

CLASSIFICATION
 PROJECT EVALUATION SUMMARY (PES) - PART I

1. PROJECT TITLE Synthesis of Water Management Improvement Processes.			2. PROJECT NUMBER 931-1007	3. MISSION/AID/W OFFICE DS/AGR/RNR
5. KEY PROJECT IMPLEMENTATION DATES			4. EVALUATION NUMBER (Error the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) <u>81-26</u> <u>6/5/81</u>	
A. First PRO-AG or Equivalent FY <u>78</u>	B. Final Obligation Expected FY <u>80</u>	C. Final Input Delivery FY <u>80</u>	6. ESTIMATED PROJECT FUNDING A. Total \$ <u>1,969,000</u> B. U.S. \$ <u>1,969,000</u>	
			7. PERIOD COVERED BY EVALUATION From (month/yr.) <u>Sept. 1978</u> To (month/yr.) <u>Jan. 1981</u> Date of Evaluation Review <u>Dec. 9-11, 1980</u>	

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. LIST DECISIONS AND/OR UNRESOLVED ISSUES; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., program, SPAR, PIC, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
1. Hold planning meeting.	Corey	4/15/81
2. Clearly and concisely define project related terms.	Clyma Corey	5/1/81
3. Prepare a revised work plan and schedule for completion of project.	Clyma Keller	6/1/81
4. Increase number of technical people involved.	Clyma Keller	8/1/81
5. Schedule field studies and training course in Africa	Corey	7/1/81
6. Extend contract w/o funding for 18 mos.	Corey	8/1/81
7. Schedule next review.	Corey	4/1/82
8. Initiate Project Paper preparation for a continuation of the project beyond present scope of work (to include consideration of Evaluation Teams' recommendations on Project Scope and greater involvement in Africa).	Corey	6/1/81

BEST AVAILABLE DOCUMENT

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS			10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT	
<input type="checkbox"/> Project Paper	<input type="checkbox"/> Implementation Plan e.g., CPI Network	<input checked="" type="checkbox"/> Other (Specify) PAF & Action Memo	A. <input type="checkbox"/> Continue Project Without Change	
<input type="checkbox"/> Financial Plan	<input checked="" type="checkbox"/> PIO/T	<input type="checkbox"/> Other (Specify)	B. <input type="checkbox"/> Change Project Design and/or	
<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIC/C		<input type="checkbox"/> Change Implementation Plan	
<input type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P		C. <input type="checkbox"/> Discontinue Project	
11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)			12. Mission/AID/W Office Director Approval	
DS/AGR/RNR: GCorey <u>AGC</u> DS/AGR/RNR: CSimkins <u>CS</u> DS/AGR: MZozynski <u>MZ</u> 4/28/81			Signature <u>Bernard Chapnick</u> Typed Name AA/DS, Bernard Chapnick (Acting) Date <u>6/5/81</u>	
DS/AGR: KMcDermott <u>KM</u> DS/AGR: RHughes <u>RH</u> DS/PO: ASilver <u>AS</u>				

13. SUMMARY

The project entitled "Synthesis of Water Management Improvement Processes" was initiated in September 1978 as a 3-year project. It is a service/support project which calls for development and refinement of six activities.

1. Project Analysis - a document review of all AID irrigation related projects and a field review of selected ones. Also selected World Bank projects will be reviewed.
2. Traditional Methods Analysis - description and analysis of three types of irrigation systems in operation in LDCs.
3. Training Course - development of a training course in the diagnostic analyses of farm irrigation systems.
4. Handbooks - preparation of at least 3 practical handbooks.
5. Workshops - Regional to present results of project to LDC technicians.
6. Technical Assistance - limited amount provided to Missions on request.

The project is making reasonable progress toward achieving its purpose; however, it is behind schedule for various legitimate reasons. It must be pointed out that, at this point in time, it appears that the quality of the outputs will be excellent.

The project will need an 18 month unfunded extension because:

1. The principal investigators did not have funding available to them until 6 months after the contract was signed.
2. The Asian survey essentially removed the project co-leaders from other project activities for a 2-month period.
3. Scheduling the training course in India took 18 months due to an unusually long time to get government clearance and when it did come it was necessary to wait 6 more months so that the course could be taught during the peak irrigation season.
4. The exposure of the project to Missions and other donors has created an unexpected demand for the services of project personnel. Meeting these demands takes time away from this project even though the experience gained is very positive for the Service.
5. The project planning was simply unrealistic regarding timing. To expect to accomplish all the requested activities, which involve gathering data in several LDC locations, in 3 years was unreasonable. This is especially so when one considers that clearances and host country cooperators must first be arranged for.

The contractor has been very prudent with expenditures and AID is getting good service for funds expended. The problem in not meeting the contract termination date results from the AID Manager and project co-leaders insistence on quality products. In other words, the products cannot be produced by someone without experience regardless of the amount of money available.

In this regard, the Review Team recommended that project personnel should increase the number of personnel who are directly involved in the project.

The Team also suggested that the project is getting good extension through newsletters, the training course, and other published outputs. For this reason, the workshops should be cancelled. Project personnel should use existing international meetings and seminars to advertise project output.

In summary, the project is developing quality products and personnel are gaining valuable experience and exposure; however, there was insufficient time allotted to accomplish the results at the quality level desired.

14. EVALUATION METHODOLOGY

The purpose of the evaluation was to (1) evaluate progress toward the specified outputs, (2) determine impact on AID's irrigation programs, (3) provide suggestions for project improvement, and (4) to provide recommendations regarding the future direction and scope of the project.

The review panel included Dr. Douglas Caton, PPC/AID, Panel Leader; Mr. Art Handely, ASIA/AID; and Dr. Marvin Jensen, USDA/Research. Dr. Caton, Agricultural Economist, is Chief of Rural Development Division in PPC; Mr. Handely is Director of the Office of Pakistan, Nepal and Sri Lanka Affairs, and Dr. Jensen is an Irrigation Engineer directing the USDA program in irrigation water management research. Dr. Coray, DS/AGR Project Manager, attended the review meetings.

The Team met with project contract personnel in Tucson, Arizona, at the Consortium for International Development's (CID) headquarters. Project co-leaders Dr. Wayne Clyma, Colorado State University and Dr. Jack Keller, Utah State University were the principal participants for the contractor, although several members of the CID headquarters staff were in attendance at various times during the review. The review was held over a two-day period, December 9-11, 1980.

Prior to the review, the Team was provided significant background documents including the Project Paper, RFP, Contractor's Proposal, Contract, Scope of Work, latest Work Plan, latest Progress Report and the previous Evaluation Report. The site visit involved oral reporting by the project co-leaders and discussions among the Panel Team and project personnel.

15. EXTERNAL FACTORS

The Asia Bureau, in June 1980, asked the Project Manager to do an irrigation review in selected Asian countries. This was needed as background to development of a Bureau strategy for irrigation investments in Asia over the next 10-15 years. The AID Project Manager and co-leaders determined that this was within the scope of the project and the reviews were completed in Pakistan, India, Bangladesh, Nepal and Thailand.

The Asian irrigation review took approximately two months' time from key project personnel. In that respect it could be viewed as delaying accomplishment of project outputs. Considering the pre-planning time and preparation of final reports it did in fact cause more than a two months' delay. However, the Review Team did not view the Asian survey as a distraction from project progress. "The experience gained in the survey, the data base obtained and the contacts made will readily work to the advantage of the project and will, over time, contribute materially to the project's progress." The materials produced (reports and analyses) will also serve as examples from which the other Regional Bureaus can judge the project and make decisions regarding similar surveys in their regions.

One project activity involved a thorough review of AID project documentation on past and present irrigation projects in order to extract from them technologies and techniques which might be readily transferable. This was not especially fruitful because the assumption that "AID project documentation is sufficiently informative to provide relevant information" was not totally correct. Securing complete project files on past projects was not usually possible. Therefore, this project activity was not as productive as anticipated in the Project Paper.

16. INPUTS

The financial inputs have created no problem. The project is fully funded and the obligated amount should be sufficient to complete the scope of work even though an extension of time is necessary.

As noted above, the AID project documents though available were not as complete or as helpful as anticipated. There was also considerable delay in gaining access to World Bank documents.

The Review Team was concerned that the project may be under-staffed. The project leadership is directly responsible for project implementation as well as conceptualization and both project leaders have other responsibilities at their respective universities. The Review Team also felt that the project leadership and the AID Project Manager were out of contact for extended periods of time leaving open the question of how much planning and/or conceptualization could really be done.

17. OUTPUTS

Reasonable progress on outputs has been made considering the factors which have caused delay. These are: (a) funding was not available to project implementors until six months after the contract was signed, (b) the Asian survey took at least 4 months' time from the project co-leaders and most importantly (c) this project is neither the usual research project nor the usual field support project. It requires conceptualization as it proceeds and learns from its own experience. At the outset, neither AID nor the contractor had experience to know how much time it would take to achieve specific outputs which would be useful and useable by field AID and host country personnel. This learning experience has taken longer than anticipated, with the result that the project will need an 18 month unfunded extension to fully complete the called for outputs.

Project outputs are presently proceeding at a good pace, however. The AID and World Bank project reviews are complete and the data have been compiled. Remaining is an analysis of the information and placing it in published form. The project calls for at least 3 handbooks. Presently four handbooks are in draft. A training course is to be developed and taught in at least two countries. Project personnel have just finished teaching the course in India. It took more than one year to gain approval from the Indian Government to teach the course. It will now be refined and revised based on this experience before it is taken to a second country, preferably in Africa.

Remaining outputs which have not been started include economics, labor and energy analyses of the various types of irrigation methods used in the LDCs. These outputs will naturally come near the end of the project because the data necessary to complete the analyses are dependent on finishing other outputs.

The technical assistance output is greater than anticipated. The Asian survey has created an awareness of the project in that region and there are far more requests for technical assistance than the project can meet. One TDY assignment has also been completed to Mauritania.

18. PURPOSE:

The log-frame stated purpose is "to develop a service to improve design, implementation, operation and evaluation of water management development projects."

The Review Team considered this objective to be commendable; however, not achievable in a short 3-year project. They indicated that this should be considered as a long term program, perhaps as long as 20 years.

However, there is progress toward the end of project status.

- Project personnel are providing technical assistance to AID, LDCs and other donors.
- A training course has been developed, needing now only to be refined and further tested.
- Training aids, handbooks, and analyses are being developed.
- The service (project personnel) are gaining experience in management of LDC irrigation systems.

The EOPS are still considered to be a good description of what should exist when the project is complete. However, as pointed out by the Review Team, the quality of the "service" could be greatly improved by taking a much longer and more comprehensive approach to the project.

There is concern regarding the development of a cadre of experienced qualified personnel to be the backbone of the service. To date only the project co-leaders and one or two other professionals have devoted major effort to the program. Some of the assistance has been on an ad-hoc basis with technicians who happened to be available. It is realized that demand for the service is variable and it is

impossible to maintain a cadre solely on an on-call basis. However, during the remainder of the project extra effort will be made to develop specific individuals who are willing to be involved in the project on a repeating basis.

19. GOAL/SUBGOAL

The stated project goal is "Increased agricultural production per unit of irrigation water." The subgoal is "Improved irrigation development projects."

Without question AID's Mission projects in irrigation are stressing more and more technologies which will improve water management. Much of this focus can be attributed not to this project but to the water management program AID funded in Pakistan during the 1970s. However, several of the same individuals who contributed to the Pakistan effort are involved with the Synthesis project.

The Asian survey conducted by Synthesis project teams was used as background material during the Asia Bureau Agriculture and Rural Development Conference held in January 1981. That conference recommended that one of the long term core programs for countries in the Asia Bureau should be: "Irrigation, particularly water management, training, and software." These are precisely the items the Synthesis project is designed to address. At this point in time there is no reason to believe that the project will not influence Mission programs in a very positive way. Certainly in Asia's case it already has.

20. BENEFICIARIES

The direct beneficiaries of the project are donor agencies and LDC governmental agencies involved with implementation of irrigation projects. The entire program is oriented toward servicing these agencies with experienced consultancies, training programs, and improved water management technologies. The ultimate beneficiaries are farmers living under LDC irrigation systems. When agricultural production per unit of irrigation water is increased water conservation, increased production, reduced production costs, increased farmer income, and reduction in the environmental hazards of waterlogging and salinity and water borne diseases are all realized.

Obviously the results of this project will be used in LDCs. Several of the outputs (technical assistance, the Asian survey, the training course) already have been used in LDCs.

21. UNPLANNED EFFECTS

There have been no special effects which require a change in project orientation or design. However, several factors have caused the need to provide more time to the contractor to accomplish the outputs. One of these could be considered an unplanned effect. The contacts (LDC governments and USAIDs) made by project staff have created a demand for their services. Sometimes these demands are outside the scope of the project. Even so, it affects rate of progress toward project related outputs because of the fact that only the experienced project staff can produce the quality of product demanded in the output. This effect is certainly not detrimental since increased experience only enhances the service; however, it does delay project completion.

22. LESSONS LEARNED

The major lesson learned from this project is that a service project which requires cooperation from non-project related institutions cannot readily be programmed on a pre-selected schedule. Also the project requires some conceptualization and revision of outputs along the way as experience is gained. The time needed to do this cannot be predicted or even controlled by project personnel. For example, scheduling the training course in India took almost 18 months; due, first, to the need to convince the host government of its merit and, second, awaiting the proper season when the course would be most meaningful.

Another lesson is that the experience gained in conducting a service project of this nature is valuable and it must be used to produce better final products; all of which adds time to the total effort.

In total, the project is about 18 months behind schedule even though a good job is being done in management of inputs and maintaining quality of outputs.

23. SPECIAL COMMENTS

Attachments:

Project Evaluation Report.

PD-AAE - 503 - B1

2

Review Report

DSB/AGR - Water Management Synthesis Project
(Consortium for International Development)

Tucson, Arizona, December 9-11, 1980

BEST AVAILABLE DOCUMENT

Douglas Caton, AID
Art Handley, AID
Marvin Jensen, USDA

Review Report

DSB/AGR - Water Management Synthesis Project (Colorado-Utah State Universities)

Tucson, Arizona, December 9-11, 1980

This review report is composed of four parts. Part I contains a statement of the project objectives and a synopsis of the project's progress. Part II is the team's evaluation of the conceptual framework of the project, the project design and project progress. Part III is the team's findings, observations and conclusions. Part IV contains two general recommendations.

I. Introduction

The primary objective of the water management synthesis project is to transfer knowledge and to improve scientific skills and institutional capacities to increase the efficiency and cost effectiveness of LDC on-farm irrigation systems. Partly this primary objective is a concern with determining technologies available and applicable to developing country irrigation programs and in part it is a concern with getting these technologies adapted for and adopted in each country.

The synthesis project embodies both technical assistance and research, with a good share of the technical assistance being training. The project format integrates farm water problem identification coupled with research and analysis on cost-effective methods of irrigation system improvement. Handbooks on specific aspects of management such as land leveling, and "how to do" manuals are being prepared in support of the training courses to supplement training materials on problem identification and irrigation systems improvement analysis.

The manpower resources and the knowledge required for effective irrigation development and management in the developing countries is enormous. Few LDCs have more than a fraction of the knowledge and skills which will be required. The United States has a large research establishment which is continuously developing new knowledge and irrigation technology. Foremost among these resources are Colorado State and Utah State Universities. In addition to their own extensive research capability and overseas experience in on-farm irrigation, they can draw upon the various additional resources of the U.S. research community as the need arises.

However, most U.S. based knowledge does not directly fit into developing countries and cannot, therefore, be transplanted without substantial additional research or technical assistance. To attempt this additional research or technical assistance entirely country by country is beyond the scope and funding of this project and, moreover, if the project were to be conducted on a country by country basis it would be counter-productive with respect to the immediate assistance needs of all countries.

Therefore, the aim of the synthesis project is the development of new and improved information and technologies applicable to conditions and irrigation management problems generally, thereby reducing the amount of country-by-country adaption necessary. Adaption is being attempted by means of area and regional on-farm irrigation problem identification and solution analysis. The aspect of the project addressed in area training courses which will be continuously up-dated throughout the course of the project.

The six project activities center on two main considerations; information transfer and skill improvement. It has long been recognized that the qualities and knowledge of a nation's people have an important influence on its prosperity and growth. As has been said by no less than Adam Smith, the prosperity of a nation is determined mainly "by the skill, dexterity, and judgement with which its labor is generally applied." The synthesis project rightly stresses, therefore, the management aspects of irrigation and the skill levels and knowledgeability of irrigation technicians. But while the project places proper emphasis on these factors, the scope of the project, e.g. on-farm water management while important in and of itself, may not be of sufficient scope, as presently formulated to effectively address important systems and other economic questions.

In this regard, to many, increased irrigation is one of the most effective ways to feed the world's growing population. Supplemental water underpins double and triple cropping and for a number of crops and for a number of places is necessary for any crop at all. These people believe that given water availability, water management (water control and water delivery according to crop demand) coordinated with "inputs" and appropriate cultural and harvesting practices is among the surest routes to meet rapidly growing demand for food. This is the technical view. From another point of view, irrigation creates a different, and new, decision-making environment.

Soil, water-logging, salinization, and even health problems are brought into the picture by water. Often, therefore, with poor management practices, the potential gains from irrigation are offset, or greatly reduced, by one or more of these elements. An introduction to the subject of irrigation may well place emphasis only on water management, however, from a more total view, on-farm water management is but one element of a larger decision package. While the on-farm water management factors are crucial, a focus is also needed on the economic potential of irrigation.

It follows that the opportunity for developing countries to achieve more rapid agricultural growth to increase and to make more secure their food supplies and to expand both on-farm and off-farm employment for rural people not only depends upon how well and how cost-effective irrigation water is developed and utilized, but also on whether it is economical. Economical production increases should be the long-run measure of irrigation's success or failure.

At the same time an economical-technical perspective of irrigation in LDCs must also be guided by the following criteria:

- an irrigation program exists, is being developed, or will be developed and U.S. assistance is requested;
- conceptual and/or technical problems exist for which the project internally, or by drawing upon additional resources and talents, has unique competence;
- the expectation is that problem resolution will have important economic and social benefit potentials such as yield increasing-cost reducing productivity, improving nutrition among low income groups, lowering food prices to consumers, increasing rural incomes, eliminating or reducing food imports, and/or expanding exports.
- builds upon LDC scientific and farmer experience and introduces applicable levels of technology in such a way that for an individual farm or an area new and improved technical and economic processes are implanted which are replicable in country and between countries;
- that improvement of irrigation is considered an integral part of AID's general effort to improve the lot of small commercial agriculture, encourage more equitable production, distribution and consumption of food.

Part I Project Objectives and Progress

A. Project Design

The main reference documents utilized for the purpose of this review were the project contracts, the project work plan, and the scope-of-work document prepared by the project manager. The main source of information on progress and problems encountered were the annual reports, the project manager's progress evaluations (in the form of project review summaries), and review discussions with the project co-leaders.

The synthesis project is viewed by the project manager as having been designed "to develop a service to improve design, implementation, operation and evaluation of irrigation water management programs in LDCs." The review brought out that the single most important objective or main

purpose of the project is to improve water management "on-farms" in LDCs. On-farm water management is considered by the project manager and the project co-leaders to be the most important aspect of water use. Also, for reasons of data development, field testing of the training courses, and for the preliminary stages of the traditional methods analysis, geographically with certain exceptions, the project has been confined primarily to Asia. The project results will, however, be more widely applicable.

Anticipated users of the project outputs are AID Missions, other donor agencies, LDCs, and contractors providing the development community with technical assistance in agricultural water management. Pages 8-9 of the project contract lists eight project services that will be developed over the three year period of the project, with the level of effort building to a maximum during the third year. These services include the following analyses, information transfer process, and technical materials:

- On-site training courses on water management problem identification.
 - "How to do" handbooks on water management techniques.
 - Evaluative analyses on advantages and disadvantages of irrigation methods and management practices under different settings.
-
- General guidelines for on-farm water management.
 - Tracking of AID supported water management projects to improve outputs.
 - Create an awareness of the socio-economic problems associated with irrigation investment and water management practices and costs.

Generalization of training aids and on site demonstration of materials developed under the project are also included in the above services. In principle, the project aim is establishing a basis by which countries can ultimately gain self sufficiency in on-farm water management.

B. Project Progress

Project progress is jointly the responsibility of Wayne Clyma, Project Co-leader, Colorado State University, Jack Keller, Project Co-leader, Utah State University and the project manager, Gil Corey, Development Support Bureau, AID.

The project was contracted by DSB as a three year project, September 27, 1978, and was funded in the amount of \$1,969,497.00. Roughly \$700,000 of these monies had been used in support of project activities as of December, 1980. Six related activities provide the basis for information transfer of irrigation technology and management principles:

1. Project Analysis: review, identification and description of water management technologies which have a high probability of successful implementation;
2. Traditional Methods Analysis: conducted in three countries in conjunction with the preparation of training course materials;
3. Training Course: a course in diagnostic analysis of farm irrigation systems for use in LDCs;
4. Handbooks and Guides: provide a technical and evaluative procedure for successful irrigation water management technology transfer of crucial management considerations;
5. Workshops: two regional workshops to be conducted to demonstrate the utility of the outputs of this project;
6. Technical Assistance: limited technical assistance on project development and evaluation for countries and missions.

At the outset the project experienced a six month delay associated with the contracting-subcontracting process, so the project was evaluated as having been underway roughly 18 months. Two months of this time was not counted against the project as this time was spent conducting an Asian irrigation survey for the Asia Bureau. The review team does not view the Asian survey as a distraction from project progress. The experience gained in conducting the survey, the base data obtained and the contacts made will readily work to the advantage of the project and will, over time, contribute materially to the project's progress.

The project is making good progress on all of its identified activities, even though delays were experienced in obtaining AID project documents and because of the time required to gain approval to review World Bank irrigation projects. The main effort of the first 18 months has been on moving the project analysis and the training course forward. The questionnaire to obtain the necessary data for the traditional methods analysis has been completed and field tested. The technical assistance contribution made so far is indicated above. The question of what handbooks and guides may be necessary to round-out and support other project activities is under active consideration but, other than a handbook on land leveling, the specifics of this activity has not been settled.

II Evaluation Overview

The review team experienced difficulty in establishing the project scope and project focus while reviewing this project according to the Team's Scope-of-Work. The main reason for this difficulty involved background documents (Project Paper, Contract, Scope-of-Work and the October 1978 Work Plan) which were not fully consistent and terminology was not always clear to reviewers with differing backgrounds. Specifically, the title "Water Management Synthesis" implied different purposes. The title of the Project Paper "Synthesis of Water Management Improvement Processes" was more descriptive. The project contract or work plan needs a set of definitions for key terms such as:

Water Management Synthesis - Synthesis of what? Is only known information being brought together or is it improving known information by how it is brought together?

Successful Technology - how is success measured? For example, if the irrigation project goal was to deliver water to farms and water is being delivered regardless of rate and amount, is this successful technology? Is success determined by increased food production, achieving a certain level of irrigation efficiency, achieving low cost food production, etc.

Traditional Methods Analysis - traditional methods of analyses or analysis of traditional irrigation methods.

Handbooks and Guides - a concise definition of each is needed.

Target Audiences - identify for each project output.

Water Management - define scope.

Successful Project - what criterion or criteria determine success? How is it measured? Does it include economics as well as technical aspects?

Farm Water Management -- is this different from water management?

Basically the project documents are more complex than necessary and leave much room for interpretation or misinterpretation. A simpler project statement is needed with definitions and specific identifiable project outputs listed in order that progress and the quality and quantity of project outputs can be evaluated. Changes made in the Work Plan by the A.I.D. Project Manager and Project Co-leaders as the project proceeded should have been documented with amendments to the contract.

The purpose of technical assistance as an integral and an essential part of this project was not clear. Similarly, the purpose of the Workshops was not clearly stated. The project contract identified two project Co-leaders (Clyma and Keller). The Work Plan described a Coordination Team and listed Clyma and Keller as Co-coordinators with Clyma as the principle contact for the A.I.D. Project Manager.

The Work Plan describes "Project Teams" and "Team Leaders," but does not clearly identify the number of such teams or their specific roles. Presumably a team would be established for each of the six activities. A Planning and Implementation Team also is described to prepare work plans, review personnel qualifications, plan and execute program activities and evaluate progress. Specific work plans developed by these teams and their revisions were not available to the Review Team. The Project Work Plan did contain a Schedule of activities listing the sequence of events in each activity, but the activity work plan and flow chart called for in the Work Plan to establish a priority time frame was not available and the Review Team could only assume that this had not been done. With the change from project Co-leaders to Co-Coordina-tors and the establishment of project teams, it appears that leader-ship responsibilities have become so disbursed that real project leadership responsibilities no longer exists. To illustrate how the project statement might be improved and how the contract should be amended, some of our interpretations are presented in detail in this part of our report.

A. Review Team's Assignment

The Development Support Bureau work assignment document dated September 9, 1980, Subject: Scope-of-Work for Team Evaluation of the "Synthesis of Water Management" project lists the purpose and rationale for this project review as follows:

- 1) Evaluate progress toward development of specified outputs,
- 2) Determine project impact on AID's irrigation programs,
- 3) Provide suggestions for project improvement, and
- 4) Provide a recommendation regarding the future direction and scope of the project.

The project review was conducted according to a review agenda prepared by the review team, as follows:

- 1) The project goal and purpose as they address the needs of A.I.D.,
- 2) The planned results of the project,
- 3) The assumptions in relation to anticipated end-of-project status, and
- 4) The adequacy and correctness of overall project design as well as methodologies used.

In making this evaluation the team considered the following issues raised during the course of the review:

- 1) Project design - appropriateness of the methodology and, usefulness of products,
- 2) Progress - is the project on schedule according to planned timing. If not, what is recommended regarding completion of the project,
- 3) Performance of Contractor - assess quality of output and the methods used to develop the products,
- 4) Staffing - adequacy, balance, and supervision. What are the strengths and weaknesses of the co-leader arrangement?
- 5) Management - A.I.D. management provides a key role in communication and planning. How can this role be strengthened and/or improved?,
- 6) Expected results - will the expected results be useful and used by A.I.D. and LDC governments? What more can be done to assure utilization?,
- 7) Project relevance - the project is aimed at providing A.I.D. with technical assistance in irrigation water management. Should this type of project be continued beyond the present contract? If so, what changes are necessary to improve it?

B. Project Objectives

As set forth in the contract, the objectives of the Water Management Synthesis project is to develop materials and methodologies to improve design, implementation, operation and evaluation of irrigation water management programs in LDCs. The objective is to be accomplished by means of six interrelated activities: 1) Project Analysis, 2) Traditional Irrigation Analysis, 3) Training Courses, 4) Handbooks, 5) Workshops, and 6) Technical Assistance. And as set forth in the project work plan summary, purposes of the project are to:

- 1) Identify technologies which have been successfully transferred and which improve on-farm water management and increase food production,
- 2) Teach host country personnel in three countries how-to-do Problem Identification studies in on-farm water management and do three such studies,
- 3) Prepare materials (technology handbooks) describing methods and procedures for transferring technology,
- 4) Provide information to host countries and development agencies about the results and use of the results of the above activities.

C. Project Funding and Leadership

The Water Management Synthesis (WMS) project is funded at approximately two million dollars for three years (October 1978 - October 1981) by the Agency for International Development (A.I.D.) through the Consortium for International Development (CID) with Colorado State University and Utah State University jointly designated as lead universities. Drs. Wayne Clyma, Colorado State University and Jack Keller, Utah State University and Project leaders.

D. Project Activities

Six interrelated project activities are called for in the project contract:

<u>Title</u>	<u>Brief Description</u>	<u>Estimated worker months</u>
1. Project Analysis	a review of all A.I.D. other completed and on-going project documents and a field review of 10-20 selected projects to provide information needed for Activity 4, and to prepare a summary report on successful water management activities.	32-38
2. Traditional Methods	an analysis to describe in detail three types of traditional LDC farm irrigation systems to establish a data base on existing methods, how they are operated and typical problems being encountered.	26-30
3. Training Course	a course in diagnostic analysis of farm irrigation systems, complete with course materials, for use in on-the-job training and taught in two LDCs selected by A.I.D. to develop illustrative diagnoses of water management problems. Much of the data for Activity 2 will be collected while conducting this course.	33-37
4. Handbooks	a "living" handbook, similar to the SCS National Engineering Handbook, with at least four chapters will be prepared describing successful water management technologies and their transfer or implementation by LDC personnel in their	40-55

D. Project Activities (continued)

<u>Title</u>	<u>Brief Description</u>	<u>Estimated worker months</u>
4. Handbooks (continued)	own country. Four or five technical field guides will be prepared for use by field technicians. Chapter subjects will be selected from Activity 1.	
5. Workshops	two regional workshops will be conducted for LDC supervisory personnel to demonstrate the utility of the project outputs.	5-8
6. Technical Assistance	technical assistance on request by missions project development and /or evaluation selected to be relevant to other project activities and to give the contractor experience with typical A.I.D. requests and the requirements of such a continuing service.	10
Total		146-178

The project documents, without the activity work plan and flow chart did not clearly indicate which activities were interdependent and which ones could be carried out sequentially or concurrently, as well as merely being inter-related.

E. Review Findings and Conclusion

The objective of the project is clearly "to develop" materials and methodologies "to improve" design, implementation, operation and evaluation of irrigation water management programs in LDCs. It is not, therefore, just one exercise to bring together information on previous and on-going projects and an assessment or grouping of the project elements relative to success or failure. The project activity process will lead to the development of improved designs, methods and implementation procedures which will, at an acceptable level of probability, be successful.

This is a notable objective, one which donors and LDCs alike have been striving for, without success, for a long time. In reality, however, this goal does not appear within the trained resources, management and time limits of a three year project. A.I.D. should, therefore, consider financing a research/technical assistance project aimed at developing new knowledge and technology applicable to Africa and Asia, including local adaptations on a case by case basis.

Also of some concern to the review team was the fact that the project may be under-staffed. The team recognizes that the staffing requirement will vary from time to time and that fully qualified staff are difficult to come by. However, when project leadership is directly responsible for project implementation as well as conceptualization and that both project leaders have other responsibilities at their respective universities project staffing is of concern. Project leadership when it undertakes project implementation as a primary task also tends to get bogged down in detail. It would also seem that project leadership and the project manager may be out of contact for extended periods of time leaving open the question of how much project planning and/or conceptualization can really be done that was not done in the first few months of the project.

The review team concurs that the technical content of the project is solid, but, as will be brought more fully in Part III, believes that the project leadership and the project manager may want to consider making the synthesis project a water systems project, at least on an area basis, and provide essential linkage with agronomic and economic factor or systems consideration. Project duration could be changed accordingly.

III Findings, Observations and Conclusions

A. On Project Progress

As noted, because of funding and contracting difficulties, the project did not actually get under way, until six months after the contract date of September 1978. Subtracting the two months spent on the Asian irrigation survey, the project has actually been underway for a period of approximately 16 months. However, the project has made strong progress, justifying extension of the project time to completion.

Also as noted under Part II of this report, a revised project statement at this point might be timely to provide a refined scope-of-work and to more sharply focus on the project's objectives. In this regard, the review team suggests in its general recommendations that consideration be given to a more comprehensive systems-like look at irrigation in a new, longer-term project. The review team, however, does not view the extension of the project to Africa to be an open question in consideration of Africa's food needs and A.I.D.'s concerns, whether under this project or a complimentary project. The Latin America region does not have the same order of priority,

In preparing a revised project statement the project manager and leadership will want to weigh the following specific recommendations on each of the project's activities:

1) Project Analysis:

a. The project plan calls for analysis of projects in addition to establishing a data base. A narrative interpretation should be added to identify relevant trends or characteristics of projects in each general region. This narrative should identify and describe water management technologies that have a significant impact on the project in achieving its goals and have successfully transferred.

b. The contractor should consider and recommend procedures or guidelines to enable projects to be monitored, or periodically evaluated, to determine if

projects are operated or performed as planned. The field studies should provide examples of evaluating project status relative to project plans for use by others in future, similar evaluations.

c. The contractor should obtain impact evaluation documents that exist, conduct a review and analysis, and make recommendations on the need for and approach to conducting future impact analyses.

d. The contractor and project manager should plan to have multidisciplinary teams make field studies in Africa so as to increase the awareness of this project in those regions and to enable including these regions in the detailed project analyses.

2) Traditional Methods Analysis

a. Critical factor analysis should be included in the analyses.

b. The analyses should identify and include the original purpose of the project.

c. Africa should be considered when selecting the countries to which the training course is to be taken.

d. The assessment should include region's concepts of on-farm water management.

e. The contractor and project manager should consider comparisons with similar, unimproved surface irrigation systems in the U.S. which were evaluated in great detail by the U.S. Bureau of Reclamation. For example, these data are available in printed volumes for hill areas in Idaho and flat areas in California and New Mexico.

f. The analyses should include an assessment of and guides to recognizing problems generated by irrigation such as waterlogging, salinity, soil compaction and possibly human disease problems.

3) Training Courses

- a. The contractor should avoid making the training course too academic. The training course materials must be applicable to all commonly used irrigation methods and should not be site specific.
- b. Introductory material, or course descriptive material should identify those training elements that are long-term training needs and provide some guidance as to when this training course or on-the-job methods should be used. Such guidelines also should consider when such training is not needed.
- c. The Review Team did not have an opportunity to study the EWUP Training course material in-depth, but recommends considering adding an introductory chapter or summary clearly stating what the trainees will learn from each chapter and why that chapter is important to technical people planning to take the course. This summary material should be concise and prepared at a level similar to the Contractor's Training Program brochure.
- d. The contractor and the project manager should clearly establish which materials are user guides to supplement handbooks and which are supplemental materials to accompany the training course, and which materials being distributed are outside of this contract.
- e. A training course has been developed for use in Egypt and the course was taught there in the summer of 1980. Some material from the Egypt Water Use Project (EWUP) will be used to further develop the course and further refinement will take place while conducting the training course in LDCs. A training section on level basin irrigation has been prepared entitled "Field Study of Level Basin Irrigation" A Manual for Engineers". Requests have been received to present the course in India sometime during the period of January-March 1981. Opportunity to promote the training occurred as a result of the team's activities. This further supports the review team's recommendation that a multi-disciplinary team make field studies in Africa.

4) Handbooks and Guides

a. In discussing this activity the evaluation team inquired as to target audience, subject matter selection and probable utilization. The responses given by the Co-directors and A.I.D. Project Manager revealed a 1) range of views as to probable audience with the suggestion that different chapters might be directed at different levels of audience, 2) continuing lack of clarity as to completeness of the Handbook with major elements not being included as they were satisfactorily covered in other existing publications. There seemed to be little evidence that there had been any feedback from the project analysis activity in selection of topics for the Handbooks.

b. The evaluation team suggested that materials needed to be prepared and distributed which would address major program issues or options faced by LDC government policy makers who were technically proficient in water management. The A.I.D. Project Manager and Project Co-directors responded that this was a good suggestion and would be pursued. It was emphasized that such materials had to be succinct and understandable to be useful. The evaluation team noted that field guides described in the contract were not being developed. In the ensuing discussion it became clear that there was less than satisfactory agreement as to relevance or need in the Handbook Activity.

c. It is the view of the evaluation team that with the passage of time since the initiation of the contract (September 1978) there has been a change in the views of Project Manager and Contract Staff, covering the Handbook Activity which should be clarified and articulated particularly in view of the fact that this activity absorbs the largest amount of staff time (50-55 WM).

d. The CID project Co-directors and the A.I.D. Project Manager should rethink the efficacy and objective of the Handbook Activity and rearticulate the logic, purpose and work plan. This should then be included in an appropriate contract amendment as soon as possible so the planned actions can be pursued during the remaining period of the contract.

5) Workshops

a. The evaluation team suggested that the workshop activity would be difficult to implement successfully in terms of outlining the appropriate LDC personnel and in securing the cooperation or participation of other donors. The A.I.D. Project Manager and Project Co-directors concurred and indicated they were considering another course of action to accomplish the objective. The Evaluation Team leader suggested other international conferences and meetings which could be used to communicate the information, findings and conclusions resulting from project activities. The Project Manager made reference to the 5-8 MM of effort that would be involved and the possibility of using this resource for other more productive activities such as technical assistance.

b. The Evaluation Team recommends that the workshop activity provided in the contract be reconsidered and alternatives investigated and determined to accomplish this objective in a more practical and cost effective manner, and such change in plans be reflected in a contract amendment.

6) Technical Assistance

a. An estimate of the probable time commitments for TA based on average project time commitments by disciplines is:

TDY Expert	Man - Months by Year			
	1st	2nd	3rd	
Keller	-	½	1	
Agronomist	½	1	1	
Economist	-	½	1	
Engineer	½	1	2	
Sociologist	-	-	1	
Totals	1	3	6	(10)

b. While technical assistance is only about 6-7% of the work months of the project the A.I.D. Project Manager and the CID Co-directors believe that it is a very important element which will undoubtedly be increasingly active as time goes on. The Evaluation team noted that project field activities appeared to be focussed on Asian countries. This is understandable perhaps taking into consideration the extensive field experience in Asia of the Project Manager and the two CID Universities (Colorado State University and Utah State University). The Co-director stated that as of now (December 1980) about 50% of the planned 10 WM of technical assistance had been used exclusively in Asia.

c. The Evaluation Team expressed concern that project focus was being overly drawn to Asia in the preparation of Irrigation subsector reviews for Asian countries and presentation of materials at the A.I.D. Asia Bureau Agriculture Conference in Indonesia January 15-20, 1981. The Project Manager and Co-director defended this activity as an integral and valuable part of their activities and felt it would be balanced in the future as the contract activities were initiated in other regions in the near future.

d. The Evaluation Team recommends that the A.I.D. Project Manager and CID Co-directors give increased attention to Africa in all project activities in the remaining period of the contract. They should define the technical assistance available and make it known to the Africa Bureau.

B. On Project Scope

While centering on on-farm water management, the project contract and the work plan appear also to be concerned with economic feasibility and with the viability of irrigation. It follows that the project at some point is concerned with sufficiency of water management as well as the technical, economic and other forces impinging upon the farming operation. Some of these forces are structural-roads, water delivery, market facilities; some are institutional, credit, extension, research; some are economic - prices, wages, taxes; and some are social - traditional, mores, attitude, learning.

Each of these functionals has a uniquely defined set of variables, each set being subject to resource or variable factor allocation principles, and for each the farming operation is subject to decreasing marginal returns as follows:

1. Our definition of water management is the activity which insures a specific water flow rate through a particular irrigation structure as guided by a particular production technically while "maintaining" the system.
 - a. This definition is static state
 - b. Any other definition is economically and technically meaningless.
2. Opposed to static state management, management dynamics involves two variable decision realms and one constant which is maintenance of the system so it will operate at the specific level of performance, e.g. rate/flow=C. The variable decision realms are:
 - a. The farm or cropping system. Each system has a derivable plant water use coefficient.
 - b. The technological and management requirement is derived from the plant water use (demand) coefficient.

The profitability of investment and management is determined by marginal cost-marginal revenue (price) comparisons.

3. Since the farm does not, and can not, operate in isolation of the environmental socio-economic factors, or of the systems which determine water availability (be they surface or ground) - except under the assumption the exogenous variables are fixed (constant) - economically rationale decision cannot be made unless such exogenous variables are taken into account. For purposes of this argument, all matters external to the irrigation system itself are considered to be exogenous.

It follows that:

a. a rationale water management and technology decision is not possible in the absence of a farm system production function and determination of tangency thereto of a cost-price line.

b. an optimal water management (and technology) decision cannot be made in the absence of a determination of the production surface associated with farming system alternatives (and therefrom the economic expansion path).

In the absence of a determination of a and b, above, the safest bet is that the current water management system is optimal.

Having said the foregoing it needs immediately to be qualified. Where it can be demonstrated that improved technologies and/or advanced managerial techniques are cost reducing or investment saving these costs or savings can be used in appropriate equations as revenues. The limit in this regard is that optimal water management solutions are not possible.

IV Recommendations

In addition to the specific recommendations contained in the body of this review report the review team has the following general recommendations regarding future direction and scope of the synthesis project:

1) For good and sufficient reasons the initial project statement was written in broad and very general terms. Experience over the past 16 months indicates that the project statement needs to be narrowed and more sharply focused. While the project analysis activity needs to be finished (it is nearing completion) the main emphasis should be given to training, the traditional methods analysis, and the handbooks and guides. The Workshop Activity could well be deleted. Technical assistance should be retained but should be used to supplement the main activities of the project. The project budget should be reevaluated comparative to the work requirement and the project extended to completion.

2) Simultaneous with the narrowing and sharpening of the present project statement (contract) a new long-term project statement should be prepared. In preparing the

new project statement consideration should be given to: a) placing the project on a total irrigation systems basis, b) incorporating the essential agronomic and economic components enumerated herein to provide necessary decision and policy guidance, and c) placing Africa and Asia on a comparable assistance basis.

a. In the above recommendation economic and system analysis are given much stronger role than presently. However, this recommendation does not envision any change in project leadership. The review team believes the current project leadership to be exceptionally qualified. The team also commends the efforts and leadership provided the project by Dr. Corey the Project Manager.

b. The above recommendation does imply a broader and more comprehensive conceptualization of water management synthesis, the development of appropriate analytical methodologies for both the macro and the micro components of water systems, as well as the development of a framework and transfer mechanisms (methods) on technology and information transfer (the team has no hesitancy in making this recommendation as it is aware that Clyma and Lowdermilk, Colorado, and Jack Keller, Utah, have been working on transfer methodologies for some time).

The team would like to end this review report by commending Drs. Clyma and Keller for the perseverance and imagination they have shown in pursuit of a difficult and complicated subject, for their willingness to make personal sacrifice in the conduct of the project, and for the substantial and worthwhile products being produced. The team firmly believes that a nucleus of water resource competency is being created in the conduct of this project which will be a valuable resource of the Agency and for developing countries over future years.