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WATER MANAGEMENT SYNTHESIS II

CID/AID-DAN-4127-C-00-2086-00

1ST QUARTERLY REPORT FY 84

OCTOBER 1, 1983 - DECEMBER 31, 1983

Submitted by:
The Consortium for
International Development

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Water Management Synthesis II Project

Quarterly Report Covering Period October 1, 1983 - December 31, 1983

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WATER MANAGEMENT SYNTHESIS II PROJECT

QUARTERLY REPORT COVERING PERIOD OCTOBER 1, 1983 - DECEMBER 31, 1983

I. INTRODUCTION

This report summarizes the activities of the Water Management Synthesis II Project for the first quarter of FY 1984, covering the period October 1, 1983 through December 31, 1983. This report includes information relative to current activities, roster update, and completed activities as well as university highlights and a review of committee work. The Financial Report Summary is included and the detailed activity financial report will be distributed by the CID Executive Office at a later date:

The central purpose of WMSII is to develop and disseminate more efficient water management technologies and practices in AID-assisted countries to increase agricultural production and rural equity. The WMSII 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. Cornell University, Utah State University, and Colorado State University, through the Consortium for International Development, share the contractor leadership responsibilities for the Water Management Synthesis II Project.

In this report, various activities may be identified with the work of a specific university. This technique has been utilized for purposes of clarification, since not all of the project activities are jointly performed. Operationally, each specific activity is designated to one particular university based on the program thrust and/or strength of that university. The overall responsibility for that activity is then assumed by that university. Non-lead universities may participate in the activity in various ways, such as contributing to the planning process and providing team members.

Efforts have been made to involve other universities, non-university groups and individuals who may not be formally associated with any organization or university in project activities. Position openings are advertised via the CID contract officer network so as to identify expertise within the CID system. The rostering activities are broadly based with persons from any source being included.

II. STATUS OF PROGRAMMED ACTIVITIES

The activities of the WMSII 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 WMSII project management from the beginning of the project up to and including December 31, 1983. Activities are categorized according to lead university as well as country.

The terms listed below are used to indicate activity status:

- Completed - as of December 31, 1983 this activity has been finished.
- Approved - this activity is to be done but as of December 31, 1983 no work has been initiated. The scope of work has been completed.
- Initiated - work has begun on this particular activity but has not yet been completed.
- Cancelled - the activity has been officially removed or deleted from the work plan.
- Preliminary - denotes that there was some information included with the activity request but scope of work and/or dates are usually insufficient or missing, so activity cannot be initiated.
- Postponed - this activity may be included in preliminary or approved status but no work has been initiated nor has there been any formal decision to cancel within FY 83 or FY 84.
- Formal - denotes an activity which has been included in the workplan but the workplan has not yet been approved.

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

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

Cornell University Activities FY-83 (1-23-84)

<u>COUNTRY</u>	<u>ACTIVITY</u>	<u>STATUS</u>	<u>SOURCE</u>
Bangladesh	TA - Water Mgmt. Systems	Completed	USAID
China	TR - FAO/AID Workshop Planning	Completed	AID/WASH
India	TA - Hill Area Land & Water Dev.	Initiated	USAID
Nepal	TR - Small-Scale Systems	Completed	USAID
Sri Lanka	TA - Various TDY's	Initiated	USAID
Worldwide	SS - Small-Scale Irrigation	Initiated	UNIV
	SS - Farmer Participation Exper.	Initiated	UNIV
	TR - Start-up Workshop	Completed	AID/WASH

Cornell University Activities FY-84 (1-23-84)

<u>COUNTRY</u>	<u>ACTIVITY</u>	<u>STATUS</u>	<u>SOURCE</u>
Bangladesh	TA - Completion WMS PP	Formal	USAID
Burma	TA - Wakema Pump Study	Formal	USAID
India	TA - Hill Irrigation Phase II	Formal	USAID
Indonesia	TA - System Design (PID/PP)	Formal	USAID
Kenya	TA - Irrigation Sector Survey	Formal	USAID
Sri Lanka	TA - Farmer Organization	Formal	USAID
Worldwide	TR - Small-Scale Irrig. Works	Formal	UNIV
	TR - Task Force, Organization	Formal	AID/WASH
	TR - Farmer Participation	Formal	UNIV
	TR - AID/FAO Expert: Indonesia	Formal	AID/WASH
	TR - Professional Visitors	Formal	UNIV
	SS - Small-Scale Irr. Systems	Formal	UNIV
	SS - Special Studies	Formal	UNIV
	TR - Current Research	Formal	UNIV
TR - Task Force, Participation	Formal	AID/WASH	

Utah State University Activities FY-83 (1-23-84)

<u>COUNTRY</u>	<u>ACTIVITY</u>	<u>STATUS</u>	<u>SOURCE</u>
Africa	SS - Dev. of Social Parameters	Completed	UNIV
Dominican Republic	TA - Project PID	Completed	USAID
	TA - Project Paper (OFWM)	Completed	USAID
Ecuador	TT - Equavir Video	Initiated	UNIV/USAID
Haiti	TA - Irrigation Project Eval.	Completed	USAID
India	TA - Water Mgmt. and Training	Completed	USAID
	TA - Olson's TDY	Completed	USAID
	TA - Institutional Analysis	Formal	AID/WASH
Jordan	TA - Review of Curriculum	Completed	USAID
Malí	TA - OFWM Specialist	Completed	USAID
Pakistan	TA - WM (CWM) Meeting	Completed	USAID
	TA - Mayfield's TDY	Completed	USAID
Peru	TA - Special Study	Completed	USAID
West Africa	SS - Small-Scale Irrigation	Completed	UNIV
Worldwide	TR - Start-up Workshop	Completed	UNIV
	TR - Short-term Non-degree	Completed	UNIV
	SS - On-farm Irr. Sys. Selection	Initiated	UNIV
	SS - Main Sys. Mgmt and Rehab.	Initiated	UNIV
	SS - Action Research	Initiated	UNIV
	SS - Monitoring Projects	Postponed	UNIV

Utah State University Activities FY-84 (1-23-84)

<u>COUNTRY</u>	<u>ACTIVITY</u>	<u>STATUS</u>	<u>SOURCE</u>
Dominican Republic	TA - Weed Control Specialist	Formal	USAID
Ecuador	TT - Finishing Original Modules	Formal	USAID
	TT - Instructional Manual	Formal	UNIV
Haiti	TA - Irrigation Sector Survey	Formal	USAID
India	TA - Maharashtra MIP	Formal	USAID
	SS - Irrig. Project Monitoring	Formal	UNIV
	TA - Maharashtra I T & M	Formal	USAID
	TA - Soc/Tech Feas. Study	Formal	USAID
	TA - Madhya Pradesh MIP	Formal	USAID
	TR - Senior Officer's Workshop	Formal	UNIV/USAID
Jordan	TA - Irrigation Sector Survey	Formal	USAID
	TA - WM Specialist (TDY)	Formal	USAID
	TR - On-Farm Water Mgmt.	Formal	USAID
Peru	TA - Small Irrigation Systems	Formal	USAID
Senegal	TA - Bakel Irr. Perimeter Assist.	Formal	USAID
Tanzania	TA - Irrigation Study	Formal	USAID
Worldwide	TT - Conference: Chile	Formal	AID/WASH
	TR - French Language Training	Formal	UNIV
	TT - Irr. Sys. Mgmt. Task Force	Formal	UNIV
	SS - Main Sys.Des.,Mgmt. & Rehab.	Formal	UNIV
	SS - Selection of Irr. Tech.	Formal	UNIV

Colorado State University Activities FY-83 (12-31-83)

<u>COUNTRY</u>	<u>ACTIVITY</u>	<u>STATUS</u>	<u>SOURCE</u>
Bangladesh	TA - Curricula Dev. (BAU)	Initiated	USAID
	TA - Consultant, Legal	Completed	USAID
	TA - Scope of Work	Completed	USAID
	T - DA Workshop	Completed	USAID
India	TT - Watercourse Handbooks	Initiated	USAID
	TA - Water Mgmt. and Training	Completed	USAID
	T - Meas. for Sys. Mgmt.	Completed	USAID
	TA - Evans Project Prep.	Completed	USAID
	TA - Clyma's TDY	Completed	USAID
Indonesia	TA - Oad's TDY	Completed	USAID
Pakistan	TA - WM (CWM) Meeting	Completed	USAID
	TA - Clyma's TDY	Completed	USAID
Sri Lanka	T - DA Workshop	Initiated	USAID
Worldwide	TT - Brochures; Newsltrs., Pub.	Initiated	UNIV
	TT - Survey & Str. for Trng.	Initiated	UNIV
	T - Increasing WM Cap.	Initiated	UNIV
	TT - Videotape Modules	Initiated	UNIV
	TT - Computer Applications	Initiated	UNIV
	T - Workshop (Tech. & Soc.)	Initiated	UNIV
	SS - Comm. for Tech. Tran.	Initiated	UNIV
	SS - Irrigation Systems Mgmt.	Initiated	UNIV
TA - Water Resource Econ.	Initiated	AID/WASH	

Colorado State University Activities FY-84 (12-31-83)

<u>COUNTRY</u>	<u>ACTIVITY</u>	<u>STATUS</u>	<u>SOURCE</u>
India	TA - Rajasthan MIP	Preliminary	USAID
	TA - Rajasthan MIP	Preliminary	USAID
	TR - DA Workshop M.P.	Initiated	USAID
Indonesia	TA - Long Term WM Spec.	Preliminary	USAID
	TR - DA Workshop	Initiated	USAID
Nepal	TR - DA Workshop Planning	Preliminary	USAID
Pakistan	TR - Sr. Off. Workshop	Preliminary	USAID
Sri Lanka	TR - DA Workshop	Preliminary	USAID
	TA - WM Central Support	Preliminary	USAID
Worldwide	TR - Inc. WM Capabilities	Initiated	UNIV
	TR - DA Trainers Workshop	Initiated	UNIV
	TT - Instructor's Guide DA	Initiated	UNIV
	TT - Brochures, Newsletters, Pub.	Initiated	UNIV
	SS - Interfacing Farm & Mgmt. System	Initiated	UNIV
	TT - Survey and Strategy	Initiated	UNIV
	TR - Workshop (Tech. and Soc.)	Preliminary	UNIV
	TT - Microcomputers	Initiated	UNIV

CID Subcontracted Activities FY-83 (1-23-84)

<u>COUNTRY</u>	<u>ACTIVITY</u>	<u>STATUS</u>	<u>SOURCE</u>
China	TA - Bell's Study Tour	Completed	AID/WASH
India	TA - WM and Training	Completed	USAID
	TA - Institutional Analysis	Initiated	USAID
Thailand	TA - Equipment Engineer	Completed	USAID
	TR - Water Mgmt. Workshop	Completed	USAID
Worldwide	SS - DA Evaluation	Completed	AID/WASH

CID Subcontracted Activities FY-84 (1-23-84)

<u>COUNTRY</u>	<u>ACTIVITY</u>	<u>STATUS</u>	<u>SOURCE</u>
Worldwide	TR - Inc. WM Cap. Intern #1	Formal	AID/WASH
	TR - Inc. WM Cap. Intern #2	Formal	AID/WASH
	TR - FAO Workshop Participants	Formal	AID/WASH

III. 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, the following section is divided into the following categories: (A) technical assistance; (B) training and technology; (C) special studies; and (D) administration.

A. Technical Assistance Activities

1. BANGLADESH - Assist with Water Management System Project Paper

Code Number: 1-02-015-82

Status: Completed Lead University: Cornell University

Scope of Work: Assistance to the Mission in preparation of project documentation for Water Management Project and analysis of related issues. During the first quarter of FY-84, Hammond Murray-Rust, project coordinator, gathered consultants reports to prepare a synopsis of WMS-II activities in Bangladesh.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
H. Murray-Rust	6.0	6.0	Cornell	Engineering
Joseph Campbell	0.0	0.2	Cornell	Engineering
Leslie Small	0.0	0.2	Rutgers	Agricultural Economics
Harry Blair	0.0	0.2	Bucknell	Institutional Analyst
Susan Turnquist	0.0	0.5	Cornell	Rural Sociology

2. BANGLADESH - BAU Collaboration Team

Code Number: 1-03-030-82

Status: Ongoing Lead University: Colorado State University

Scope of Work: Investigate current water management resources at BAU and made recommendations to strengthen various aspects of the program.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Ramchand Oad	1.00 ppm	3.00	CSU	Agricultural Engrg.
Dave Redgrave	0.00 ppm	1.00	CSU	Agronomy
Florence McCarthy	0.00 ppm	1.00	Independent	Rural Sociology
Duane Johnson	0.38 ppm	0.38	CSU	Agronomy
John Baxter	0.00 ppm	0.50	CSU	Agronomy
Mike Walters	0.24 ppm	0.78	CU	Agricultural Engrg.

3. INDIA - Assist with Hill Irrigation Project Preparation

Code Number: 1-02-013-83

Status: Ongoing Lead University: Cornell University

Scope of Work: Assistance to the Delhi Mission in the preparation of a project plan and documentation for assistance to small-scale irrigation development in the state of Himachal Pradesh. A revised work plan and budgets for FY-84 activities were prepared. Dean Peterson was appointed project coordinator and began preparations in India for the second phase of the activity. A subcontract was negotiated between CID and the Indian Institute of Management in Ahmedabad to conduct a study of seven irrigation projects in Himachal Pradesh as a background for materials to be prepared later.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
E.Walter Coward, Jr	1.5	3.5	Cornell	Rural Sociology
Dean Peterson	3.0	4.0	USU	Engineering
Edward Vander Velde	0.0	1.0	Aquinas Coll.	Geography

4. INDIA - DA Workshop Planning

Code Number: 1-02-044-83

Status: Initiated Lead University: Colorado State University

Scope of Work: Planning for DA Workshop in Madhya Pradesh, India, during the early part of 1984.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Wayne Clyma	0.75 ppm	0.75	CSU	Agricultural Engrg.
Mohammed Haider	2.00 ppm	4.33	CSU	Economy
Dave Redgrave	0.25 ppm	0.25	CSU	Agronomy

5. INDIA - Hill Area Project

Code Number: CU Activity

Status: On-going Lead University: Cornell University

Scope of Work: To provide assistance to the Mission in the preparation of a project plan and documentation for assistance to small-scale irrigation development in the State of Himachal Pradesh.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
R. Kern Stutler	0.96 ppm	0.96 ppm	USU	Irrigation Engineering

6. INDIA - Maharashtra Minor Irrigation Project

Code Number: 1-02-018-84

Status: On-going Lead University: Utah State University

Scope of Work: Assist USAID/India in determining the scope and nature of AID assistance to the minor irrigation program in the State of Maharashtra and prepare a report on feasibility as a basis for a project paper. In addition, a comprehensive institutional analysis will be carried out of public and private sector entities, social constraints, and policy approaches which will serve as the basis of the project paper and other WMS II activities in the Maharashtra State.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Wynn Walker	1.19 ppm	1.19 ppm	USU	Irri. Engineering
David James	1.23 ppm	1.23 ppm	USU	Soil Science
Elizabeth Sims	1.65 ppm	1.65 ppm	Univ. Cal, Berk.	Sociology
Samuel Daines	1.92 ppm	1.92 ppm	Consultant	Institutional
Fletcher Riggs	1.80 ppm	1.80 ppm	Consultant	Ag. Economics

7. JORDAN - Senior On-farm Water Management Advisor

Code Number: 1-02-014-84
1-02-041-83

Status: On-going Lead University: Utah State University

Scope of Work: A senior on-farm water management advisor will provide periodic assistance in advising the University of Jordan on its soil and irrigation curriculum and review future projects involving water management activities of the Jordan Valley Authority.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Jack Keller	0.18 ppm	0.68 ppm	USU	Irri. Engineering

8. PERU - Consultant/Engineering

Code Number: 1-02-035-84

Status: On-going Lead University: Utah State University

Scope of Work: Review and evaluation the USAID/Peru Plan Meris project and make recommendations for modifications necessary for project extension.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Bruce Anderson	0.76 ppm	0.76 ppm	Consultant	Irri. Engineering

9. PERU - Peru Sector Assessment

Code Number: 1-04-027-82

Status: On-going Lead University: Utah State University

Scope of Work: To provide a synthesis document to the 200-page report of the Peru irrigation sector survey. The sector assessment identified major issues in the Peruvian irrigation sector, evaluated alternative sector investment and operational strategies, and reviewed the effectiveness of alternative policy instruments.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Bryant Smith	1.5 ppm	3.8 ppm	USU	Institutional
Jack Keller	0.0 ppm	1.0 ppm	USU	Irri. Engineering
M. Walter	0.0 ppm	0.9 ppm	Cornell	Ag. Engineering
J. Wolf	0.0 ppm	1.0 ppm	Consultant	Ag. Engineering
A. LeBaron	0.8 ppm	1.3 ppm	USU	Ag. Economics
P. Aitken	0.0 ppm	1.1 ppm	Consultant	Anthropology
Ray Meyer	0.0 ppm	1.0 ppm	AID	Agronomy

10. TANZANIA - Evaluation Team

Code Number: 1-02-082-84

Status: On-going Lead University: Utah State University

Scope of Work: Review various aspects of the Rift Valley Rice Project and ascertain how well objectives were being accomplished during project implementation. Articulate the impact the project has had with emphasis on how it has affected rice growers in the target area and the population in general. Also, conduct a mini-irrigation sector study of several irrigation activities underway and planned for the country.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Jack Keller	0.50 ppm	0.50 ppm	USU	Irri. Engineering
Thomas Weaver	0.69 ppm	0.69 ppm	Univ. Rh. Is.	Ag. Economics

B. Training and Technology Transfer

1. CHILE - Conference

Code Number: 2-14-058-84

Status: Completed Lead University: Utah State University

Scope of Work: USU will participate in an international conference on irrigation sponsored by the Inter-American Institute of Agricultural Cooperation being held in Santiago, Chile. A paper was presented by the associate director of the International Center of USU in Spanish.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Humberto Yap	0.27 ppm	0.27 ppm	USU	Irri. Engineering

2. ECUADOR - Ecuavir/Trainer Modules

Code Number: 2-03-054-84

Status: On-going Lead University: Utah State University

Scope of Work: This is a two-year project to develop conceptual video training modules, and was undertaken in part in response to the Ecuador Mission. The program is developing 45 video modules through the use of computer animation and graphics which will be used as training aids for courses for engineers, agronomists, and government officials in Ecuador who are involved in irrigation development. The modules will also be used worldwide in training programs of the International Irrigation Center of Utah State University.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
David Daines	0.0 ppm	6.60 ppm	USU	Proj. Coord.
Tom Cronkite	1.5 gpm	10.50 ppm	USU/Grad.Stu.	Media Special.
L. Salazar	0.0 ppm	2.00 ppm	Consultant	Irri. Engineering
G. Merkeley	0.75 ppm	9.75 ppm	USU	Irri. Engineering
J. Forero	0.0 gpm	3.20 ppm	USU/Grad.Stu.	Spanish Transl.
L. Francuz	0.0 ppm	4.50 ppm	USU	Secretary
L. Willardson	0.0 ppm	1.60 ppm	USU	Irri. Engineering
G. Stringham	0.0 ppm	1.10 ppm	USU	Irri. Engineering
K. Stutler	0.0 ppm	2.00 ppm	USU	Irri. Engineering
K. Boutwell	0.0 ppm	3.00 ppm	USU	Instruct. Media
K. Smart	1.5 gpm	4.30 ppm	USU/Grad.Stu.	Instruct. Media
H. Quiroz	0.0 gpm	0.10 ppm	USU/Grad.Stu.	Spanish Transl.
S. von Borries	1.8 gpm	2.50 ppm	USU/Grad.Stu.	Spanish Narration
E. Campanella	2.96 ppm	4.40 ppm	USU/Grad.Stu.	Computer Graphics
B. Reid	1.73 gpm	3.40 ppm	USU/Grad.Stu.	Computer Graphics
S. Douglas	0.0 gpm	0.20 ppm	USU/Grad.Stu.	Computer Graphics
C. Taft	0.0 gpm	0.10 ppm	USU/Grad.Stu.	Technical Editing
K. Grah	1.5 gpm	1.50 ppm	USU/Grad.Stu.	Computer Graphics

3. INDIA - DA Workshop Madhya Pradesh

Code Number: 2-02-031-84

Status: Initiated Lead University: Colorado State University

Scope of Work: Diagnostic Analysis Workshop to be held in Madhya Pradesh during January and February of 1984 to train Irrigation and Agriculture Department field officers in interdisciplinary water management. Sixth day pay will be paid. Mission to provide in-country travel.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Robby Laitos	0.25 ppm	0.25	CSU	Sociology
Al Madsen	0.25 ppm	0.25	CSU	Economics
Mohan Reddy	0.25 ppm	0.25	CSU	Agricultural Engrg.
Dave Redgrave	0.50 ppm	0.50	CSU	Agronomy
Tom Sheng	0.25 ppm	0.25	CSU	Civil Engineering
Sandra Wunch	0.25 ppm	0.25	CSU	Support Staff

4. INDIA - Senior Officers Workshop

Code Number: 2-04-053-84

Status: On-going Lead University: Utah State University

Scope of Work: Six short workshops will be held, one at the Center (Federal Government/New Delhi) and one in each of five states. A final Roundup will be held at the Center. The purposes of the workshops are to provide orientation of high level Government of India and State officials in principles of improved water management, purposes and implementation of USAID Water Management and Training Project, and to explore and discuss policy and operational ways to realize improved irrigation water management as a national objective.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Dean Peterson	1.68 ppm	1.68 ppm	Consultant	Civil Engineering
Venkatesan	1.50 ppm	1.50 ppm	Consultant	Agri. Engineering

5. INDIA - Watercourse Handbooks

Code Number: 2-13-025-82

Status: Ongoing Lead University: Colorado State University

Scope of Work: Assist the GOI and State Governments in the developing of handbooks for the field staff covering the planning, design and construction of the irrigation works on the lower end of the distribution network including on-farm systems.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Dave Redgrave	0.00 ppm	0.50	CSU	Agronomy
A. R. Robinson	1.07 ppm	1.07	Consultant	Agricultural Engrg.

6. INDONESIA - DA Workshop

Code Number: 2-04-010-84

Status: Initiated Lead University: Colorado State University

Scope of Work: A training program for district level GOI officials involved with irrigation development. Trainees will be from Ministries of Agriculture, Public Works, and Home Affairs. Objectives of training are to familiarize trainees with techniques in monitoring the impacts of water users' participation on the performance of irrigation systems and to impart a comprehensive understanding of Irrigation system management. The training program should be based on the "Diagnostic Analysis of Irrigation Systems" approach developed by WMS II. Sixth day pay will be paid.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Mohammed Haider	0.50 ppm	0.50	CSU	Economics

7. PAKISTAN - Sr. Officers' Workshop/Seminar

Code: 2-04-019-84

Status: Preliminary Lead University: Colorado State University

Scope of Work: Seminar for senior officers to enhance appreciation of integrated approach to improved system management. Sixth day pay is requested. Materials and curriculum will be prepared to familiarize senior officers with the fundamental principles and concepts of water management. The materials will be tested prior to the International Commission on Irrigation and Drainage.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Ramchand Oad	1.00 ppm	1.00	CSU	Agricultural Engrg.

8. SRI LANKA - Diagnostic Analysis Workshop

Code Number: 2-02-028-83

Status: Completed Lead University: Colorado State University

Scope of Work: CSU will continue leadership for diagnostic analysis workshops. Our approach to diagnostic analysis combines the training of local staff through a field study of actual constraints that are limiting the effectiveness of irrigation systems and field systems. The field study includes an interdisciplinary investigation of the critical factors in water management.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Lynn Gibson	0.50 gpm	1.25	CSU	Economics
Larry Nelson	0.75 ppm	5.25	CSU	Agronomy
Tom Sheng	1.00 ppm	2.74	CSU	Civil Engineering
Paul Wattenburger	0.75 gpm	3.39	CSU	Agricultural Engrg.
Kathleen Kilkelly	0.50 ppm	0.50	CSU	Agronomy
Robby Laitos	0.25 ppm	0.25	CSU	Sociology
Mary Ann Moore	0.25 ppm	0.25	CSU	Tech. Journalism

9. WORLDWIDE - Brochures; Newsletters; Publications

Code Number: 2-12-018-83

Status: Ongoing Lead University: Colorado State University

Scope of Work: Preparation of a project brochure, newsletters, and other informational materials are part of WMS II's effort to communicate project goals, ideas, and activities to audiences in the U.S. and developing countries.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Darlene Fowler	0.25 ppm	0.25	CSU	Tech. Journalism
Dan Lattimore	0.00 ppm	0.50	CSU	Tech. Journalism

10. WORLDWIDE - Computer Applications

Code Number: 2-10-022-83

Status: Ongoing Lead University: Colorado State University

Scope of Work: Calculators, microcomputers and main-frame computers together with the rapidly expanding availability of good software, make computer utilization an important part of the project. Interactive modules for water distribution and delivery are being designed for training and management purposes. CSU plans to adapt current computer technology to more efficient management of the project (such as bibliographic searches, direct transmission of project documents and the professional roster).

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Tom Sheng	0.00 ppm	4.26	CSU	Civil Engineering
Daniel Sunada	0.00 ppm	2.92	CSU	Civil Engineering
David Molden	1.00 gpm	6.00	CSU Grad St.	Civil Engineering

11. WORLDWIDE - DA Trainers Workshop

Code Number: 2-08-040-84

Status: Initial Lead University: Colorado State University

Scope of Work: Weeklong workshop to train those interested in becoming trainers for future DA workshops. Participants should already be competent in discipline, but workshop will emphasize philosophy of irrigation water management as expressed by WMSII including interdisciplinary team approach, systems approach, and building institutional capacities.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Ramchand Oad	1.00 ppm	1.00	CSU	Agricultural Engrg.

12. WORLDWIDE - French Language Training

Code Number: 2-11-059-84

Status: On-going Lead University: Utah State University

Scope of Work: In order to enhance the French language capacity of USU's core staff, language training is given through a French speaking graduate student. This is a continuation of USU's efforts to increase its capacity to service mission requests, especially those involving French speaking Africa.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Phillipe Zgheib	0.31 ppm	0.31 ppm	USU	Civil Engineering

13. WORLDWIDE - Instructor's Guide for DA

Code Number: 2-13-042-84

Status: Initial Lead University: Colorado State University

Scope of Work: A DA workshop teaching manual for coordinators and training staff will be prepared to assist new workshop trainers. Manual will provide suggested schedule, lesson plans and objectives, and printed and audio visual materials available.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Larry Nelson	2.25 ppm	2.25	CSU	Agronomy

14. WORLDWIDE - Irrigation System Management Task Force

Code Number: 2-14-060-84

Status: On-going Lead University: Utah State University

Scope of Work: This task force provides intellectual guidance and coordination of the irrigation system management focus of the WMSII project. It reviews and advises the three lead universities regarding the substantive content of these special studies in irrigation system management to assure their technical work is integrated and properly focused on common issues and approaches. Likewise, it monitors the studies of the universities to ensure proper coordination and communication.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Jack Keller	0.5 ppm	0.5 ppm	USU	Irri. Engineering

15. WORLDWIDE - Microcomputers

Code Number: 2-10-051-84

Status: Initiated Lead University: Colorado State University

Scope of Work: Computer applications developed for simulation and design of irrigation systems to assist trainees in DA workshops to analyze data and simplify report writing, and for linking disciplinary activities.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Dave Molden	0.50 gpm	0.50	CSU	Civil Engineering
Tom Sheng	0.75 ppm	0.75	CSU	Civil Engineering

16. WORLDWIDE - Professional Visitors

Code Number: 2-11-068-84

Status: Initiated Lead University: Cornell University

Scope of Work: Individual junior and senior professionals are invited to report on recent research and to exchange information and views with Cornell group working on irrigation.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
H. R. Kahn	.01 ppm	.01 ppm	Independent Consultant	Engineering
Leslie Small	.01 ppm	.01 ppm	Rutgers	Ag. Economics

17. WORLDWIDE - Small-Scale Workshop

Code Number: 2-14-064-84

Status: Completed Lead University: Cornell University

Scope of Work: Criticism and analysis of four discussion papers prepared by Cornell Small-Scale irrigation systems study group; preparation of recommendations for paper compilation and for research and program development.

Staffing:

PERSON	ACTIVITY Quart.	TIME Cum.	AFFILIATION	SPECIALIZATION
Mike Walter	0.50 ppm	0.50 ppm	Cornell	Ag. Engineering
Jim Nickum	1.00 ppm	1.00 ppm	Cornell	Economics
Barbara Lynch	1.00 ppm	1.00 ppm	Cornell	Rural Sociology
Beth Rose	0.80 ppm	0.80 ppm	Cornell	Editor
Susan Turnquist	1.00 gpm	1.00 gpm	Cornell	Rural Sociology

18. WORLDWIDE - Survey and Strategy

Code Number: 2-09-049-84

Status: Initial Lead University: Colorado State University

Scope of Work: Survey of training programs will include directory of major training centers published, collection of training materials gathered and filed, and evaluation of training techniques and strategies made.

Staffing:

PERSON	ACTIVITY QUARTERLY	TIME CUM	AFFILIATION	SPECIALIZATION AREA
Lynn Gibson	1.00 gpm	1.00	CSU	Economics

19. WORLDWIDE - Survey and Strategy for Training

Code Number: 2-09-019-83

Status: Ongoing Lead University: Colorado State University

Scope of Work: A number of applied training programs in water management or related areas are being offered around the world to those from developing countries. The advisability of collecting, evaluating, and using such training material and approaches will be examined. Also, use of other training centers will be explored. Major training centers such as Irri's Water Management Training Program will be studied carefully. In addition, effort will be made to develop a strategy for WMSII training programs.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
David Freeman	0.00 ppm	1.00	CSU	Sociology
Lynn Gibson	0.00 gpm	2.25	CSU	Economics
Albert Madsen	0.81 ppm	2.87	CSU	Economics
Edwin Shinn	0.00 gpm	1.25	CSU	Sociology
John Wilkins-Wells	0.00 gpm	1.50	CSU	Sociology

20. WORLDWIDE - Videotape Modules

Code Number: 2-03-021-83

Status: Ongoing Lead University: Colorado State University

Scope of Work: One of the project strategies for technology transfer involves developing videotape modules that will not only tell how something is done, but will also show it. Water management concepts will be explicated through video. For example, tapes will be developed taking concepts of main system management and showing how improved management techniques would work in a particular situation. Tapes also will be developed to transfer training concepts such as might be needed in the diagnostic analysis, development of solutions or senior officials workshops.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Dan Lattimore	0.00 ppm	2.25	CSU	Tech. Journalism
Clarence Shook	0.00 ppm	2.67	CSU	Tech. Journalism
John Webb	3.00 ppm	6.00	CSU	Tech. Journalism
Robby Laitos	0.25 ppm	0.25	CSU	Sociology

C. Special Studies

1. WORLDWIDE - Communication for Technology Transfer

Code Number: 3-04-024-83

Status: Ongoing Lead University: Colorado State University

Scope of Work: The objectives of this study are to both evaluate present methods of communication within the project and to devise more effective communication for the project. The concentration will be on exploring, determining and explicitly defining the means of technology transfer for the ultimate users of WMS II information. Investigation will be made into socio-economic patterns, information flow and linkage patterns within the farming system, government organizations, and other agricultural support groups to determine the effectiveness of various communication channels and the best means to motivate and encourage farmers to develop and use better water management techniques.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Mary Ann Moore	0.00 ppm	0.25	CSU	Tech. Journalism
Oguz Nayman	3.00 ppm	7.44	CSU	Tech. Journalism
Darlene Fowler	0.00 ppm	0.50	CSU	Tech. Journalism

2. WORLDWIDE - Comparative Analysis of Farmer Participation Experiences

Code Number: 3-04-046-83

Status: Ongoing Lead University: Cornell University

Scope of Work: Review and Analysis of experiences with enhancing the participation of farmers in programs of irrigation development. Special focus on experiences in Sri Lanka, the Philippines, and Indonesia, but with attention to experiences elsewhere. Project paper summarizing experiences and the literature identifies programmatic implications.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
Norman Uphoff	1.0	2.4	Cornell	Political Science
Nancy St. Julien	1.0	8.0	Cornell	City & Regional Planning
Bryan Bruns	0.0	3.0	Cornell	Agricultural Economics
Ruth Meitzen-Dick	2.0	2.0	Cornell	Rural Sociology

3. WORLDWIDE - Irrigation Systems Management

Code Number: 3-04-025-83

Status: Ongoing Lead University: Colorado State University

Scope of Work: The initiation of a major emphasis on developing and implementing a strategy for improving the management of irrigation systems. The study will include an interdisciplinary approach to water management with a farm focus integrated into main system management. Monitoring and evaluation for both improvement and management will be emphasized.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Wayne Clyma	0.00 ppm	1.00	CSU	Agricultural Engrg.
Alan Early	0.73 ppm	2.73	Independent	Agricultural Engrg.
David Freeman	0.00 ppm	1.00	CSU	Sociology
Mohan Reddy Junna	1.19 ppm	2.19	CSU	Agricultural Engrg.
Albert Madsen	0.00 ppm	1.72	CSU	Economics
Robert Mohammed	0.00 gpm	1.50	CSU Grad. St.	Agricultural Engrg.
Robby Laitos	1.50 ppm	1.50	CSU	Sociology
Kanda Pakanakian	0.00 gpm	3.00	CSU	Sociology
Paul Wattenburger	0.75 gpm	0.75	CSU	Agricultural Engrg.

4. WORLDWIDE - Interfacing Farm & Mgmt. Systems

Code Number: 3-04-045-84

Status: Initiated Lead University: Colorado State University

Scope of Work: Advance knowledge regarding means to manage local command area irrigation units as interfaces between farm and main system operations.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	QUARTERLY	CUM		
Mohammed Haider	0.50 ppm	0.50	CSU	Economics
Robby Laitos	0.50 ppm	0.50	CSU	Sociology
Al Madsen	0.81 ppm	0.81	CSU	Economics
Edwin Shinn	2.00 gpm	2.00	CSU	Sociology
John Wilkins-Wells	2.00 gpm	2.00	CSU	Sociology

5. WORLDWIDE - Main System Design, Management, and Rehabilitation

Code Number: 3-04-061-84

Status: On-going

Lead University: Utah State University

Scope of Work: The main system subproject focuses on a central theme of the WMS project: irrigation system management. This activity specifically looks at the whole irrigation system from the perspective of the main or conveyance system to determine how it can be managed so as to be more responsive to farmers. The approach of the project is to examine the system in an interdisciplinary way, looking at both the conveyance system and needs of the farmer. Data will be gathered from U. S. sites and from systems in several AID assisted countries. On the basis of action research the model will be developed and tested in real situations in LDCs.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Wynn Walker	0.00 ppm	2.2 ppm	USU	Irri. Engineering
G. Skogerboe	0.00 ppm	1.0 ppm	CSU	Irri. Engineering
A. Keller	1.50 gpm	6.0 gpm	USU/Grad.Stu.	Irri. Engineering
N. Haie	1.50 gpm	5.0 gpm	USU/Grad.Stu.	Irri. Engineering
T. Hughes	0.26 ppm	2.3 ppm	USU	Water Res. Engrg.
R. Robson	0.00 ppm	0.9 ppm	USU	Manpower Exper.
J. Loftus	0.00 ppm	0.7 ppm	CSU	Systems Analy.
R. Sampath	0.00 ppm	0.9 ppm	CSU	Ag. Economics
D. Hernandez	1.50 gpm	1.5 gpm	USU/Grad.Stu.	Economics

6. WORLDWIDE - Selection of Irrigation Technology

Code Number: 3-04-062-84

Status: On-going Lead University: Utah State University

Scope of Work: The state-of-the-art of irrigation methods and technology selection in terms of interrelationships of physical, economic, and social parameters is poorly developed. USU is developing an interdisciplinary methodology of selecting appropriate irrigation technology. The selection methodology identifies integrated physical, economic, and social descriptors in terms of their probable range of limits to production. The irrigation technologies being considered are confined to those related to collective and individual farmer management of irrigation water.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
J. Moris	0.0 ppm	0.0 ppm	USU	Sociology
G. Dobbs	1.5 gpm	8.0 gpm	USU/Grad.Stu.	Irri. Engineering
J. Keller	0.0 ppm	1.0 ppm	USU	Irri. Engineering

7. WORLDWIDE - Small-Scale Irrigation Systems Study

Code Number: 3-04-069-84

Status: Ongoing Lead University: Cornell University

Scope of Work: A review of small-scale irrigation development issues and a comparative analysis of experiences in Asia, Africa and Latin America based on an extensive review of literature, field visits, and discussion with AID staff. A workshop to discuss an overall concepts paper was held in late November. At present, the Cornell team is revising the paper for publication early in 1984.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION AREA
	Quart.	Cum.		
E.Walter Coward Jr	0.5	2.1	Cornell	Rural Sociology
Michael Walter	0.3	2.1	Cornell	Agri. Engineering
James Nickum	1.5	6.0	Cornell	Asian Studies (Economics)
Barbara Lynch	1.5	6.0	Cornell	Rural Sociology
Beth Rose	0.2	2.4	Cornell	Editor
Ray Norman	3.0	12.0	Cornell	Agri. Engineering
Susan Turnquist	3.0	12.0	Cornell	Rural Sociology
Luin Goldring	0.0	0.1	Cornell	Rural Sociology

D. ADMINISTRATIVE STAFF

1. Cornell University Administration

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
E. Walter				
Coward, Jr.	0.5 ppm	2.5 ppm	Cornell	Proj. Coordination
Barbara D. Lynch	1.5 ppm	7.5 ppm	Cornell	Assoc. Coordination
Fua M. Hazelman	3.0 ppm	15.0 ppm	Cornell	Project Secretary
Betty Van Amburg	0.8 ppm	4.0 ppm	Cornell	Sec. to Coordinator
Grace Saatman	1.2 ppm	6.0 ppm	Cornell	Project Accounts Coordination
Beth Rose	1.5 ppm	7.5 ppm	Cornell	Project Editing

2. Utah State University Administration

Code Number: 0-02-997-84

Scope of Work: Provide administrative support to the project through the organization of technical assistance teams, travel arrangements, intellectual conceptualization of work activities and new sub-projects, accounting services, and preparation of reports and financial statements for the WMSII project.

Staffing:

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
Jack Keller	1.00 ppm	5.50 ppm	USU	Irri. Engineering
Dean Peterson	0.00 ppm	2.20 ppm	USU	Civil Engineering
Bryant Smith	1.50 ppm	10.0 ppm	USU	Institutional
L. Walker	1.50 ppm	5.50 ppm	USU	Accounting
JoAnn Biery	3.00 ppm	4.40 ppm	USU	Secretary
DeAnn Draper	1.50 ppm	1.50 ppm	USU	Prod. Typing
Linda Fields	1.00 ppm	1.00 ppm	USU	Secretary
A. LeBaron	0.00 ppm	0.40 ppm	USU	Ag. Economics
Jon Moris	0.00 ppm	0.20 ppm	USU	Sociology
S. Collins	0.00 ppm	6.00 ppm	USU	Secretary
S. Gagnon	0.00 ppm	6.70 ppm	USU	Secretary
C. Taft	0.00 ppm	1.00 ppm	USU	Editorial Services
A. Bishop	0.36 ppm	1.36 ppm	USU	Ag. Engineering
E. Malano	0.80 ppm	1.60 ppm	USU	Secretary
N. Adams	0.00 ppm	1.00 ppm	USU/Grad.Stu.	Irri. Engineering
A. Krambule	0.00 ppm	0.10 ppm	---	Secretary

3.a. CSU Administration (FY-83 Funding)

PERSON	ACTIVITY TIME		AFFILIATION	SPECIALIZATION
	Quart.	Cum.		
<u>Professional</u>				
David Redgrave	0.00 ppm	2.75 ppm	CSU	Agronomy
Dan Sunada	0.00 ppm	1.00 ppm	CSU	Civil Engineering
David Freeman	0.00 ppm	1.00 ppm	CSU	Sociology
Dan Lattimore	1.00 ppm	1.07 ppm	CSU	Tech. Journalism
Terrence Podmore	0.00 ppm	1.50 ppm	CSU	Ag. Engineering
Willis Shaner	0.00 ppm	7.82 ppm	CSU	Mech. Engineering
Albert Madsen	0.00 ppm	1.24 ppm	CSU	Ag. Economics
Mary Ann Moore	1.00 ppm	1.00 ppm	CSU	Tech. Journalism
<u>Support Staff</u>				
Janelle Armentrout	0.00 ppm	1.66 ppm	CSU	Secretary
Beverly Button	0.00 ppm	2.83 ppm	CSU	Accounting
Donald Kelly	0.00 ppm	4.00 ppm	CSU	Admin. Officer
Mary Lindburg	0.00 ppm	1.77 ppm	CSU	Support Staff
Marcia Trepka	0.00 ppm	6.45 ppm	CSU	Support Staff
Sandra Wunch	0.00 ppm	10.05 ppm	CSU	Support Staff
Betsy Zakely	0.00 ppm	1.00 ppm	CSU	Admin. Officer

3.b. CSU Administration (FY-84 Funding)

<u>Professional</u>				
David Freeman	1.00 ppm	1.00 ppm	CSU	Sociology
Dan Lattimore	1.25 ppm	1.25 ppm	CSU	Tech. Journalism
Dave Redgrave	0.25 ppm	0.25 ppm	CSU	Agronomy
Tom Sheng	0.50 ppm	0.50 ppm	CSU	Mech. Engineering
Dan Sunada	0.22 ppm	0.22 ppm	CSU	Civil Engineering
<u>Support Staff</u>				
Janelle Armentrout	0.75 ppm	0.75 ppm	CSU	Secretary
Beverly Button	2.25 ppm	2.25 ppm	CSU	Accounting
Don Kelly	1.50 ppm	1.50 ppm	CSU	Admin. Officer
Mary Lindburg	3.00 ppm	3.00 ppm	CSU	Support Staff
Sandra Wunch	2.75 ppm	2.75 ppm	CSU	Support Staff

E. OVERALL ADMINISTRATION-- (FY-83 Funding)

Overall project administration was involved in defining and improving procedures for the project. Project-wide themes in Irrigation System Management and Community Managed Irrigation Systems were identified. Project-wide teams for each theme are being developed. Planning and budgeting of activities were initiated for FY-84 from Mission requests. The person months of time and expenditures by line item for overall administration are given below.

NAME	QUARTERLY 10/1/83-12/31/83	CUMULATIVE 12/31/83
Professional		
Wayne Clyma	0.00	5.52
Tom Sheng	0.00	0.00
Paul Wattenburrger	0.00	1.00
David Redgrave	0.00	1.50
Darlene Fowler	0.25	0.25
Mary Ann Moore	1.25	1.25
Support		
Janelle Armentrout	1.40	5.00
Beverly Button	1.50	6.00
Donald Kelly	1.20	5.00

OVERALL ADMINISTRATION-- (FY-84 Funding)

NAME	QUARTERLY 10/1/83-12/31/83	CUMULATIVE 12/31/83
Professional		
Wayne Clyma	1.53	1.53
Darlene Fowler	0.75	0.75
Dan Lattimore	0.25	0.25
Mary Ann Moore	0.50	0.50
Tom Sheng	0.50	0.50
Paul Wattenburger	0.75	0.75
Support		
Janelle Armentrout	2.25	2.25
Beverly Button	0.75	0.75
Don Kelly	1.50	1.50

CSU PPM on Other Institution's Activities

CID 2-11-037-84

Elaine Emling	2.00	2.00
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Utah State University 2-14-060-84

Gaylord Skogerboe	1.00	1.00
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Utah State University 3-04-059-83

R. Sampath	0.00	0.86
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G. Skogerboe	0.00	0.86
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F. SUMMARY

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 A. Amount of Employment Time Relative to Organizational Affiliations

<u>AFFILIATIONS:</u>	<u>QUARTERLY EMPLOYMENT TIME:</u>
Colorado State University	26.56 ppm
Colorado State Graduate Students	7.50 gpm
Cornell University	26.06 ppm
Independent Consultants	9.46 ppm
University of California, Berkeley	1.65 ppm
University of Rhode Island	.69 ppm
Utah State University	11.45 ppm
Utah State Graduate Students	16.99 gpm

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 lead universities are fulfilling this objective by involving professionals from other institutions in activities, employing persons who are not affiliated with any institution, and by incorporating graduate students whenever appropriate.

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

SOURCE OF PERSONNEL: QUARTERLY EMPLOYMENT TIME:

TABLE B. Cornell University Employment Profile

Cornell University	25.82 ppm
Utah State University	3.96 ppm

TABLE C. Utah State University Employment Profile

Utah State University	7.49 ppm
University of California, Berkeley	1.65 ppm
University of Rhode Island	.69 ppm
Independent Consultants	7.66 ppm
Utah State Graduate Students	16.99 gpm

TABLE D. Colorado State University Employment Profile

Colorado State University	26.56 ppm
Colorado State Graduate Students	7.50 gpm
Cornell University	.25 ppm
Independent Consultants	1.80 ppm

IV. COMPLETED ACTIVITIES

A. Technical Assistance Activities

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

Country: BANGLADESH

Title of Activity: Assist with Water Management System Project Paper

Code Number of Activity: 1-02-015-82 Completion Date: December 1983

Lead University: Cornell University

Description of Activity/Services Involved:

Assistance was made to the Mission in the preparation of project documentation for the Water Management Project and in the Analysis of related issues.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Hammond Murray-Rust	Cornell	Agri. Engineering
Joseph Campbell	Cornell	Agri. Engineering
Leslie Small	Rutgers	Agri. Economics
Harry Blair	Bucknell	Institutional
Susan Turnquist	Cornell	Rural Sociology

Significant Findings and Results: The group made significant progress in analyzing water management issues in Bangladesh. Results of their research are available in the following consultancy reports.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Bangladesh Trip Report J.K. Campbell	7/1983	USAID/W; WM personnel
Consltancy Report: Organizational Analyst for Water Management Systems —S. Turnquist	8/1983	" "
Design Team Report—H.Murray-Rust	9/29/83	USAID/W; WM Systems Project Committee
Report of Three-Week in Bangladesh for the Cornell/USAID WMS-II Project	7/14/83	USAID/W; WM personnel

Country: Bangladesh

Title of Activity: Legal Consultant

Code Number of Activity: 1-03-029-82 Completion Date: February 1, 1983

Lead University: CSU

Description of Activity/Services Involved: Mission requested assistance to advise them on appropriate steps to encourage Government of Bangladesh to develop a national water policy and law.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
George Radosevich	CSU	Economics
Mohammed Haider	CSU	Economics
Mohan Reddy	CSU	Ag. Engineering

Significant Findings and Results:

Existing laws are inadequate to address the Water Resources development, utilization and management needs of Bangladesh.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Major Water Laws Related to Agriculture in Bangladesh	February 1, 1983	Clyma, Coward, Keller, Fitzgerald, Reuss, USAID Mission/Bangladesh

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-In</u>		
19,185	19,185	0	14,671	4,514

Country: Bangladesh

Title of Activity: Scope of Work

Code Number of Activity:
1-2-6-82

Completion Date:
December 21, 1982

Lead University: CSU

Description of Activity/Services Involved:

Develop scope of work for Bangladesh Water Management Systems Project and prepare for diagnostic analysis workshop.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Larry Nelson	CSU	Agronomy
Mohammed Haider	CSU	Economics

Significant Findings and Results:

Set-up Bangladesh Diagnostic Analysis Workshop and prepared Scope of Work for Bangladesh Water Management Systems Project.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
TDY Report	December 21, 1982	Keller, Coward, Fitzgerald, Reuss, Clyma
Water Mgmt. Systems Scope of Work	December 21, 1982	Keller, Coward, Fitzgerald, Reuss, Clyma

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-In</u>		
26,799	26,799	0	16,222	10,527

Country: Dominican Republic

Title of Activity: Project Identification Document

Code Number of Activity: 1-02-010-83

Completion Date: 12/82

Lead University: Utah State University

Description of Activity: A two person team examined the importance of water development relative to agricultural development; related these problems to poor on-farm management; examined national institutional problems in water development and on-farm water management; examined the potential direct beneficiaries of such a project; and prepared a project identification document.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Dean F. Peterson	Consultant	Ag. & Civil Engineering
Bruce Anderson	Consultant	Irrigation Engineering

Significant Findings and Results: See development of project paper for the Dominican Republic.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
PID	12/82	USAID/Santo Domingo

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-in</u>		
\$22,851	\$22,851	-0-	\$26,556	-\$3,705

Country: Dominican Republic

Title of Activity: Project Paper

Code Number of Activity: 1-02-009-83

Completion Date: 6/83

Lead University: Utah State University

Description of Activity: Produced a technical, institutional, and social analysis for a project on on-farm water management training. Analysis focused on two basic components--institutional planning and management of water resources, and on-farm management of water. The team prepared a draft project paper for a project in these areas.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Bruce Anderson	Consultant	Irrig. Engineering
Lyman Willardson	USU	Irrig. Engineering
Howard Peterson	Consultant	Agronomy
Melvin Burke .	Univ. Maine	Ag. Economics
Helen Ingram	Univ. Arizona	Political Science
Larry Bond	USU	Economics

Significant Findings and Results: (1) It is easier to obtain financing for design and construction of irrigation and drainage systems than it is to operate and maintain systems. Operation and maintenance requires a constant vigilance and continuing support. (2) It requires time, patience and understanding to help dry land or rainfed farmers become irrigation farmers. Many dry farmers have the concept that under irrigation, water is "the medium" for plant growth. (3) To provide the technical support required in agricultural development in all its phases, technical, socio-economic institutions and farmer organizations require a continuous network of training to cover all levels of expertise in the production system. (4) In arid countries, water and its multiple uses must be governed in priority use to serve the common good. This priority designation should be articulated, regulated, and periodically reviewed to meet the dynamics involved in a developing society. (5) Responsibility and authority for water development and its use needs to include those directly involved. It cannot be assumed, however, that this involvement vis-a-vis farmers can be instantaneous, but rather it must be entered into with care and forethought. (6) There is a point of compromise on how much time and money goes into the design of irrigation and drainage projects. It is difficult to carry out the detail of study usually required to consider all problems that may arise during the life of a project. Every attempt, however, should be made to consider all aspects of water development from the watershed through to the use and disposal of the water.

Reports/Documents
Draft Project Paper

Completion Date
6/83

Distribution
USAID/Santo Domingo

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-in</u>		
\$93,755	\$26,755	\$67,000	\$87,713	\$6,042

Country: Haiti

Title of Activity: Irrigation Project Evaluation

Code Number of Activity: 1-02-039-83

Completion Date: 9/83

Lead University: Utah State University

Description of Activity: The purpose of this activity was to evaluate the irrigation component of an integrated rural development project in Haiti.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
R. Kern Stutler	USU	Irrig. Engineering
James Walter	USAID/Haiti	Economics
Miguel A. Lugo-Lopez	Univ. Puerto Rico	Agronomy
Carol A. Stengel	AID/Washington	Ag. Economics
Merritt J. Taylor	Texam A&M Univ.	Ag. Economics
Ruth Yabes	AID/Washington	Planning

Significant Findings and Results: 1. Rehabilitation of the Dubreuil irrigation system was initiated in July 1981, but hampered because of financial constraints. The project was adequately designed and constructed and the Irrigation Service of DARNDR included a basic competent staff of young engineers who gained experience on the project and have received some training through the PDAI Project. Water user groups for the secondary and tertiary canals in Phase I of the project have been formed and delivery schedules prepared by the engineer in charge of operation and maintenance and on-farm water application. A water users association capable of managing the system was not formed and without DARNDR supervision and financial support, proper O&M probably will not continue after project completion.

2. Estimates suggest that crops in the Dubreuil project area will be subjected to considerable moisture stress. Crop yields could be expected to increase by two times, or more, as water is provided in the proper time. Reduced risks associated with irrigation will induce farmers to adopt modern technological packages including high-yield seeds, fertilizer and insecticides. Farmers will increase plantings of high value, short growing cycle cash crops such as beans and tobacco. A relatively large reduction in the area planted in sorghum and sugar cane would be expected.

3. The costs and benefits of the irrigation project were estimated and the internal rate of return of the total Dubreuil system and the incremental rate of return for the completing of Phase II are sufficiently high under a variety of assumptions to confirm the project's

economic soundness. Management and financial delays, however, which slow project implementation result in significantly lower estimated rates of return. Also, a lack of attention to O&M and watershed protection activities reduces the expected life of the project and the internal rates of return.

4. The three main institutional constraints that hampered the smooth implementation of the PDAI project are: (i) lack of proper administrative and financial control, (ii) lack of resources, and (iii) lack of communication.

5. Overall results and accomplishments of the TA have been much less than should be expected. This has been the result of untimely arrival of technicians, lack of support facilities, counterpart personnel, and construction funds.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Evaluation of the Irrigation Component of the Integrated Agricultural Development Project	12/83	General

<u>Funding:</u>				
<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-in</u>		
\$23,867	\$23,867	-0-	\$ *	-0-

* actual expenditure figures not yet available

Country: India

Title of Activity: Development of Solutions

Code Number of Activity:

Completion Date:

1-02-024-82A

July 31, 1983

Lead University: CSU

Description of Activity/Services Involved:

Team sent to India to work on developing solutions to problems identified in a DA Workshop in Rajasthan and further diagnostic analysis to be done by the team.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
A.R. Robinson	Independent/Consultant	Ag. Engineering
G.E. Carlson	Independent/Consultant	Civil Engineering
W.R. Laitos	CSU	Sociology
Dave Redgrave	CSU	Agronomy

Significant Findings and Results:

Need to complete Thikaria Minor and Chack 2, Leveling on Chack 1 is good selection. Different designs suggested for three small fields. After leveling is completed, farmers can make decision of which design to use; leveling can also be demonstrated at an experimental farm near Chittorgarh.

Reports/Documents

Completion Date

Distribution

TDY Report

June 13, 1983

Fitzgerald, Keller, Clyma

Progress Report

July 14, 1983

Fitzgerald, Keller, Clyma

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-In</u>		
59,731	0	59,731	59,141	590

Country: India

Title of Activity: India TDY - Clyma

Code Number of Activity: 1-02-035-83 Completion Date: December 31, 1983

Lead University: CSU

Description of Activity/Services Involved:

Consult with USAID mission personnel concerning future directions to the WMSII effort in India.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Wayne Clyma	CSU	Ag. Engineering

Significant Findings and Results:

Draft letter prepared suggesting alternatives for using diagnostic analysis in various programs in India. Also, institution of development of solutions effort in Rajasthan and preparation of technical manuals in India where suggested.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
TDY Report	December 31, 1983	Clyma, Fitzgerald, Lattimore, Coward, Kearns, Keller, Svendsen, Merrey

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-In</u>		
3,039	3,039	0	2,896	143

Country: INDIA

Title of Activity: Institutional Analysis in Himachal Pradesh

Code Number of Activity: 1-02-047-83 Completion Date: August 1983

Lead University: Cornell University

Description of Activity/Services Involved:

Activity Description: Analysis and evaluation of key institutions involved in irrigation development in Himachal Pradesh.

Services Involved: Review of agencies implementing irrigation development in Himachal Pradesh. Information regarding local government and community institutions engaged in irrigation activities was also collected.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
E. Walter Coward, Jr.	Cornell	Rural Sociology

Significant Findings and Results: Preparation of institutional analysis statement for inclusion in Hill Area Land and Water Development Project paper.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Irrigation Institutions in Himachal Pradesh: Their Impact on the State's Pattern of Irrigation Development E. Walter Coward, Jr.	6/28/83	USAID/W; WM personnel
Report on Analysis of System Performance of Selected Irrigation Subproject in Himachal Pradesh— Indian Institute for Management.	9/1983	USAID Mission in India and others in India

Country: India

Title of Activity: Olsen (TDY)

Code Number of Activity: 1-02-037-83

Completion Date: 8/83

Lead University: Utah State University

Description of Activity: As part of its longer term assistance to the India Mission, Utah State University will be placing a full time engineer in India to coordinate a number of action research and technical assistance activities through WMS II. This coordinator, Dr. Edwin Olsen, visited the Maharashtra state to meet individuals and institutions he will be working with, and to familiarize himself with the irrigation characteristics and problems of that state.

Staffing:

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

Significant Findings and Results: not applicable

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Trip Report	8/83	WMS Universities

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-in</u>		
\$21,403	\$ -0-	\$21,403	\$12,247	-0-

Country: India

Title of Activity: Project Preparation

Code Number of Activity:
1-2-33-83

Completion Date:
July, 1983

Lead University: CSU

Description of Activity/Services Involved:

Assist USAID mission, World Bank, and GOI in planning irrigation training programs in India for WMSII.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Norman Evans	CSU	Ag. Engineering

Significant Findings and Results:

Suggested Maharashtra University as the university to train graduate engineers. Curriculum was suggested.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
None		

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-In</u>		
14,560	14,560	0	12,603	1,957

Country: India

Title of Activity: Water Management and Training

Code Number of Activity: 1-2-20-82A Completion Date: January 19, 1983

Lead University: CSU

Description of Activity/Services Involved:

To assist Lowdermilk and Vankatesan in developing, analyzing, evaluating and synthesizing various aspects involved in the content, strategy, organization, and the institutional arrangements necessary to implement the Water Mgmt.

Staffing: Training Project in India.

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
R.K. Sampath	CSU	Economics

Significant Findings and Results:

Budget estimates were developed for several proposals. Economic analysis of the training program and a financial analysis of the project and various subprojects was prepared.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
TDY Report	January 19, 1983	Clyma, Fitzgerald, Reuss

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-In</u>		
27,991	27,991	0	16,901	11,090

Country: India

Title of Activity: Water Management and Training

Code Number of Activity: 1-02-020-82b

Completion Date: 4/83

Lead University: Utah State University

Description of Activity: The purposes of the assistance were (1) assist USAID/India in preparing the final draft of the project paper for its Irrigation Management and Training Project; and (2) give a short course and consult as Visiting Professor, Water Development Training Center at Roorkee University under Ford Foundation sponsorship.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Dean F. Peterson	Consultant	Civil Engineering
R. Sanpath	CSU	Ag. Economics

Significant Findings and Results: This seven year project will implement a large in-house training program designed to enhance professional development in irrigation water management within Irrigation and Agricultural Departments in five Indian States. Academic instruction will be strengthened in three universities and a substantial program of action research on selected irrigation systems will be undertaken. In addition, the project will finance development of national capability in water resource planning.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Draft Project Paper	4/83	USAID/India
Trip Report	4/83	WMS Universities

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-in</u>		
\$20,336	\$20,336	-0-	\$24,402	-\$4,066*

* D.F. Peterson Pakistan activity charged to this account.

Country: Indonesia

Title of Activity: TDY - Oad

Code Number of Activity: 1-02-030-83 Completion Date: July 5, 1983

Lead University: CSU

Description of Activity/Services Involved:

Provide help to USAID and appropriate GOI Agencies working on HPSIS to develop approaches for measuring hydrologic aspects of small-scale irrigation system performance.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Ramchand Oad	CSU	Aq. Engineering

Significant Findings and Results:

Identified engineering parameters and indicators of the physical performance of irrigation systems. Suggested Indonesian institutions and personnel who can collect data for those parameters.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
TDY Report	July 5, 1983	Clyma, Fitzgerald, Svendsen, Merrey

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-In</u>		
14,408	14,408	0	14,408	0

Country: Jordan

Title of Activity: Curriculum Development

Code Number of Activity: 1-02-041-83

Completion Date: 6/83

Lead University: Utah State University

Description of Activity: Assistance was provided to review the curriculum of the University of Jordan relative to the topics of water, irrigation, and agronomy. Suggestions were made for curriculum development and an evaluation was carried out of the University's field training program.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Jack Keller	USU	Irrig. Engineering

Significant Findings and Results: The previous AID assistance to the University of Jordan Soils and Irrigation Development has been effective in helping the University generate a very well qualified staff of students. Although the staff is well qualified, they are young and relatively inexperienced. From a review of their activities it would appear that consultation with senior level academicians would be helpful in (a) keeping their academic program up to date, and (b) improving the quality and benefits from their extensive research activities. While the University and more specifically, the Soils and Irrigation Department, have the predominant capability in the area of irrigated agricultural research, full advantage of this capability is not being taken within the country.

It would seem that some outside assistance will be necessary to help bring the Department of Agriculture, and Jordan Valley Authority, and the University together, so that they can coordinate the water management studies in Jordan. In addition to giving consultative support, it appears that the University of Jordan does not provide sufficient operating funds for special training and necessary research equipment. This is typical of many universities and one place where AID can gain high leverage inputs because the major expense in buildings and personnel has already been committed and is being supported by the Government through the University.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Trip Report	7/83	WMS Universities

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-in</u>		
\$12,161	\$12,161	-0-	\$9,912	\$ 2,249

Country: Mali

Title of Activity: Mali Land Leveling

Code Number of Activity: 1-02-006-83

Completion Date: 3/83

Lead University: Utah State University

Description of Activity: Assess needs and requirements of on-farm land leveling and water management techniques; feasibility of land leveling methods and water management techniques suitable to Malian conditions; water/irrigation requirements; evaluation on-farm irrigation structures and practices followed by farmers and suggest improvements; assess potential for emergence of drainage problems; review grant proposal of ICRISAT/Mali for land leveling equipment.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Ted Olsen	USU	Irrig. Engineer

Significant Findings and Results: There is a need to eliminate seepage losses through irrigation distribution systems, since the fuel savings will be proportional to the saving of water. Farm turn-out structures need to be incorporated so that farmers can better control water, and farmers need to be better instructed in observing the soil moisture within the root zone to determine when to irrigate.

Land leveling was not a problem for most irrigation systems, but could become so for new land which will be brought under irrigated cultivation. Where needed, simple methods should be tried and then more complex methods can be considered. Technical assistance and credit is needed by farmers to develop simple shallow wells with small pumps for irrigating vegetable crops during the dry season. Local engineers and agronomists who work with farmers would greatly benefit from short courses in on-farm water management principles and techniques.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Trip Report	3/83	USAID/Mali, WMS Universities.

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-in</u>		
20,698	20,698	-0-	\$16,445	\$4,253

Country: Pakistan

Title of Activity: Clyma TDY

Code Number of Activity: 1-2-31-83

Completion Date: December 12, 1983

Lead University: CSU

Description of Activity/Services Involved:
Assist mission with irrigation systems management program.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Wayne Clyma	CSU	Ag. Engineering
Doug Merrey	AID/Washington	Anthropology

Significant Findings and Results:

Developed a concepts paper for a future command water management program. Recommendations for further developing the program as well as a definition of the research team focus were given.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Concepts Paper	December 31, 1983	AID/W, CID WMSII Universities

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-In</u>		
9,117	9,117	0	8,181	936

Country: Pakistan

Title of Activity: Mayfield TDY

Code Number of Activity: 1-02-029-83

Completion Date: 6/83

Lead University: Utah State University

Description of Activity: Assistance was given to federal, provincial, and local officials of the Government of Pakistan to prepare the implementation plan for an on-farm water management project. The project was a pilot one on a district level effort.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
James Mayfield	Univ. of Utah	Public Administration

Significant Findings and Results: None.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
None		

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-in</u>		
\$15,666	\$ -0-	\$15,666	\$15,505	-0-

Country: Pakistan

Title of Activity: Water Management Meeting

Code Number of Activity: 1-02-029-83a

Completion Date: 4/83

Lead University: Utah State University

Description of Activity: Consulting services were requested on a proposed joint project with the World Bank and AID on Command Area Management, a program of pilot level rehabilitation and improved management of irrigated commands designed to strengthen the social and agronomic content of the Center's courses in design and management issues of irrigation systems. This was to be done through the development and testing of course materials in economics, agronomy, anthropology, and sociology.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Dean F. Peterson	Consultant	Civil Engineering

Significant Findings and Results: None.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Trip Report	4/83	WMS Universities

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-in</u>		
\$2,466	\$	\$2,466	*	-0-

* expenses charged to India Water Management and Training Project activity.

Country: Pakistan

Title of Activity: WMC (WM) Mtg.

Code Number of Activity: 1-02-029-83B
Completion Date:

Lead University: CSU

Description of Activity/Services Involved:

Institutional specialist with experience in organizational problems of irrigation management to present experiences on project management problems at a seminar in Pakistan.

Staffing:

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

Significant Findings and Results:

From experiences presented, Pakistan USAID Mission decided to request short-term consultation on institutional problems through several TDY's during 1984-85.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
None		

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-In</u>		
9,931	9,931	0	3,168	6,763

Country: Peru

Title of Activity: Small and Medium Irrigation Systems

Code Number of Activity: 1-02-035-84

Completion Date: 12/83

Lead University: Utah State University

Description of Activity: The purpose of this assistance was to review and evaluate the Plan Meris project of USAID/Peru and make recommendations for its improvement.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Bruce Anderson	Consultant	Irrig. Engineering

Significant Findings and Results: The Plan Meris project needs to emphasize a strong technical assistance approach, especially to minifundios, based upon qualified and experienced technical support in water management and its related fields. Additional emphasis should also be given to strengthening farmer organizations so that they can assume more authority and responsibility for O&M of the systems that service their water needs. Further encouragement and involvement should assist farmers in taking an active part in the decision-making process that affects them and their way of life.

The second phase of the project needs a field oriented research program directed to the identifiable needs of farmers and those factors that adversely affect agricultural production. Likewise, the project area is in need of a realistic training program to provide a full range of training. Concurrently, an innovative approach to getting credit into the hands of small farmers is needed because of the restrictive nature of the current system.

The project should provide for benchmark data to establish a reference base and a system of monitoring and measuring progress. Finally, a realistic time frame to bring about the desired changes should be adopted; at least on the order of five years.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Trip Report	11/83	USAID/Peru, WMS Universities

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-in</u>		
\$35,157	\$11,000	24,157		

* Because of the possibility of future assistance to Peru through this account in FY 84, actual expenditure cannot be estimated yet.

Country: SRI LANKA

Title of Activity: Assist Irrigation and Water Management Group, ARTI

Code Number of Activity: Completion Date: September 30, 1983

Lead University: Cornell University

Description of Activity Services Involved:

Activity Description: This activity rendered assistance to ARTI in the development of a strategy for farmer participation and the formation of water user groups in the Gal Oya Project. It helped strengthen the capacity of the Irrigation Group within ARTI.

Services Involved: Aid in the recruitment, training organizations and deployment of a cadre of Institutional Organizers (IOs) to introduce farmers. Aid in the strengthening of a Water Management Group within ARTI. Training of ARTI staff in data processing and analysis and the preparation of a mid-project impact assessment.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Norman Uphoff	Cornell	Political Science
Piyasena Ganewatte	Sri Lanka	Rural Sociology
Hammond Murray-Rust	Cornell	Agri.Engineering

Significant Findings and Results: The initiative and responsibility demonstrated by field channel representatives has been exemplary. This has encouraged technical staff to work more cooperatively with farmers. Minor improvements were made by farmers with modest technical assistance from the Irrigation Department staff. Government and foreign staff are using the Gal Oya experiences as a model for developing water management.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
1. Trip Report: Visit to ARTI & Gal Oya Nov. 1-13, 1982, E.Walter Coward, Jr.	12/20/82	USAID/W; WM personnel
2. An Analysis of Communication Relevant to Improving Water Management in Gal Oya Project—Milan Rodrigo	12/1982	" "
3. Gal Oya Water Management Project Trip Report: Hammond Murray-Rust (January 2-20, 1983)	1/20/83	" "
4. Draft Proposal for Farmer Water User Organization in Left Bank, Gal Oya, Ampore District	1/16/83	" "
5. The Institutional Organizer (IO) Programme After Two Years Norman Uphoff	1/19/83	" "
6. Guidelines for Water Management Activities in Uhana Unit for Yala Season 1983		" "
7. The Learning Process Approach to Farmer Organization for Water Manage- ment: An Analysis of the Institutional Organizer Program in Gal Oya, Sri Lanka—Nancy St. Julien		" "
8. Trip Report—Water Management Project/Sri Lanka - January 1-22, 1983 Norman Uphoff	1/30/83	" "
9. Draft of Trip Report	2/6/83	" "
10. The Institutional Organizer (IO) in the Field After Twenty-Seven Months: A Report on Trip to Ampore/Gal Oya, June 5-12, 1983 Norman Uphoff		" "
11. Report on TDY to Sri Lanka, India July 8 - August 17, 1983 James Nickum		" "
12. Activities of Cornell University Consultants to ARTI, July - September 1983.		" "

B. Training and Technology

Country: Bangladesh

Title of Activity: Diagnostic Analysis Workshop

Code Number of Activity:

Completion Date:

Lead University: 2-02-007-82A
CSU

October 31, 1983

Description of Activity/Services Involved:

D.A. Workshop combines the training of local staff through a field study of actual constraints that are limiting the effectiveness of irrigation systems.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Larry Nelson	CSU	Agronomy
Terry Podmore	CSU	Ag. Engineering
Ramchand Oad	CSU	Ag. Engineering
John Baxter	CSU	Agronomy
Mohammed Hiader	CSU	Economics
Dave Redgrave	CSU	Agronomy
William Laitos	CSU	Sociology
Mary Ann Moore	CSU	Tech. Journalism
Mohan Reddy	CSU	Ag. Engineering

Significant Findings and Results:

- The discharge rate of deep tubewell was substantially lower than the design.
- All the farmer groups were informal, possessing few, if any, written rules or procedures. There was little institutional penetration of these tubewell groups by government agencies.
- The farmers at these sites appeared to be more interested in water reliability and adequacy than in participation in the tubewell organization.

Reports/Documents

Completion Date

Distribution

Technical Report

October 31, 1983

Fitzgerald, Merrey, Svendsen, Kearns, Coward, Keller, all participants, USAID Mission
CSU Project Staff, Clyma

Bangladesh Training
Evaluation

August, 1983

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-In</u>		
187,088	187,088	0	202,597	<15,509>

Country: CHINA

Title of Activity: FAO/AID Workshop Planning

Code Number of Activity: 2-14-064-83 Completion Date: August 1983

Lead University: Cornell University

Description of Activity/Services Involved:

Activity Description: James Nickum made a visit to China August 17-23, 1983 to explore the interest of the Institute of Geography, Chinese Academy of Sciences in participating in the Expert Consultation on Irrigation Management to be held in Yogyakarta, Indonesia July 16-21, 1984.

Services Involved: James Nickum will collaborate with the Chinese to produce a case study of Yucheng County. He will assist in the preparation of written material.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
James Nickum	Cornell	Asian Studies

Significant Findings and Results: Leading members of the Institute of Geography, including its head Zuo Dakang, indicated their willingness to prepare a case study. Ren Hongzun, a groundwater hydrologist with experience in Yucheng County, was assigned to work with James Nickum.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Report on Trip to Beijing, China	September 1983	AID/W & WM personnel

Country: DOMESTIC

Title of Activity: WMS-II Summer Internship in Washington, D.C.

Code Number of Activity: Completion Date: September, 1983

Lead University: Cornell University, Utah State University

Description of Activity/Services Involved:

Activity Description: Ruth Yabes, a graduate student in City and Regional Planning, provided assistance to AID/W staff by reviewing technical requests, contributing to planning, evaluation and assessment activities, and reviewing technical literature.

Services Involved: Ruth Yabes provided support to AID/W and participated as an institutional analyst in a Haiti sector study.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Ruth Yabes	Cornell	City & Regional Planning

Significant Findings and Results: The summer internship provided valuable assistance to AID/W staff. It also helped expand the pool of U.S. water management expertise.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Internship Report - R. Yabes	September 1983	Not distributed

Country: India

Title of Activity: Measurement for Systems Management

Code Number of Activity: 02-07-026-82A Completion Date: March 24, 1983

Lead University: CSU

Description of Activity/Services Involved:

Conduct a workshop with focus on water management structures in Rajasthan, India.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Bob Mohammed	CSU	Ag. Engineering

Significant Findings and Results:

Major result was the training in looking at measurement as a means for systems management for the 35 Indian engineers and scientists that attended from eight states in India.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
TDY Report	March 24, 1983	Coward, Keller, Reuss, Clyma, Fitzgerald, Svendsen

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-In</u>		
12,758	12,758	0	12,943	<185>

Country: NEPAL

Title of Activity: Workshop on Small-scale Irrigation

Code Number of Activity: 2-14-050-83 Completion Date: August 1983

Lead University: Cornell University

Description of Activity/Services Involved:

Activity Description: A workshop was held July 31 - August 2, 1983 in Nepal under the auspices of APROSC to review Nepalese experiences with small-scale irrigation development and to examine prospects for future small-scale development in Nepal based on Nepalese and other experiences.

Services Involved: Cornell faculty and graduate students helped plan the workshop. They acted as synthesizers for the technical sessions, helped with the formulation of issues and with the summary reports to the plenary, as well as contributing from time to time to the group discussions.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Gilbert Levine	Cornell	
Randolph Barker	Cornell	
Norman Uphoff	Cornell	Political Science

Significant Findings and Results: A widely shared concern about the performance of the irrigation sector, especially the governmental irrigation sector, was demonstrated by all workshop participants. In addition, a great deal of practical information was exchanged. The workshop acted as a focal point for the expression of concern, with subsequent coalescence of concrete solutions. As a summation, APROSC took steps to form a core group to work on water management issues.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Trip Report WMS-II--Gilbert Levine	9/1983	USAID/W & WM personnel
Trip Report WMS-II--Norman Uphoff	8/14/83	" "
Trip Report Nepal--Gilbert Levine	3/12/83	" "
Trip Report Nepal--Randolph Barker	9/1983	" "
Upcoming Documents: Workshop Findings	12/1983	Nepalese
Workshop Proceedings	6/1984	Nepalese

Country: Sri Lanka

Title of Activity: WID-DA Workshop

Code Number of Activity: 2-02-034-83 Completion Date: October 31, 1983

Lead University: CSU

Description of Activity/Services Involved:

To study the Role of Women in irrigated agriculture and train women counterparts how to prepare and carry out such studies.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Kathleen Kilkelly	Independent	Agronomy

Significant Findings and Results:

The Role of Women in irrigated agriculture in one system in Sri Lanka was described as part of a training effort with women in the Sri Lankan Diagnostic Analysis Workshop.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
System H of Mahaweli Development Project; Women's Role	October 31, 1983	Part of D.A. Report to be distributed when approved.

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-In</u>		
16,154	154	16,000	16,424	<270>

Country: Worldwide

Title of Activity: Short Term Non-Degree Training

Code Number of Activity: 2-08-056-83

Completion Date: 9/83

Lead University: Utah State University

Description of Activity: The International Irrigation Center (IIC) of USU provides international leadership in the training of LDC irrigation officials and technicians. Having a strong engineering and technical course program, the activity was designed to strengthen the social and agronomic content of the Center's courses in design and management issues of irrigation systems. This was to be done through the development and testing of course materials in economics, agronomy, anthropology, and sociology.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
Humberto Yap	USU	Irrig. Engineering
David James	USU	Soil Science
Hector Malano	USU/Grad Stu.	Irrig. Engineering
Peter Hildebrandt	Univ. of Florida	Econ/Sociology

Significant Findings and Results: The IIC, on the basis of the new materials developed and tested, started a new approach and short training course on multidisciplinary and interdisciplinary approaches to irrigation water development and management. This course will be taught on a continuous basis in the Center to LDC irrigation officials. The testing of the materials with students from different countries and disciplines showed the varying importance of distinct aspects of each discipline being taught, according to the geographic and professional backgrounds of the participant.

<u>Reports/Documents</u>	<u>Completion Date</u>	<u>Distribution</u>
Farming Systems Approach to Technology Development and Transfer	9/83	participants of course
Irrigated Crop Production Research & Demonstration: A Manual of Field Plot Technique	9/83	participants of course
Teoria y Practica del Riego por Superficie	9/83	participants of course
Manuel de Diseno de Sistemas de Riego por Aspersion y Goteo	9/83	participants of course

Funding:

<u>Budget</u>	<u>Funding Source</u>		<u>Actual Expenditure</u>	<u>Savings</u>
	<u>Core</u>	<u>Buy-in</u>		
\$35,670	\$35,670	-0-	\$35,670	-0-

Country: WORLDWIDE

Title of Activity: Start-up Workshop

Code Number of Activity: 2-14-051-83 Completion Date: December 1982

Lead University: Cornell, USU, CSU

Description of Activity/Services Involved:

Activity Description: Workshop held at Colorado State University to provide initial exchange and project planning among major faculty participants from Cornell University, Colorado State University, and Utah State University.

Services Involved: Faculty from the three universities attended the workshop and contributed their ideas.

Staffing:

<u>Personnel</u>	<u>Affiliation</u>	<u>Specialization</u>
E. Walter Coward, Jr.	Cornell	Rural Sociology
Norman Uphoff	Cornell	Political Science
James Nickum	Cornell	Asian Studies (Economist)
Michael Walter	Cornell	Agri. Engineering

V. SPECIAL FOCUS

In this section of the report, each university presents a summary of an activity which was led by that university. The in-depth report of these activities was prepared so as to acquaint the reader with a more detailed understanding of the universities' work and involvement.

A. CORNELL UNIVERSITY: BANGLADESH WATER MANAGEMENT SYSTEMS PROJECT PAPER

During the past few years, there has been a strong interest in the AID Bangladesh Mission in supporting the irrigation sector. The Bangladesh Government has also strongly supported irrigation and in particular pump irrigation. As a result, Cornell University was asked to assemble, field, and administer a team to examine the pump irrigation sector and to prepare a project paper on Water Management Systems. The Cornell team included members from many disciplines chosen for their experience: Dr. Hammond Murray-Rust, Engineer and Team Leader (Cornell University), Dr. Leslie Small, Agricultural Economist (Rutgers University); Dr. Joe Campbell, Pump Specialist (Cornell University); Dr. Harry Blair, Institutional Specialist (Bucknell University); Ms. Susan Turnquist, Organizational Specialist (Cornell University); Dr. Martin Hanratty (consultant); and Dr. Hamidur Khan, Agricultural Engineer (private consultant).

A preliminary study was carried out by Dr. Martin Hanratty in April 1983. Hanratty's report prepared a base for Team Leader, Hammond Murray-Rust and other consultants. Each short-term consultant prepared a detailed report of findings and Murray-Rust compiled a final report. Dr. Khan concluded that pump irrigation was likely to become the single most important component of the irrigation sector. Increasing investment by the Government was likely to make food self sufficiency a possibility in the future. However, he found that improved management of the infrastructure would be necessary to maintain gains.

Dr. Hanratty reiterated that AID could play a useful role by supporting management without conflicting with other donors, who largely support the purchase of foreign irrigation equipment. He indicated a number of key areas, e.g., including support for equipment manufacture, sales and service, provision of better spare part manufacture and distribution, training of mechanics, training of operators of equipment, support for water management services for farmers, and continued research into water management problems in Bangladesh. As a result, AID concluded that full support should be given to the project team in developing a Project Paper.

Work began in earnest in May 1983 when Murray-Rust arrived. During the summer months, five short-term consultants carried out studies and submitted reports to Murray-Rust. Project activities were divided into five major categories including water resource planning and development, irrigation equipment manufacture, support services for irrigation equipment, support services for farmers, and institutional aspects.

The pump irrigation sector in Bangladesh is quite new. The first tubewells and low-lift pumps were initially installed in the late

1960s. Although deep tubewells were emphasized, the government quickly decided that during the Second Five Year Plan (1980-1985) there would be a massive expansion of shallow tubewell development. Two main planning objectives were to extract only rechargeable groundwater and to ensure adequate spacing between wells. The team found that donor agencies involved in providing irrigation hardware were not always responsive to planning requirements. Positively, the team found initiatives toward improved groundwater management and the creation of the Master Planning Organization (MPO) within the Ministry of Agriculture to develop water resources.

At present most equipment used in the minor irrigation sector is imported through the assistance of aid programs. Only cast iron centrifugal pumps for shallow tubewells and low-lift pumps are locally manufactured. Although the government would like to increase domestic manufacture of irrigation components, it has not eased stiff tariffs on raw materials. It is the opinion of the team that considerable potential for domestic production exists. The team concluded that for long-term self-sufficiency, it is essential that equipment be as appropriate as possible for the conditions in Bangladesh. Two issues are crucial: the need to have pumps and engines suited to groundwater conditions, and the need to have equipment that could be repaired in local workshops. In conclusion, the team stated that domestic manufacture of irrigation equipment should be the highest priority area for AID support.

Closely allied to the manufacture of irrigation equipment is the provision of necessary support services. The team found that the entire support service sector would need assistance if the pump irrigation sector were to remain viable. It was recognized, however, that the transitional government policy would probably lead to improvements. The government has promoted privatization of the sale and service of tubewells. Although difficulties have been encountered, the team firmly supported increased privatization. The increasing strength of the private sector was best observed in the number of mechanics serving private and leased tubewells. Spare parts are also being manufactured locally, and the private sector supplies some operating inputs.

A major job for the team was to investigate ways in which farmers could be given support in improving water management within the command area of tubewells. The initial assumption was that farmers were making inefficient use of water. However, a closer look showed that inefficiencies were largely due to overly optimistic assumptions regarding command areas. These inaccuracies were largely due to organizational problems. Government agency inflexibility and the lack of coordination among service organizations were major constraints identified by team members. These combined with a lack of detailed knowledge of local conditions led the team to conclude that while there are undoubtedly serious problems at the local level, it would be difficult to base a program on provision of support for

on-farm water management activities. The team felt that because farmers were likely to eventually develop their own solutions, widespread intervention at the local level would be difficult and likely unproductive.

A major consideration in project design and implementation is the nature of the local institutional arrangements. Because of the rapid development of the pump irrigation sector in Bangladesh, responsibilities have usually been assigned to existing government agencies instead of creating or modifying administrative structures. This has created institutional problems that affect the implementation of water management projects. There has been little effort to ensure that the responsibilities of different agencies are clearly defined and overlap tends to occur. Many of the agencies involved in aspects of pump irrigation have little experience with daily problems. The third potential problem is the decentralization of some government power to districts by the end of 1984.

In September 1983, Murray-Rust and AID staff discussed the direction of project development. In light of the consultant's findings, the logical starting place for a project dealing with the minor irrigation sector would be in encouraging domestic manufacture of irrigation equipment and spare parts. Evaluating the activities of other donor agencies showed that little attention had been paid to upgrading this capability. By focusing on this, AID would not only be implementing a project in which it had some prior experience in Bangladesh, but would also be in a strong position to influence government policy.

The team also concluded that it was premature to develop a project that was aimed primarily at on-farm water management. While acknowledging that this type of support would be valuable in the future, it noted that information was insufficient at present to adequately design a project that would address the critical issues.

Murray-Rust has presented the following set of recommendations for consideration by the Bangladesh mission:

1. AID should not further pursue the component concerned with provision of water management services to farmers;
2. AID should not get involved in promoting additional training courses for mechanics, as there are likely to be sufficient mechanics trained in current and proposed programs;
3. the proposed project should focus on the domestic manufacture of pumps, engines and spare parts, together with improved sales, distribution and servicing;
4. the terms of reference for the team be altered to reflect these changes.

These proposals were presented to AID in mid-October by the team leader in the form of a draft Project Identification Document (PID). It was suggested that the project be structured around a credit of \$50 million, including \$2 million for technical assistance. By releasing funds to the government contingent on certain policy adjustments and changes, AID would have some ability to ensure that overall development of the irrigation sector proceeded in the best interests of manufacturers and users.

With the acceptance of these proposals by the Mission and the agreement to bring out a team of consultants using other services of funding, the technical assistance under the Water Management Synthesis II project was terminated. Individual team member's reports have been circulated, and a final detailed review of the irrigation sector in Bangladesh is forthcoming.

B. UTAH STATE UNIVERSITY: MAIN SYSTEM DESIGN, MANAGEMENT AND REHABILITATION

The large discrepancy between irrigation performance, and expectations in irrigation system feasibility studies and implementation plans, has been documented in many countries. In recent years, considerable understanding has been gained regarding the reasons for this discrepancy, and what kinds of solutions are required. Efforts to improve irrigation performance must involve three important institutional innovations:

- enhancement of the managerial capacity and capability of the main irrigation conveyance system down to the interface with water users;
- the development of farmer organizational capabilities to handle system rehabilitation, operations and maintenance from the agricultural production and farm distribution network to the interface with agency personnel; and
- the institutionalization of training and skills enrichment in the agency, especially focusing on system managers, field personnel, and farmers. These efforts must be based on a continuous research program to identify problems and develop viable solutions, which can then feed into the management process.

These three types of institutional innovations would complement the tremendous investments that are being made in irrigation infrastructure by the international lending and donor agencies along with national governments. Irrigation agencies worldwide have focused for the past 20 years on construction, with a concerted effort to generate newly irrigated areas in response to readily available capital resources. These development programs have been matched by improved organizational skills in construction management, design and planning. With rapidly increasing costs of development and few favorable sites remaining, irrigation agencies are beginning to turn greater attention to the management issues of operations and maintenance. Potential long-term benefits from the three areas noted above are tremendous. The impact of relatively modest investments on long-term productivity would be exceptional and have a significant multiplier effect on the irrigation (and other) agencies far beyond the original investments in infrastructure. The Utah State University WMSII effort in this regard is focused on the first activity.

In addition to the meeting the need for more advanced and comprehensive computational tools and training, the main system sub-project will also begin evaluating a host of institutional issues. These include: (1) the institutional linkages in the water law system governing the development and use of water and the impact on the operation of the irrigation network; (2) policies which administratively define and extend the

legal framework and set in motion procedures for financing, project selection, design and construction, operation, agricultural production supports, etc.; (3) the organizational arrangements between the public agencies responsible for water development, water conveyance and sometimes allocation; (4) the interactions between these agencies and the irrigators; (5) the effectiveness of the irrigators in organizing for the construction, operation, maintenance, equitable allocation and use of the irrigation water supplies based on the water demands for optimal crop production below the point of main system control; and (6) the impact of main system operations and maintenance on irrigation water use.

The main systems study will involve field research and training at three to four international sites. During September, 1983, an interdisciplinary team originated the first case study at two sites in Northeast Thailand. Another case study is being implemented in Sri Lanka in cooperation with Cornell University. An interest in one of USAID medium irrigation projects in Maharashtra, India, has also been noted. These projects will involve integrated efforts by USAID, WMSII and host country agencies and personnel. Three general objectives are being pursued.

- (1) To develop and verify computer simulation programs for application in evaluating design, management and rehabilitation alternatives using operations data from host country case study sites;
- (2) To implement the models as system controller aids at the sites and modify as needed to incorporate local infrastructure and personnel assignments; and
- (3) To utilize the programs and operational experience as training systems for the governmental irrigation departments, particularly the Operation and Maintenance Divisions.

In order to fully achieve the objectives of this study,, an interdisciplinary workshop will be held in 1984 to assess the project's rationale and underlying assumptions. Thus, it is hoped that an interdisciplinary thought will guide the project outcome to a more effective tool for main system engineering and management.

C. COLORADO STATE UNIVERSITY: TRAINING STRATEGIES

Training in water management continues to be an emphasis of WMSII. During the first quarter of FY-84 Colorado State University has been developing a training strategy for both current and future training activities. The strategy involves integrating the workshops that are either currently offered or those that are proposed at CSU into an appropriate program to meet the varied needs of different country or mission requests. A link with relevant training programs offered at the other lead universities, CID universities, and major training centers is being investigated.

Workshops that have been examined in special seminars during the first quarter include the diagnostic analysis, senior officials, DA trainers, and social/technical aspects of irrigation management workshops. Emphasis has been placed on identifying goals of each workshop and how those goals fit with overall project objectives, detailing the specific topics to be covered, investigating methods to be used to accomplish the objectives of the course, and examining the qualifications necessary for prospective trainers.

In addition, it is recognized that there are several key institutions that have been involved in training for improving the management of irrigation systems and on-farm application of irrigation water. An examination of these programs is underway to identify the effective training information, methods, and materials used by some of these key agencies. We are attempting to synthesize and build in those methods and information into our training programs.

Effort for the next few months in developing training strategies includes completion of the study of proposed training courses with a report to be prepared, giving a summary of each course, its objectives, content and methodology. The report will begin with CSU's synthesis of training and its application to the overall project goals. The result is seen as a better planned and developed training program in water management.

VI. COMMITTEES

Project management has identified various issues to be addressed via the committee system. The following information refers to the Publications Committee which is chaired by Dr. Dan Lattimore.

A. PUBLICATIONS COMMITTEE

The WMSII project publications committee was appointed on December 20, 1983 by Wayne Clyma, Managing Project Director. The Contractor Project Management Team reviewed and approved the membership and functions of the committee at the December PMT meeting. The committee appointed included Dan Lattimore, CSU as chairman; Norm Uphoff, Cornell; Humberto Yap, Utah State University; and L. Worth Fitzgerald, AID Washington. The committee was charged to bring a report at the next PMT meeting Feb. 20, 1984 in Washington D.C. The committee will meet Feb. 17 in Washington to prepare that report.

The following responsibilities were assigned the committee:

Committee Status and Membership Composition:

The Publications Committee is to be an ad hoc committee appointed to carry out the specific tasks outlined below. Membership will consist of the above persons representing Colorado State University, Cornell University, Utah State University and AID Washington. The AID representative shall serve as a resource person and not function for approval/disapproval of committee recommendations.

Procedural Guidelines:

The Committee should convene, either physically or by phone, as soon as possible to initiate its work and should conclude its study and review as soon as possible, submitting its findings and recommendations to Contractor Project Management Team (CPMT) for consideration and action. Dan Lattimore is designated to serve as Chairman and should take leadership in calling the Committee together.

General Scope of Work:

Review the specific need and role of publications within both the Technology Transfer Component of the project as well as with regard to the overall purpose and objectives of WMS II; and, recommend policies and operational guidelines with respect to type, number, style and format of publications to be produced, including those that primarily report and document the work of the project as well as those aimed at encouraging, facilitating and directly helping to bring about better water management practices, improved irrigation system performance and increased productivity and output from the world's irrigated agriculture.

These findings should be compared to the instructions/requirements regarding publications, set forth in the WMS II contract (DAN-4127-C-00-2086-00) and any areas of significant conflict or omission reconciled through modification in the actions/guidelines being proposed or suggested amendments to the current contract. These recommendations should then be submitted to the CPMT for review, approval and implementation.

Specific Objectives:

1. From an analysis of the stated objectives of the project, the overall operational strategy being adopted and the Committee's perceived role and need for publications within this framework, recommend a broad publication policy for WMS II, in terms of the role (in general) publications are to play, their linkage and relationship to the other broad, activity-areas (T.A., Training, Special Studies) as well as to (other) companion efforts within the Technology Transfer Component (Workshops, Conferences, etc.);

2. With the above as a basis and framework for policy formulation and analysis, recommend (in broad terms) the type and style of publications that will best meet project requirements, keeping in mind the audiences they are individually and collectively to serve, the specific and general needs they are to fulfill, and the particular purposes to be achieved by this component of the project.

3. Develop and recommend guidelines regarding the format and number as well as publication and distribution of WMS II documents, including a project logo or other identifying symbol/means of unifying and tying together the various and separate publications that will be generated by the three (or more) major-contributing universities. As a part of this process, review and assess the suitability/desirability of adopting/continuing the type, format and logo that has been used under the WMS I project.

4. Recommend procedures for internally reviewing/approving, printing and distributing project publications, including recognition and accommodation of AID regulations/requirements in this regard, to insure sufficient uniformity and compliance with the policies and guidelines eventually adopted.

VII. ROSTER UPDATE

One of the WMS II activities is the establishment of a human resource file or professional roster of persons interested in water management work. The lead university for this activity is Colorado State University.

In order to initiate the activity, a standard roster form was first developed. The form's purpose was to acquire relevant information in the areas of professional competence, education, U.S. work experience, overseas work experience, availability for overseas assignments, language competence, geographic preferences, as well as additional information. The form was then sent through AID and the Consortium for International Development systems. In addition, forms were sent to all persons who inquired about the project.

The solicited information was then stored on the microcomputer data base system for general usage by the project. Thus, the data is recorded, filed, retrievable, and able to be summarized. The information can be retrieved utilizing such variables as primary discipline, experience, languages, availability, as well as others.

As of December 31, 1988, approximately 186 persons were listed on the roster. A summary of entries is as follows:

Discipline: AGRONOMY

	<u>NUMBER ROSTERED</u>
Universities	
Bangladesh Agriculture Univ.	1
Colorado State University	8
Iowa State University	1
Metropolitan State Coll.	1
Oregon State University	3
University of Arizona	2
University of Idaho	1
University of Minn.	4
Government	1
Consulting Firm/Independent	<u>9</u>
Total Rostered	31

DIFFERENT TITLES

Agricultural Scientist - 1
Agronomist - 3
Assistant Professor - 1
Associate Professor - 2
Computer Advisor - 1
Consultant - 2
Director - 1
Ext. Specialist - 1
Head, Ag. & Ext. Educ. - 1
Professor & Director - 1
Professor & Head - 1
Professor - 8
Research Agronomist - 1
Research Associate - 1
Research Scientist - 1
Soil Scientist - 1
Senior Agronomist - 1
Team Leader - 1

PRIMARY DISCIPLINES

Agricultural Education - 1
Agricultural Ext. Education - 1
Agricultural Science - 1
Agronomy - 6
Agronomy, Soil & Water Mgmt. - 1
Crop & Soil Science - 1
Crop Physiology - 1
Crop Production - 1
Plant Nutrition - 1
Soils - 1
Soil & Water Management - 1
Soil & Water Science - 1
Soil Biochemistry - 1
Soil Microbiology - 1
Soil Physical Chemistry - 1
Soil Physics - 1
Soil Science - 8
Vegetable Production - 1
Weed Science - 1

TERMINAL ACADEMIC DEGREE

Ph.D. - 26
M.S. - 4
B.S. - 1

Discipline: ECONOMICS

NUMBER
ROSTERED

Universities

Cal State Poly Univ.	1
Clemson University	1
Colorado State University	7
Cornell University	1
Delhi University	1
Oregon State University	1
Penn State University	1
South Dakota State University	1
University of Arizona	1
University of Hawaii	2
University of Idaho	2
University of Minn.	5
University of Wisconsin	1
University of Wyoming	2

Government 1

Consulting Firm/Independent 6

Total Rostered 34

DIFFERENT TITLES

Administrative Manager - 1
Agricultural Economist - 2
Assistant Professor - 2
Assistant Specialist - 1
Associate Professor - 4
Consultant & Manager - 1
Consultant - 1
Doctoral Candidate - 1
Economist - 1
Ext. Water Resources Specialist - 1
GRA - 2
Professor - 14
Research Associate - 2
Research Officer - 1

PRIMARY DISCIPLINES

Agricultural & Resource Economics - 4
Agricultural Economics - 19
Agricultural Production Economics - 1
Business Administration/Legal Offices - 1
Economics - 1
Farm Management - 1
Farming Systems - 1
Regional Planning - 1
Resource Economics - 2
Socioeconomic Impact Analysis - 1
Urban & Regional Planning - 1
Water Resource Development - 1

TERMINAL ACADEMIC DEGREE

Ph.D. - 23
M.S. - 9
On.D. - 1
B.S. - 1

Discipline: ENGINEERING

	<u>NUMBER ROSTERED</u>
<u>Universities</u>	
Auburn University	1
Bangladesh Agriculture Univ.	1
Colorado State Univ.	18
Cornell University	1
K.U. Leuven University	1
Michigan State Univ.	1
Oregon State University	1
Rutgers University	1
Texas Tech University	1
Univ. of Moratuwa	1
University of Arizona	2
University of Arkansas	2
University of Idaho	6
University of Minn.	3
University of Texas	1
University of Wyoming	3
Consulting Firm/Independent	22
Government	<u>5</u>
Total Rostered	71

DIFFERENT TITLES

Agricultural Engineer - 2
 Assistant Chief - 1
 Assistant Professor - 7
 Assistant Res. Prof. - 1
 Assoc. Professor - 6
 Budget Analyst - 1
 Civil Engineer - 1
 Consultant - 4
 Consulting Engineer - 1
 Director - 1
 Extension Ag. Engr. - 1
 Geotech & Materials Engr. - 1
 GRA - 4
 Head, Hydrology - 1
 Hydrologist - 1
 Instructor - 1
 Lecturer - 2
 President - 1
 Professor - 12
 Prof. & Extension Engr. - 1
 Professional Hydrologist - 1
 Professor & Director - 1
 Project Engineer - 1
 Project Manager - 1
 Researcher II - 1
 Res. Leader-Ag. Engr. - 1
 Research Assistant - 2
 Research Associate - 5
 Sr. Engineer - 1

PRIMARY DISCIPLINES

Agricultural & Irrig. Engr. - 3
 Agricultural Engr. - 16
 Civil & Ag. Engr. - 1
 Civil Engr. - 5
 Economic Development - 1
 Engineering - 1
 Engineering Construction - 1
 Engineering-Econ. Planning - 1
 Environmental Engr. - 2
 Geotech. & Materials Engr. - 1
 Groundwater Hydrology - 1
 Hydraulics & Water Resources - 4
 Hydrology - 1
 Irrigation - 1
 Irrigation & Drainage - 2
 Irrigation & Waste Resource Engr. - 1
 Irrigation & Water Management - 3
 Irrigation Engr. & Agri. Mgmt. - 1
 Irrigation Engr. - 4
 Irrigation Equipment - 1
 Irrigation/Open Channel Flow - 1
 Mechanical Engr. - 1
 On-Farm Water Mgmt. - 2
 Soil & Water Conservation - 1
 Soil & Water Engr. - 3
 Structural Evaluation & Design - 1
 Water Management - 2
 Water Quality Management - 1
 Water Resources Development - 1

Supervisor - 1	Water Resources Management - 1
Trng. Res. & Investment Manager - 1	Water Resources Planning - 1
Vice President - 1	Water Resources - 2
No titles - 4	Water Resources/Hydrology - 1
	Water System Engr. - 1
	Watershed Management - 1

TERMINAL ACADEMIC DEGREE

Ph.D.	- 29
M.S.	- 23
M.E.	- 1
B.S.	- 8

Discipline: SOCIOLOGY AND OTHERS

	<u>NUMBER ROSTERED</u>
Universities	
Aquinas College	1
Cal St. Poly. University	1
California State University	1
Colorado State University	7
Cornell University	2
Rural Dev. Academy Bangladesh	1
Staples Tech. Institute	1
University of Arizona	3
University of Cincinnati	1
University of Denver	1
University of Idaho	1
University of Minn.	8
University of Penn.	2
Yale University	1
Government	3
Consulting Firm/Independent	<u>14</u>
Total Rostered	50

DIFFERENT TITLES

Adjunct Professor - 1
Assoc. Professor - 6
Associate - 1
Asst. Professor - 3
Comm. Dev. Specialist - 1
Consultant - 2
Director - 1
Geologist - 1
GRA - 1
GTA - 1
Hydrologist - 1
Instructor - 1
President - 1
Professor & Acting Director - 1
Professor - 8
Program Director - 1
Research Affiliate - 1
Research Associate - 3
Sociologist - 2
No title - 3

TERMINAL ACADEMIC DEGREE

Ph.D. - 25	D. Ed - 1
M.S. - 4	B.S. - 2
M.A. - 6	B.A. - 2

PRIMARY DISCIPLINES

Administration - 1
Anthropology - 6
Anthropology/Rural Sociology - 3
Applied Anthropology - 1
Applied Social Science - 1
Community Dev./Organ. - 1
Development Sociology - 4
Farm Management - 1
Forestry & Remote Sensing - 1
Geography - 3
Geology - 1
Irrigation/Agricultural - 2
Journalism - 2
Limnology-Water Aud. - 1
Mass Communication - 3
Political Science - 1
Range & Forest Watershed Mgmt. - 1
Silviculture - 1
Social Anthropology - 1
Social Policy Research - 1
Sociology - 6
Soil & Water Conservation - 1
Technical Journalism - 1
Third World Ag. Development - 1
Urban & Regional Planning - 1
Water Resources - 2
Watershed Management - 2

VIII. FINANCIAL SUMMARY REPORT

Consortium for International Development

Water Management Synthesis II

Project Expenditure by University

Cumulative to Date as of December 31, 1983

Fiscal Year 1983 Activities

	Colorado State University	Utah State University	Cornell University	Consortium for International Development	Total Costs
<u>DIRECT COSTS:</u>					
Salaries and Benefits	\$ 673,627	\$373,435	\$226,189	\$ -0-	\$1,273,251
Travel and Per Diem	185,758	127,331	78,950	40,665	432,704
Other Direct Costs	134,900	142,878	53,708	109,283	440,769
Equipment	33,589	34,916	-0-	-0-	68,505
Total Direct Costs	<u>1,027,874</u>	<u>678,560</u>	<u>358,847</u>	<u>149,948</u>	<u>2,215,229</u>
<u>INDIRECT COSTS:</u>					
University	325,534	225,275	153,203	5,248	709,260
CID G&A & DBA	102,365	69,502	35,526	14,542	221,935
Total Indirect Costs	<u>427,899</u>	<u>294,777</u>	<u>188,729</u>	<u>19,790</u>	<u>931,195</u>
TOTAL DIRECT COSTS	<u>\$1,455,773</u>	<u>\$973,337</u>	<u>\$547,576</u>	<u>\$169,738</u>	<u>\$3,146,424</u>

Consortium for International Development

Water Management Synthesis II

Project Expenditure by University

Cumulative to Date as of December 31, 1983

Fiscal Year 1984 Activities

	Colorado State University	Utah State University	Cornell University	Consortium for International Development	Total Costs
<u>DIRECT COSTS:</u>					
Salaries and Benefits	\$ 83,789	\$25,970	\$57,911	\$ -0-	\$167,670
Travel and Per Diem	1,958	20,543	3,658	6,276	32,435
Other Direct Costs	7,119	15,798	5,082	22,548	50,547
Equipment	646	1,598	545	-0-	2,789
Total Direct Costs	93,512	63,909	67,196	28,824	253,441
<u>INDIRECT COSTS:</u>					
University	32,170	21,670	25,129	-0-	78,969
CID G&A & DBA	9,306	7,008	6,598	2,854	25,766
Total Indirect Costs	41,476	28,678	31,727	2,854	104,735
TOTAL DIRECT COSTS	\$134,988	\$92,587	\$98,923	\$31,678	\$358,176

Consortium for International Development

Water Management Synthesis II

Summary Financial Report with Budget Comparison

For the Period October 1, 1983 through December 31, 1983

Fiscal Year 1983 Activities

	Total FY 1983 Work Plan Budget	Current Qtr. Period Expenditures	Cumulative Expenditures Inception to Date	Unexpended Balance	Percent of Budget Unexpended
<u>DIRECT COSTS:</u>					
Salaries and Benefits	\$1,447,419	\$220,738	\$1,273,251	\$174,168	12%
Travel and Per Diem	718,554	93,228	432,704	285,850	40%
Other Direct Costs	412,514	78,319	440,769	(28,255)	(7%)
Equipment	82,352	41,023	68,505	13,847	17%
Total Direct Costs	2,660,839	433,308	2,215,229	445,610	17%
<u>INDIRECT COSTS:</u>					
University	904,341	131,995	709,260	195,081	22%
CID G&A & DBA	323,255	40,816	221,935	101,320	31%
Total Indirect Costs	1,227,596	172,811	931,195	296,401	24%
TOTAL PROJECT COSTS	\$3,888,435	\$606,119	\$3,146,424	\$742,011	19%

Consortium for International Development

Water Management Synthesis II

Summary Financial Report with Budget Comparison

For the Period October 1, 1983 through December 31, 1983

Fiscal Year 1984 Activities

	Total FY 1983 Work Plan Budget	Current Qtr. Period Expenditures	Cumulative Expenditures Inception to Date	Unexpended Balance	Percent of Budget Unexpended
<u>DIRECT COSTS:</u>					
Salaries and Benefits	\$1,907,905	\$167,670	\$167,670	\$1,740,235	91%
Travel and Per Diem	712,140	32,435	32,435	679,705	92%
Other Direct Costs	600,053	50,547	50,547	549,506	92%
Equipment	25,300	2,789	2,789	22,511	89%
Total Direct Costs	3,245,398	253,441	253,441	2,991,957	92%
<u>INDIRECT COSTS:</u>					
University	984,225	78,969	78,969	905,256	92%
CID G&A & DBA	319,908	25,766	25,766	294,142	92%
Total Indirect Costs	1,304,133	104,735	104,735	1,199,398	92%
TOTAL PROJECT COSTS	\$4,549,531	\$358,176	\$358,176	\$4,191,355	92%

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT

WATER MANAGEMENT SYNTHESIS II

FISCAL YEAR 1983 ACTIVITIES

SUMMARY BY ACTIVITY

CUMULATIVE AS OF DECEMBER 31, 1983

<u>ACTIVITY</u>	<u>CODE</u>	<u>UNIV.</u>	<u>BUDGET</u>	<u>EXPENSES</u>	<u>BUDGET BALANCE</u>
ADMINISTRATION					
Worldwide					
Overall Administration	0-01-999-83	Overall	\$ 145,937	\$ 139,428	\$ 6,509
CU Administration	0-02-996-83	CU	222,672	169,645	53,027
USU Administration	0-02-997-83	USU	243,710	212,802	30,908
CSU Administration	0-02-998-83	CSU	281,382	278,490	2,892
CID Administration		CID	-0-	3,071	- 3,071
TOTAL ADMINISTRATION			<u>893,701</u>	<u>803,436</u>	<u>90,265</u>
TECHNICAL ASSISTANCE					
Bangladesh					
BAU Collaboration Team	1-03-030-82	CSU	84,243	51,216	33,027
Consultant, Legal	1-03-029-82	CSU	19,185	14,671	4,514
Identify RI Needs	1-03-028-82	CU	-0-	17,167	- 17,167
Scope of Work	1-02-006-82	CSU	26,749	16,222	10,527
Water Mgmt Systems	1-02-015-82A	CU	143,692	79,190	64,502
Water Mgmt. Systems	1-02-015-82B	CID	10,595	10,595	-0-
China					
Bell's Study Tour	1-02-038-83	CID	3,297	2,379	918
Dominican Republic					
Project Paper (OFWM)	1-02-009-83	USU	93,755	87,713	6,042
Project PID	1-02-010-82	USU	22,851	26,556	- 3,705
Haiti					
Irrig. Project Evaluation	1-02-039-83	USU	23,867	25,275	- 1,408
India					
Clyma's TDY	1-02-035-83	CSU	3,039	2,897	142
DA Workshop Planning	1-02-044-83	CSU	28,149	34,572	- 6,423
Development of Solutions	1-02-024-82A	CSU	59,731	59,141	590
Development of Solutions	1-02-024-82B	CID	4,205	4,205	-0-
Evans Project Preparation	1-02-033-83	CSU	14,560	12,603	1,957
Hill Area Land & Water Dev.	1-02-013-83A	CU	138,991	48,196	90,795
Hill Area Land & Water Dev.	1-02-013-83B	USU	182	12,658	- 12,476
Hill Area Land & Water Dev.	1-02-013-83C	CID	1,776	1,776	-0-
Institutional Analysis	1-02-047-83	CU	32,647	-0-	32,647
Institutional Analysis	1-02-053-83	USU	26,725	-0-	26,725

<u>ACTIVITY</u>	<u>CODE</u>	<u>UNIV.</u>	<u>BUDGET</u>	<u>EXPENSES</u>	<u>BUDGET BALANCE</u>
Olsen TDY	1-02-037-83B	CID	\$ 108	\$ 108	\$ -0-
Olson's TDY	1-02-037-83A	USU	21,295	12,251	9,044
Water Mgmt. & Training	1-02-020-82A	CSU	27,991	16,901	11,090
Water Mgmt. & Training	1-02-020-82B	CSU	20,336	24,402	- 4,066
WM & Training	1-02-014-83A	CID	12,199	11,511	688
WM & Training	1-02-014-83B	CID	12,199	12,199	-0-
Indonesia					
Oad's TDY	1-02-030-83	CSU	14,408	16,865	- 2,457
Jordan					
Review of Curriculum	1-02-041-82	USU	12,161	9,912	2,249
Mali					
OFWM Specialist	1-02-006-83	USU	20,698	16,445	4,253
Pakistan					
Clyma's TDY	1-02-031-83	CSU	9,117	8,182	935
Mayfield's TDY	1-02-040-83	USU	15,666	15,505	161
WM (CWM) Meeting	1-02-029-83A	USU	2,466	-0-	2,466
WM (CWM) Meeting	1-02-029-83B	CSU	9,931	3,168	6,763
Peru					
Special Study	1-04-027-82A	USU	85,512	58,638	26,874
Special Study	1-04-027-82B	CID	8,243	8,243	-0-
Sri Lanka					
Various TDY's	1-02-008-82	CU	93,174	59,955	33,219
Thailand					
Equipment Engineer	1-02-005-82	CID	31,107	32,012	- 905
Worldwide					
Water Resource Econ.	1-02-042-83	CSU	19,703	18,435	1,268
WID - Tucson Trip		CSU	-0-	985	- 985
TOTAL TECHNICAL ASSISTANCE			<u>1,154,553</u>	<u>832,749</u>	<u>321,804</u>
TRAINING & TECHNOLOGY TRANSFER					
Bangladesh					
DA Workshop	2-02-007-82A	CSU	187,088	202,573	- 15,485
DA Workshop	2-02-007-82B	CID	32,086	32,086	-0-
Ecuador					
Equivar Video	2-03-054-83	USU	204,837	230,125	- 25,288

<u>ACTIVITY</u>	<u>CODE</u>	<u>UNIV.</u>	<u>BUDGET</u>	<u>EXPENSES</u>	<u>BUDGET BALANCE</u>
India					
Measurement for Sys. Mgmt.	2-07-026-82A	CSU	\$ 12,758	\$ 12,942	\$- 184
Measurement for Sys. Mgmt.	2-07-026-82B	CID	4,382	4,382	-0-
Senior Officials	2-04-007-83	USU	-0-	1,054	- 1,054
Watercourse Handbooks	2-13-025-82	CSU	15,188	17,075	- 1,887
Nepal					
Small-Scale Systems	2-14-050-83	CU	41,774	37,531	4,243
Philippines					
Video Production	2-03-049-83	CU	8,122	-0-	8,122
Video Production	2-03-049-83	CID	-0-	2,950	- 2,950
Sri Lanka					
DA Workshop	2-02-028-83	CSU	113,739	113,181	558
DA Workshop - WID	2-02-034-83	CSU	16,154	16,410	- 256
Video Production	2-03-048-83	CU	8,122	-0-	8,122
Thailand					
Improving Allocations	2-14-062-83	CID	44,250	44,221	29
Worldwide					
Brochures; Newsletters; Pub	2-12-018-83	CSU	8,435	3,297	5,138
Computer Applications	2-10-022-83	CSU	70,020	73,058	- 3,038
FAO/AID Workshop Planning	2-14-064-83	CU	2,626	4,378	- 1,752
Increasing WM Cap.	2-11-020-83	CSU	29,857	9,754	20,103
Increasing WM Cap.	2-11-020-83B	USU	18,237	18,237	-0-
Increasing WM Cap.	2-11-020-83C	CU	9,475	8,793	682
Short-Term Non-Degree	2-08-056-83	USU	37,909	35,645	2,264
Start-up Workshop	2-14-051-83	CU	15,150	5,502	9,648
Start-up Workshop	2-14-055-83	USU	22,228	15,159	7,069
Survey & Strat. for Training	2-09-019-83	CSU	34,267	40,999	- 6,732
Videotape Modules	2-03-021-83	CSU	90,755	69,886	20,869
Workshop (Tech. & Soc. Asp)	2-04-023-83	CSU	61,398	70,547	- 9,149
TOTAL TRAINING & TECHNOLOGY TRANSFER			<u>1,088,857</u>	<u>1,069,785</u>	<u>19,072</u>
SPECIAL STUDIES					
Africa					
Dev. of Social Parameters	3-04-057-83	USU	67,039	55,656	11,383
Worldwide					
Action Research	3-04-060-83	USU	82,384	6,609	75,775
Communication of Tech. Tran.	3-04-024-83	CSU	52,783	46,191	6,592

<u>ACTIVITY</u>	<u>CODE</u>	<u>UNIV.</u>	<u>BUDGET</u>	<u>EXPENSES</u>	<u>BUDGET BALANCE</u>
DA Evaluation	3-04-063-83	CID	\$ 7,163	\$ -0-	\$ 7,163
Development of Handbook	3- - -	USU	-0-	4,712	- 4,712
Farmer Participation Exp.	3-04-046-83	CU	80,018	18,656	61,362
Irrig. Systems Management	3-04-025-83	CSU	156,507	89,374	67,133
Main System Management	3-04-059-83A	USU	64,521	87,466	-22,945
Main System Management	3-04-059-83B	CSU	14,716	13,297	1,419
Monitoring Projects	3-04-061-83	USU	18,350	-0-	18,350
On-Farm Irrig. Sys. Sel.	3-04-058-83	USU	47,146	16,514	30,632
Small-Scale Irrigation	3-04-045-83B	CSU	3,416	3,416	-0-
Small-Scale Irrigation	3-04-045-83B	CU	157,281	98,563	58,718
TOTAL SPECIAL STUDIES			<u>751,324</u>	<u>440,454</u>	<u>310,870</u>
TOTAL FY-83 ACTIVITIES			<u>\$3,888,435</u>	<u>\$3,146,424</u>	<u>\$742,011</u>

CONSORTIUM FOR INTERNATIONAL DEVELOPMENT
 WATER MANAGEMENT SYNTHESIS II
 FISCAL YEAR 1984 ACTIVITIES
 SUMMARY BY ACTIVITY
 CUMULATIVE AS OF DECEMBER 31, 1983

<u>ACTIVITY</u>	<u>CODE</u>	<u>UNIV.</u>	<u>BUDGET</u>	<u>EXPENSES</u>	<u>BUDGET BALANCE</u>
ADMINISTRATION					
Worldwide					
CSU Administration	0-02-998-84	CSU	\$ 237,618	\$ 49,839	\$187,779
Overall Administration	0-01-999-84	Overall	164,104	31,291	132,813
USU Administration	0-02-997-84	USU	230,911	45,010	185,901
CU Administration	0-02-996-84	CU	201,270	14,640	186,630
TOTAL ADMINISTRATION			<u>833,903</u>	<u>140,780</u>	<u>693,123</u>
TECHNICAL ASSISTANCE					
Bangladesh					
Water Mgmt. Sys. Proj. Pap.	1-02-072-84	CU	20,719	15,243	5,476
Burma					
Wakema Pump Scheme Study	1-02-036-84	CU	43,022	-0-	43,022
Haiti					
Irrigation Sector Survey	1-04-017-84	USU	68,072	-0-	68,072
India					
Hill Irrig. Proj. Prep. II	1-02-074-84	CU	61,218	16,523	44,695
Hill Irrig. Proj. Prep. II	1-02-074-84	CID	-0-	3,628	- 3,628
Madya Pradesh Minor Irrig.	1-02-023-84	USU	174,989	-0-	174,989
Madya Pradesh Socio-Tech	1-01-025-84	USU	226,229	952	225,277
Madya Pradesh Socio-Tech	1-01-025-84	CID	-0-	1,634	- 1,634
Maharashtra Irrig. T & M	1-02-021-84	USU	226,229	952	225,277
Maharashtra Irrig. T & M	1-02-021-84	CID	-0-	1,634	- 1,634
Maharashtra Minor Irrig.	1-02-018-84	USU	152,960	15,830	137,130
Maharashtra Minor Irrig.	1-02-018-84	CID	-0-	15,825	-15,825
Rajasthan MIP	1-02-027-84	CSU	100,000	-0-	100,000
Rajasthan MIP-CAD Modified	1-02-026-84	CSU	109,385	-0-	109,385
Stutler	1- - -84	USU	-0-	8,229	- 8,229
Indonesia					
Long-Term Water Mgmt. Spec.	1-01-008-84	CSU	130,113	-0-	130,113
Small-Scale Irrig. & Mgmt.	1-02-011-84	CU	54,468	-0-	54,468

<u>ACTIVITY</u>	<u>CODE</u>	<u>UNIV.</u>	<u>BUDGET</u>	<u>EXPENSES</u>	<u>BUDGET BALANCE</u>
Jordan					
Irrigation Sector Study	1-04-013-84	USU	\$ 31,429	\$ -0-	\$ 31,429
Se. On-Farm WM Advisor	1-02-014-84	USU	4,767	-0-	4,767
Kenya					
Irrigation Sector Study	1-04-002-84	CU	23,191	-0-	23,191
Peru					
Expansion of Irrigation Sys.	1-02-035-84	USU	35,157	-0-	35,157
Expansion of Irrigation Sys.	1-02-035-84	CID	-0-	8,955	- 8,955
Senegal					
Bakel Small Irrig. Perimeter	1-02-033-84	USU	56,681	-0-	56,681
Sri Lanka					
Farmer Organization Project	1-02-007-84	CU	64,466	-0-	64,466
Water Mgmt. Central Support	1-01-022-84	CSU	139,789	-0-	139,789
Tanzania					
Tanzania Irrig. Study	1-02-082-84	USU	12,567	-0-	12,567
TOTAL TECHNICAL ASSISTANCE			<u>1,735,451</u>	<u>89,405</u>	<u>1,646,046</u>

TRAINING & TECHNOLOGY TRANSFER

Ecuador					
Finishing Orig. Trng. Mod.	2-03-054-84	USU	80,088	-0-	80,088
Instructional Manual	2-03-055-84	USU	23,788	-0-	23,788
India					
DA Workshop Madya Pradesh	2-02-031-84	CSU	135,470	8,516	126,954
DA Workshop - WID	2-02-090-84	CSU	-0-	381	- 381
Senior Officer's Workshop	2-04-053-84	USU	74,360	-0-	74,360
Indonesia					
DA Workshop	2-02-010-84	CSU	176,756	2,055	174,701
Jordan					
Training Course	2-01-015-84	USU	26,514	-0-	26,514
Nepal					
DA Workshop Planning	2-02-003-84	CSU	12,286	-0-	12,286
Pakistan					
Senior Officer's Workshop	2-04-019-84	CSU	49,946	4,899	45,047
Sri Lanka					
DA Workshop	2-02-006-84	CSU	75,582	-0-	75,582

<u>ACTIVITY</u>	<u>CODE</u>	<u>UNIV.</u>	<u>BUDGET</u>	<u>EXPENSES</u>	<u>BUDGET BALANCE</u>
Worldwide					
AID/FAO Expert Consul WM	2-14-067-84	CU	\$ 9,228	\$ -0-	\$ 9,228
Brochures; Newsletters; Pub Conference	2-12-044-84	CSU	39,976	1,870	38,106
	2-14-058-84	USU	18,623	2,784	15,839
Current Research Seminar	2-14-075-84	CU	44,831	-0-	44,831
DA Trainers Workshop	2-08-040-84	CSU	29,736	4,899	24,837
Farmer Participation Wksp.	2-14-066-84	CU	36,193	-0-	36,193
French Language Training	2-11-059-84	USU	10,650	437	10,213
Increasing WM Cap.	2-11-039-84	CSU	9,288	105	9,183
Increasing WM Cap.	2-11-081-84	Overall	20,847	-0-	20,847
Increasing WM Cap. Intern	2-11-037-84	CSU	52,422	4,748	47,674
Instructors Guide DA Work.	2-13-042-84	CSU	24,881	11,022	13,859
Irrig. Sys. Mgmt. Task Force	2-14-060-84A	USU	44,284	-0-	44,284
Irrig. Sys. Mgmt. Task Force	2-14-060-84B	CSU	-0-	7,788	- 7,788
Main Sys. Mgmt. Task Force	2-06-077-84	CU	7,552	-0-	7,552
Microcomputer Applications	2-10-051-84	CSU	62,615	5,558	57,057
Professional Visitors	2-11-068-84	CU	9,673	-0-	9,673
Small-Scale Task Force	2-14-065-84	CU	20,741	-0-	20,741
Survey & Strat. for Training	2-09-049-84	CSU	27,379	39	27,340
Workshop (Tech. & Soc. Asp)	2-04-050-84	CSU	45,000	5	44,995
Workshop on Design Small Sc.	2-14-064-84	CU	47,163	17,411	29,752
TOTAL TRAINING & TECHNOLOGY TRANSFER			<u>1,215,872</u>	<u>72,517</u>	<u>1,143,355</u>
SPECIAL STUDIES					
India					
Irrig. Proj. Monitoring	3-04-020-84	USU	46,496	-0-	46,496
Worldwide					
Interdisp. Irr. Sys. Sel.	3-04-062-84	USU	62,430	2,191	60,239
Interfacing Farm & Mgmt.	3-04-045-84	CSU	223,239	1,973	221,266
Main Sys. Design, Mgmt., Rehab.	3-04-061-84	USU	221,424	16,202	205,222
Projected Special Studies	3-04-071-84	CU	187,312	-0-	187,312
Domestic-Part. Completion		CU	-0-	3,353	- 3,353
Domestic-Mgmt. Inte.		CU	-0-	855	- 855
Small-Scale Irrigation	3-04-069-84	CU	23,404	30,900	- 7,496
TOTAL SPECIAL STUDIES			<u>764,305</u>	<u>55,474</u>	<u>708,831</u>
TOTAL FY-84 ACTIVITIES			<u>\$4,549,531</u>	<u>\$358,176</u>	<u>\$4,191,355</u>