci.

Country: Pakistan

Title of Activity: Mayfield TDY

Code Number of Activity: 1-02-040-83

Completion Date: 9/83

Lead University: Utah State University

Description of Activity: James Mayfield went to Pakistan for the purpose of doing an Implementation Plan on On-Farm Water Management of local irrigation councils. He developed a proposed pilot activity for this subject.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
James Mayfield	University of Utah	Political Science

Significant Findings and Results: The proposed pilot project involves the creation of local government councils at the district and the union level, made up of locally elected officials. The objective of the program is for these councils to be given an opportunity to demonstrate their ability to function as an implementation agency for an OFWM program which is committed to (1) establishing Water User Associations; and (2) improving the construction and maintenance of local watercourses.

There are basic problem areas that face the watercourse system: (1) the gradual and unrelenting deterioration of improved watercourses due to lack of systematic and consistent maintenance; (2) a shortage of skilled engineers and extension workers capable of improving and monitoring all 89,000 watercourses; and (3) inadequate levels of financial support at the central government level for the procurement of materials and technical staff to improve and maintain the watercourses in Pakistan.

Reports/Documents

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Implementation Plan: On-Farm Water Management Local Councils; Water User Associations in the Pakistan OFWM Project: A Rational and Strategy for Action	6/83	USAID/Pakistan

Country: Sri Lanka

Title of Activity: Design Team

Code Number of Activity: 1-02-102-84

Finished Date: September 30, 1985

Lead University: Colorado State University

Description of Activity: A 5-person team prepared a project paper for the Irrigation System Management Project in Sri Lanka.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Alan Early	CSU	Agricultural Engr.
Wayne Clyma	CSU	Agricultural Engr.
Jeff Brewer	Consultant	Social Scientist
R. McConnen	Consultant	Economics
G. V. Skogerboe	USU	Agricultural Engr.
Darlene Fowler	CSU	Tech. Journalism
Support Staff	CSU	Support Staff

Significant Findings and Results:

The Irrigation Systems Management Project (ISM Project) is designed to carry out the second phase of the water management improvement program begun in Sri Lanka in 1979 with USAID's Water Management Project. The ISM Project will work with the newly established Irrigation Management Division in the Ministry of Lands and Land Development, the Irrigation Department, and other departments and agencies to achieve the Government of Sri Lanka's goal of improving agricultural production.

Highlights of the Procurement Plan

Small construction equipment will be purchased to improve essential structures and to do priority maintenance on the four tank irrigation schemes in Polonnaruwa District. Construction equipment purchased under the Water Management Project will be used to rehabilitate the Gal Oya Right Bank Canal system.

The ISM Project strongly emphasizes the use of micro-computers for operations and maintenance, financial management, and monitoring, evaluation

and feedback. In addition, radio communications equipment will be purchased for operating the irrigation schemes.

### Cost Estimate

The total estimated cost of the ISM Project is \$29.5 million, with AID contributing \$19.9 million and the Government of Sri Lanka (GSL) contributing the equivalent of \$9.6 million. AID will contribute a \$12.5 million loan and \$7.4 million grant. Foreign exchange would total \$11.7 million while local currency would amount to \$17.8 million.

A large portion (\$1.2 million) of the proposed budget for GSL personnel is to increase the size of the O&M staff at the Gal Oya Irrigation Project. The contract GSL personnel are institutional organizers (IO's) who assist in creating farmers' organizations. Their salaries will be paid through a cost-sharing arrangement to be negotiated.

The AID grant will primarily finance the services of long- and short-term consultants who will provide technical assistance and for research and/or study. The AID loan will finance commodities, overseas training, GSL contract personnel, and construction with 60% of the construction costs reimbursable to the GSL.

### Project Activities (Technical Analysis Summary)

The Gal Oya Left Bank Canal system has the highest priority because pragmatic rehabilitation will be completed during calendar year 1985 (which corresponds with the Sri Lanka fiscal year) under the Water Management Project. By the start of the Irrigation Systems Management Project (January 1986), farmers' organizations will exist on most field channels. Also, some distributary-channel farmer organizations will have been created. The ISM Project will complete the job of organizing farmers on all field channels and attempt to create farmer's organizations on all of the distributaries.

The Water Management Project will develop an operations plan using computerized, weekly, water-delivery schedules, and the ISM Project will bring this capability up to daily scheduling of water deliveries. Project funds will be used to provide an adequate staff for O&M and to maintain the main and branch channels as part of a preventive maintenance plan, while O&M fees and farmers' labor will be used to maintain distributary and field channels. Improved financial management practices will be undertaken, and the capability for monitoring, evaluating and providing feedback will be further strengthened. Training and research will continue.

The Gal Oya Right Bank Canal system was selected as a site because: it is a part of the same system as the Gal Oya Left Bank Canal, which the Senanyake Samudra Reservoir largely controls; the available irrigation water management is particularly important; and about 4,000 acres of land in the lower portions of the system no longer receive irrigation water because of deteriorating irrigation channels and inadequate irrigation water management is on the 10,000 acres cultivated by the Sri Lanka Sugar Corporation. Project funds would be used for pragmatic rehabilitation similar to the work being completed on the Gal Oya Left Bank Canal system. In fact, the construction equipment purchased through the Water Management Project can be used for structurally repairing the Right Bank irrigation channels. The process for undertaking O&M activities, as well as other ISM Project activities, would be the

same as described below for the four tank irrigation schemes in the Polonnaruwa District.

A major thrust for the ISM Project is to use fewer capital expenditures than with pragmatic rehabilitation, but to invest more in human resources to structurally upgrade the irrigation channels in the four tank-irrigation schemes near Polonnaruwa; and then to maintain the channels (rather than allowing them to deteriorate again) and operate the system so that farmers' organizations receive a timely, equitable share of the available water supplies.

To accomplish these objectives considerable emphasis must be placed on monitoring, evaluation and feedback to understand and be sensitive to the internal workings of each irrigation scheme; training to enhance monitoring, evaluation and feedback to understand and be sensitive to the internal workings of each irrigation scheme; training to enhance professional capabilities is required and research is needed to improve and transfer the process to other irrigation projects. To sustain an irrigation network that can equitably distribute water, financial management must improve so that accountability for adequate operations and maintenance is assured, a strong emphasis must be placed on organizing farmers for operations and maintenance, and the farmers' organizations must be strengthened so farmers can improve their irrigation water management to diversify and intensify their crop production.

The Ridi Bendi Ela Tank Irrigation Scheme, which serves 6,500 acres, was selected to test a lower level of irrigation system improvement. This site, located in Kurunegala District, was purposefully chosen because it lies outside of Polonnaruwa and Amparai Districts where higher levels of improvement are proposed. At Ridi Bendi Ela, project funds would not provide for structurally repairing irrigation channels but would be available for all other ISM Project activities including farmers' organizations; financial management; monitoring, evaluation and feedback; training; and research.

At the Hakwatuna Oya Tank Irrigation Scheme in Kurunegala District, which serves 5,500 acres, only research to study the impact of the Integrated Management of Major Irrigation Schemes program is to be funded, the lowest level of improvement under consideration.

#### Results of the Economic Analysis

The economic analysis of increasing crop production indicates that the ISM Project will generate enough net benefits to justify the work done on each site. However, the most important benefit from the ISM Project is to develop more knowledge about the internal, physical irrigation system so that improved management practices can equitably distribute water and increase total farm income; but more importantly, provide equity in farm incomes. The project also should establish more cost-effective and affordable methods of improving irrigation schemes. Combining lower capital expenditures and improving management will cost less than a cycle of rehabilitation and deterioration. Also, the irrigation facilities are much more likely to be maintained afterwards.

### Results of the Social Soundness Analysis

The Project will immediately benefit the 55,000 farm families in the eight target schemes who should earn more income through increased production. Since the Project will improve water availability in the tail areas of the eight systems more than in the head areas, the Project should improve income equity throughout the schemes.

A problem exists. In Gal Oya Right Bank, the Sri Lanka Sugar Corporation can control water use and availability below its plantation. To prevent the Sugar Corporation from garnering most of the benefits of this project, the Sugar Corporation should sign an agreement concerning its rights and duties toward irrigation water in the system.

Participants in the Project include government officers and farmers. As experience in Gal Oya Left Bank shows, farmers will participate if reliability and water supplies improve, and if Irrigation Department officers respond positively to farmers' problems. The problem of overlapping functions between farmer representatives and vel vidanes will be overcome through some changes brought about by the Commissioner of Agrarian Services. Other problems found in the Gal Oya Left Bank can be overcome with proper planning and training.

The Project should positively affect women, but will have an uncertain impact on domestic water supplies. Increased income spent on goods and services will spread the benefits of the Project, as better irrigation management will spread benefits throughout the government.

### Results of the Administrative Analysis

The Ministry of Lands and Development (MLLD), responsible for major irrigation schemes outside of Mahaweli, will implement the Project. A project coordinating committee, chaired by the Secretary of the MLLD will oversee the Project. A project director who reports to the Secretary of the MLLD will lead the Project. Four project deputy-directors, one for each of the four major management efforts: farmer organization, financial management, monitoring and evaluation, and O&M will assist the director. The first three of these functions will be the responsibility of the Irrigation Department. Responsible officers will be assigned within the districts and at the individual schemes.

The Irrigation Management Division began operation in April 1984 with seven officers and ten support staff in Colombo and a project manager for each irrigation scheme. The IMD is not fully staffed yet. The IMD has four major responsibilities: managing the Integrated Management of Major Irrigation Schemes program, overseeing O&M fee collection, managing the Major Irrigation Rehabilitation Project funded by the World Bank, and implementation of the ISM Project. For the ISM Project, the IMD must recruit a large number of new staff including another deputy director, 14 staff in Colombo, 8 district staff, and 72 scheme staff, plus a large number of short-term institutional organizers. The IMD's organization and functions are still evolving and need clarifying. This Project will help provide that clarification.

The Irrigation Department is well established and capable of undertaking the construction and other tasks placed upon it by this Project. The Irrigation Department will need 18 additional staff at the schemes plus some number to be decided later for O&M at the Gal Oya Irrigation Project.

Training will be conducted by the Project for Advancing Settlement Expertise (PASE) within the Ministry of Lands and Land Development, the Irrigation Department's Galgamuwa Irrigation Training Institute, the Sri Lanka Institute of Development Administration, the University of Moratuwa and the University of Peradeniya. All are capable. However, PASE is a United Nations Development Project that may not continue. If not, its training responsibilities will be taken over by the Sri Lanka Institute of Development Administration or the Irrigation Management Division itself. Research will be contracted out to capable Sri Lanka institutions.

### Overview of Technical Assistance

Technical assistance is expected to be provided by a private firm and a university as appropriate for the structural and managerial emphasis of the ISM Project. Three consultants will carry out the major technical assistance efforts; one each at Headquarters (project/financial management), Polonnaruwa (engineer) and Ampara (engineer) for the life of the project. Long-term experts staying for shorter times will aid the consultants. Most of the long-term experts will be present early in the project to help systematize and establish procedures and conduct on-the-job training. Technical assistance includes support for the farmer-organization effort; maintenance-system improvements; computer-assisted, scheme-operation models; the financial management system; and the monitoring, evaluation and feedback system introduced under the ISM Project. The long-term personnel include computer specialists, financial-management specialists, agricultural economists and agronomists. Short-term personnel would include consultants mentioned earlier who return on TDY at critical junctures in the program. Other short-term assistance would be provided by a water management design engineer, a training specialist in O&M to help the Galgamuwa Irrigation Training Institute prepare training manuals, and a consultant to assist the Project for Advancing Settlement Expertise with training materials for project managers.

### Status at End of Project

After five years, the integrated program of irrigation systems management is expected to result in the following conditions:

- Better communication and coordination among farmers' organizations, Irrigation Management Division personnel, and Irrigation Department personnel;
- Increased capability of IMD to create farmers' organizations, to incorporate computerized financial management practices, and to monitor, evaluate and provide feedback;
- Improved operations and maintenance procedures incorporated into the standard operations of the Irrigation Department;
- Improved methods for creating and strengthening farmers' organizations;
- Annual maintenance activities at all major irrigation schemes incorporated into improved financial management procedures;

- Monitoring, evaluation and feedback strengthened in donor-funded irrigation projects by requiring seasonal and annual reports of important performance indicators;
- Strengthened training capability in the Galgamuwa Irrigation Training Institute (O&M training), the Agrarian Research and Training Institute (for training institutional organizers to help farmers create farmers' organizations and for research on methodologies), the Sri Lanka Institute of Development Administration (to provide assistance in computerized financial management), and the Project for Advancing Settlement Expertise (for project management training);
- Analysis of monitoring, evaluation and feedback data and research to evaluate strategies for improving irrigated agriculture;
- The Gal Oya Left Bank Canal system being maintained in a sustained condition after pragmatic rehabilitation and supporting a new program of improved farm management and diversified agricultural production during the life of the project, and/or afterwards; and
- Pragmatic rehabilitation of the Gal Oya Right Bank Canal system and essential structural improvements at the four Polonnaruwa tanks to make them highly suitable for a new program of improved farm water management and diversified agricultural production.

Reports/Documents

Completion Date

Distribution

WMS II Report #33

December 1984

Mission, JPMT

FINISHED ACTIVITIES

B. Training and Technology

Country: Worldwide

Title of Activity: Seminar on System Rehab. Phase I

Code Number of Activity: 2-05-033-85      Finished Date: September 30, 1985

Lead University: Colorado State University

Description of Activity: To prepare a state of the art paper on rehabilitation of irrigation systems and make initial plans for an international seminar.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Mohammed Haider	CSU	Economics
Mohan Reddy Junna	CSU	Agricultural Engr.
Alan Early	CSU	Agricultural Engr.
William Laitos	CSU	Sociologist
Darlene Fowler	CSU	Tech. Journalism
Vicki Duneman	CSU	Tech. Journalism

Significant Findings and Results:

State of the art paper revision suggestions were made at a workshop held at CSU's Pingree Park, September 3-5, 1985. The draft will be revised in FY86 under the Rehabilitation Seminar Phase 2 Activity. Also, workshop participants made recommendations to a committee formed to plan the international seminar. Committee members included Mohammed Haider (chairman), Al Early, Norm Uphoff, Dean Peterson, and Mark Svendson.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
TDY Report	June 1985	JPMT
State of Art Paper Draft	September 4, 1985	Rehabilitation Workshop Participants

Country: Worldwide

Title of Activity: Microcomputers

Code Number of Activity: 2-10-051-84      Finished Date: September 30, 1985

Lead University: Colorado State University

Description of Activity:

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Dave Molden	CSU	Civil Engr.
Tom Sheng	CSU	Civil Engr.
Dan Sunada	CSU	Civil Engr.
Mohammed Haider	CSU	Economics

Significant Findings and Results:

Microcomputer applications in water management have provided major assistance in the WMSII's training, technical assistance, and special study activities. Data processing of questionnaire results from sociology, economic, and Women in Development studies, routine statistical analyses, word processing, water measurement calculations, economic evaluations, hydrolic simulations, and field levelness elevations all have been performed on our microcomputers.

During FY84, eight microcomputer programs were written to enhance the capability of our project staff and host country officials in evaluating irrigation system performance and to provide rapid data analysis for more responsive results. A brief description of the programs is presented as follows:

- 1) CADEP - simulates irrigation water flow through a distributary canal and the farm channels it feeds. The program mathematically models steady, open channel flow to calculate discharge and water surface elevation at selected points along the channels, allowing the user to design a channel network that delivers water to farms, as well as evaluates existing canal systems.
- 2) CASHFLOW - assists users to speed up the calculations for cash flow analysis to determine the best among alternative investments.
- 3) CMCOOMB - calculates the cross-section areas and flow rates of an open channel using RPM readings taken from a current meter set at predetermined depths and widths. This program works only with the Moulinet Type C-2 current meter.
- 4) CTFCOMB - calculates channel flow rates using staff gauge readings taken from a cutthroat flume set in an open chanel under free flow or submerged

conditions. This program works with several cutthroat flume sizes - 1.5 ft, 3.0 ft, 6.0 ft, and 9.0 ft in length - that are commonly used by engineers in small open channels.

5) FIELDEL - calculates the best fit slope of a field in one direction using data sets of elevation and distance obtained from the grid method. In addition, it calculates the field deviation from the best fit slope at each survey point. With this information, the user can determine the levelness of the field.

6) INFILT - calibrates the Kostikov infiltration equation using the field data sets of time and cumulative infiltration taken from an infiltration ring experiment. Prediction of cumulative infiltration for a given time can be calculated with the calibrated Kostikov infiltration equation.

7) LTFLUME - generates discharge tables for all long-throated flume sizes possible. Since the discharge through the long-throated flumes can be calculated theoretically without laboratory calibrations, there is great flexibility in constructing the flumes in different dimensions to meet the water measurement needs. LTFLUME program eliminates the need to search for existing discharge tables.

8) WATCONT - provides a worksheet to calculate bulk density, water content and depth of water for a given set of inputs obtained from the gravimetric method.

All these programs were written in BASIC programming language for use on an IBM PC/XT or any other microcomputer that uses MicroSoft Disk Operating System (MS-DOS). The major advantages of using BASIC instead of other programming languages are: 1) inexpensive, 2) easy to understand, 3) interactive in nature (user friendly), and 4) readily available with any microcomputer systems.

For FY85, the major task of the Microcomputer Applications Activity was to test, revise and finalize the users' manual for the microcomputer programs. This user's manual was designed and written for the users who are knowledgeable in their field of expertise, but not necessarily experienced with microcomputers. Theories used in the programs are not provided in the manual, either for computer operations or for disciplinary information in economic, agronomy or engineering.

Each program in the users' manual has four sections: an introduction, how to use the program, a description of the program options, and an example problem. The manual takes the user step-by-step through the process needed to use the program. Further testing of the microcomputer programs and the users' manual was conducted during the Nepal DA (January-February) and TDY assignment in Sri Lanka (May-June). From those experiences, the users' manual was revised and completed in final form by T.S. Sheng and D. Molden, and edited by D.A. Fowler as September 30, 1985.

The WMSII-CSU software and the users' manual will be distributed to the coordinators of long-term DA and Interfacing OFWM special study in Sri Lanka. WMSII will make the programs and manual available to anyone who wishes to utilize them to assist him/her in irrigation data analyses. In addition, the project will use the software and the users' manual as a building block for the computer component of technical assistance and training activities in FY86,

i.e., the Irrigation Data Management Workshop in Pakistan and Interfacing OFWM Data Analysis in Sri Lanka.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Seven Microcomputer Programs	September 30, 1985	- Staff on the Interfacing OFWM Activity in Sri Lanka
Users' Manual for the WMS-CSU microcomputer programs.		- Staff on the long-term DA activity in Sri Lanka
		- EPD office in Arizona

FINISHED ACTIVITIES

C. Special Studies

Country: Sri Lanka

Title of Activity: Landsat 85

Code Number of Activity: 3-04-038-85      Finished Date: September 30, 1985

Lead University: Colorado State University

Description of Activity: Use of Landsat data for the Sri Lanka Irrigation System Rehabilitation Project. The data is to assist in the planning for the rehabilitation effort.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Tim Martin	CSU	Agronomy
J. Cipra	CSU	Agronomy

Significant Findings and Results:

Mr. Tim Martin, CSU agronomy graduate student under the supervision of Dr. Jan Cipra, has been coordinating a special study project using Landsat data in Sri Lanka. He went to Sri Lanka in the summer of 1985. The primary objective of his visit was to determine the acreage and extent of irrigated command areas of four tank irrigation schemes in the Polonnaruwa district. The proposed methodology was to establish ground correlation training areas and test areas for a supervised computer classification of the four irrigation schemes using Landsat computer compatible tapes (CCT). Prior to this TDY visit, an unsupervised classification of a CCT was performed (date of CCT coverage: August 4, 1983) and the ground data was also to serve as a test for the unsupervised method of classification. This Landsat classification was to serve as the primary tool for the determination of the command area boundaries and acreage of the four tank irrigation schemes: Parakrama Samudra (PSS), Giritale, Minneriya and Kaudulla. It was also anticipated that the ground data would be adequate for the testing of computer classification of Landsat data as a means of detecting water distribution patterns, crop health, and certain soil and drainage characteristics.

However, after Martin became more familiar with the resources available and the specific needs of the government of Sri Lanka and USAID, he decided the detailed field classification of current land use of large-scale aerial photographs was a more accurate and reliable method of achieving the above objectives and could also serve as the basis for a detailed map of the irrigation distribution system. In addition, this detailed classification will serve as a reliable basis for selecting training areas for computer classification of Landsat data by a standard supervised technique. The accuracy of this method can then be checked against the detailed field analysis. In the supervised computer classification proves as accurate as expected this method, which requires considerably less time and expense, will be used to determine command area boundaries and irrigated acreage for areas not covered by the detailed field classification.

Prior to arrival in Sri Lanka, Tim Martin stopped in Bangkok and visited the National Research Council of Thailand, Remote Sensing Division. This agency operates a Landsat receiving station with coverage including all of Sri Lanka. Contact was established with this agency and the relevant personnel, the capabilities of the agency was observed, and the acquisition of Landsat data for the 1985 Yala season was coordinated. The visit proved most beneficial to this project.

Martin obtained topographic maps (scale 1:63,360) and land use maps (scale 1:50,000), and discovered the availability of relatively recent aerial photographs (scale 1:20,000; date February 1979). An order was placed for full stereo coverage of the PSS, Giritale, Minneriya and the southern portion of the Kaudulla scheme. I obtained a number of "library copies" of the aerial photos in advance so that I might initiate detailed field study prior to the completion and delivery of my aerial photo order.

During the first week in the Polonnaruwa area, Martin attended several meetings with local irrigation and government officials, and conducted a two-day reconnaissance of the four tank irrigation schemes. As a result of these meetings and reconnaissance, the Colombo meetings with USAID and Sri Lanka government agencies, and discussions with Dr. Nelson and other Water Management Synthesis and Special Studies personnel, it became apparent that the methodology for this project should be tempered somewhat to provide a work product with more utility for the intended users. There was disagreement among various government agencies as to the extent of irrigated acreage within each of the four schemes and as to the amount and location of encroached acreage. In a memo to the USAID ISM Project Design Team, Mr. Palitha Elkaduwa, AGA Polonnaruwa District, specifically noted that more accurate irrigated acreage figures were necessary for proper planning (see 10/15/84 memo in Attachment A). Also, there was no map of the irrigation delivery system nor of the location of currently irrigated paddy. With the level of detail attainable with the aerial photographs as a base map, it was then decided to conduct a detailed land use classification. The aerial photographs were also to be used as a basis for a map of the irrigation delivery system.

Martin spent several days conducting detailed classification using the library copies of aerial photographs. He devised a simple classification scheme by separating the land use into three major classes: paddy, highland and water. These major classes were then divided into subclasses. For example, highlands included subclasses such as highland crops, forest cover, bare soil, rock outcrop, fallow paddy, etc. The primary emphasis was on separating paddy from non-paddy, but this additional detail should prove most valuable in selecting training areas for a computer classification of the Landsat CCT.

The full set of stereo aerial photos arrived on July 17. Martin was then able to examine the photographs with a pocket stereoscope and later with a desk model on loan from the Survey Department. Although he covered all areas satisfactorily, his field efforts were concentrated on fringe areas between paddy and highlands. These areas were subject to the most change since the 1979 aerial photographs were collected, and were the most difficult to confidently classify without visual inspection. The acreage located at the tails of the irrigation systems was examined in greater detail, also because of active change and assumed increased encroachment. Field transportation was by jeep, foot and motorcycle.

While he could not complete the detailed classification of all four irrigation schemes, and research and map the irrigation delivery system he was able to do all of two systems and the classification on one. The Kaudulla tank was operating below capacity (for maintenance) and the entire north half of the scheme did not receive irrigation water this Yala season. For that reason, the Kaufulla system was dropped from this detailed study. It appeared most reasonable to complete the classification on the PSS and Giritale systems, and to complete the classification for the Galamuna Scheme. The BOP (Blocking Out Plan) maps for each of these schemes were secured from their appropriate IE office and from the DDI office. With as much detail and accuracy as could be attained, the layout of the major canals, D-channels, and some F-channels was transferred from the BOP maps to the aerial photographs. There was some lack of continuity among the original BOP design maps (dated 1940s and 1950s), the irrigation water issue trees and the government officials familiar with the schemes.

Because Martin was unable to perform a detailed classification of the Minneriya scheme, my efforts were limited to establishing training areas for computer classification of Landsat CCT. This was performed for random areas on the aerial photographs with ground correlation.

In addition to the above tasks, Martin took a series of photographs representing the major land use categories of the area. These photographs were taken in duplicate with both infrared and normal slide film. The infrared photographs will simulate the false color infrared images as detected by the sensors on-board the satellite. From these photographs, he should be able to determine the variability of the land cover types in the infrared portion of the electromagnetic spectrum.

Martin has completed a detailed land use classification of the PSS, Giritale and Galamuna Schemes using aerial photographs as a base. He has also drafted the primary and secondary irrigation distribution systems on the aerial photographs. He plans to compile base maps of these three schemes, preferably at a scale of 1:20,000. This base map will depict, at a minimum, the paddy and non-paddy acreage for Yala season 1985, the irrigation distribution system, major roads, railroads, and recognized "legal" command area boundary. This activity will receive priority and intends to complete this task by December 31, 1985 during the Landsat FY86 activity.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Martin, TDY Report	August 26, 1985	JPMT

Country: Worldwide

Title of Activity: SS-Interfacing On-Farm Water Management, Backstopping

Code Number of Activity: 3-04-036A-85 Finished Date: September 30, 1985

Lead University: Colorado State University

Description of Activity: To study the interface between on-farm irrigation management and main system management at four tank sites near Polonnaruwa.

Staffing:

<u>Personnel</u>	<u>Activity Time</u>		<u>Affiliation</u>	<u>Specialization</u>
	<u>Quart.</u>	<u>Cum.</u>		
Dennis Wendell	1.50 ppm	6.00 ppm	CSU	Sociology
Kanda Paranakian	0.00 ppm	1.50 ppm	CSU	Sociology
David M. Freeman	1.00 ppm	1.50 ppm	CSU	Sociology
John Wilkins-Wells	0.00 ppm	3.00 ppm	CSU	Sociology
Mohan Junna	0.75 ppm	1.50 ppm	CSU	Agricultural Engr.
Alan Early	0.00 ppm	0.25 ppm	CSU	Agricultural Engr.

Significant Findings and Results:

Four TDY's were used to assist Larry Nelson, John and Pat Wilkens-Wells as they set up the data collection for the Yala season in Polonnaruwa. Three of those on TDY -- Tom Sheng, Mohan Reddy and Mohammed Haider -- spent significant amounts of time working with Larry Nelson in coordinating the data collection for the DA studies during Yala. Ramchand Oad specifically set up data collection that would assist in the special studies. Since he went a couple of months after the others, Ramchand did most of the coordination of the data gathering between the DA studies and the special studies. The data being gathered under the special studies activity is being used by Larry Nelson in the pre-rehabilitation study so there is considerable overlap of the two activities.

The Diagnostic Analysis Project is a long-term investigation of four irrigation systems in Polonnaruwa District. The stated objective of the DA project is to provide guidelines to future rehabilitation efforts for improving system performance in the four irrigation systems. USAID provided the services of Dr. Larry Nelson to the Irrigation Management Division (IMD) of the Ministry of Lands and Lands Development (MLLD) for implementing the DA study.

IMD is a growing division; it was formed in March, 1984. Although IMD is responsible for the DA study, it neither has the funds nor the personnel to effectively implement the study. Funds for the DA come from the Department of Irrigation to the IMD office in Colombo and are then appropriated to the field offices of the Irrigation Department that conduct the DA.

The Department of Irrigation is generous, but there are limits to its generosity. One limitation with serious consequences for the DA is that the Department cannot provide full-time, counterpart engineers to supervise data collection. Similarly, the Department of Agriculture cannot provide full-time agricultural officers. This trend is not peculiar to the government departments of Sri Lanka; very few government departments in developing countries can afford to engage in long-term research projects. The reason is not that the government departments do not appreciate the benefits of research; rather, the operational rules of the departments restrict involvement of their employees in long-term research. If the government employees take long-term leave from their parent departments, their changes for promotion, graduate studies abroad, free housing and other benefits are often adversely affected.

As a result, our DA has part-time counterparts to supervise data collection in various disciplines. These professionals come to Polonnaruwa for two to three days per week from as far away as Colombo. Henry Gamage and Vijay Bandaranayake come from the Department of Agriculture to supervise on-farm engineering and agronomy; C. Manayakkara from the Land Use and Policy Planning Division of the Department of Irrigation supervises economics. Main system engineering is supervised by the irrigation engineers of the four irrigation systems.

Despite the lack of manpower and funds, the DA is making progress, and it appeared to me that the AID Mission and concerned government departments feel positive about some of its potential benefits. A factor that is surely helping the DA study is the dedication of the field workers who collect the data. They are technical assistants (TAs) from the Irrigation Department, flume readers and agricultural instructors (AI) from the Department of Agriculture, and field officers from the Agricultural Development Authority (ADA).

#### Engineering Data Needs of Special Studies Program

The objective of the special studies is to conduct a program of integrated research that will produce a greater understanding of and capacity to link farm systems to main systems. This linkage can be provided by using farmer associations as the middle- or intermediate-level organization.

The central hypothesis of the special studies research is that design of the middle-level social-technical linkages is a strategic determinant of farmer water control. Organizational links must possess the rules and technology necessary to break large, main-system water volumes into small amounts such that the farmer can employ is productively by virtue of his capacity to control it. Farmers cannot be expected to pay for system maintenance and unit command organizational affairs unless the systems provide to farmers acceptable control over water. Farmer water control in this context is defined as the capacity to apply proper quantity and quality of water at the proper time to the crop root zone to satisfy crop consumptive needs.

To test the hypothesis we need to identify variables that can define middle-level organizations, degree of water control, and farmers' willingness to pay. The following diagram may help develop a framework of research methodology and identify data that needs to be collected to analyze the hypothesis.

Hypothesis:	Middle level organizations	Farmer water control Farmer water rights	Farmer willingness to pay
Data needs:	rules and tech. of water operational procedures	water supplies water demand	economic value ability to pay
	organizational levels	local norms regarding water rights	willingness to pay
	organizational types		

a. Middle-level organizations

To study middle-level organizations we must investigate various levels of main system -- farm system linkages and possible organizational types that can exist at each of the main farm system linkages. I have used a sketch of Giritale Irrigation System to identify various organizational levels and types that are being used to supply water to the farms. There are three levels of social-technical interfaces:

- between main canal (RM) and distributary canal (D),
- between distributary canal and field channel (F),
- between field channel and individual farm turnouts.

At least four different organizational types are being used to deliver water across these three levels. Organizational patterns are variable to make pragmatic use of physical features and local norms and values. In the first organizational type, water is delivered from main to distributary and field channels using a rotational method supervised by the Irrigation Department. In the second organizational type, certain distributary command areas are supplied water by the Irrigation Department almost continuously, and these areas are the last to be cutoff in times of acute water shortage. The reason for this preferential treatment is that these are old, original irrigated areas (puranaela) that existed before the present irrigation systems were organized under the colonization scheme. The organization is recognizing the senior water rights of these early settlers.

A third organizational form exists in low-lying areas that capture return flows. An anicut (diversion weir) is built across a drain and water is diverted to a main canal (eg., Kumbukkan Aru drain system). Along this main canal, farmer groups have built brushwood diversion weirs to divert water into small field channels. These small irrigation systems are constructed and managed by farmers; the Irrigation Department does not supervise water distribution. The systems are almost identical to the community-based irrigation systems of Indonesia and Philippines.

A fourth type of organization is structured around intermediate tanks that lie within the overall command area of the main tank. These intermediate tanks break the overall command area into smaller organizational units and thereby enable the system management to obtain a better match of supply and demand. Control structures in the tanks are constructed by the Irrigation Department, but the management may then be transferred to the Agrarian Services Department and farmer groups (eg., Atumalpitya tank). The Agrarian Services Department maintains the tank and farmer organizations (such as the Vel Vidane

system) are responsible for water distribution below the tank and maintenance of the main and distributary channels. The intermediate tanks are effective tools that help farmers disengage themselves from central bureaucracies.

b. The units of analysis

Based on considerations mentioned above, John, Pat and I decided that there are two critical interfaces:

- the interface between main and distributary channels, and
- the interface between distributary and field channels.

To select main, distributary and field channels we made several field visits to PSS, Giritale and Minneriya irrigation schemes. Irrigation engineers Ivan De Silva and Nikatena, were very helpful in supplying maps and technical assistance to guide our site selection. Because of Tim Martin's efforts, we finally have air photos of the systems which are extremely useful. A list of selected sample sites in all three irrigation systems is attached as Appendix B. The most important criteria for selecting the branch and distributary command units is that they represent the various organizational types described previously. They also represent a range of available water supplies.

c. Farmer water control

Farmer water control can be measured by evaluating available water supplies in reference to the farmers' demand for water over a specified time interval. One concept that relates water supplied to an irrigation unit and the need for water within that unit is called relative water supply (RWS). Mathematically, RWS is defined as:

$$RWS = \frac{\text{Rainfall} + \text{Irrigation Water Supply}}{(\text{Evapotranspiration} + \text{Seepage} \& \text{Percolation}) \text{ Cropped Area}}$$

The irrigation unit, for our research, could be the branch canal command, distributary canal command, or the field channel command. I have discussed with John and Pat the methods and equipment to use to measure irrigation deliveries and crop water needs to construct water supply and water demand hydrographs. These methods are described briefly below.

Irrigation water supply. In general, current-meter gauging stations should be used for branch and distributary canals, portable flumes for field channels, and the orifice flow equation for main canals to measure water discharges (method for discharge measurement is indicated against each sample canal in Appendix B).

Water demand (evapotranspiration and percolation). A simple meteorological station consisting of a standard rain gauge and evaporation pan should be established at a representative location within each of the irrigation systems. For ease of supervision, I would recommend these sites be near residences of work supervisors in the Irrigation Department. The evaporation pan should be four feet in diameter and one foot in height. It should be constructed of 15 gauge G.I. sheet and painted with aluminum paint. The pan should be mounted to an open wooden stand so that the water surface in the pan is approximately 50 cms above the ground.

Water surface elevation in the pan can be measured using a half-meter stick with a small-bore glass tube attached to its face. The meter stick/glass assembly should be attached to a pair of support brackets welded to the inside of the pan at a 5:1 slope. A one mm change in the water level in the pan is thus displayed as a five mm change in the inclined gauge reading.

Water surface elevation in the pan should be read once a day at 6 o'clock in the morning. The difference between the elevation readings taken on two successive days minus rainfall, if any, gives the evaporation. Evapotranspiration is then calculated by multiplying the evaporation value by locally established crop coefficients. However, it is known that for the purpose of field research, evapotranspiration for rice grown in flooded paddies is approximately the same as evaporation.

The second component of water demand is the deep percolation that exists as a result of submerging paddy lands with water. The DA is measuring deep percolation in fields with well-drained, moderately-drained, and water-logged soils. The special studies program can use this information to estimate deep percolation if the soil within the research sites can be classified through a soil survey.

We discussed this with Henry Gamage and he is willing to help arrange a soil classification program. Mr. Chandrasekera, who may work as a full-time agronomist for special studies, can take the responsibility for arranging a soil survey, developing a soil classification, and estimating deep percolation for the research sites.

d. Economic value of water and farmers' willingness to pay

The central premise of our research is that if the middle-level organizations are able to provide farmers with water control, farmers should willingly pay for building and sustaining such organizations. In addition to the degree of water control, a contributing factor to farmers' willingness to pay is the recognition of their water rights and shares by the irrigation organizations.

To analyze this hypothesis, the special studies program will need to collect data on the above economic issues. The farm budget data being collected during the DA should help evaluate farmers' ability to pay; very limited data has been collected regarding farmers' water rights and willingness to pay. John and Pat have arranged for a graduate student from the University of Peradenya Economics Department to conduct his research with the special studies program. Gamini Delungahawatta's research interests are essentially the same as the issues outlined above. Some of the data collected will be used by Mr. Delungahawatta to partially fulfill his degree requirements.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
TDY Report - Oad	September 1985	JPMT, Norm Uphoff, Dave Freeman
TDY Report - Reddy (and for 1-02-003-85)	July 29, 1985	JPMT
TDY Report - Haider (and for 1-02-003-85)	June 1985	JPMT

TDY Report - Sheng  
(and for 1-02-003-85)

June 1985

JPMT

## VI. COMMITTEES

Project management has identified various issues to be addressed via the committee system. The following information refers to the \_\_\_\_\_ , chaired by \_\_\_\_\_ and the \_\_\_\_\_ chaired by \_\_\_\_\_.

NONE REPORTED THIS QUARTER

## VII. ROSTER UPDATE

One contract required WMS II activity is the establishment of a human resource file or a professional roster of persons interested in water management work. The activity is part of the overall management unit of the WMS II Project.

In order to initiate the activity, a standard roster form was developed which would acquire relevant information in the areas of professional competence, education, work experience, availability for overseas assignments, language competence, geographic preferences, and other information. Approximately 400 forms were then sent through AID and the CID systems, as well as Colorado State University, Cornell University and Utah State University. In addition, approximately 100 forms were subsequently sent to persons who made inquiries about the project.

The acquired data were stored on the microcomputer data base system for general usage by the project. Thus, the data were recorded, filed, retrievable, and can be summarized. The computerized roster of water management specialists facilitates the identification and selection of professionals in agronomy, economics, engineering, sociology, Women in Development (WID), and other disciplines for WMS II assignments.

The roster has been used by DA coordinators for Bangladesh (1983), Sri Lanka (1982 and 1983), and India (1984) DA Workshops. In addition, the roster has been used to identify suitable professionals for short-term technical assistance activities overseas.

As of September 30, 1985 approximately 221 persons were listed on the roster. A total entry of 39 in agronomy, 38 in economics, 83 in engineering, and 61 in sociology and other disciplines.

VIII. FINANCIAL REPORT

## CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

WATER MANAGEMENT SYNTHESIS II PROJECT  
(AID/DAN 4127-C-00-2084-00)QUARTERLY REPORT  
FOR THE PERIOD ENDING SEPTEMBER 30, 1985

FISCAL YEAR 1985 WORK PLAN ACTIVITIES

ACTIVITY	CODE	UNIV.	STATUS	APPROVED BUDGET	- - EXPENDITURES - -			BUDGET BALANCE
					THROUGH- JUN. 30, 85	CURRENT QUARTER	THROUGH SEP. 30, 85	
<b>ADMINISTRATION:</b>								
<b>WORLDWIDE</b>								
EPD ADMINISTRATION	0-01-999-85	CID	INIT	191,810	143,484	76,136	219,590	( 27,780)
CU ADMINISTRATION	0-02-996-85	CU	INIT	206,932	30,621	76,106	106,727	100,205
USU ADMINISTRATION	0-02-997-85	USU	INIT	233,126	152,449	98,727	211,176	21,950
GSU ADMINISTRATION	0-02-998-85	GSU	INIT	231,641	187,191	46,401	228,592	3,049
CLOSED OUT CU ADMIN	0-99-996-84	CU	TERM	0	-60,727	46,401	-14,326	14,326
CLOSED OUT USU ADMIN	0-99-997-84	USU	TERM	0	-60,206	46,401	-3,804	3,804
CLOSED OUT GSU ADMIN	0-99-998-84	GSU	TERM	0	-47,729	46,401	-1,328	1,328
<b>TOTAL ADMINISTRATION \$</b>				<b>863,609</b>	<b>350,054</b>	<b>181,234</b>	<b>746,627</b>	<b>116,652</b>
<b>TECHNICAL ASSISTANCE:</b>								
<b>AFRICA:</b>								
African Irrigation Overvi CHAD:	1-02-108-84	USU	INIT	140,230	159,907	60	159,967	( 19,737)
Irrigated Agric. Assessm EGYPT:	1-02-073-85	USU	FORM	116,022	27,248	33,719	60,967	55,055
Egypt Water Use & Mngmnt SYS Evaluation Team	1-02-066-85	USU	FORM	41,268	25,269	0	25,269	15,999
EL SALVADOR:	1-02-072-85	GSU	FORM	0	0	25,435	25,435	( 25,435)
PID Preparation	1-02-059-85	GSU	INIT	22,500	22,604	0	22,604	( 104)
PP Development	1-02-077-85	USU	FORM	164,814	78,238	46,601	124,639	39,975
<b>ASIA:</b>								
Cayes Plain-Distrib. Bene Irrigation Sector Survey	1-02-084-85	CU	FORM	3,249	0	844	844	7,405
HONDURAS:	1-02-017-84	USU	INIT	68,072	41,033	9,299	50,332	17,740
Irrigation Development Pr INDIA:	1-02-060-85	USU	FORM	12,309	7,924	0	7,924	4,385
TA/Field Stu./TR-Machya P University Curriculum	1-01-025-84	USU	TERM	9,000	3,975	0	3,975	5,025
Priority Research	1-02-013-85	USU	INIT	26,472	19,344	504	19,848	6,624
TA/Field Stu./TR-Machya P INDIA:	1-02-014-85	GSU	FORM	113,877	-504	504	0	113,877
	1-02-021-84	USU	INIT	418,000	356,840	65,060	411,900	3,100

FISCAL YEAR 1985 WORK PLAN ACTIVITIES

ACTIVITY	CODE	UNIV.	STATUS	APPROVED BUDGET	/ - E X P E N D I T U R E S - \			BUDGET BALANCE
					THROUGH JUN. 30, 85	CURRENT QUARTER	THROUGH SEP. 30, 85	
Mdya Pr Mnr Irr: Socio-Tech	1-02-023-84	USU	APPR	174,969	18	0	18	174,971
Water Balance	1-02-023-85	USU	FORM	40,333	0	0	0	40,333
Hydraulic Conductivity St	1-02-024-85	USU	FORM	31,750	0	0	0	31,750
Reservoir Operation Stud	1-02-025-85	USU	FORM	36,990	0	0	0	36,990
Irr Sector Eval & Stratsy	1-02-103-84	USU	INIT	209,716	205,687	1,915	210,622	( 886)
INDONESIA:								
Small-scale Irr. Developm	1-02-019-85	CU	INIT	200,658	56,524	0	56,524	144,134
Cost Recovery	1-02-074-85	CSU	APPR	10,611	11,880	65	11,945	666
JAMAICA:								
Planning Activities	1-02-007-85	USU	APPR	11,970	-65	65	0	11,970
Systems Study	1-02-008-85	USU	APPR	24,822	-65	65	0	24,822
JORDAN:								
Jordan Advisory Services	1-02-009-85	USU	APPR	10,338	-65	65	0	10,338
MALI:								
Closed Out OFWY Specifics	1-99-004-83	USU	TERM	0	-67	65	8	( 8)
MAURITANIA:								
Peace Corps Assistance	1-02-041-85	CU	APPR	4,930	-65	65	0	4,930
River Valley - Plan of Ac	1-02-076-85	USU	APPR	45,915	5,761	13,360	20,123	25,792
MOROCCO:								
PID Development	1-02-002-85	USU	APPR	47,629	0	20,872	20,872	26,757
NEPAL:								
Sm/Med Scale Irrigation	1-02-067-85	USU	INIT	89,481	66,330	-3,432	62,898	26,583
Nepal Radio Apprais	1-02-067-85	CSU	FORM	77,390	0	10,346	10,346	67,044
PAKISTAN:								
Curriculum Development	1-02-071-85	CSU	INIT	74,443	53,773	4,895	58,668	15,775
Baseline Survey	1-02-083-85	CSU	FORM	39,749	0	5,484	5,484	34,265
Command Water Management	1-02-114-84	CSU	INIT	739,011	284,030	125,244	409,274	329,737
PERU:								
Plan YERIS	1-01-012-84	USU	INIT	642,215	372,461	67,865	440,316	201,899
SRI LANKA:								
Long Term Water Mgmt Spec	1-01-109-84	CSU	INIT	216,137	116,926	259,364	376,290	( 160,153)
Central Support	1-02-003-85	CSU	FORM	73,695	42,622	16,757	59,379	14,316
Socioeconomic studies -	1-02-004-85	CU	APPR	82,673	12,483	13,471	25,954	56,719
Model Calibration	1-02-005-85	USU	APPR	37,600	10,883	20,931	31,814	6,786
Irr Sys Mgmt Proj Design	1-02-102-84	CSU	INIT	172,000	123,655	166	123,821	48,179
SWAZILAND:								
Irrigation Assistance	1-02-029-85	USU	APPR	17,207	-166	166	0	17,207
Irrigation Priorities	1-02-049-85	CSU	APPR	25,843	17,542	5,580	23,122	2,721
WORLDWIDE:								
Meeting recurrent costs of	1-02-050-85	CU	INIT	51,345	22,812	17,344	40,156	11,189
Shortcourse Staff Assist	1-02-070-85	CID	APPR	14,690	5,495	5,495	10,990	3,600
Peace Corps Support	1-02-178-85	CID	APPR	15,331	0	15,331	15,331	0
TOTAL TECHNICAL ASSIST.				4,364,174	2,154,767	772,777	2,927,539	1,426,635

# Best Available Document

## FISCAL YEAR 1985 WORK PLAN ACTIVITIES

ACTIVITY	CODE	UNIV.	STATUS	APPROVED BUDGET	/- - E X P E N D I T U R E S - - /-			BUDGET BALANCE
					THROUGH JUN. 30, 85	CURRENT QUARTER	THROUGH SEP. 30, 85	
<b>TRAINING AND TECHNOLOGY TRANSFER:</b>								
<b>BOLIVIA:</b>								
Course - Off-Farm Water Mn	2-01-011-85	USU	APPR	81,368	-15,331	15,331	0	81,368
Course - Small-Scale Irr	2-14-010-85	USU	FORM	41,333	16,555	0	16,555	24,778
<b>ECUADOR:</b>								
Finish Original Training	2-03-054-84	USU	INIT	161,176	159,876	210	159,886	2,090
<b>INDIA:</b>								
Innovative Teaching	2-03-012-85	USU	FORM	138,090	-210	210	0	138,090
Video Modules	2-03-075-85	USU	APPR	74,001	71	33,258	33,279	40,722
Senior Officer's Workshop	2-04-053-84	USU	INIT	74,337	33,726	0	33,726	40,611
Technology Transfer	2-06-022-85	CSU	FORM	164,971	0	0	0	164,971
Training Materials	2-13-020-85	CSU	FORM	435,210	0	0	0	435,210
Development of Handbooks	2-13-027-85	CSU	INIT	79,956	29,841	-112	29,729	50,227
Main Systems Training	2-14-015-85	USU	FORM	65,372	112	-112	0	65,372
Farmer Organization Works	2-14-017-85	CU	FORM	81,141	112	-112	0	81,141
Training of Trainers	2-14-019-85	CSU	FORM	37,594	112	-112	0	37,594
Demo/Wkshop of Cont. Irr.	2-14-040-85	USU	INIT	57,471	112	-112	0	57,471
<b>NEPAL:</b>								
Diagnostic Anal. of Irr.	2-02-031-85	CSU	INIT	176,479	122,034	32	122,036	4,443
<b>PAKISTAN:</b>								
Managt Officials Trng -	2-01-045-85	CSU	FORM	99,881	-32	32	0	99,881
Sr Officers Workshop/Sen	2-04-019-84	CSU	INIT	90,692	32,997	221	33,218	57,674
Management Tr. Key Official	2-04-050-85	CSU	FORM	17,612	0	16,647	16,647	865
<b>SRI LANKA:</b>								
Seminar on Irr System R	2-05-033-85	CSU	INIT	63,030	27,749	17,493	45,242	7,788
<b>WORLDWIDE:</b>								
DA Trainers Workshop	2-08-040-84	CSU	INIT	29,736	16,341	3,924	20,265	4,471
Strategy for Training	2-09-049-84	CSU	INIT	27,378	13,914	6,824	20,738	6,640
Micro Applications for DA	2-10-051-84	CSU	INIT	62,615	52,298	0	62,298	317
Professional Visitors & N	2-11-039-84	CSU	INIT	10,294	7,926	136	8,042	2,242
French Language Training	2-11-041-85	USU	INIT	10,650	979	0	979	9,671
Professional Visitors	2-11-068-84	CU	INIT	9,673	1,656	1,132	3,018	6,655
Brochures, Newsletters, P	2-12-044-84	CSU	INIT	39,976	33,371	6,997	40,368	392
Instructors Guide for DA	2-13-042-84	CSU	INIT	24,681	24,735	0	24,735	96
"Rehab." & Gene Simulat.	2-13-048-85	CU	INIT	33,445	3,672	6,927	12,619	20,826
Micro Computer Workshop	2-14-032-85	CSU	INIT	59,972	3,867	17,334	26,201	33,771
Lessons Learned Irr Sys	2-14-039-85	USU	APPR	103,209	9,924	-466	9,259	93,950
Lessons Learned Wkshop A	2-14-049-85	CU	APPR	41,790	465	-465	0	41,790
Jr Seminar on Current Res	2-14-050-85	CU	FORM	74,372	60,744	-638	60,106	34,266
Irr Sys Managt Task Force	2-14-040-84	USU	INIT	44,064	9,504	0	9,504	34,560
Task Fnd Sr -Scl Comm-Med	2-14-045-84	CU	INIT	20,741	7,686	1,220	8,906	11,835
<b>TOTAL TRAINING AND TECHNOLOGY TRANSFER \$</b>				<b>2,497,820</b>	<b>871,236</b>	<b>115,940</b>	<b>301,606</b>	<b>1,691,214</b>

FISCAL YEAR 1985 WORK PLAN ACTIVITIES

ACTIVITY	CODE	UNIV.	STATUS	APPROVED BUDGET	EXPENDITURES			BUDGET BALANCE
					THROUGH JUN. 30, 85	CURRENT QUARTER	THROUGH SEP. 30, 85	
<b>SPECIAL STUDIES:</b>								
<b>INDIA:</b>								
India Main Systems Case S	3-04-043085	USU	INIT	31,928	-1,220	1,220	0	31,928
<b>MOROCCO:</b>								
Moroccan Case Studies	3-04-043085	USU	APPR	29,433	27,006	-5,809	20,197	9,236
<b>NGER:</b>								
Trac & Devel Sma I-Scale	3-04-052-85	CU	INIT	42,484	24,419	8,919	33,333	9,146
Smi-Sol Irr & Wtr Mgmt, P	3-04-098-84	CU	FORM	5,508	-2,933	8,919	5,986	(478)
<b>SRI LANKA:</b>								
Interfacing On-Farm Wtr M	3-04-036A85	CSU	INIT	36,390	41,440	23,095	64,535	21,655
Sri Lanka Interfacing On-	3-04-036B85	CSU	INIT	130,907	17,720	33,504	51,224	79,683
Landsat85-Remote Sensing	3-04-036-85	CSU	INIT	34,442	21,121	9,315	30,436	4,006
Phys & Oper Rehab Impact	3-04-097-84	CU	INIT	26,492	9,461	9,315	18,796	7,696
<b>THAILAND:</b>								
Thailand Case Study	3-04-043885	USU	INIT	44,067	20,098	8,478	28,576	15,491
<b>WORLDWIDE:</b>								
Rapid Irr. Project Apprai	3-04-042-85	USU	INIT	73,710	20,119	8,370	28,489	45,321
Irrigation System Model D	3-04-043085	USU	INIT	87,623	25,697	45,503	71,200	16,423
Interdisciplinary Mn Sys	3-04-043585	USU	INIT	27,646	0	5,804	5,804	21,842
Comp Anal of Farm Particp	3-04-046-83	CU	INIT	17,535	15,452	7,609	23,061	(5,526)
Comp Anal of Ind Invest St	3-04-053-85	CU	FORM	15,031	24,949	7,416	32,365	(17,334)
Comp Anal of Ind Invest St	3-04-054-85	CU	INIT	97,899	-7,416	7,416	0	97,899
Rural Employment & Sys Pa	3-04-055-85	CU	INIT	16,150	11,430	2,656	14,086	2,064
Irr Sys Reference-Mgmt In	3-04-056-85	CU	INIT	69,615	37,498	20,959	58,457	11,158
Smi-Sol Irr Sys Spcl Stcy	3-04-067-84	CU	INIT	57,059	49,290	4,192	53,482	3,577
<b>TOTAL SPECIAL STUDIES \$</b>				<b>893,321</b>	<b>334,101</b>	<b>180,011</b>	<b>540,982</b>	<b>352,339</b>
<b>TOTAL FY 85 ACTIVITIES \$</b>				<b>3,603,824</b>	<b>3,609,458</b>	<b>1,247,462</b>	<b>5,016,754</b>	<b>3,557,370</b>

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

WATER MANAGEMENT SYNTHESIS II PROJECT  
(AID/DAN 4127-C-00-2086-00)

EXPENDITURE REPORT  
AS OF SEPTEMBER 30, 1965

CID / EPD OFFICE  
FISCAL YEAR 1965 WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>UNIVERSITY SUPPORT ACTIVITIES:</b>									
<b>ADMINISTRATION:</b>									
EPD ADMINISTRATION 3-01-999-85	85,909	24,967	25,365	518	19,347	156,106	13,488	169,594	191,810
<b>TOTAL UNIVERSITY SUPPORT \$</b>	<b>85,909</b>	<b>24,967</b>	<b>25,365</b>	<b>518</b>	<b>19,347</b>	<b>156,106</b>	<b>13,488</b>	<b>169,594</b>	<b>191,810</b>
<b>TECHNICAL ASSISTANCE:</b>									
<b>INDIA:</b>									
University Curricula 1-02-013-85	0	459	0	0	0	459	45	504	USU
TA/Field Stu/TR-Maha Inv T&M Proj 1-02-021-84	0	1,488	0	0	0	1,488	147	1,635	USU
<b>NEPAL:</b>									
Nepal Rapid Appraisal 1-02-087-85	0	0	327	0	0	327	32	359	CSU
<b>PAKISTAN:</b>									
Curriculum Development 1-02-071-85	0	4,857	31	0	0	4,888	484	5,372	CSU
Command Water Management Prog 1-02-114-84	0	0	106	0	0	106	11	117	CSU
<b>SRI LANKA:</b>									
Inv Sys Mgmt Proj Design Team 1-02-102-84	8,142	5,566	0	0	3,770	17,478	1,534	19,012	CSU
<b>WORLDWIDE:</b>									
Meeting recurrent costs of inv 1-02-062-85	21,462	171	959	0	5,129	27,722	2,237	29,959	CU
Shortcourse Staff Assistance 1-02-070-85	10,000	0	0	0	0	10,000	990	10,990	14,590
Peace Corps Support 1-02-078-85	0	0	13,950	0	0	13,950	1,381	15,331	15,331
<b>TOTAL TECHNICAL ASSIST. \$</b>	<b>39,604</b>	<b>12,544</b>	<b>15,373</b>	<b>0</b>	<b>8,899</b>	<b>76,418</b>	<b>20,349</b>	<b>93,277</b>	<b>29,921</b>

CID / EPD OFFICE  
FISCAL YEAR 1985 WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>TRAINING AND TECHNOLOGY TRANSFER:</b>									
<b>INDIA:</b>									
Senior Officers Workshop 2-04-053-84	0	9,811	5,172	0	0	14,983	1,483	16,467	USU
<b>TOTAL TRAINING AND TECHNOLOGY TRANSFER \$</b>	<b>0</b>	<b>9,811</b>	<b>5,172</b>	<b>0</b>	<b>0</b>	<b>14,983</b>	<b>21,912</b>	<b>16,467</b>	<b>0</b>
<b>SPECIAL STUDIES:</b>									
<b>SRI LANKA:</b>									
Interfacing On-Farm Wtr Mgmt 7-04-036485	0	0	397	0	0	397	39	436	OSU
<b>THAILAND:</b>									
Thailand Case Study 7-04-043285	0	416	0	0	0	416	41	457	USU
<b>TOTAL SPECIAL STUDIES \$</b>	<b>0</b>	<b>416</b>	<b>397</b>	<b>0</b>	<b>0</b>	<b>813</b>	<b>21,912</b>	<b>893</b>	<b>0</b>
<b>TOTAL FY 85 ACTIVITIES \$</b>	<b>125,613</b>	<b>47,735</b>	<b>46,307</b>	<b>518</b>	<b>28,244</b>	<b>248,323</b>	<b>21,912</b>	<b>270,233</b>	<b>221,731</b>

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

WATER MANAGEMENT SYNTHESIS II PROJECT  
(AID/DAN 4127-C-00-2086-00)

EXPENDITURE REPORT  
AS OF SEPTEMBER 30, 1985

COLORADO STATE UNIVERSITY  
FISCAL YEAR 1985 WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>UNIVERSITY SUPPORT ACTIVITIES:</b>									
<b>ADMINISTRATION:</b>									
EPD ADMINISTRATION									
3-01-999-86	31,672	181	7,414	0	12,337	46,604	3,392	49,996	CID
COLORADO STATE UNIV.									
3-02-998-85	113,292	7,407	30,874	0	56,041	213,096	16,028	229,572	231,641
CLOSED OUT CSU ADMIN									
3-79-998-84	-577	0	-333	0	-328	-1,238	-90	-1,328	0
<b>TOTAL UNIVERSITY SUPPORT</b>	<b>149,387</b>	<b>7,588</b>	<b>72,905</b>	<b>0</b>	<b>68,050</b>	<b>257,930</b>	<b>19,330</b>	<b>277,260</b>	<b>231,641</b>
<b>TECHNICAL ASSISTANCE:</b>									
<b>AFRICA:</b>									
African Irrigation Overview									
1-02-108-84	7,297	368	3,363	0	4,870	18,398	1,339	19,737	USU
<b>EGYPT:</b>									
LYS Evaluation Team									
1-02-072-85	12,009	4,997	256	0	6,214	23,726	1,959	25,435	0
<b>EL SALVADOR:</b>									
PID Preparation									
1-02-057-85	5,990	3,430	5,553	0	5,553	21,108	1,568	22,604	22,500
<b>INDIA:</b>									
Priority Research									
1-02-014-85	0	0	0	0	0	0	0	0	113,877
<b>INDONESIA:</b>									
Small-scale Irr. Workshop, etc									
1-02-009-85	13,536	7,611	104	0	5,130	26,726	2,588	31,034	0
Cost Recovery									
1-02-074-85	4,420	3,470	46	0	2,930	11,140	890	11,945	12,611
<b>NEPAL:</b>									
Small-scale Irrigation									
1-02-067-85	11,592	6,389	75	0	4,071	22,805	2,060	24,637	USU

COLORADO STATE UNIVERSITY  
FISCAL YEAR 1985 WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	GID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
Nepal Rapid Appraisal 1-02-087-85	3,327	3,664	0	0	2,004	8,995	692	9,687	77,390
PAKISTAN:									
Curriculum Development 1-02-071-85	16,313	8,316	524	0	9,775	37,195	3,007	39,935	74,443
Baseline Survey 1-02-083-85	0	3,395	344	0	1,353	5,112	372	5,484	39,749
Command Water Management Prog 1-02-114-84	214,653	38,077	36,638	2,998	86,176	380,490	30,416	439,157	739,011
SRI LANKA:									
Long Term Wtr Mgmt Specialist 1-01-107-84	150,586	5,095	35,562	11,628	148,616	357,060	21,800	376,290	216,137
Central Support 1-02-103-85	28,742	14,911	64	0	10,961	55,058	4,700	59,379	73,695
Int Sys Mgmt Proj Design Team 1-02-102-84	27,519	12,283	4,531	0	11,409	55,153	4,830	60,572	172,000
SWAZILAND:									
Investigation Priorities 1-02-069-85	10,153	8,310	249	0	6,656	21,567	1,754	23,122	25,843
<b>TOTAL TECHNICAL ASSIST.</b>	<b>610,638</b>	<b>123,584</b>	<b>87,578</b>	<b>14,626</b>	<b>304,728</b>	<b>1,041,090</b>	<b>97,294</b>	<b>1,119,018</b>	<b>1,567,256</b>
<b>TRAINING AND TECHNOLOGY TRANSFER:</b>									
INDIA:									
Technology Transfer 2-04-022-85	0	0	0	0	0	0	0	0	164,971
Training Materials 2-13-020-85	0	0	0	0	0	0	0	0	435,210
Development of Handbooks 2-13-027-85	18,030	2,468	96	0	7,096	27,690	2,039	29,729	79,956
Training of Trainers 2-14-019-85	0	0	0	0	0	0	0	0	37,694
NEPAL:									
Diagnostic Anal. of Int. Sys. 2-02-031-85	53,265	21,389	15,482	0	22,219	113,113	9,681	122,036	126,479
PAKISTAN:									
Mgmt Officials Trng - Pkng 2-01-066-85	0	0	0	0	0	0	0	0	99,881
Sr Officer's Workshops/Seminar 2-04-019-84	17,086	4,247	1,435	0	8,196	30,964	2,254	33,218	90,692
Management Tr. Key Officials 2-04-080-85	11,350	0	0	0	4,086	15,436	1,211	16,647	17,512

COLORADO STATE UNIVERSITY  
FISCAL YEAR 1985 WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	STD G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>SRI LANKA:</b>									
Seminar on Irrig System Rehab 7-03-033-85	23,300	758	1,627	0	11,020	41,705	3,038	44,743	53,030
<b>WORLDWIDE:</b>									
DA Trainers Workshop 2-08-040-84	14,178	1,469	1,670	0	6,234	23,551	1,714	25,265	29,736
Strategy for Training 2-09-049-84	13,750	0	606	0	4,960	19,317	1,421	20,738	27,376
Micro Applications for DA Trng 2-10-051-84	30,950	129	10,747	2,312	14,019	58,157	4,141	62,298	62,615
Professional Visitors & Netwks 2-11-039-84	2,670	2,640	228	0	1,956	7,494	548	8,042	10,284
Brochures, Newsletters, Publ. 2-12-044-84	19,565	478	7,625	0	9,961	37,629	2,739	40,368	39,976
Instructors Guide for DA Wkshp 2-13-042-84	16,013	0	750	0	6,107	23,106	1,715	24,821	24,881
Micro Computer Workshop 2-14-032-85	11,439	0	6,519	0	6,465	24,423	1,778	26,201	59,972
Jt Seminar on Current Research 2-14-050-85	1,220	1,552	0	0	610	3,405	297	3,679	CU
Tek Pro Sal-Sol Conn-Med System 2-14-065-84	0	992	0	0	854	1,846	98	1,944	CU
<b>TOTAL TRAINING AND TECHNOLOGY TRANSFER \$</b>	<b>237,817</b>	<b>36,122</b>	<b>46,985</b>	<b>2,312</b>	<b>103,783</b>	<b>427,019</b>	<b>129,968</b>	<b>459,693</b>	<b>1,360,367</b>
<b>SPECIAL STUDIES:</b>									
<b>SRI LANKA:</b>									
Interfacing On-Farm Agr Mngmnt 3-04-036A85	39,492	0	6,571	0	14,575	59,638	4,461	64,099	86,390
Sri Lanka Interfacing On-Farm 3-04-036B85	22,848	7,282	7,562	0	9,644	47,492	3,989	51,224	130,907
Landsat65-Remote Sensing, Recon 3-04-038-85	14,751	2,272	4,526	0	6,754	28,303	2,133	30,436	34,442
<b>TOTAL SPECIAL STUDIES \$</b>	<b>77,091</b>	<b>9,554</b>	<b>17,659</b>	<b>0</b>	<b>30,973</b>	<b>135,177</b>	<b>140,580</b>	<b>145,759</b>	<b>251,739</b>
<b>TOTAL FY 85 ACTIVITIES \$</b>	<b>974,833</b>	<b>176,848</b>	<b>185,127</b>	<b>16,936</b>	<b>507,434</b>	<b>1,861,216</b>	<b>140,550</b>	<b>2,001,730</b>	<b>3,411,003</b>

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

WATER MANAGEMENT SYNTHESIS II PROJECT  
(AID/DAN 4127-C-00-2086-00)

EXPENDITURE REPORT  
AS OF SEPTEMBER 30, 1965

CORNELL UNIVERSITY  
FISCAL YEAR 1965 WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>UNIVERSITY SUPPORT ACTIVITIES:</b>									
<b>ADMINISTRATION:</b>									
CORNELL UNIVERSITY									
0-02-976-85	51,377	4,178	8,493	0	34,323	100,385	6,342	106,727	206,932
CLOSED OUT CU ADMIN									
0-77-976-84	-7,553	-830	-190	0	-4,904	-13,477	-847	-14,324	0
<b>TOTAL UNIVERSITY SUPPORT \$</b>	<b>43,824</b>	<b>3,348</b>	<b>8,303</b>	<b>0</b>	<b>31,419</b>	<b>86,908</b>	<b>5,495</b>	<b>92,403</b>	<b>206,932</b>
<b>TECHNICAL ASSISTANCE:</b>									
<b>CHAD:</b>									
Irrigated Agric. Assessment									
1-02-073-85	0	125	0	0	87	212	12	224	USU
<b>HAITI:</b>									
Hayes Plain-Distrib. Benefits									
1-02-084-85	0	0	642	0	138	780	64	844	8,249
<b>INDIA:</b>									
Irr. Sector Eval & Strategy Revu									
1-02-103-84	6,161	4,524	10	0	6,491	17,186	1,059	18,245	USU
<b>INDONESIA:</b>									
Small-scale Irr. Workshop, etc									
1-02-007-85	1,086	0	10,080	0	2,602	13,767	1,106	14,873	200,658
<b>MAURITANIA:</b>									
Peace Corps Assistance									
1-02-061-85	0	0	0	0	0	0	0	0	4,930
<b>PAKISTAN:</b>									
Curriculum Development									
1-02-071-85	4,937	0	3,840	0	3,713	12,492	847	13,339	CSU
<b>PERU:</b>									
Plan MERIS									
1-01-112-84	10,094	4,346	764	0	9,047	24,251	1,605	25,856	USU
<b>SRI LANKA:</b>									
Socioeconomic studies - rehab.									
1-02-004-85	4,646	9,732	327	0	9,793	24,478	1,436	25,914	82,673

CORNELL UNIVERSITY  
FISCAL YEAR 1985 WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	OID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>WORLDWIDE:</b>									
Meetings recurrent costs of Int 1-02-062-85	3,156	2,773	16	0	3,663	9,608	539	10,147	51,345
<b>TOTAL TECHNICAL ASSIST. \$</b>	<b>30,080</b>	<b>21,500</b>	<b>15,679</b>	<b>0</b>	<b>35,536</b>	<b>102,794</b>	<b>12,153</b>	<b>119,454</b>	<b>347,855</b>
<b>TRAINING AND TECHNOLOGY TRANSFER:</b>									
<b>INDIA:</b>									
Farmer Organization Workshops 2-14-017-85	0	0	0	0	0	0	0	0	81,141
<b>SRI LANKA:</b>									
Seminar on Invis System Rehab 2-05-033-85	0	278	0	0	193	471	28	499	0
<b>WORLDWIDE:</b>									
Professional Visitors 2-11-043-84	0	72	1,670	0	1,103	2,845	173	3,018	9,673
"Rehab." & A Game Simulation 2-13-048-85	4,973	0	2,671	0	4,196	11,860	759	12,619	33,443
Lessons Learned Workshop Activ. 2-14-047-85	0	0	0	0	0	0	0	0	41,790
Jt Seminar on Current Research 2-14-050-85	4,400	4,806	18,980	0	9,844	38,030	2,790	40,820	94,372
Tsk Pro Sm-Scl Conn-Med Systm 2-14-065-84	2,240	591	820	0	1,761	5,412	361	5,773	20,741
<b>TOTAL TRAINING AND TECHNOLOGY TRANSFER \$</b>	<b>11,633</b>	<b>5,747</b>	<b>24,141</b>	<b>0</b>	<b>17,097</b>	<b>58,618</b>	<b>14,264</b>	<b>52,729</b>	<b>281,162</b>
<b>SPECIAL STUDIES:</b>									
<b>NIGER:</b>									
Trad & Devel Small-Scale Irr 3-04-052-85	10,925	5,860	7,251	1,178	5,744	30,958	2,380	33,338	42,484
Sm-Scl Irr & Wtr Mgmt: Prelin 3-04-098-84	4,237	0	2	0	1,327	5,564	420	5,984	5,508
<b>SRI LANKA:</b>									
Phys & Oper Rehab Impact 3-04-097-84	9,916	0	2,894	0	4,718	17,528	1,268	18,796	26,492
<b>WORLDWIDE:</b>									
Comp Anal of Farm Particpatn Exp 3-04-046-83	12,216	0	3,043	0	6,291	21,550	1,511	23,061	17,535

CORNELL UNIVERSITY  
FISCAL YEAR 1985 WORK PLAN ACTIVITIES

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DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	GID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
Comp Anal of Ind Invest Strategy 3-04-053-85	16,694	0	3,170	0	10,336	30,400	1,986	32,386	15,031
Comp Anal of Ind Invest Strategy 3-04-054-85	0	0	0	0	0	0	0	0	97,099
Rural Employment & Sys Perform 3-04-055-85	6,308	0	2,833	0	4,040	13,181	905	14,086	16,150
Ind Sys Perform-Young Intnsts 3-04-056-85	33,965	90	1,346	0	19,482	54,893	3,505	58,397	49,615
Smi-Sol Ind Sys Syst Study Comp 3-04-057-84	31,927	0	3,704	0	14,258	49,949	3,533	53,482	57,059
<b>TOTAL SPECIAL STUDIES \$</b>	<b>126,448</b>	<b>5,950</b>	<b>24,243</b>	<b>1,178</b>	<b>64,196</b>	<b>224,016</b>	<b>31,772</b>	<b>239,521</b>	<b>346,773</b>
<b>TOTAL FY 85 ACTIVITIES \$</b>	<b>211,987</b>	<b>35,557</b>	<b>72,366</b>	<b>1,178</b>	<b>158,248</b>	<b>472,335</b>	<b>31,772</b>	<b>504,105</b>	<b>1,182,922</b>

## CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

WATER MANAGEMENT SYSTHESIS II: PROJECT  
(AID/DAN 4127-C-00-2084-00)EXPENDITURE REPORT  
AS OF SEPTEMBER 30, 1985UTAH STATE UNIVERSITY  
FISCAL YEAR 1985 WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
UNIVERSITY SUPPORT ACTIVITIES:									
ADMINISTRATION:									
UTAH STATE UNIV.									
0-02-997-85	116,898	8,491	20,248	3,354	47,767	196,758	14,418	211,176	233,126
CLOSED OUT USU ADMIN									
0-99-997-84	-2,682	0	1	0	-858	-3,539	-245	-3,804	0
TOTAL UNIVERSITY SUPPORT	114,216	8,491	20,249	3,354	46,909	193,219	14,153	207,372	233,126
TECHNICAL ASSISTANCE:									
AFRICA:									
African Irrigation Overview									
1-02-108-84	54,000	18,750	25,980	0	31,694	130,454	9,906	140,230	140,230
CHAD:									
Irrigated Agric. Assessment									
1-02-073-85	0	8,662	33,513	0	14,153	56,430	4,615	60,743	116,822
EGYPT:									
Egypt Water Use & Mngmnt Eval									
1-02-066-85	0	4,458	13,145	0	5,633	23,626	2,033	25,269	41,268
EL SALVADOR:									
PP Development									
1-02-077-85	8,700	10,423	79,247	0	15,648	114,172	10,821	124,839	164,814
HAITI:									
Irrigation Sector Survey									
1-04-017-84	26,062	8,242	892	0	11,296	46,648	3,840	50,332	48,072
HONDURAS:									
Irrigation Development Project									
1-02-060-85	3,280	2,211	52	0	1,774	7,375	607	7,924	12,309
INDIA:									
TA/Field Stu/TR-Madhya Pr Minn									
1-01-025-84	0	3,617	0	0	0	3,617	358	3,975	9,000
University Curricula									
1-02-013-85	10,484	2,938	80	0	4,320	18,007	1,522	19,344	26,472

UTAH STATE UNIVERSITY  
FISCAL YEAR 1985 WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	GID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
TA/Fld Stu/TR-Maha Inv T&M Paj									
1-02-021-84	95,971	123,684	46,576	10,543	31,561	381,740	30,010	410,245	415,000
Myda Pr Mnr Inv: Socio-Tch Fees									
1-02-023-84	0	0	13	0	4	17	1	18	174,989
Water Balance									
1-02-023-85	0	0	0	0	0	0	0	0	40,333
Hydraulic Conductivity Studies									
1-02-024-85	0	0	0	0	0	0	0	0	31,750
Reservoir Operation Studies									
1-02-025-85	0	0	0	0	0	0	0	0	35,990
Inv Sector Eval & Strcty Revw									
1-02-103-84	48,380	14,043	78,470	0	36,179	178,409	15,285	192,357	209,716
INDONESIA:									
Small-scale Inv. Workshops, etc									
1-02-009-85	1,640	5,756	60	0	2,336	9,679	775	10,617	00
JAMAICA:									
Planning Activities									
1-02-007-85	0	0	0	0	0	0	0	0	11,970
Systems Study									
1-02-008-85	0	0	0	0	0	0	0	0	24,822
JORDAN:									
Jordan Advisory Services									
1-02-028-85	0	0	0	0	0	0	0	0	10,338
YALI:									
Closed Out OFWM Specialist									
1-99-006-83	0	4	0	0	2	8	0	8	0
MAURITANIA:									
River Valley - Plan of Action									
1-02-076-85	9,175	4,683	19	0	4,620	18,759	1,526	20,123	45,915
MOROCCO:									
PID Development									
1-02-002-85	0	14,690	19	0	4,707	19,416	1,456	20,872	47,629
NEPAL:									
Sm/Med Scale Irrigation									
1-02-067-85	10,730	4,297	9,717	0	3,558	35,613	2,959	38,261	89,481
PERU:									
Plan MERIS									
1-01-112-84	47,297	46,340	183,252	20,394	39,397	387,245	28,840	414,660	642,215
SRI LANKA:									
Model Calibration									
1-02-005-85	16,151	5,482	271	0	7,437	29,600	2,473	31,814	37,600
Inv Sys Ymnt Proj Design Team									
1-02-102-84	21,128	8,529	1,262	0	7,894	41,176	3,424	44,237	050
SWAZILAND:									
Irrigation Assistance									
1-02-029-85	0	0	0	0	0	0	0	0	12,207

UTAH STATE UNIVERSITY  
FISCAL YEAR 1985 WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	GD G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
TOTAL TECHNICAL ASSIST. \$	352,978	287,531	494,568	30,957	329,363	1,494,296	134,524	1,615,788	2,409,142
TRAINING AND TECHNOLOGY TRANSFER:									
BOLIVIA:									
Course - On-Farm Water Mngmnt 2-01-011-85	0	0	0	0	0	0	0	0	81,368
Course - Small-Scale Irr Design 2-14-010-85	3,928	348	5,180	0	3,685	15,415	1,354	16,555	41,333
ECUADOR:									
Finish Original Training Module 2-03-054-84	105,667	1,665	4,877	0	35,878	147,987	11,077	159,084	161,176
INDIA:									
Innovative Teaching 2-03-012-85	0	0	0	0	0	0	0	0	138,090
Video Modules 2-03-075-85	17,782	0	2,021	1,397	7,701	31,101	2,178	33,279	74,001
Senior Officer's Workshop 2-04-053-84	0	2,186	9,864	0	3,856	15,906	1,353	17,259	74,337
Main Systems Training 2-14-015-85	0	0	0	0	0	0	0	0	65,372
Semr/Wkshop of Comp. Irr. Sys. 2-14-040-85	0	0	0	0	0	0	0	0	57,471
WORLDWIDE:									
French Language Training 2-11-041-85	572	0	18	0	221	911	68	979	10,650
Lessons Learned: Irr Sys Mngmt 2-14-039-85	5,869	0	553	0	2,201	8,623	636	9,259	103,209
Jt Seminar on Current Research 2-14-050-85	4,783	6,051	105	0	3,501	14,524	1,167	15,607	CU
Irr Sys Mngmt Task Force 2-14-060-84	5,188	1,492	18	0	2,143	8,841	463	9,504	44,284
Tex Fnc Sml-Sci Comm-Mng Systm 2-14-045-84	0	820	18	0	268	1,106	53	1,189	CU
TOTAL TRAINING AND TECHNOLOGY TRANSFER \$	148,049	12,662	22,654	1,397	39,454	244,116	153,125	262,717	851,291
SPECIAL STUDIES:									
INDIA:									
India Main Systems Case Study 3-04-043085	0	0	0	0	0	0	0	0	31,928

UTA- STATE UNIVERSITY  
FISCAL YEAR 1985 WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	GID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>MOROCCO:</b>									
Moroccan Case Studies 3-04-043085	1,459	17,614	14	0	4,689	23,802	1,421	25,197	29,433
<b>THAILAND:</b>									
Thailand Case Study 3-04-043085	3,442	1,305	13,036	0	6,337	24,158	1,979	26,119	44,067
<b>WORLDWIDE:</b>									
Rapid Irr. Project Appraisal 3-04-042-85	0	38	20,576	0	6,812	27,446	2,043	29,489	73,710
Irrigation System Model Devel. 3-04-043085	46,853	1,722	937	0	16,786	66,298	4,902	71,200	87,623
Interdisciplinary Mn Sys Wkshp 3-04-043E85	4,211	0	485	0	1,643	6,339	465	6,804	27,848
<b>TOTAL SPECIAL STUDIES \$</b>	<b>57,985</b>	<b>19,679</b>	<b>35,068</b>	<b>0</b>	<b>35,267</b>	<b>143,999</b>	<b>163,935</b>	<b>154,809</b>	<b>294,609</b>
<b>TOTAL FY 85 ACTIVITIES \$</b>	<b>673,248</b>	<b>324,243</b>	<b>572,639</b>	<b>35,708</b>	<b>470,993</b>	<b>2,075,630</b>	<b>163,935</b>	<b>2,240,656</b>	<b>3,788,168</b>

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

EXHIBIT B

WATER MANAGEMENT SYSTHESIS II PROJECT  
(AID/DAN 4127-C-00-2086-00)

QUARTERLY REPORT  
FOR THE PERIOD ENDING SEPTEMBER 30, 1985

PRIOR YEARS WORK PLAN ACTIVITIES NOT CLOSED OUT

ACTIVITY	CODE	UNIV.	STATUS	APPROVED BUDGET	/ - - E X P E N D I T U R E S - - \			BUDGET BALANCE
					THROUGH JUN. 30, 85	CURRENT QUARTER	THROUGH SEP. 30, 85	
<b>ADMINISTRATION:</b>								
<b>WORLDWIDE</b>								
EPD ADMINISTRATION	0-01-999-83	CID	COMP	145,937	145,778	0	145,778	159
CSU ADMINISTRATION	0-02-998-83	CSU	COMP	281,382	281,317	0	281,317	65
<b>TOTAL ADMINISTRATION:</b>				<b>427,319</b>	<b>427,095</b>	<b>0</b>	<b>427,095</b>	<b>224</b>
<b>TECHNICAL ASSISTANCE:</b>								
<b>BANGLADESH:</b>								
Water Management Systems	1-02-015-82	CU	COMP	154,287	106,858	0	106,858	47,429
Water Mgmt Sys Proj Paper	1-02-072-84	CU	COMP	20,719	30,343	0	30,343	( 9,624)
BAU Collaboration Team	1-03-030-82	CSU	COMP	84,243	66,956	0	66,956	17,287
<b>BURMA:</b>								
Wakema Pump Scheme Study	1-02-036-84	CU	TERM	4,759	4,359	0	4,359	400
<b>DOMINICAN REPUBLIC:</b>								
Weed Control Specialist	1-02-091-84	USU	FINI	3,354	3,118	0	3,118	236
Water Management Spec.	1-02-110-84	CSU	COMP	26,813	19,091	0	19,091	7,722
<b>EL SALVADOR:</b>								
Evaluation Team	1-02-107A84	CID	COMP	107,449	107,090	14,750	121,840	( 14,391)
<b>INDIA:</b>								
Hill Area Land & Water De	1-02-013-83	CU	COMP	140,949	28,254	14,750	43,004	97,945
Maharashtra Minor Irrig	1-02-018-84	USU	FINI	171,970	161,088	0	161,088	10,882
Water Management & Traini	1-02-020B82	USU	COMP	22,802	24,026	0	24,026	( 1,224)
Development of Solutions	1-02-024-82	CSU	COMP	63,936	61,219	0	61,219	2,717
DA Workshop Planning	1-02-044-83	CSU	COMP	28,149	31,718	0	31,718	( 3,569)
Institutional Analysis	1-02-047-83	CID	COMP	32,647	21,498	0	21,498	11,149
Institutional Analysis	1-02-053-83	USU	FINI	26,725	0	0	0	26,725
Hill Irrig Proj Prep II	1-02-074-84	CU	FINI	61,218	111,773	0	111,773	( 50,555)
Curriculum Development	1-02-094-84	CSU	COMP	10,682	10,992	0	10,992	( 310)
Short Course	1-02-100-84	USU	FINI	84,388	76,127	0	76,127	8,261
<b>INDONESIA:</b>								
Small Scale Irrig & Mgmt	1-02-011-84	CU	INIT	54,468	151,745	0	151,745	( 97,277)
OAD'S TDY	1-02-030-83	CSU	COMP	14,498	16,204	0	16,204	( 1,706)

PRIOR YEARS WORK PLAN ACTIVITIES NOT CLOSED OUT

ACTIVITY	CODE	UNIV.	STATUS	APPROVED BUDGET	/ - EXPENDITURES - \			BUDGET BALANCE
					THROUGH JUN. 30, 85	CURRENT QUARTER	THROUGH SEP. 30, 85	
JORDAN:								
SR. On Farm WY Advisor	1-02-014-84	USU	INIT	4,767	5,844	0	5,844	( 1,077)
Irrigation Sector Study	1-04-013-84	USU	FINI	31,429	19,175	0	19,175	12,254
PAKISTAN:								
WM (CWY) Meeting	1-02-029883	CSU	COMP	9,931	3,168	0	3,168	6,763
Mayfield's TDY	1-02-040-83	USU	COMP	15,666	15,505	0	15,505	161
Long-Term Strategies	1-02-101-84	USU	FINI	9,369	1,856	0	1,856	7,513
Command Area Management	1-02-106-84	USU	FINI	16,066	14,053	0	14,053	2,013
PERU:								
Expansion of Irrig. System	1-02-035-84	USU	FINI	53,681	60,031	39,933	99,964	( 46,283)
Special Study	1-04-027-82	USU	FINI	93,755	31,474	39,933	71,407	22,348
SENEGAL:								
Bakeri Small Irrig. Perimeter	1-02-033-84	USU	APPR	56,681	-39,933	39,933	0	56,681
SRI LANKA:								
Water Mgmt Central Region	1-01-072-84	CSU	FINI	58,984	66,524	0	66,524	( 7,540)
Farmer Organization Program	1-02-007-84	CU	FINI	64,466	63,647	0	63,647	819
TANZANIA:								
Tanzania Irrig. Study	1-02-082-84	USU	FINI	12,567	11,747	0	11,747	820
WORLDWIDE:								
Water Resource Econ	1-02-042-83	CSU	COMP	19,703	19,597	0	19,597	106
TOTAL TECHNICAL ASSIST. \$				1,561,033	2,305,147	54,683	1,454,446	106,587
TRAINING AND TECHNOLOGY TRANSFER:								
AFRICA:								
At-ice Workshop	2-14-113-84	CSU	FINI	14,333	14,748	365	14,613	( 280)
BANGLADESH:								
JA Workshop	2-02-007-82	CSU	COMP	219,174	234,248	0	234,248	( 15,074)
BOLIVIA:								
Tarija Short Course	2-01-095-84	CU	FINI	64,995	5,226	0	5,226	59,769
ECUADOR:								
Equiver Video	2-03-064-83	USU	INIT	204,837	204,695	0	204,695	142
INDIA:								
JA Workshop Yachya Pradesh	2-02-031-84	CSU	FINI	135,470	140,404	0	140,404	( 4,934)
JA Workshop - WID	2-02-090-84	CID	FINI	21,980	5,531	0	5,531	16,449
Senior Officials	2-04-007-83	USU	TERM	1,054	1,055	0	1,055	( 1)
Watercourse Handbooks	2-13-025-82	CSU	COMP	15,188	20,217	0	20,217	( 5,029)
INDONESIA:								
JA Workshop	2-02-010-84	CSU	TERM	3,736	3,257	0	3,257	479
NEPAL:								
JA Workshop Planning	2-02-003-84	CSU	FINI	21,842	21,978	-533	21,445	397
SRI LANKA:								
JA Workshop	2-07-028-83	CSU	COMP	121,475	120,441	0	120,441	1,034

PRIOR YEARS WORK PLAN ACTIVITIES NOT CLOSED OUT

ACTIVITY	CODE	UNIV.	STATUS	APPROVED BUDGET	/- - E X P E N D I T U R E S - - /			BUDGET BALANCE
					THROUGH JUN. 30, 85	CURRENT QUARTER	THROUGH SEP. 30, 85	
Videa Production THAILAND:	2-03-046-83	CU	COMP	8,122	0	0	0	8,122
Improving Allocations WORLDWIDE:	2-14-042-83	CID	COMP	44,250	44,221	0	44,221	29
DA Review	2-02-050-84	CID	TERM	0	13,448	0	13,448	( 13,448)
Videotape Modules	2-03-021-83	CSU	COMP	90,755	90,747	0	90,747	8
ICID Conference	2-04-048-84	CSU	COMP	20,678	20,239	0	20,239	439
Main System Mgmt Task For	2-06-077-84	CU	FINI	7,557	1,087	0	1,087	6,470
Short Term Non-Degree	2-08-056-83	USU	COMP	37,909	27,795	0	27,795	10,114
Survey & Strategy for Tra	2-09-019-83	CSU	COMP	34,267	33,441	0	33,441	826
Computer Applications	2-10-022-83	CSU	COMP	70,020	69,734	0	69,734	286
Increasing WM Capabilitie	2-11-020-83	CID	INIT	57,569	50,201	-1	50,200	7,369
French Language Training	2-11-059-84	USU	INIT	10,650	6,004	0	6,004	4,646
Increasing WM Capabilitie	2-11-081-84	CID	INIT	20,847	16,244	0	16,244	4,603
Small Scale Irrigation Wo	2-14-064-84	CU	FINI	47,163	32,756	0	32,756	14,407
Farmer Participation Wksp	2-14-066-84	CU	FINI	36,193	24,583	0	24,583	11,610
AID/FAO Expert Consul WM	2-14-067-84	CU	FINI	9,288	12,779	0	12,779	( 3,491)
Planning for Seminar	2-14-075-84	CU	FINI	9,889	6,737	0	6,737	3,152
FAO Workshop Participants	2-14-078-84	CID	INIT	26,000	12,000	0	12,000	14,000
<b>TOTAL TRAINING AND TECHNOLOGY TRANSFER \$</b>				<b>1,360,241</b>	<b>1,238,316</b>	<b>-169</b>	<b>1,238,147</b>	<b>122,094</b>
<b>SPECIAL STUDIES:</b>								
<b>AFRICA:</b>								
Dev. Of Social Parameters NIGER:	3-04-057-83	USU	FINI	57,039	59,291	0	59,291	7,748
Traditional & Dev. SS:	3-04-111-84	CU	INIT	14,825	17,844	0	17,844	( 3,019)
<b>WORLDWIDE:</b>								
Development of Handbook	3-00-000-83	USU	TERM	4,615	4,616	0	4,616	( 1)
Communication of Tech Tra	3-04-024-83	CSU	COMP	52,783	52,761	0	52,761	22
Irrigation Systems Manage	3-04-025-83	CSU	COMP	156,507	156,546	-97	156,449	58
Small Scale Irrigation	3-04-045-83	CU	INIT	160,697	104,276	-97	104,179	56,518
Interfacing Farm & Manage	3-04-045-84	CSU	INIT	223,239	106,964	1	106,965	116,274
Small scale irrigation	3-04-045883	CU	APPR	3,416	0	3,416	3,416	0
On-Farm Irrigation System	3-04-058-83	USU	INIT	47,146	14,945	3,416	18,361	28,785
Main System Management	3-04-059-83	USU	INIT	146,905	108,818	0	108,818	38,087
Monitoring Projects	3-04-061-83	USU	POST	18,350	0	0	0	18,350
Main Sys Design, Mgmt Ren	3-04-061-84	USU	INIT	221,424	166,540	1,295	167,835	53,589
Interdisc. Incls. Sys. Se	3-04-062-84	USU	INIT	62,430	34,561	0	34,561	27,869
DA Evaluation	3-04-063-83	CID	COMP	7,163	0	0	0	7,163
Management Intensity	3-04-096-84	CU	INIT	77,239	63,724	0	63,724	13,514
<b>TOTAL SPECIAL STUDIES \$</b>				<b>1,263,777</b>	<b>890,886</b>	<b>4,615</b>	<b>898,820</b>	<b>364,957</b>

TOTAL PRIOR YEARS ACTIVITIES :

4,612,370    3,841,444    59,129    4,018,508    593,862

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CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

SCHEDULE B-1

WATER MANAGEMENT SYNTHESIS II PROJECT  
(AID/DAN 4127-C-00-2084-00)

EXPENDITURE REPORT  
AS OF SEPTEMBER 30, 1985

CID / EPD OFFICE  
PRIOR YEARS WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>TECHNICAL ASSISTANCE:</b>									
<b>BANGLADESH:</b>									
Water Mgmt Central Support 1-02-015-82	0	0	7,641	0	0	7,641	754	10,595	CSU
Water Mgmt Sys Proj Paper 1-02-072-84	0	0	7,011	0	0	7,011	892	9,903	CU
<b>EL SALVADOR:</b>									
Evaluation Team 1-02-107A84	0	0	89,888	0	0	89,888	7,827	97,715	107,447
<b>INDIA:</b>									
Hill Area Land & Water Dev 1-02-013-83	0	0	1,574	0	0	1,574	156	1,730	CU
Maharashtra Minor Irrig 1-02-018-84	0	21,467	73,330	0	3,309	48,106	4,735	52,841	USU
Development of Solutions 1-02-024-82	0	0	3,826	0	0	3,826	379	4,205	CSU
Institutional Analysis 1-02-047-83	0	3,354	12,608	0	3,706	19,668	1,830	21,498	32,647
Hill Irrig Proj Prep II 1-02-074-84	0	6,743	0	0	0	6,743	687	7,430	CU
Short Course 1-02-100-84	0	7,161	0	0	0	7,161	709	7,870	USU
<b>JORDAN:</b>									
Irrigation Sector Study 1-04-013-84	0	0	7,500	0	0	7,500	742	8,242	USU
<b>PAKISTAN:</b>									
Long-Term Strategies 1-02-101-84	0	749	0	0	0	749	74	823	USU
Command Area Management 1-02-106-84	0	2,609	0	0	0	2,609	258	2,867	USU
<b>PERU:</b>									
Expansion of Irrig. Systems 1-02-036-84	0	0	8,148	0	0	8,148	807	8,955	USU
Specia Study 1-04-027-82	0	0	7,500	0	0	7,500	742	8,242	USU

CID / EPD OFFICE  
PRIOR YEARS WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>SRI LANKA:</b>									
Water Mgmt Central Support 1-01-022-84	0	3,640	0	0	0	3,640	350	3,890	CSU
<b>TOTAL TECHNICAL ASSIST. \$</b>	<b>0</b>	<b>46,823</b>	<b>173,026</b>	<b>0</b>	<b>7,016</b>	<b>224,386</b>	<b>23,142</b>	<b>247,006</b>	<b>140,096</b>
<b>TRAINING AND TECHNOLOGY TRANSFER:</b>									
<b>BANGLADESH:</b>									
DA Workshop 2-02-007-82	0	0	29,436	0	0	29,436	2,914	32,350	CSU
<b>INDIA:</b>									
DA Workshop Madhya Pradesh 2-02-031-84	0	12,090	0	0	0	12,090	1,207	13,297	CSU
DA Workshop - WID 2-02-090-84	0	2,006	0	0	0	2,006	199	2,205	21,980
Watercourse Handbooks 2-13-025-82	0	2,530	0	0	0	2,530	250	2,780	CSU
<b>THAILAND:</b>									
Improving Allocations 2-14-042-83	0	34,909	663	0	6,248	40,710	3,511	44,221	44,250
<b>WORLDWIDE:</b>									
Increasing WM Capabilities 2-11-081-84	0	2,011	0	0	0	2,011	199	2,210	20,647
FAO Workshop Participants 2-14-078-84	0	10,919	0	0	0	10,919	1,081	12,000	26,000
<b>TOTAL TRAINING AND TECHNOLOGY TRANSFER \$</b>	<b>0</b>	<b>64,465</b>	<b>29,989</b>	<b>0</b>	<b>6,248</b>	<b>99,692</b>	<b>32,503</b>	<b>109,063</b>	<b>113,077</b>
<b>SPECIAL STUDIES:</b>									
<b>NIGER:</b>									
Traditional & Dev. SS: 2-04-111-84	0	0	0	6,797	0	6,797	0	6,797	CU
<b>WORLDWIDE:</b>									
Main Sys Design, Mgmt Rehab 2-04-061-84	0	0	1,043	0	0	1,043	103	1,146	USU
DA Evaluation 2-04-063-83	0	0	0	0	0	0	0	0	7,163
<b>TOTAL SPECIAL STUDIES \$</b>	<b>0</b>	<b>0</b>	<b>1,043</b>	<b>6,797</b>	<b>0</b>	<b>6,840</b>	<b>32,606</b>	<b>6,943</b>	<b>7,163</b>
<b>TOTAL PRIOR YEARS ACTIV. \$</b>	<b>0</b>	<b>110,288</b>	<b>204,058</b>	<b>6,797</b>	<b>12,263</b>	<b>330,918</b>	<b>32,606</b>	<b>365,012</b>	<b>260,336</b>

## CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

WATER MANAGEMENT SYNTHESIS II PROJECT  
(AID/DAN 4127-C-00-2086-00)EXPENDITURE REPORT  
AS OF SEPTEMBER 30, 1985COLORADO STATE UNIVERSITY  
PRIOR YEARS WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
UNIVERSITY SUPPORT ACTIVITIES:									
ADMINISTRATION:									
EPD ADMINISTRATION									
3-01-977-83	78,404	5,173	13,267	2,964	55,224	136,031	9,746	145,778	CID
COLORADO STATE UNIV.									
3-02-998-83	124,503	2,895	52,710	19,204	64,174	263,486	17,831	281,317	281,362
TOTAL UNIVERSITY SUPPORT \$	202,907	9,068	65,977	22,168	99,398	399,518	27,577	427,095	281,362
TECHNICAL ASSISTANCE:									
BANGLADESH:									
BAU Collaboration Team									
1-03-030-82	20,928	10,208	9,208	0	12,600	53,138	4,188	57,132	84,243
DOMINICAN REPUBLIC:									
Water Management Spec.									
1-02-110-84	7,530	2,142	3,339	0	4,684	17,911	1,396	19,091	26,813
EL SALVADOR:									
Evaluation Team									
1-02-107A84	13,674	561	930	0	5,460	20,625	1,500	22,125	CID
INDIA:									
Development of Solutions									
1-02-024-82	27,582	12,226	1,835	0	10,625	52,891	4,746	57,014	63,936
DA Workshop Planning									
1-02-044-83	17,523	4,002	158	0	7,806	29,571	2,229	31,718	28,149
Curriculum Development									
1-02-094-84	7,114	0	312	0	2,673	10,237	893	10,992	10,682
INDONESIA:									
Small Scale Irrig & Mgmt									
1-02-011-84	13,678	15,737	482	0	10,036	40,207	3,216	43,169	CID
OAD'S TDY									
1-02-030-83	4,527	7,360	84	0	2,951	15,019	1,282	16,204	14,408
PAKISTAN:									
WM (CWM) Meeting									
1-02-029283	2,143	0	0	0	772	2,956	253	3,168	9,931

COLORADO STATE UNIVERSITY  
PRIOR YEARS WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DSA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>SRI LANKA:</b>									
Water Yent Central Support 1-01-022-84	23,690	21,203	1,751	148	10,810	58,616	5,032	62,634	56,934
<b>WORLDWIDE:</b>									
Water Resource Econ 1-02-042-83	12,490	700	252	0	4,824	18,266	1,331	19,597	19,703
<b>TOTAL TECHNICAL ASSIST. 9</b>	<b>150,899</b>	<b>74,139</b>	<b>19,351</b>	<b>148</b>	<b>73,241</b>	<b>316,886</b>	<b>53,643</b>	<b>342,844</b>	<b>316,849</b>
<b>TRAINING AND TECHNOLOGY TRANSFER:</b>									
<b>AFRICA:</b>									
Africa Workshop 2-14-113-84	3,177	4,683	59	0	3,682	13,628	1,052	14,613	14,333
<b>BANGLADESH:</b>									
DA Workshop 2-02-007-82	91,121	39,551	13,343	790	43,310	187,740	14,733	201,898	219,174
<b>INDIA:</b>									
DA Workshop Yachya Panchan 2-02-031-84	41,871	73,774	7,200	0	24,327	117,915	9,935	127,157	135,470
DA Workshop - WID 2-02-090-84	0	753	1,572	0	735	3,093	233	3,326	CID
Watercourse Handbooks 2-13-025-82	9,254	2,525	57	0	4,261	16,265	1,340	17,437	15,166
<b>INDONESIA:</b>									
DA Workshop 2-02-010-84	2,849	890	1,955	0	1,999	7,693	554	8,257	8,736
<b>NEPAL:</b>									
DA Workshop Planning 2-02-003-84	7,041	6,355	1,566	0	4,970	19,964	1,513	21,445	21,842
<b>SRI LANKA:</b>									
DA Workshop 2-02-028-83	41,877	32,539	11,444	0	25,736	111,941	8,845	120,441	121,475
<b>WORLDWIDE:</b>									
Videotape Modules 2-03-021-83	33,483	17,850	13,525	0	19,230	84,326	6,659	90,747	90,755
ICID Conference 2-04-048-84	13,416	0	456	0	4,994	18,866	1,373	20,239	20,678
Survey & Strategy for Training 2-07-019-83	21,377	749	1,031	0	7,991	31,148	2,293	33,441	34,267
Computer Applications 2-10-022-83	33,736	455	7,589	9,475	14,343	65,598	4,136	69,734	70,020
Increasing WY Capabilities 2-11-020-83	4,211	8,102	2,867	0	4,878	20,102	1,547	21,605	CID

COLORADO STATE UNIVERSITY  
PRIOR YEARS WORK PLAN ACTIVITIES

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DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
Increasing WY Capabilities 2-11-81-84	1,301	0	0	0	468	1,769	129	1,898	CID
Farmer Participation Wksp 2-14-84-84	0	1,944	0	0	700	2,644	192	2,836	CU
<b>TOTAL TRAINING AND TECHNOLOGY TRANSFER \$</b>	<b>326,714</b>	<b>139,200</b>	<b>62,694</b>	<b>10,265</b>	<b>141,527</b>	<b>700,400</b>	<b>108,267</b>	<b>755,024</b>	<b>751,938</b>
<b>SPECIAL STUDIES:</b>									
Communication of Tech Trans 3-04-024-83	34,613	575	755	0	13,018	49,161	3,580	52,761	52,783
Irrigation Systems Management 3-04-025-83	97,134	7,208	1,019	0	38,393	145,820	10,693	156,449	156,507
Small Scale Irrigation 3-04-045-83	0	2,341	0	0	343	3,184	232	3,416	CU
Interfacing Farm & Management 3-04-046-84	60,556	10,090	3,166	0	25,846	99,658	7,307	106,965	223,239
Small scale irrigation 3-04-048883	0	2,341	0	0	343	3,184	232	3,416	CU
Main System Management 3-04-059-83	10,006	0	0	0	3,602	13,798	1,181	14,789	USU
Main Sys Des enl Yent Rehab 3-04-061-84	13,624	0	32	0	6,698	25,396	1,934	27,238	USU
<b>TOTAL SPECIAL STUDIES \$</b>	<b>223,035</b>	<b>22,675</b>	<b>5,022</b>	<b>0</b>	<b>89,243</b>	<b>339,875</b>	<b>133,426</b>	<b>365,034</b>	<b>432,529</b>
<b>TOTAL PRIOR YEARS ACTIVITY \$</b>	<b>903,655</b>	<b>244,982</b>	<b>162,044</b>	<b>32,561</b>	<b>423,409</b>	<b>1,756,679</b>	<b>133,426</b>	<b>1,889,997</b>	<b>1,782,698</b>

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

WATER MANAGEMENT SYSTHEMIS II PROJECT  
(AID/DAN 4127-C-00-2086-00)

EXPENDITURE REPORT  
AS OF SEPTEMBER 30, 1985

CORNELL UNIVERSITY  
PRIOR YEARS WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	GR & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>TECHNICAL ASSISTANCE:</b>									
<b>BANGLADESH:</b>									
Farmer Organization Program									
1-02-015-82	27,621	22,615	12,156	1,675	26,219	90,106	6,157	96,263	154,287
Water Mgmt Sys Proj Paper									
1-02-072-84	11,766	0	1,364	545	6,246	19,120	1,320	20,440	20,719
BAU Collaboration Team									
1-03-030-82	3,779	3,661	0	0	2,856	9,196	628	9,824	050
<b>BURMA:</b>									
Wakana Pump Scheme Study									
1-02-036-84	2,914	0	1	0	1,155	4,070	289	4,359	4,759
<b>INDIA:</b>									
Area Land & Water Dev									
1-02-013-83	7,791	3,004	7,596	0	6,079	26,990	1,670	28,660	140,949
Hill Irrig Proj Prep II									
1-02-074-84	12,347	7,649	287	0	6,609	29,092	2,008	31,100	61,218
<b>INDONESIA:</b>									
Small Scale Irrig & Mgmt									
1-02-011-84	17,223	22,019	4,944	0	25,898	70,084	4,374	74,458	54,468
<b>PERU:</b>									
Expansion of Irrig. Systems									
1-02-035-84	1,260	1,239	1,683	0	1,904	6,786	404	6,390	050
<b>SRI LANKA:</b>									
Farmer Organization Program									
1-02-007-84	13,260	20,014	884	0	20,612	59,770	3,877	63,647	64,466
<b>TOTAL TECHNICAL ASSIST.</b>	<b>102,261</b>	<b>50,001</b>	<b>29,116</b>	<b>2,240</b>	<b>100,797</b>	<b>314,414</b>	<b>20,927</b>	<b>335,341</b>	<b>500,866</b>
<b>TRAINING AND TECHNOLOGY TRANSFER:</b>									
<b>BOLIVIA:</b>									
Tarifa Short Course									
2-01-095-84	0	0	66	0	45	111	7	117	64,995

CORNELL UNIVERSITY  
PRIOR YEARS WORK PLAN ACTIVITIES

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DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>SRI LANKA:</b>									
Video Production 2-03-048-83	0	0	0	0	0	0	0	0	0
<b>WORLDWIDE:</b>									
Main System Mgmt Task Force 2-06-077-84	0	507	0	0	418	1,027	40	1,087	7,557
Increasing WM Capabilities 2-11-020-83	3,744	4,258	0	0	1,600	9,602	792	10,394	CID
Increasing WM Capabilities 2-11-081-84	3,072	0	0	0	733	3,805	304	4,109	CID
Small Scale Irrigation Works 2-14-064-84	7,497	716	10,905	0	9,547	30,665	2,091	32,756	47,163
Farmer Participation Wksp 2-14-066-84	4,030	40	7,772	0	6,933	18,775	1,172	19,947	36,193
AID/FAO Expert Consul Wk 2-14-067-84	2,811	6,149	27	0	3,979	11,986	793	12,779	9,286
Planning for Seminar 2-14-075-84	4,080	0	3	0	2,250	6,333	404	6,737	9,859
<b>TOTAL TRAINING AND TECHNOLOGY TRANSFER \$</b>									
	26,234	11,792	18,773	0	25,508	32,304	24,550	87,926	133,207
<b>SPECIAL STUDIES:</b>									
<b>NIGER:</b>									
Traditional & Dev. SSI 3-04-111-84	3,848	3,134	2,628	0	1,925	11,135	912	12,047	14,825
<b>WORLDWIDE:</b>									
Small Scale Irrigation 3-04-045-83	45,919	15,662	4,347	0	26,308	94,236	6,527	100,763	160,697
Management Intensity 3-04-096-84	38,517	415	752	0	20,111	59,795	3,929	63,724	77,238
<b>TOTAL SPECIAL STUDIES \$</b>									
	87,954	19,711	7,627	0	50,344	165,146	37,918	176,534	252,760
<b>TOTAL PRIOR YEARS ACTIV. \$</b>									
	216,479	111,014	65,515	2,240	175,646	561,884	37,918	599,801	936,833

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

SCHEDULE B-4

WATER MANAGEMENT SYNTHESIS II PROJECT  
(AID/DAN 4127-C-00-2086-00)

EXPENDITURE REPORT  
AS OF SEPTEMBER 30, 1965

UTAH STATE UNIVERSITY  
PRIOR YEARS WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
TECHNICAL ASSISTANCE:									
DOMINICAN REPUBLIC:									
Small Scale Irrig & Mgmt 1-02-091-84	674	1,611	1	0	700	2,982	232	3,118	CU
INDIA:									
Hill Area Land & Water Dev 1-02-013-83	0	841	7,726	0	2,999	11,566	348	12,414	CU
Maharashtra Minor Irrig 1-02-016-84	15,246	25,222	33,793	0	24,275	100,737	5,111	108,247	171,970
Water Management & Training 1-02-020382	0	4,121	12,460	0	5,603	22,384	1,642	24,026	22,802
Institutional Analysis 1-02-053-83	0	0	0	0	0	0	0	0	26,725
Hill Irrig Proj Prep II 1-02-074-84	5,315	14,751	30,945	0	16,324	67,993	5,708	73,043	CU
Short Course 1-02-100-84	14,303	10,060	23,414	0	15,259	63,027	5,191	68,257	84,388
INDONESIA:									
Small Scale Irrig & Mgmt 1-02-011-84	7,487	15,635	328	0	7,664	31,747	2,504	34,118	CU
JORDAN:									
SR. On Farm WY Advisor 1-02-014-84	1,440	360	2,318	0	1,318	5,436	408	5,844	4,767
Irrigation Sector Study 1-04-013-84	5,345	932	300	0	2,440	10,178	546	10,933	31,429
PAKISTAN:									
Yayfile s/s TDY 1-02-040-83	0	4,987	5,606	0	3,708	14,456	1,204	15,505	15,666
Long-Term Strategies 1-02-101-84	0	0	728	0	233	961	72	1,033	9,367
Command Area Management 1-02-104-84	0	1,724	6,063	0	2,497	10,279	507	11,186	16,068
PERU:									
Expansion of Irrig. Systems 1-02-035-84	0	15,750	29,018	0	35,889	79,657	4,962	84,619	53,681

UTAH STATE UNIVERSITY  
PRIOR YEARS WORK PLAN ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
Special Study 1-04-027-82	31,541	6,291	6,273	0	14,084	58,799	4,976	63,165	93,755
SENEGAL:									
Bakei Gra. Irrig. Refinement 1-02-033-84	0	0	0	0	0	0	0	0	56,481
TANZANIA:									
Tanzania Irrig Study 1-02-032-84	2,880	280	5,783	0	2,637	11,931	867	11,747	12,567
TOTAL TECHNICAL ASSIST. \$	86,631	102,615	143,556	0	135,255	488,757	38,498	627,255	597,868
TRAINING AND TECHNOLOGY TRANSFER:									
BOLIVIA:									
Tarija Short Course 2-01-095-84	1,488	2,047	47	0	1,146	4,764	381	5,109	CU
EQUADOR:									
Equivar Video 2-03-054-83	97,023	9,519	34,432	0	49,341	190,739	14,380	204,495	204,637
INDIA:									
Senior Off. classes 2-04-007-83	0	0	728	0	355	983	72	1,055	1,054
WORLDWIDE:									
DA Review 2-02-050-84	4,961	4,420	34	0	3,013	12,516	1,020	13,448	CID
Short Term Non-Degree 2-08-056-83	11,522	1,533	6,533	0	6,268	25,856	1,939	27,795	37,909
Increasing WM Capabilities 2-11-020-83	6,683	5,706	86	0	4,366	16,946	1,360	18,201	CID
French Language Training 2-11-059-84	3,211	0	1,020	0	1,354	5,585	419	6,004	10,650
Increasing WM Capabilities 2-11-081-84	0	5,573	84	0	1,810	7,467	560	8,027	CID
Farmer Participation Wksp 2-14-066-84	0	1,248	0	0	406	1,674	126	1,800	CU
TOTAL TRAINING AND TECHNOLOGY TRANSFER \$	124,888	30,066	42,964	0	67,959	265,677	58,755	286,134	254,450
SPECIAL STUDIES:									
AFRICA:									
Dev. Of Socia. Parameters 3-04-057-83	24,650	13,678	2,736	0	14,337	55,236	3,990	59,291	67,039

UTAH STATE UNIVERSITY  
PRIOR YEARS WORK PLAN ACTIVITIES

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DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	GID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>WORLDWIDE:</b>									
Development of Handbook									
3-00-000-83	3,201	0	52	0	1,041	4,294	322	4,616	4,616
On-Farm Irrigation Systems Sel									
3-04-058-83	12,476	373	91	0	4,140	17,080	1,281	18,361	47,146
Main System Management									
3-04-059-83	34,237	22,354	8,186	0	22,672	87,449	6,580	94,029	146,985
Monitoring Projects									
3-04-061-83	0	0	0	0	0	0	0	0	18,350
Main Sys Design, Maint Rehab									
3-04-061-84	70,871	5,001	22,291	131	31,439	129,733	9,718	139,451	221,424
Interdisc. Irrig. Sys. Sel.									
3-04-062-84	22,739	873	744	0	7,794	32,150	2,411	34,561	62,430
<b>TOTAL SPECIAL STUDIES \$</b>	<b>148,174</b>	<b>42,179</b>	<b>34,100</b>	<b>131</b>	<b>81,423</b>	<b>326,007</b>	<b>63,057</b>	<b>350,309</b>	<b>567,909</b>
<b>TOTAL PRIOR YEARS ACTIV. \$</b>	<b>375,893</b>	<b>174,760</b>	<b>240,620</b>	<b>131</b>	<b>285,237</b>	<b>1,080,641</b>	<b>83,057</b>	<b>1,163,698</b>	<b>1,422,227</b>

Best Available Document

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

EXHIBIT C

WATER MANAGEMENT SYNTHESIS II PROJECT  
(AID/DAN 4127-C-00-2086-00)

QUARTERLY REPORT  
FOR THE PERIOD ENDING SEPTEMBER 30, 1985

CLOSED OUT ACTIVITIES

DESCRIPTION	CODE	UNIV.	DATE CLOSED	APPROVED AMOUNT
<b>ADMINISTRATION:</b>				
EPD OFFICE	0-01-999-84	CID	Mar. 31, 1985	151,815
CORNELL UNIVERSITY	0-02-996-83	CU	Mar. 31, 1985	191,967
CORNELL UNIVERSITY	0-02-996-84	CU	Mar. 31, 1985	251,970
UTAH STATE UNIVERSITY	0-02-997-83	USU	Mar. 31, 1985	712,734
UTAH STATE UNIVERSITY	0-02-997-84	USU	Mar. 31, 1985	228,956
COLORADO STATE UNIVERSITY	0-02-996-84	CSU	Mar. 31, 1985	238,375
TOTAL ADMINISTRATION				\$ 1,225,637
<b>TECHNICAL ASSISTANCE:</b>				
<b>BANGLADESH:</b>				
Scope of Work	1-02-006-82	CSU	Mar. 31, 1985	16,221
Consultant, Legal	1-03-029-82	CSU	Mar. 31, 1985	14,671
<b>CHINA:</b>				
Bell's Study Tour	1-02-038-83	CID	Mar. 31, 1985	2,617
<b>DOMINICAN REPUBLIC:</b>				
Project Paper (OFWM)	1-02-009-83	USU	Mar. 31, 1985	92,538
Project PID	1-02-010-82	USU	Mar. 31, 1985	20,564
<b>HAITI:</b>				
Irrigation Project Evalua	1-02-037-83	USU	Mar. 31, 1985	25,083
<b>INDIA:</b>				
WM & Training	1-02-014-83	CID	Mar. 31, 1985	23,710
Water Management & Traini	1-02-020A82	CSU	Mar. 31, 1985	16,901
Evans Project Preparation	1-02-033-83	CSU	Mar. 31, 1985	12,581
Olyma's TDY	1-02-035-83	CSU	Mar. 31, 1985	2,838
Olsen's TDY	1-02-037-83	USU	Mar. 31, 1985	12,448
<b>JORDAN:</b>				
Review of Curriculum	1-02-041-82	USU	Mar. 31, 1985	9,911
<b>MALI:</b>				
OFWM Specialist	1-02-004-83	USU	Mar. 31, 1985	16,421
<b>PAKISTAN:</b>				
OLYMA'S TDY	1-02-031-83	CSU	Mar. 31, 1985	8,165
<b>SRI LANKA:</b>				
Various TDY's	1-02-008-82	CU	Mar. 31, 1985	67,471

CLOSED OUT ACTIVITIES

DESCRIPTION	CODE	UNIV.	DATE CLOSED	APPROVED AMOUNT
<u>THAILAND:</u>				
Equipment Engineer	1-02-005-82	CID	Mar. 31, 1985	32,012
TOTAL TECHNICAL ASSISTANCE				----- \$ 374,202
<u>TRAINING AND TECHNOLOGY TRANSFER:</u>				
<u>INDIA:</u>				
Measurement for System Mg	2-07-026-82	CSU	Mar. 31, 1985	17,324
<u>NEPAL:</u>				
Small Scale Systems	2-14-060-83	CU	Mar. 31, 1985	41,554
<u>SRI LANKA:</u>				
JA Workshop - WID	2-02-034-83	CSU	Mar. 31, 1985	16,386
<u>WORLDWIDE:</u>				
Workshop (Tech. & Soc. AS	2-04-023-83	CSU	Mar. 31, 1985	63,241
Workshop (Tech & Soc ASP)	2-04-050-84	CSU	Mar. 31, 1985	44,977
Increasing WY Cap. Intern	2-11-037-84	CID	Mar. 31, 1985	6,367
Brochures; Newsletters; P	2-12-018-83	CSU	Mar. 31, 1985	8,421
Start-Up Workshop	2-14-051-83	CU	Mar. 31, 1985	11,832
Start-Up Workshop	2-14-055-83	USU	Mar. 31, 1985	15,161
Conference	2-14-058-84	USU	Mar. 31, 1985	5,409
FAO/AID Workshop Planning	2-14-064-83	CU	Mar. 31, 1985	2,141
TOTAL TRAINING AND TECHNOLOGY TRANSFER				----- \$ 232,635
TOTAL CLOSED OUT ACTIVITIES				----- \$ 1,632,874

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

WATER MANAGEMENT SYNTHESIS II PROJECT  
(AID/DAN 4127-C-00-2086-00)

EXPENDITURE REPORT  
AS OF SEPTEMBER 30, 1985

CID / EPD OFFICE  
CLOSED OUT ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>UNIVERSITY SUPPORT ACTIVITIES:</b>									
<b>ADMINISTRATION:</b>									
EPD ADMINISTRATION 0-01-999-84	0	703	29	0	0	732	72	804	0
<b>TOTAL UNIVERSITY SUPPORT \$</b>	<b>0</b>	<b>703</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>732</b>	<b>72</b>	<b>804</b>	<b>0</b>
<b>TECHNICAL ASSISTANCE:</b>									
<b>CHINA:</b>									
Bell's Study Tour 1-02-038-83	0	0	2,381	0	0	2,381	236	2,617	0
<b>INDIA:</b>									
WY & Training 1-02-014-83	0	0	21,574	0	0	21,574	2,136	23,710	24,398
Olsen's TDY 1-02-037-83	0	0	98	0	0	98	10	108	0
<b>THAILAND:</b>									
Equipment Engineer 1-02-005-82	0	0	29,128	0	0	29,128	2,884	32,012	0
<b>TOTAL TECHNICAL ASSIST. \$</b>	<b>0</b>	<b>0</b>	<b>53,181</b>	<b>0</b>	<b>0</b>	<b>53,181</b>	<b>5,338</b>	<b>58,447</b>	<b>24,398</b>
<b>TRAINING AND TECHNOLOGY TRANSFER:</b>									
<b>INDIA:</b>									
Measurement for System Maint 2-07-024-82	0	0	3,987	0	0	3,987	395	4,382	0
<b>TOTAL TRAINING AND TECHNOLOGY TRANSFER \$</b>	<b>0</b>	<b>0</b>	<b>3,987</b>	<b>0</b>	<b>0</b>	<b>3,987</b>	<b>5,733</b>	<b>4,382</b>	<b>0</b>
<b>TOTAL CLOSED OUT ACTIV. \$</b>	<b>0</b>	<b>703</b>	<b>57,197</b>	<b>0</b>	<b>0</b>	<b>57,900</b>	<b>5,733</b>	<b>63,633</b>	<b>24,398</b>

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

WATER MANAGEMENT SYNTHESIS II PROJECT  
(AID/DAN 4127-C-00-2084-00)

EXPENDITURE REPORT  
AS OF SEPTEMBER 30, 1985

COLORADO STATE UNIVERSITY  
CLOSED OUT ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CI0 G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>UNIVERSITY SUPPORT ACTIVITIES:</b>									
<b>ADMINISTRATION:</b>									
EPD ADMINISTRATION									
0-01-977-84	58,237	1,904	13,362	0	37,261	143,764	10,247	151,011	0
COLORADO STATE UNIV.									
0-02-978-84	126,746	5,857	30,438	0	58,738	222,211	16,184	238,395	0
<b>TOTAL UNIVERSITY SUPPORT</b>	<b>184,983</b>	<b>7,761</b>	<b>43,800</b>	<b>0</b>	<b>95,999</b>	<b>365,975</b>	<b>26,431</b>	<b>392,406</b>	<b>0</b>
<b>TECHNICAL ASSISTANCE:</b>									
<b>BANGLADESH:</b>									
Scope of Work									
1-02-006-82	5,212	5,750	75	0	3,974	15,128	1,210	16,338	0
Consultant, Legal									
1-03-029-82	5,868	4,135	0	0	3,601	13,601	1,067	14,668	0
<b>INDIA:</b>									
Water Management & Training									
1-02-020A-82	5,413	6,073	0	0	4,136	15,764	1,277	17,041	27,991
Evans Project Preparations									
1-02-033-83	4,034	4,545	0	0	3,059	11,732	713	12,445	0
Clyma's TDY									
1-02-035-83	1,224	739	0	0	707	2,694	218	2,912	0
<b>PAKISTAN:</b>									
Clyma's TDY									
1-02-031-83	2,449	3,116	0	0	2,003	7,614	597	8,211	0
<b>TOTAL TECHNICAL ASSIST.</b>	<b>24,202</b>	<b>24,358</b>	<b>75</b>	<b>0</b>	<b>17,510</b>	<b>66,145</b>	<b>31,713</b>	<b>71,427</b>	<b>27,991</b>
<b>TRAINING AND TECHNOLOGY TRANSFER:</b>									
<b>INDIA:</b>									
Measurement for System Mgmt									
2-07-026-82	4,856	4,205	39	0	2,134	11,982	1,108	13,090	0

COLORADO STATE UNIVERSITY  
CLOSED OUT ACTIVITIES

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DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	GID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
SR: LANKA:									
DA Workshop - WID 2-02-034-83	6,290	6,692	20	0	3,133	16,198	1,261	16,356	0
WORLDWIDE:									
Workshop (Tech. & Soc. ASP) 2-04-023-83	27,652	403	16,748	0	13,783	58,786	4,455	63,241	0
Workshop (Tech & Soc ASP) 2-04-050-84	36,914	3,149	994	0	18,867	41,924	3,075	44,999	0
Increasing WY Cap. Intern 1 2-11-037-84	4,527	0	0	0	1,062	6,889	478	6,367	6,367
Brochures; Newsletters; PUB. 2-12-018-83	4,921	0	551	0	2,078	7,850	571	8,421	0
TOTAL TRAINING AND TECHNOLOGY TRANSFER \$	75,460	14,049	18,652	0	33,057	141,418	42,651	152,356	6,367
TOTAL CLOSED OUT ACTIV. \$	315,045	46,200	62,727	0	146,566	570,538	42,651	613,189	34,358

# Best Available Document

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

SCHEDULE C-3

WATER MANAGEMENT SYNTHESIS II PROJECT  
(AID/DAN 4127-C-00-2086-00)

EXPENDITURE REPORT  
AS OF SEPTEMBER 30, 1985

CORNELL UNIVERSITY  
CLOSED OUT ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<b>UNIVERSITY SUPPORT ACTIVITIES:</b>									
<b>ADMINISTRATION:</b>									
CORNELL UNIVERSITY 2-02-976-83	92,116	6,625	26,376	0	54,463	179,680	12,387	191,967	0
CORNELL UNIVERSITY 2-02-976-84	97,601	7,197	20,035	3,359	61,200	189,692	12,378	201,970	0
<b>TOTAL UNIVERSITY SUPPORT \$</b>	<b>189,717</b>	<b>13,822</b>	<b>46,411</b>	<b>3,359</b>	<b>115,663</b>	<b>369,372</b>	<b>24,765</b>	<b>393,937</b>	<b>0</b>
<b>TECHNICAL ASSISTANCE:</b>									
<b>SRI LANKA:</b>									
Various TOY's 1-02-008-82	18,658	16,876	6,866	0	20,654	63,254	4,217	67,471	0
<b>TOTAL TECHNICAL ASSIST. \$</b>	<b>18,658</b>	<b>16,876</b>	<b>6,866</b>	<b>0</b>	<b>20,654</b>	<b>63,254</b>	<b>28,982</b>	<b>67,471</b>	<b>0</b>
<b>TRAINING AND TECHNOLOGY TRANSFER:</b>									
<b>NEPAL:</b>									
Small Scale Systems 2-14-050-83	19,760	7,038	133	0	11,935	38,866	2,666	41,554	0
<b>WORLDWIDE:</b>									
Start-Up Workshop 2-14-051-83	3,598	3,604	403	0	3,474	11,079	753	11,832	11,833
FAQ/AID Workshop Planning 2-14-064-83	771	615	6	0	611	2,003	138	2,141	0
<b>TOTAL TRAINING AND TECHNOLOGY TRANSFER \$</b>	<b>24,129</b>	<b>11,277</b>	<b>542</b>	<b>0</b>	<b>16,020</b>	<b>51,948</b>	<b>32,541</b>	<b>55,527</b>	<b>11,833</b>
<b>TOTAL CLOSED OUT ACTIV. \$</b>	<b>232,904</b>	<b>41,975</b>	<b>53,819</b>	<b>3,359</b>	<b>152,337</b>	<b>484,394</b>	<b>32,541</b>	<b>516,935</b>	<b>11,833</b>

## CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

WATER MANAGEMENT SYNTHESIS II PROJECT  
(AID/DAN 4127-C-00-2086-00)EXPENDITURE REPORT  
AS OF SEPTEMBER 30, 1985UTAH STATE UNIVERSITY  
CLOSED OUT ACTIVITIES

DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
<u>UNIVERSITY SUPPORT ACTIVITIES:</u>									
<u>ADMINISTRATION:</u>									
UTAH STATE UNIV. 3-02-977-83	100,395	11,305	11,018	34,916	42,951	200,585	12,149	212,734	0
UTAH STATE UNIV. 3-02-977-84	121,252	7,074	32,205	0	51,632	212,983	15,973	228,956	0
<b>TOTAL UNIVERSITY SUPPORT \$</b>	<b>221,647</b>	<b>18,379</b>	<b>43,223</b>	<b>34,916</b>	<b>94,583</b>	<b>413,568</b>	<b>28,122</b>	<b>441,690</b>	<b>0</b>
<u>TECHNICAL ASSISTANCE:</u>									
<u>DOMINICAN REPUBLIC:</u>									
Project Paper (OFWM) 1-02-009-83	7,287	23,221	33,236	0	22,310	86,227	6,484	92,711	0
Project P10 1-02-010-82	4,496	4,514	5,108	0	4,941	19,059	1,505	20,564	0
<u>HAITI:</u>									
Irrigation Project Evaluation 1-02-039-83	5,512	5,077	6,631	0	6,077	23,378	1,836	25,214	0
<u>INDIA:</u>									
Olsen's TDY 1-02-037-83	7,964	247	174	0	2,735	11,510	1,020	12,530	0
<u>JORDAN:</u>									
Review of Curriculum 1-02-041-82	2,390	4,334	77	0	2,380	9,238	730	9,968	0
<u>YALI:</u>									
OFWM Specialist 1-02-006-83	5,036	4,846	323	0	3,939	15,194	1,227	16,421	0
<b>TOTAL TECHNICAL ASSIST. \$</b>	<b>33,735</b>	<b>42,239</b>	<b>45,547</b>	<b>0</b>	<b>42,532</b>	<b>163,835</b>	<b>40,924</b>	<b>176,857</b>	<b>0</b>
<u>TRAINING AND TECHNOLOGY TRANSFER:</u>									

UTAH STATE UNIVERSITY  
CLOSED OUT ACTIVITIES

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DESCRIPTION	SALARIES & BENEFITS	TRAVEL & PER DIEM	OTHER DIRECT COSTS	EQUIPMENT	INDIRECT COSTS	TOTAL UNIVERSITY COSTS	CID G & A AND DBA	TOTAL ACTIVITY EXPENSE	APPROVED ACTIVITY BUDGET
WORLDWIDE:									
Start-up Workshop 2-14-85-83	5,971	4,491	1	0	3,662	14,125	1,036	15,161	0
Conference 2-14-85-84	1,955	1,824	2	0	1,210	5,135	418	5,407	0
<hr/>									
TOTAL TRAINING AND TECHNOLOGY TRANSFER \$	7,926	6,315	3	0	4,872	19,116	42,378	20,570	0
<hr/>									
TOTAL CLOSED OUT ACTIV. \$	263,306	47,153	89,378	34,916	141,927	596,619	42,378	439,117	0