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**FINAL EVALUATION OF THE
WATER RESOURCES MANAGEMENT AND
TRAINING PROJECT, INDIA**

Project No. 386-0484

#418

SPAN Report No. 48

SPAN

IRRIGATION SUPPORT PROJECT FOR ASIA AND THE NEAR EAST
Sponsored by the U.S. Agency for International Development

ISPAN

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ISPAN Report No. 48

**FINAL EVALUATION OF THE WATER
RESOURCES MANAGEMENT AND TRAINING
PROJECT, INDIA**

(Project No. 386-0484)

Prepared for the Office of Irrigation and Water Resources,
U.S. Agency for International Development
New Delhi, India, under ISPAN Activity No. 732E

by

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U.S. Agency for International Development
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Acronyms

AKRSP	Aga Khan Rural Support Program
AR	Action Research
ARP	Action Research Program
CADA	Command Area Development Authority
CADP	Command Area Development Program
CE	Chief Engineer
CES	Consulting Engineering Services (India) Pvt., Ltd.
CGWB	Central Ground Water Board
CTU	Central Training Unit
CWC	Central Water Commission
CWPRS	Central Water and Power Research Station
EDC	Education Development Center, Inc.
EE	Executive Engineer
E in C	Engineer in Chief
GOI	Government of India
ID	Irrigation Department
IMTI	Irrigation Management Training Institute
IRMIO	Irrigation Research and Management Improvement Organization
ISPAN	Irrigation Support Project for Asia and the Near East
JPMC	Joint Project Management Committee
LBII	Louis Berger International Inc.
MCIVD	Micro-computer Interactive Video Disc
MOWR	Ministry of Water Resources
MPAU	Mahatma Phule Agricultural University
NIH	National Institute of Hydrology

NIMI	National Irrigation Management Institute
O&M	Operation and Maintenance
OPC	Organizational and Procedural Changes
PACD	Project Activity Completion Date
PIL	Project Implementation Letter
STC	State Technical Council
STI	State Training Institute
TAC	Technical Advisory Committee
TOT	Training of Trainers
TPM	Team Planning Meeting
TRG	Training Resources Group
USAID	United States Agency for International Development
USGS	United States Geological Survey
VLW	Village Level Extension Worker
WALMI	Water and Land Management Institute
WAPCOS	Water and Power Consultancy Services (India), Ltd.
WREMI	Water Resources Engineering and Management Institute
WRM&T	Water Resources Management and Training
WRMTP	Water Resources Management and Training Project

Acknowledgments

This project had a complex design, and the evaluation team was very grateful to the numerous men and women both in Delhi and in the states who patiently explained their roles in its development, as well as how their activities contributed to the whole.

The evaluation team would like to acknowledge the advice and assistance provided by the Ministry of Water Resources, the Central Water Commission and, not least, by the governments of the states visited. The team would also like to thank the contract consultants for their open discussion and cooperation, and the directors and faculties of the WALMIs, the Central Training Unit, and the universities visited who went out of their way to be cooperative. Their gracious assistance, shown in a variety of ways, made the team's work infinitely easier.

The evaluation team would like to extend a special thank you to Dr. D.R. Arora, Project Coordinator, and Mr. Gokhul Prasad, Monitoring Advisor in the Office of Natural Resources Development, whose perspectives on the history of the project were essential to the team's understanding of this project. A special thanks goes also to Dr. B.R. Patil, Evaluation Specialist, Office of Program Development and Project Support, who assisted the team in the intricacies of the agency's evaluation procedures.

Finally, the team would like to thank Ms. Alka Kapur and Mr. S. K. Ghosh, who patiently and competently typed the final document.

Executive Summary

Introduction

This report is the final evaluation of the Water Resources Management and Training (WRM&T) Project, which was designed to strengthen the institutional capacity of the Government of India and selected states to plan, design, construct, operate, manage, and maintain efficient and productive irrigation systems and to conduct river basin planning for water resources development.

This project is a human resources and institutional development project conceived as one of many responses aimed at USAID's sectoral objectives of increasing agricultural production and farmers' incomes, both of which had been articulated in India's Sixth Development Plan.

Additionally, this project was designed to introduce to professional engineers tools they could use over time to improve the performance of the Irrigation Department.

Background

By 1980 Indian engineers had sufficient expertise to plan, design, and construct hydraulic structures for storing and conveying water. They did not, however, have all the necessary expertise to plan, design, and manage distribution systems at the outlet level, considering farmers' needs, nor the expertise to develop plans for integrated river basin development. The WRM&T Project sought to enable engineers to become experts in delivering water to farmers' fields and systematically plan development of river basins. It provides an in-service training capability to the state Irrigation Departments through the Water and Land Management Institutes (WALMIs) and selected agricultural universities and engineering colleges. Likewise, their needs for training in river basin planning are served through the Central Training Unit (CTU).

Implementation

Through this project, USAID proposed to make technical resources available over a seven-year period (1983-1990) which would provide training in irrigation management, water resources management, systems analysis, action research, communication, and organizational and procedural changes. USAID awarded three contracts to accomplish these tasks. The first was to Louis Berger International, Incorporated (LBII), a U.S.-based general consulting firm, to develop the WALMIs. In doing so, LBII would work closely with the Water and Power Consultancy Services (India), Ltd. (WAPCOS). A second contract was awarded to Harza Engineering Company, a U.S.-based engineering

consulting firm, supported by Utah State University to develop a CTU in the Central Water Commission (CWC), that would provide training in river basin planning. Harza was supported by Consulting Engineering Services (India) Pvt., Ltd. (CES). The third contract was awarded to Educational Development Center, Inc. (EDC), also a U.S.-based educational consulting firm, to develop and implement a micro-computer interactive video disc capability in the WALMIs.

The Harza contract was completed in December 1991, and the LBII/WAPCOS and EDC contracts were extended to the Project Activity Completion Date (PACD). In 1990, the PACD was extended by two years from September 1990 to September 1992.

Day-to-day management of the project and implementation of all USAID contract agreements were accomplished through the Joint Project Management Committee (JPMC) of each individual contract. Project technical issues were addressed by the Technical Advisory Committee (TAC). Staff support was provided by a full-time permanent Irrigation Research and Management Improvement Organization (IRMIO) established in the CWC.

Cost

The estimated cost of this project to USAID was \$51 million (\$41 million in grant funds, \$10 million in loan funds), to be repaid over 40 years. The Government of India provided a rupee equivalent of \$28.2 million.

Overview of Findings and Recommendations

The WALMIs have taken root and are beginning to thrive. Yet, despite the fact that the project is eight years old, the rooting process is still very young and will require direct funding from the states for some time to come. Many of the issues that affect the WALMIs are beyond their control and require structural changes in the Irrigation Departments, including implementation of the National Water Policy and of certain organizational and procedural changes.

The team found that the contracts were well administered by USAID, and the contractors were responsive to the changing demands of the project. Those issues that constrained their missions were the same issues constraining the institutions—the need for organizational and procedural changes within the Irrigation Departments.

The team thinks a pilot project of this complexity should be expanded beyond its original scope, as occurred in 1986 in this project. However, this should only occur if accompanied by a corresponding increase in its management capability, and assurances that other issues affecting the project, but outside its control, would be addressed.

The team also believes it would be in the U.S. government's interest to provide selective continued funding to those WALMIs that need to complete their infrastructure.

If there are lessons to be learned from mounting experimental projects of this sort, they are that things take time and patience is important, and that the success of any one component, important as it is, is not as important as the direction in which the whole project is moving.

The team found that at all levels, from state ministers and state secretaries of irrigation, to chief engineers and engineers-in-chief, to directors of state institutions and their faculty and students, down to the farmers, people were beginning to understand the need to develop plans to distribute water and systematically plan the use of the river basins. The team recognizes that hard evidence for this will not show up, however, until those people who have been trained under this program are in positions where they can make appropriate decisions, and effect those policy, organizational, and procedural changes that are needed.

Finally, the team thinks putting this process in place was a good investment of U.S. funds, and of India's engineers' time and energy.

In the scope of work the evaluators were asked to look at a number of issues. The following recommendations are issue-specific and were developed to help USAID and contractors increase the impact of the institutions created under this project **in the time remaining in the contracts**. The location in the document of the discussion that led to the recommendations is indicated in parentheses.

General Recommendations for the Government of India's Consideration

1. The WALMIs and the CTU are in place and provide training for operation and maintenance of the irrigation systems and for river basin planning. To fully realize their potential, however, the team suggests that the Government take appropriate steps to implement the National Water Policy, especially as it concerns irrigation systems performance.
2. To create an appropriate environment in which effective operation and maintenance can take place, the team recommends the Government give priority to completion and implementation of those organizational and procedural changes relevant to main system management.
3. To ensure the long-term sustainability of these institutions, the team recommends the Government begin to direct funding to the operation and maintenance of irrigation systems and to river basin planning in order to attain the potential

benefits of the training being provided and to improve the institutions' performance.

4. To achieve the larger goal of greater agricultural productivity and increased farmer incomes from irrigation, the team suggests the Government pay attention to the full range of issues and inputs involved, not irrigation alone.

General Recommendations for USAID's Consideration

1. In a project of this complexity, where success depends on multiple factors outside the scope of the project, the team recommends that USAID or other agencies address these other factors at all appropriate levels.
2. The issues posed by the need for organizational and procedural changes (OPC) emanate from the states and, in fact, require someone of considerable stature and credibility at that level to promote them. The team recommends that for future programs of this kind, USAID consider dividing the scope of the project into two phases. The first phase would focus on OPC and would be accomplished either by its own staff or a local consultant. When these relevant changes were effected, phase two could begin, using a prominent technical consulting firm to achieve the project's goals.
3. Because doing so dilutes input to individual sites, the team recommends that USAID resist expanding an experimental concept of this kind beyond its original scope until it is sufficiently field-tested, and is accompanied by a corresponding revision of management capability.
4. Given the fact that several institutes established under this project need to complete their infrastructure, and are subject to the availability of funds, the team recommends that USAID consider providing monies for such institutions for a limited period after the end of the project.

Issue-specific Recommendations

1. *State- and National-Level Organizations* (For full discussion, see page 16.)
 - 1.1 The team recommends that USAID continue to support opportunities for university faculty training abroad and for visiting faculty from abroad.
 - 1.2 The team recommends that universities refrain from designating undergraduate degrees in irrigation.
 - 1.3 The team recommends that needs assessments be completed for the Irrigation and Agriculture Departments and that decisions be made as to

which of the current training programs respond to those needs. In turn, these needs would be prioritized and form the basis for courses in the training institutes.

- 1.4 The team recommends that WALMIs not be created in additional states until the demand for training in operation and maintenance becomes a department need as evidenced by appropriate policies and funding of operation and maintenance.
 - 1.5 The team recommends that the staff levels at the CTU be increased to planned numbers so that faculty have sufficient time free of administrative duties to prepare and conduct the courses.
 - 1.6 The team recommends that the U.S. portion of the training-of-trainers (TOT) course for the CTU be completed before September 1992.
 - 1.7 Due to the late start of the Indo-U.S. studies, some may not be completed by September 1992. Should funding be available after that date, the team recommends that USAID/CWC give the following studies priority:
 - a. Dynamic Regulation of Canals
 - b. Real Time Operation of Reservoirs
 - c. Snow Hydrology
 - d. Sustainable Water Resources Development and Management
 - 1.8 The team recommends that collaboration between the Central Ground Water Board and the United States Geological Survey continue through follow-on research.
2. *Staff Capabilities* (For full discussion, see page 23.)
- 2.1 The team recommends that a chapter be added to the *Trainer's Guide* that focuses on the practical application of training techniques and approaches to adult learners.
 - 2.2 The team recommends the design of the classrooms in future WALMIs meet professional training needs, not professional academic needs. The team recognizes that it may be too late to change existing WALMIs significantly.
 - 2.3 The team recommends LBI help identify other training institutions in India that are using modern training delivery techniques that the WALMI staff could use as models for improving their own teaching performance.

- 2.4 The team recommends that WALMI directors encourage the exchange of faculty among themselves for guest lectures, short visits, and so on.
 - 2.5 The team recommends that WALMI directors strive to achieve a mix of 50 percent core faculty and 50 percent deputation. Core faculty guarantee continuity of experience, and deputed faculty bring fresh ideas.
 - 2.6 The team recommends that the joint director be a core faculty member, thus bringing continuity and experience to training. This model is in use in the WALMI in Aurangabad (Maharashtra).
 - 2.7 The team recommends that the tenure of the faculty on deputation continue for a minimum of three years, but that those faculty who wish to remain longer at the WALMIs be allowed to do so.
 - 2.8 The team recommends that sufficient administrative staff be provided to trainers to handle training logistics.
 - 2.9 The team recommends that provision be made to allow for the continuing professional education of the training staff through such mechanisms as training journals, trainer conferences, and methods workshops. Trainers ought to be encouraged to join the Indian Society of Training and Development.
 - 2.10 The team recommends that WALMI libraries develop sections dedicated to training theory and training methods as a resource for their faculty.
3. *Action and Adaptive Research* (For full discussion, see page 26.)
 - 3.1 The team recommends that the Action Research Program take the role defined for it in the project paper and develop field training sites. For this purpose, the necessary physical facilities as provided in the project paper will need to be put in place.
 - 3.2 The team recommends that field training be scheduled to coincide with operation of the irrigation system.
4. *Technology Transfer* (For full discussion, see page 28.)
 - 4.1 The team recommends that micro-computer interactive video disc technology be limited to the sites currently planned.
 - 4.2 The team recommends that WALMIs pool their resources to continue the national newsletter by rotating the editorship on a yearly basis. The WALMI accepting the editorship would bear the cost for that year.

- 4.3 The team recommends that in order to allow for an orderly system of transfer, transfer courses be passed on to faculty members who will be on the faculty for at least one more year and who will be responsible for delivering transfer courses at that time.
- 4.4 The team recommends sufficient uninterrupted lead time be given to both the visiting professor and the resident professor for planning and preparing transfer courses.
5. *Organizational and Procedural Changes* (For full discussion, see page 30.)
- 5.1 The team recommends that to fully realize the WALMIs' potential, the Government of India implement the National Water Policy, especially with respect to the performance of irrigation systems.
- 5.2 The team thinks state Irrigation Departments would benefit from establishing professional development programs that would be supported by training at the WALMIs.
6. *Role of Consultants* (For full discussion, see page 31.)
- 6.1 The team recommends transfer course planning meetings be introduced that will take place sufficiently ahead of time to facilitate effective transfer of the course. This would mean the consultant and the involved faculty member would need to allocate time for the meetings before the start of the course.
- 6.2 The team recommends consultants spend more time in the field during the diagnostic analysis phase of action research.
- 6.3 The team recommends that a mechanism be developed to inform consultants of the advice their predecessors gave so that they can prepare their client if they plan to modify the direction recommended earlier.
7. *Net Impact* (For full discussion, see page 32.)
- 7.1 The team recommends the Irrigation Department clearly enunciate the irrigation service to be provided, implement the required system operation plan for every irrigation system, and adequately fund operation and maintenance. This would allow effective use of the people trained at the institutes.
- 7.2 The team recommends that the Irrigation Department obtain feedback from the farmers to develop a system operation plan acceptable to them.

8. *Coordination and Linkages* (For full discussion, see page 33.)

- 8.1 The team recommends that the all-India courses be continued as an instrument for linking the institutes and the universities. In addition, each WALMI could develop additional all-India courses that would result in further linkages.
- 8.2 The team recommends that the WALMIs convene four times a year to coordinate topics, content, and timing of the all-India courses. In the event the Technical Advisory Committee is disbanded, this activity could be handled by the director or joint director of the WALMIs.
- 8.3 The team recommends that the WALMIs continue to use newsletters, workshops, visiting faculty, and guest trainers as conventional ways of linking the institutions.

9. *Future Directions* (For full discussion, see page 34.)

- 9.1 The team recommends that the Government of India allow time for the existing WALMIs to consolidate their gains before considering expansion into other states.
- 9.2 The team recommends that the WALMIs seek to develop a unique identity as training institutions and thus avoid becoming additional academic institutions.
- 9.3 The team recommends that the WALMIs conduct research on appropriate training methods.

Chapter 1

Project Description

1.1 Background

Although considerable progress and investment have been made in India's industrial sector since 1947, the country continues to be an agricultural society. Almost 70 percent of the population derives its livelihood from agriculture and related activities, while contributing more than 40 percent of the gross national product. Agriculture and related activities, thus, need continued attention to develop the rural sector and alleviate poverty.

The bulk of the cropland remains under rainfed practices. Food production has just kept apace as newer areas have been brought under irrigation. While irrigated areas constitute only about 40 percent of the area under agriculture, they contribute approximately 70 percent of food production. The production and productivity from irrigated agriculture has, however, remained below its potential.

To bridge the gap between irrigation potential created and utilized, studies were conducted during the early 1970s by the Irrigation Commission (1972), the Committee of Irrigation Ministers (1972), the Planning Commission (1973), and others. As a result of these studies, the Government of India (GOI) in 1974 approved the Central Sector Scheme for Command Area Development Program (CADP). The scheme focused on irrigation systems below the outlet from the main canal (the micro-distribution system) and on-farm development, including efficiency and equity in water distribution, land improvement, provision of facilities for agricultural inputs, credit, and marketing.

Initially, the Command Area Development Authority (CADA) program was based on the perception that the critical element hindering agricultural production and productivity in irrigated areas was the lack of development and management of the system below the outlet. Subsequent experience, however, has indicated that management of the main system (the irrigation system from source to the outlet, i.e., to the interface with farmers) is the critical link hindering productivity in relation to water input.

To tackle this problem, the program envisaged an integrated and coordinated approach by all state government departments related to agricultural production, including Irrigation, Agriculture, and the cooperatives.

Recognizing the need to increase total agricultural production, USAID proposed to the Government the Irrigation Management and Training Project. The purpose of the project was to strengthen institutional capabilities at both national and state levels to plan, design,

construct, operate, manage, and maintain efficient and productive irrigation systems through a massive effort in training and development. The emphasis was on the optimal delivery and use of water in farmers' fields, and the integrated planning of river basin development.

The project was not designed to produce a specific product or series of products; rather, it was designed as a "process project" introducing to professional engineers tools they could use to improve the performance of the Irrigation Department.

The project was conceived as one of many responses aimed at USAID's sectoral objectives of increasing agricultural production while increasing farmers' incomes, both of which had been articulated in India's Sixth Development Plan.

In time, the period of which was left unspecified, it was hoped the following changes in attitudes and behavior would be noticeable: farmers would prepare their fields taking maximum advantage of available water; engineers would deliver water to farmers at the times and in the amounts it was needed; irrigation projects would be better managed, as professionals associated with irrigated agriculture would be able to apply up-to-date technologies in water management; main canals and distribution systems would be designed using modern concepts and technology; and river basins would be developed using a systems approach.

To do this, USAID proposed through this project to make available over a seven-year period (1983-1990) technical resources to provide irrigation management training, water resource management and systems analysis training, action research for practical training, communication, and organizational and procedural change by awarding three contracts. To accomplish these tasks, USAID awarded a contract to Louis Berger International Inc. (LBII), a U.S.-based general consulting firm, to develop the WALMIs. In doing so, LBII would work closely with the Water and Power Consultancy Services (India), Ltd. (WAPCOS), contracted by the Indian Government to carry out the contract. A second contract was awarded to Harza Engineering Company, a U.S.-based engineering consulting firm, to develop a Central Training Unit (CTU) in the Central Water Commission (CWC) that would provide training in integrated river basin planning. Harza was supported by Utah State University and by Consulting Engineering Services (India) Pvt., Ltd. (CES). A third contract was awarded to Educational Development Center, Inc., also a U.S.-based education consulting firm, to develop and implement a micro-computer interactive video disc (MCIVD) capability in the WALMIs. (See Appendix A for Project Implementation Letter #2). The Harza contract was completed in December 1991, and the LBII/WAPCOS and EDC contracts were extended to the PACD. In 1990, the PACD was extended by two years from September 1990 to September 1992.

In August 1986 the CWC and USAID undertook an internal review of the status of the project. As a result, the project focus was shifted from on-farm management to main

systems management. At this time the project's name was changed to the Water Resources Management and Training (WRM&T) Project to reflect the fact that the project's scope was broader than irrigation management alone. (See Appendix B for Project Implementation Letter #17.)

The estimated cost of this project to USAID was \$51 million (\$41 million in grant funds, \$10 million in loans funds) to be repaid over 40 years. The Government of India would provide rupee equivalent of \$28.2 million.

Currently there are 11 WALMIs in the country. Water resources/irrigation academic programs are supported at two agricultural universities and three engineering colleges.

1.2 Activities and Outcomes

The scope of work of the evaluation (see Appendix C) called for a review of the state-level WALMIs, the national CTU, and five university-level interdisciplinary water management units and their activities in the following areas.

1.2.1 Professional Development

1. Training courses in irrigation management, water resources planning, and development.
2. Interdisciplinary courses in irrigation management at engineering and agricultural universities.
3. Integrated river basin planning.

1.2.2 Action Research

Development of a long-term, on-site case study of an irrigated area sufficiently large to be representative of a complete system. The researchers would conduct action research studies that identify problems constraining optimal irrigated agricultural production on the system under examination; formulate and implement corrective actions; monitor actions for their impact and potential for broader application; and hold on-site seminars, demonstrations, and workshops.

1.2.3 Systems of Technology Transfer

Development of a set of communication channels for disseminating information throughout India's water resources, irrigation, and agricultural circles to be set in motion by the Irrigation Research and Management Improvement Organization

(IRMIO). Reports and analyses of action research studies, regular newsletters, and videos would be some of the channels used for dissemination.

1.2.4 Organizational and Procedural Changes

Changes in organizational structure and procedures to accommodate new technologies and operations concerning chak-level organizations for operation and maintenance, interactions between water user organizations and state- and block-level organizations, adjustments to areas of responsibilities of Village Level Extension Workers (VLWs), improved coordination of budgeting and personnel, and sanctions between state Irrigation and Agriculture Departments with respect to command areas of the irrigation system. Oversight of the process is to be provided by IRMIO and the states.

1.2.5 Promotion of Cooperative Programs and Research

Developing specialized studies, collaborative research programs, and Indo-U.S. linkages in groundwater, and fostering awareness of the latest technological developments in water resources at the national and state levels through workshops, seminars, and conferences.

The expected results of completing the above activities were as follows:

- Development of state and national capabilities to plan and manage water resources of major river basins as integrated systems.
- The upgrading of professional skills in all phases of irrigation system management and operation.
- Adoption of a systems approach that considers the interactive effects of engineering, agronomic, and social components.
- A shift in management focus from “administering” water to “meeting farmers’ needs.”
- Increased participation by farmers in deciding the location of canal outlets, the location and size of watercourses and field channels, and system operation and maintenance.
- Reduction of water losses within individual irrigation systems and development of more effective water distribution systems.

1.3 Coordination and Management

Supervision of the day-to-day management of the project, and implementation of all agreements reached between the Government of India and the USAID contracts was carried out by the Joint Project Management Committee (JPMC) of each individual contract. JPMCs were composed of members of the CWC, USAID, and the contract team leaders. In addition to supervisory and implementation functions, the JPMC reviewed and approved all consultants the contractors nominated.

Planning and oversight of the project's technical aspects were addressed by the Technical Advisory Committee (TAC). The TAC was composed of a member of the CWC, representatives of the ministries of Irrigation and Agriculture; the Command Area Development Authority (CADA); the secretaries of the state Irrigation and Agriculture departments; the director of the State Training Center for participating states; and representatives of USAID, the World Bank, and the contracts' team leaders.

Staff support to the TAC was provided by the full-time, permanent IRMIO established in the CWC. The office set up for the project was composed of a chief project coordinator, directors, and support staff. (See Appendix D for a sample of the TAC's minutes.)

In each state, a State Technical Council (STC) was established to approve institute work plans, curricula and requests for training, equipment, or funds, which were passed on to the TAC. Each STC also served as the overseer of funds provided from the GOI to its state for use by the institutes of the state.

Chapter 2

Evaluation Process

2.1 Purpose

The purpose of this evaluation was to assess the overall Water Resources Management and Training Project fairly and realistically. The evaluation team tried to answer the following general questions:

1. Was the solution proposed suited to the problem?
2. Was the project successful in establishing sustainable institutions?
3. What impact has the project had?
4. Was the money well-spent?
5. What remains to be done?

2.2 Team

USAID/India selected a four-person evaluation team of two Indians and two Americans. The Indians were contracted directly by USAID, and the Americans through the Irrigation Support Project for Asia and the Near East (ISPAN). The team members were:

Richard Wall, Team Leader, is a consultant in training and institutional development based in Washington, D.C. He is associated with Training Resources Group (TRG). Mr. Wall has served as Peace Corps Country Director in several African countries and has recent experience evaluating water resources and health projects for USAID and other agencies.

A. Das Gupta, Irrigation Engineer, is a consultant in irrigation who resides in Patna. Mr. Das Gupta served as Chief Engineer of the Bihar Irrigation Department before becoming Commissioner of the Gandak Command Area Development Authority.

A. Sundar, Management Specialist, is a consultant in irrigation management currently associated with Wamana Consultants in Hyderabad on the Indo-Dutch Irrigation Project. Dr. Sundar is a civil engineer who has taught and written extensively on management. For several years, he edited the irrigation newsletter, *Wamana*.

Roy Elmore, Water Resources Engineer, is the Director of ISPAN and an employee of Camp Dresser and McKee International Inc. Dr. Elmore has worked on water resources planning in the subcontinent for 6 of the past 10 years. He was on the Harza team that developed case study models and materials for the Central Training Unit.

2.3 Timetable

Team members were each authorized eight weeks (50 days) of effort. The team leader was authorized an additional 5 days for completion of the final report following receipt of comments from USAID on the final draft. The team met in Delhi on January 21, 1992, and remained together until March 13, except for the fourth week when it divided between field visits in Maharashtra and Tamil Nadu.

The team was able to visit 5 of the 11 WALMIs, 4 of the 5 participating universities, and the CTU, all outside Delhi. Visits in Delhi included those to the following agencies, contractors, and consultants: USAID, Louis Berger International Inc. (LBII) and Water and Power Consultancy Services (India), Ltd. (WAPCOS), Education Development Center, Inc. (EDC), IRMIO, the CWC, the Central Ground Water Board (CGWB), the Ministry of Water Resources (MOWR), the Planning Commission, the World Bank, and the Ford Foundation. (Appendix E lists the people contacted for this report.)

2.4 Issues and Questions Addressed

This report is structured around the issues the scope of work identifies as being key to evaluating the WRM&T Project's effectiveness. Each issue is presented below. The team's findings for each are discussed in detail in Chapter 3.

2.4.1 State- and National-Level Institutions

Issue: What is the extent to which institutional capability is developed under the project?

2.4.2 Staff Capabilities

Issue: What is the extent to which the training and research staff developed professional skills and capabilities to manage training and research activities on its own in the future?

2.4.3 Action and Adaptive Research

Issue: What is the extent to which action/adaptive research carried out under this project enhanced professionals' capability to better plan and manage water resources?

2.4.4 Systems of Technology Transfer

Issue: What is the extent to which skills and technologies transferred under this project through training and research activities have been applied and found to be useful by professionals and farmers?

2.4.5 Organizational and Procedural Changes

Issue: What is the extent to which specific plans/recommendations have been developed and followed to accommodate new technologies and operational concepts?

2.4.6 Role of Consultants

Issue: How relevant and useful has been the technical assistance provided by expatriate and local contractors and consultants to the CTU, the WALMIs, and universities under the project?

2.4.7 Net Impact

Issue: How significant is the net impact on professionals of training, research, and other activities carried out by the institutes under this project in terms of upgrading skills, adopting systems and interdisciplinary approaches, shifting the management focus from "administering water" to "managing water" and "meeting farmers' needs," improving the efficiency and productivity of irrigation systems, and enlisting the participation and involvement of farmers in deciding, operating, and maintaining the irrigation systems?

2.4.8 Coordination and Linkages

Issue: How successful have efforts of coordination and linkages been within and between the concerned institutions and departments to synergize activities initiated under the project?

2.4.9 Future Directions

Issue: What are the innovative ways in which institutional capabilities can be further developed and used on a long-term and sustainable basis?

2.5 Methodology

The evaluation methodology used in the field employed a pattern of questions designed to stimulate discussion of accomplishments and difficulties encountered. Anecdotal evidence of the project's impact was sought because no measurable effect on agricultural productivity or farmers' income from irrigation projects could be expected at this early stage of the WALMIs' existence. To establish a reliable baseline database and to monitor progress adequately enough to attribute progress to individual inputs exceeds the capabilities of concerned departments in the foreseeable future.

The evaluation methodology was developed with the view that WRM&T is more a process- than a product-oriented project. One of the project's goals is to promote the development of manpower for irrigation management and integrated river basin planning during a period when the demand for such skills in the concerned departments is just emerging.

The participating institutions are young ones, some extremely so. Therefore, the team decided to concentrate on assessing factors related to sustainability of the institutions at the expense of quantifying outputs of the 17 principal institutions in detail.

The team leader held a team planning meeting (TPM) when the team assembled in Delhi to define and agree on its purpose, its approach to the task, and its internal working relations. A similar TPM had been facilitated by ISPAN's Human Resources Development coordinator before the two ISPAN team members left Washington. Background interviews with personnel of LBII and Harza Engineering Company were done before leaving for India.

Following background briefings by USAID, the team conducted interviews with project participants in New Delhi. From the third through the sixth week of the assignment, the team visited institutions in the selected states of Gujarat, Maharashtra, Tamil Nadu, Orissa, and Bihar. The team worked as a unit except when splitting into two groups for the visits to Aurangabad and Rahuri and to Madras and Trichy. USAID staff accompanied the team to all sites except Aurangabad and Rahuri. Where feasible, interviews were arranged with institution staff and faculty, students, field personnel and farmers at action research sites, and interested officials outside the institutions themselves. In nearly all cases, the team was able to schedule an exit interview with senior managers to discuss findings. (See Appendix F for the team's itinerary.)

During the seventh and eighth weeks, the team completed additional interviews in New Delhi, prepared its final draft report, and briefed USAID and the Government of India on its findings and recommendations.

The following principal activities are expected to continue after the completion of the project: training at all 11 state WALMIs and the CTU; one or more action research studies directed at identified irrigation problems at each WALMI; and continued education and research at five agricultural universities and engineering colleges.

Chapter 3

Findings, Lessons Learned, and Recommendations

3.1 Overview

This project was informally evaluated by USAID in 1987, and its training component was evaluated in 1988. The team began the final evaluation aware that a process project of this sort, of learning new skills and changing attitudes, was difficult to quantify objectively, and that, at best, it would only be able to gather anecdotal evidence of the project's effectiveness.

The team was also aware that the CWC is not a regulatory agency but instead an advisory board to the Central Government. As such, its source of power is its ability to persuade state governments that it is in their best interests to consider the need for and benefits of a managed irrigation system. As a corollary, the team was also aware that the power to regulate water was a jealously guarded prerogative of the states.

With those constraints in mind, the team learned the following about the net impact of the WRM&T Project.

First, the WALMIs have taken root and are beginning to thrive. Second, despite the fact the project is eight years old, the process of the institutes taking root is very young and will require direct funding from the states for some time to come. Third, many of the issues that affect the WALMIs are beyond their control and require structural changes in the Irrigation Department, including implementation of the National Water Policy (see Appendix G). The risk exists that unless appropriate organizational and procedural changes are made, the WALMIs and the CTU may end up being ideas slightly ahead of their time.

The team found that contracts were well administered, and that those issues that constrained contractors from fulfilling their missions were the same ones that constrained the institutions—the need for operational and procedural changes.

The team was very impressed by the contractors' responsiveness to the mid-course corrections the internal evaluation recommended, given the complexity of the project and the challenges involved in working with multiple levels of bureaucracy. In addition, the team was impressed with the efforts of the LBII team and WAPCOS to create a working environment that was both cooperative and respectful.

The team thinks a pilot project of this complexity should be expanded beyond its original scope, as occurred in 1986 in this project, but only if accompanied by a corresponding

increase in its management capability, and assurances that other issues affecting the project that are outside its control are addressed. For instance, slow growth of operation and maintenance budgets and river basin planning activities in the states has meant that most trainees have not returned to jobs suited to their training.

The team also suggests that the U.S. government provide selective, continued funding to those WALMIs that need to complete their infrastructure.

If any lessons are to be learned from mounting experimental projects of this sort, they are that things take time and that, therefore, patience is important. Moreover, the success of any one component, important as it is, is not as important as the trend or direction in which the whole project is moving.

The team found that at all levels, from state ministers and state secretaries of Irrigation, to chief engineers and engineers-in-chief, to directors of state institutions, their faculty, and students, down to the farmers, people were beginning to understand the need to develop plans to distribute water and systematically plan the use of the river basins. The team recognized, however, that hard evidence for this will not show up until those who have been trained under this program are in positions in which they can make appropriate decisions, and effect those policy, organizational, and procedural changes that are needed.

Finally, the team thinks that putting this process in place was a good investment of U.S. government funds, and a good use of Indian engineers' time and energy.

3.2 General Recommendations for the Government of India's Consideration

1. The WALMIs and the CTU are in place and provide training for operation and maintenance of the irrigation systems and for river basin planning. To fully realize their potential, however, the Government needs to take appropriate steps to implement the National Water Policy, especially as it concerns irrigation systems performance.
2. To create an appropriate environment in which effective operation and maintenance can take place, the team recommends the Government give priority to completion and implementation of those organizational and procedural changes relevant to main system management.
3. To ensure the long-term sustainability of these institutions, the team recommends the Government begin to direct funding to the operation and maintenance of irrigation systems and to river basin planning in order to attain the potential benefits of the training being provided and to improve the institutions' performance.

4. To achieve the larger goal of greater agricultural productivity and increased farmer incomes from irrigation, the team suggests the Government pay attention to the full range of issues and inputs involved, not just irrigation alone.

3.3 General Recommendations for USAID's Consideration

1. In a project of this complexity, where success depends on multiple factors outside the scope of the project, the team recommends that USAID or other agencies address these other factors at all appropriate levels.
2. The issues posed by the need for organizational and procedural changes (OPC) emanate from the states and, in fact, require someone of considerable stature and credibility at that level to promote them. The team recommends that for future programs of this kind, USAID consider dividing the scope of the project into two phases. The first phase would focus on OPC and would be accomplished either by its own staff or a local consultant. When these relevant changes were effected, phase two could begin, using a prominent technical consulting firm to achieve the project's goals.
3. Because doing so dilutes input to individual sites, the team recommends that USAID resist expanding an experimental concept of this kind beyond its original scope until it is sufficiently field-tested, and is accompanied by a corresponding revision of management capability.
4. Given the fact that several institutes established under this project need to complete their infrastructure, and subject to the availability of funds, the team recommends that USAID consider providing monies for such institutions for a limited period after the end of the project.

3.4 Evaluation Issues

The central project evaluation issues introduced in Section 2.4 are examined in more detail below, along with the team's findings and recommendations for each. The recommendations are for joint consideration by both USAID and the GOI, as ways to increase the project's effectiveness between now and the end of the project.

3.4.1 State and National-Level Organizations

Issue: What is the extent to which institutional capability has been developed under the project?

A. WALMIs

The WRM&T Project has supported 11 WALMIs, assisting them in constructing facilities, purchasing equipment, training faculty in India and abroad, designing and producing training courses and materials, and establishing action research sites.

Physical facilities have been constructed or are under construction at 10 of the 11 WALMIs (construction of the facility at Dharwad, Karnataka, is reported to be imminent), but the institutes now stand at many different levels of development. (See Table 1 for a description of the current status of the WALMI infrastructure.)

The WALMIs' training curricula could be made more relevant to the needs of their client departments if departmental needs assessments were conducted and used to identify those skills that training can supply. Such needs assessments could lead to the acceptance of professional development objectives within the departments and of the role of meaningful training in reaching those objectives. This could also correct the peculiar position of some institutes that are nominally part of an Irrigation Department whose needs they were created to serve, but cannot because their mission has not been accepted. Instead, the WALMIs are forced to fit into departmental professional development programs and end up selling general services to the departments rather than being allowed to design specific services tailored to meet the departments' particular needs.

The WALMIs lack a clear institutional model to follow and therefore tend to model themselves after the familiar pattern of the universities. This encourages the drift toward being an academic institution rather than a training institution that offers a unique identity and product.

Although the project was reoriented from a focus on on-farm and tertiary system performance to a focus on main systems management, the curricula appear still to emphasize specific agricultural activities more than the managerial tasks required for successful operation and maintenance of main systems.

The organization of the WALMIs as so-called autonomous societies under state societies' registration acts (see Appendix H) has enabled them to hire faculty from outside the Irrigation Departments and avoid certain burdensome administrative

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Table 1

Status of Infrastructure of State Training Institutes

<i>State</i>	<i>Year of Inclusion in WRM&T</i>	<i>Status</i>
Andhra Pradesh	1/88	WALAMTARI at Hyderabad has a campus about half an hour outside the city. This campus has never been occupied by the faculty. There is a small demonstration farm and courses are held on the campus.
Bihar	1/88	WALMI at Patna has a campus with buildings rapidly nearing completion. Space exists for a demonstration farm but no plans have yet been made to develop it.
Gujarat	6/84	WALMI at Anand is known for its fine campus and buildings. It has a good demonstration farm managed by a permanent farm manager on deputation from the local agricultural university.
Karnataka	11/89	WALMI at Dharwad has recently acquired an extensive site near Dharwad Agricultural University. A good design has been developed and construction is scheduled to begin this year with funds from a World Bank loan.
Kerala	1/88	IMTC of CWDRM at Calicut is located in a well-established research institute. The training cell does not currently have a demonstration farm.
Madhya Pradesh	6/84	WALMI at Bhopal has a large campus and has constructed a building of novel design. Construction has been stalled for about a year due to a reported shortage of funds. A promising demonstration farm is under development.

Table 1 continued

Status of Infrastructure of State Training Institutes

<i>State</i>	<i>Year of Inclusion in WRM&T</i>	<i>Status</i>
Maharashtra	6/84	WALMI at Aurangabad is a well-established institute with a good campus and demonstration farm.
Orissa	1/88	WALMI at Pratapnagiri near Bhubaneshwar has recently moved into its new campus. Buildings are being completed and the faculty has moved to the campus. A small demonstration farm is planned on the campus.
Rajasthan	6/84	IMTI at Kota is under construction. There is no provision for a farm on the campus, but the institute uses a farm at an agricultural station at Kota.
Tamil Nadu	6/84	IMTI at Trichy has a good fully developed campus. Construction of additional facilities is nearing completion. A demonstration farm on the campus is under development and use is also made of the excellent demonstration farm at the adjacent regional engineering college.
Uttar Pradesh	5/88	WALMI has an old campus at Okhla near Delhi and a new campus to be completed at Lucknow in 1994. A demonstration farm is planned at Lucknow.

Source: Dr. John Brown, Education Specialist, LBII. Data reflects status as of February 1992.

requirements of government organizations. Unfortunately, this status has not allowed the WALMIs to avoid other unproductive government practices, notably the use of the director's post as a short-term preretirement assignment and the deputation of faculty from the department for reasons unrelated to potential ability as trainers. However, since the Irrigation Departments finance the WALMIs' budgets, the WALMIs will remain subject to the former's administrative control. Thus, the degree of autonomy the WALMIs enjoy under the registration acts has proven to be insignificant.

Another, intensifying problem affecting the WALMIs is a lack of strong leadership. Weak leadership is to be expected from brief and additional postings of chief engineers as WALMI directors. Yet, without stable leadership, the development of strategic operating plans and of adequate monitoring and evaluation procedures for training programs is difficult. Not surprisingly, those WALMIs that have had strong leadership over several years have made the most impressive progress.

The team has found no evidence that any WALMI except that in Maharashtra has responded to the mid-term evaluation of the project's training component. Even in Maharashtra, the written response has not yet been released.

Recommendations

1. The team recommends that the Irrigation and Agriculture Departments complete their needs assessments and determine which of their needs training can address. Those needs would then be prioritized to guide the selection of courses for the WALMIs.
2. The team recommends that replication of WALMIs in additional states wait until the Irrigation Departments determine a need for training in operation and maintenance.

B. Universities

The WRM&T Project has supported five university-level programs: two irrigation programs in agricultural universities and three water resources and irrigation programs in engineering colleges (see Table 2). Assistance has been provided to train faculty, improve curricula and teaching materials, provide research opportunities for graduate students, purchase books and equipment, construct facilities, and conduct adaptive research.

The team found that the universities had benefitted from enhancing their staff through training and their facilities through improved computers and other

equipment. Some dissatisfaction was expressed, however, over the difficulty in securing timely approval from the JPMC for training consultants.

Adaptive research programs were found to be rather limited in scope and relevance to the adaptation of findings to local conditions. Much of the adaptive research appeared to differ little from the crop trials normally conducted by agricultural universities.

Designating an undergraduate degree in irrigation management at M.S. University at Vadodara (Baroda) has proven disappointing. The state Irrigation Departments have not been recruiting new graduates, and the undergraduate level of the program limits the scope of potential employment for its graduates as compared with that available to holders of traditional civil engineering degrees.

The linkages of the participating universities with the WALMIs was not as strong as the team expected to find. The WALMIs more frequently exchanged faculty with nonparticipating universities at nearer locations.

On the positive side, the computer laboratories established in these centers will be a strong attraction for students to these programs.

Recommendations

1. The team recommends that USAID continue to support opportunities for university faculty training abroad and for visiting faculty from abroad.
2. The team recommends that the universities refrain from designating undergraduate degrees in irrigation. This is appropriate only at the postgraduate level.

C. Central Training Unit (CTU)

The Central Training Unit (CTU) of the CWC has been established to train practicing water resources scientists and engineers from state and Central Government organizations in integrated river basin planning using a systems engineering approach. An excellent training program was designed and conducted by a strong team of consultants from the United States and India. The prime contractor was Harza Engineering Company, and the team included Utah State University and Consulting Engineering Services (India) Pvt., Ltd. They developed multidisciplinary courses with considerable practical material that are strongly oriented toward applications. A three-month introductory course and a nine-month advanced course have been offered.

Table 2

WRM&T University Programs

<i>Location</i>	<i>University</i>	<i>Participating Department</i>
Rahuri, Maharashtra	Mahatma Phule Agricultural University	Department of Irrigation & Water Management
Udaipur, Rajasthan	Sukhadia (Rajasthan Agricultural) Univ.	College of Technology and Agriculture
Vadodara, Gujarat	M.S. University	Water Resources Engineering and Management Institute
Madras, Tamil Nadu	Anna University	Center for Water Resources
Patna, Bihar	Bihar College of Engineering	Center for Water Resources Studies

Academic linkages between the CTU and Utah State University and the University of Poona were firmly established.

The CTU has been located in temporary quarters at the Central Water and Power Research Station (CWPRS) near Pune. A permanent home in Nagpur is proposed to be built sometime in the future. The CTU is staffed by engineers from the CWC. The faculty has never reached more than about half its authorized number, however, and its administration has also been understaffed.

CTU courses were originally prepared and conducted by a mix of expatriate and visiting Indian faculty. The permanent CTU faculty assumed principal responsibility for conducting courses beginning with the third introductory course in January 1991. After the Harza contract was completed in December 1991, the permanent faculty completed the second advanced course (June 1991-March 1992) without further expatriate assistance.

In order to become the outstanding training institution it strives to be, the CTU will require strong support from the CWC. The permanent location of the CTU is uncertain; its current space arrangement at CWPRS is temporary. CTU is understaffed, and USAID support for foreign study tours, currently a major factor

in recruiting students, will end with the project. All of these factors threaten the sustainability of a vigorous CTU.

Additionally, stability of the assignment of CTU faculty and attention to their development as effective trainers are required in order to achieve the quality of training that is sought.

Recommendations

1. The team recommends that CTU staff levels be increased to planned numbers so that faculty have sufficient time free of administrative duties to prepare and conduct courses. The team recommends that the U.S. portion of the TOT course be completed before September 1992.
2. The team recommends that the CWC complete plans for a permanent CTU without delay.

D. Indo-U.S. Studies

Late in the project, the CWC undertook seven technical studies to investigate water resources planning and management in India. The studies are as follows:

- Real Time Operation of Reservoirs
- Dynamic Regulation of Canals
- Sustainable Water Resources Development and Management
- Snow Hydrology
- Application of Spatial Data Technology to Water Resources Development and Management (Remote Sensing)
- Paleo-Flood Studies of Some Indian Rivers
- Development of Hydrological Models Using Geomorphological Parameters

Recommendations

1. Due to their late start, some of the above studies may not be completed by September 1992. Should funding be available after that date, the team recommends that USAID/CWC give the following studies priority: Dynamic Regulation of Canals, Real Time Operation of Reservoirs, Snow Hydrology, and Sustainable Water Resources Development and Management.

E. CGWB/USGS Collaboration

Following the mid-term changes in the WRM&T Project, the Central Ground Water Board (CGWB) developed a collaborative project with the U.S. Geological Survey (USGS). It contains the following components:

1. *Training in the U.S.*—Tailor-made training program for 41 Indian scientists will have been completed by the USGS in the United States by September 1992.
2. *Training in India*—USGS personnel visited India to plan a technical assistance program for the National Institute of Ground Water at Faridabad. The resulting training will begin in May 1992.
3. *Special equipment*—Specialized hydrogeological equipment has been procured from the United States.
4. *Collaborative research*—A follow-on project will be designed to transfer computer modeling programs related to regional aquifer analysis, groundwater pollution/quality monitoring, and storage of fresh water in saline aquifer systems.

Recommendations

1. CGWB/USGS collaboration appears to have been highly successful. Therefore, the team recommends its continuation through the follow-on collaborative research cited above.

3.4.2 Staff Capabilities

Issue: What is the extent to which the training and research staff has developed its professional skills and capabilities to manage training and research activities on its own in the future?

The WRM&T Project is designed for human resource development. Among its purposes were to develop the staff's capability to manage training and research activities to provide optimal delivery to and use of water on farmers' fields, and to systematically plan the integrated use of river basins.

By and large, the team found the staff to be competent and growing in confidence. Indeed, competence and confidence feed into one another. Growth in one promotes growth in the other.

A. Confidence

With the exception of that in Aurangabad, the faculty involved in training had not, in their own minds, separated the content of the training courses from the process by which training is delivered. Thus, much time has been spent making sure the technical information in the courses is accurate and up-to-date, but little attention has been given to identifying effective ways to communicate the content and to ensure that learning is taking place. These are two different functions. For example, one team evaluator was surprised to see how much lecturing was going on in all the training institutes, how little was understood about how to involve the participants in the learning process, and how often the training rooms were designed to serve the needs of university professors—desks, platforms, lecture stands, chalkboards, and so on—and how rarely they were designed to serve the needs of professional trainers—tables and chairs in an open space, multiple flip charts and easels, break-out rooms, and so on. A thorough grounding in the practical issues involved in delivering training would give the practitioners more confidence in their ability to train their students.

The *Irrigation Water Management Trainer's Guide* is a well thought out introduction to the practice of teaching and training adults. Building on the information and suggestions in it could make the manual even more useful in the form of a second iteration which would translate general principles of adult learning into specific practices for adult training using the most current recommendations available. During the past 20 years in particular, a number of methodologies formally known as andragogy and prompted by the original studies of Malcolm Knowles (see *The Adult Learner: A Neglected Species*, Gulf Publishing Co., Houston, Texas, 1984) and others have been aimed at helping practitioners of stand-up training delivery. (See Appendix I for guidelines on training delivery methods.)

The above tools would be very helpful when combined with the "Training Evaluation Procedures for Use by State Training Institutes" developed in draft under the LBII contract. Together, they offer a sound and practical approach to the issue of evaluation.

The team noted that the staff has no model of a training institute using a similar approach to training adults against which to measure performance. Visiting such a facility in operation would no doubt build the staff's confidence. The team has been told that the Administrative Staff College of India and the Indian Institutes of Management use the approaches suggested, but has not had an opportunity to investigate further.

B. Competence

The team noted that a significant number of the faculty, particularly the engineers, were on deputation from the Irrigation Department. The turnover under such a system is enormous and precludes building a faculty with a strong reputation dedicated to training as a profession. A mix of 50 percent core faculty and 50 percent deputation would guarantee continuity of experience, as well as an influx of fresh ideas.

As noted previously, the team observed that the turnover in directors is particularly high. In some cases, there has been more than one director in a year, and in others, such as at the WALMI in Anand, the director has other, even larger, responsibilities. The change in directors is very disruptive to the institution, where a steady hand at the helm during a long period of time is essential to the development of a young institution. One possible solution is to leave the administration of the institution to the director and to shift the responsibility for academic performance to the joint director, who, if hired from the open market, could bring extensive scholarly experience to the institution as well as ensure academic continuity. This model is in use in the WALMI in Aurangabad (Maharashtra).

Faculty on deputation often saw their assignment to training as transitory and assumed they would return to the Irrigation Department in three years. While the tenure of the faculty on deputation should continue to be a minimum of three years, those faculty who so wished should be allowed to stay, and perhaps make a career out of training.

The team noted that in most WALMIs the faculty often had to handle the logistic and administrative matters to the detriment of the training course. The team suggests that sufficient administrative staff be given to trainers to handle logistics. Such a model already exists in the Indian Institutes of Management.

To have a competent staff, an institute needs a mechanism to allow for continuing professional education through such things as journals, conferences, and methods workshops. The team recommends that trainers be encouraged to join the Indian Society of Training and Development. In addition, the team recommends that the WALMI libraries dedicate a section to training theory and methods as a faculty resource. (See Appendix J for a suggested training bibliography.)

Recommendations

1. The team recommends WALMI directors encourage the exchange of faculty among themselves for guest lectures and short visits.

2. The team recommends that WALMI directors strive to achieve a mix of 50 percent core faculty and 50 percent deputation. Core faculty guarantee continuity of experience, and deputed faculty bring fresh ideas.
3. The team recommends that the joint director be a core faculty member, thus bringing continuity and experience to training. This model is in use in the WALMI in Aurangabad (Maharashtra).
4. The team recommends that the tenure of the faculty on deputation continue for a minimum of three years, but that those faculty who wish to remain longer at the WALMIs be allowed to do so.
5. The team recommends that sufficient other administrative staff be given to trainers to handle training logistics and that provision be made for the continuing professional education of the training staff through such mechanisms as training journals, trainer conferences, and methods workshops. The team suggests that trainers be encouraged to join the Indian Society of Training and Development.
6. The team recommends that WALMI libraries develop sections dedicated to training theory and training methods as a faculty resource.
7. The team recommends that a chapter be added to the *Trainer's Guide* that is focused on the practical application of training techniques and approaches to adult learners.
8. The team recommends that classrooms in future WALMIs be designed to meet professional training needs, not professional academic needs. The team recognizes that it may be too late to change existing WALMIs significantly. (See Appendix I for suggestions.)
9. The team recommends LBII help identify other training institutions in India that employ modern training delivery techniques that the WALMI staff could use as models for improving their own teaching performance.

3.4.3 Action and Adaptive Research

Issue: What is the extent to which action/adaptive research carried out under this project has enhanced the capability of professionals to plan and manage water resources for higher agricultural productivity?

A. Role of Action Research

As envisaged in the project paper, "action research" is essentially a long-term case study of an irrigated area sufficiently large to be representative of a complete system. Action research includes diagnostic analysis of problems that constrain irrigated agricultural production in the system being examined, application of selected interventions and corrective measures, and analysis of the findings and site demonstrations for use by the professionals receiving training for broader application to other state irrigation sites.

The concept of the Action and Adaptive Research Program, however, seems to have been diluted. While the program has given WALMI staff an excellent opportunity to investigate and find solutions to many of the problems on-site, it has not provided the trainees an opportunity to practice and apply what they learned in the classroom. Under the concept of action research for training, the trainees are expected to stay at the action research site for fairly long periods, undertake field studies on multidisciplinary subjects, and interact with the farmers in order to acquaint themselves in greater detail with problems in irrigated agriculture. But in this project, because of the distance from the WALMIs to the action research sites and the absence of overnight and long-term accommodations, trainees usually paid only brief visits of a few hours to the sites.

B. Physical Facilities

The evaluation team's visit to the action research (AR) sites was frustrating. At most of the sites, temporary buildings to accommodate staff and trainees (as provided in the project paper) were yet to be built. The action research staff, who mostly continue to reside at the headquarters of the various WALMIs, visit the AR sites infrequently. Trainees who are expected to spend considerable time in the field conducting field studies are more often to be found at the AR sites as casual visitors. This defeats the purpose of this component, which was to provide field training to professional engineers.

C. Action and Adaptive Research vis-à-vis Farmer Organizations

While not meaning to underestimate the utility of Farmer Organizations, the team thinks the program treats such organizations as a panacea to meet all the needs of farmers. The action research program now centers on farmer organizations. All other actions, including the improvements to be brought about in the main system, seem to have been relegated to a lower priority in the program despite their importance in Project Implementation Letter #7 (see Appendix K).

D. Need for Field Training during Canal Operation

During an interview with a trainee who had completed his course in one of the WALMIs, the team learned that trainees were sent to the action research site for field training when the canals were closed between the two irrigation seasons. The trainees thus had no opportunity to see the canal in operation or the distribution of water to the farmers' fields. Again, this defeated the real purpose of the field training.

Recommendations

- The team recommends that the physical facilities as provided in the project paper be put in place.
- The team recommends field training be scheduled to coincide with irrigation operation.
- The team recommends that the action research program take the role defined for it in the project paper and develop true field training sites. In doing so, it would help promote other research actions which could take their place alongside farmer organizations.

3.4.4 Technology Transfer

Issue: What is the extent to which skills and technologies transferred under the project through training and research activities have been applied and found useful by farmers and professionals?

Transfer under this project developed three sorts of skills: 1) skills in dealing with problems in the irrigation system through long-term studies; 2) skills in investigating, developing, and planning irrigation systems through integrated river basin planning; and 3) skills in training developed through TOT courses given in India and the United States. The first and second groups of skills were augmented in turn by transfer courses given by guest lecturers from American universities. A micro-computer interactive video disc (MCIVD) technology, introduced on a limited scale, provided simulated field experience and self-paced instruction. In addition, a newsletter was created and distributed to the WALMIs and other interested parties.

In the five WALMIs it visited, as well as the CTU, the team found that the faculties thought they had acquired some useful skills, both through the TOT courses and the transfer courses. The MCIVD generated a lot of interest, and the newsletter received much praise for both its content and format.

The MCIVD technology developed at Aurangabad is very exciting, but very expensive. It is probably way ahead of its time for extensive use in the WALMIs in India. Six discs have been pressed; five of them provide simulated field experience in identifying field problems, and the sixth deals with the development, management, and modification of MCIVD Level III training courses.

The implementation of the transfer courses was affected by two issues. The first was that faculty members to whom courses were transferred sometimes were not present the following year to give the course. (The question of faculty tenure is explored more fully in Section 3.4.2, Staff Capabilities.)

The second issue arises from a lack of planning and preparation. To function well the guest professor should spend, at the minimum, two days with the resident professor discussing the learning strategy in his presentation, the basis for his lecture notes and how they complement the presentation, how to deliver the presentation effectively, and how to evaluate the results. The guest professor should arrange with the resident professor to team-teach the class—selecting segments of the course the resident could teach (possibly with some coaching). In this way the resident professor can learn how to prepare and present at least part of the course. The next year, in a follow-up course, the visiting professor should again team-teach, but this time with the goal of gradually becoming only an observer, and shifting the full responsibility for the course to the resident professor.

The above scenario implies that WALMI directors must choose resident professors they know will be available to take responsibility for the course, and provide them with two to three days of lead time to work with the visiting professor. It also implies that the visiting professor should plan to arrive in country early enough to work with the resident, and be willing to serve as a supervising professor rather than as the chief instructor.

Recommendations

1. The team recommends that, due to its expense and complexity, MCIVD technology be limited to sites for which it currently is planned.
2. The team recommends that the WALMIs pool their resources to continue the national newsletter by rotating the editorship on a yearly basis. The WALMI accepting the editorship would bear the cost for that year.
3. The team recommends that transfer courses be passed on to faculty members who will be on staff for at least one more year, and that sufficient

uninterrupted lead time be given to both visiting and resident professors to plan and prepare transfer courses.

3.4.5 Organizational and Procedural Changes

Issue: What is the extent to which specific plans have been developed to accommodate new technologies and organizational concepts?

The project envisaged that participating states would conduct studies on the following organizational concepts: staffing requirements; administrative and managerial procedures, rules, and regulations; and job assessments, descriptions, and practices. The latter are needed to shift the focus of irrigation system management away from administration to facilitating farmers' participation in the operation and maintenance of irrigation systems. Such a shift was expected to lead to the development of more effective water distribution systems that ultimately would have improved agricultural productivity and rural incomes in irrigation system command areas.

During its visits to the WALMIs and discussions held with faculty and trainees, the team found no plans for professional development of personnel in the departments sending trainees to WALMIs, even though such plans could help the institutes mount appropriate curricula. Professional development should be based on the departmental needs that stem from the goals of the irrigation service, which, in turn, determine the operational plans for a given irrigation system. Operation plans form the framework for the various jobs to be performed in the department. Analyses of impediments to job performance can reveal problems that training might be able to solve. The team has not found any evidence of such an exercise having been carried out, however.

The WALMIs accept trainees nominated by the concerned departments. In the absence of training reserves in departmental manpower plans, important officers are not free to attend. Moreover, those trained do not receive appropriate job postings. Thus the training imparted in the WALMIs lacks the anchoring in departmental structures that would have been provided had organizational and procedural changes received appropriate attention from the start of the project. In fact, insufficient recognition of the importance of this component during the project's design phase has precluded appropriate changes in India's governmental structure. Directing enough funds to the functions of operation and maintenance (O&M) would have helped bring about such changes. Adequate funding also would have signified the importance of O&M in enabling the departments to meet the goals of a designated irrigation service.

Recommendations

1. The team recommends that, in order to fully realize the WALMIs' potential, the GOI implement the National Water Policy, especially with respect to the performance of irrigation systems. State irrigation departments would benefit from establishing professional development programs that would be supported by training at the WALMIs.

3.4.6 Role of Consultants

Issue: How relevant and useful has the technical assistance been from expatriate and local contractors and consultants to CTU, the WALMIs, and universities under the project?

The contractors and consultants played a key role in the WRM&T Project, since it was with their advice and guidance that all the project components—training, long-term in-depth action research, development of training and research capabilities in the universities, technology transfer and organizational and procedural changes—were realized.

During its visits to various institutions, the team found that the technical assistance provided by long-term and short-term consultants has facilitated the performance of project activities to varying extents. Faculty at the various institutions said they would have benefitted more from the technical assistance if the consultants' visits were longer in duration. Faculty members also received short advance notice of consultants' arrival, insufficient detail as to the reasons for their mission, and (in the case of guest lecturers) lecture materials arriving too late to be reviewed before classes began. This may have been due to a simple administrative or communication slip-up. Nonetheless, it prevented the faculty from taking full advantage of the technical assistance offered. The faculty also said that one consultant provided advice on a particular issue that differed from that given by his predecessor, which caused confusion.

Recommendations

1. The team recommends a course transfer planning meeting take place sufficiently ahead of time to facilitate effective course transfer. The consultant and the involved faculty member should decide upon a time for the meeting.
2. The team recommends consultants spend more time in the field during the diagnostic analysis phase of action research.

3. The team recommends that consultants be informed of the advice their predecessors gave students in order to prepare the client if he plans to modify the direction recommended earlier.

3.4.7 Net Impact

Issue: What is the net impact of the WALMIs' training, research, and other activities on professionals in terms of the following: upgrading skills, adopting systems and interdisciplinary approaches, shifting the management focus from "administering water" to "managing water" and "meeting farmers' needs," improving the efficiency and productivity of irrigation systems, and involving farmers in operating and maintaining the irrigation systems?

Determining the effects of the WRM&T Project is still in the early stage. Awareness exists of the importance of improved operation and maintenance, the multidisciplinary nature of irrigation management, the need to consult and involve farmers in system management, the advantages of integrated river basin planning, and the importance of training to upgrade the skills of irrigation engineers and agricultural professionals. The activities of the WALMIs, including construction of their new campuses, have promoted this awareness widely. At action research sites where farmer organizations have been formed, the idea that farmers can work together for their mutual benefit is being tested with great interest.

The National Water Policy (see Appendix G) has enunciated objectives similar to the above as national policy since 1987, and other organizations such as the World Bank and the Ford Foundation have been actively supporting this approach for several years. Thus the momentum for increased attention to the opposite ends of the water resources development spectrum—river basin planning and system operation and maintenance—is building in India.

However, financial constraints in the irrigation sector have limited the funding of operation and maintenance and, together with interstate political competition, river basin planning. The Eighth Plan is expected to reduce funding for the irrigation sector, and many states are currently in financial difficulty. The interests of the Irrigation Departments seem to follow the funds available in construction rather than those in operation and maintenance. A solution to this problem will clarify the roles of the training programs and allow them to respond more effectively as the demand for their services develops. Matters are compounded when training programs are established ahead of demand, the team observed, as they require special attention to sustain them while demand grows.

In India it appears easier to create new institutions than to change existing ones (including legal institutions), as the project has been more successful doing the former. Indeed, training has proven an ineffective vehicle for institutional change. The provision of information and education is a more appropriate function of the training institutes.

Recommendations

1. The team recommends that the Irrigation Department enunciate clearly the irrigation service to be provided, implement the required System Operation Plan for every irrigation system, and adequately fund operation and maintenance in order to use the people trained at the institutes effectively.
2. The team recommends that the Irrigation Department create a mechanism with which to obtain feedback from farmers and develop a system operation plan acceptable to them.

3.4.8 Coordination and Linkages

Issue: How successful have efforts been to ensure coordination and linkages within and between the concerned institutions and departments to synergize project activities?

Attempts to coordinate the various activities under different project components played a key role in the project's implementation, as did establishing linkages between the departments and the institutes. The latter were achieved through various committees at the national and state levels, through the provision of faculty on deputation from the concerned departments and institutions, as well as through seminars, workshops, visiting faculty, all-India courses, and newsletters. In total, 11 training institutions, 5 universities in several states, and several Central Government departments and organizations took part in the process.

The mechanism for coordination and linkage, as envisaged in the project document, included a central documentation center for collection and dissemination of information. This particular element did not materialize, however. All other instruments for coordination and linkage have been helpful to the project. Some WALMIs also worked successfully with universities outside those included in the project.

Recommendations

1. The team recommends that all-India courses already in place be continued as an instrument for linking the institutes and the universities. Also, each

WALMI could develop additional all-India courses to strengthen such linkages.

2. The team recommends that every effort be made to encourage both formal and informal links between the various institutions.
3. The team recommends the newsletter, workshops, visiting faculty, and guest trainers continue as conventional ways of linking the institutions.
4. The team recommends the WALMIs convene four times a year to coordinate the topics, contents, and timing of the all-India courses. The directors and joint directors are encouraged to attend.

3.4.9 Future Directions

Issue: In what innovative ways can institutional capabilities be further developed and used on a long-term, sustainable basis?

A. Current Status of the WALMIs

Eleven WALMIs have been set up in as many states in different parts of India with different agro-climatic conditions. Some of those established in the early 1980s are well entrenched with built-up infrastructure and fully staffed faculty. Other WALMIs are in the process of filling sanctioned positions, while a few still lag behind but are trying to catch up in both infrastructure and faculty.

B. Need for Consolidation of Gains

Though the WRM&T Project is scheduled to end in September 1992, it is widely felt that the WALMIs should continue to get support both from the GOI and the respective state governments in order to consolidate their gains.

The evaluation team has found that trainees recognize the usefulness of training in land and water management. The training's usefulness in meeting the project's overall objectives, however, remains obscure.

Much of the training's success will stem from the way trainees are able to use their knowledge. This will depend on organizational and procedural changes to be brought about in the Irrigation Departments. The present rules and regulations are not only bureaucratic but are not conducive to irrigation development. The procedures were devised a century ago, when irrigation projects were only "administering" water. Now, the concept of development has undergone changes to "managing water" and "meeting farmers' needs." The state governments so far have been unable to move in tune with these changes, however. The state

governments may face real difficulties in enforcing organizational and procedural change and allocating more funds for operation and maintenance (maintenance costs have risen many times) but, nonetheless, they might take a more pragmatic view and allow changes to occur. Farmers must be involved in system operation and maintenance, at least up to the minor canals, and this will result only if changes occur in current irrigation laws, organizational structure, and procedures. Until such changes have taken place, the team recommends that the WALMIs be allowed to consolidate their gains before the government considers expanding the program into other states.

C. Changes in Focus on Training and Research Needs

When the WALMIs were created, their curricula were predominantly theoretical in nature. While not disagreeing with the view that some basic knowledge of water management, agronomy, social sciences, and rural economics is essential, the team observed that field training in all the related subjects needs more emphasis. The WALMIs are training institutions and unlike the universities are not meant to provide only academic courses. "Education" and "training" differ in their goals and methodology. The WALMIs are expected to train more than to educate. The appropriate place for getting education is the university. This aspect seems to have been forgotten. The WALMIs have now become parallel institutions to the universities, imparting knowledge about land and water management but little training in how to do it. It is essential that the WALMIs also emphasize field training and develop a unique identity to avoid becoming additional academic institutions.

During its visit, the evaluation team saw no one teaching training to the WALMI trainers. The faculty members are largely engineers who have little exposure to known training methods. In the absence of such preparation, training courses become ineffective.

The evaluation team suggests that each WALMI not only teach modern training methods but conduct research on appropriate methods of training both in the classroom and in the field.

D. Support to WALMIs after Project End

The WRM&T Project comes to an end in September 1992. Some of the WALMIs have established themselves, while others are struggling to build up their infrastructure and faculty. The evaluation team thinks a good beginning has been made and that it would be unwise to withdraw financial support to the WALMIs in October 1992.

During discussions, the team learned of plans, currently in their initial stages, to develop an APEX institute as a national irrigation management institute that would take up irrigation management issues from a national point of view. Should such an institution be developed, and to the degree to which the state departments of irrigation agreed to participate, it could play a role in coordinating WALMI activities and establish additional linkages between them.

Recommendations

1. The team recommends that the Government allow time for the existing WALMIs to consolidate their gains before expanding the institutes into other states.
2. The team recommends that the WALMIs seek to develop a unique identity as training institutions and thus avoid becoming additional academic institutions.
3. Given the fact that several institutes established under this project need to complete their infrastructure, and subject to the availability of funds, the team recommends that USAID consider providing monies for such institutions for a limited period after the end of the project.

Appendix A

PROJECT IMPLEMENTATION LETTER #2



UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

NEW DELHI, INDIA

August 7, 1985

Mr. H.C. Pant
Director
Department of Economic Affairs
Ministry of Finance
North Block
New Delhi

Sub: Irrigation Management and Training
Project Loan and Grant Agreement
Project No. 386-0484
AID Loan No. 386-T-236
Project Implementation Letter No. 2

Dear Mr. Pant:

This letter sets forth procedures for utilizing the proceeds of the subject Loan and Grant and provides information and guidance regarding the provisions of the project Loan and Grant Agreement dated July 30, 1983 between the President of India (Cooperating Country) and the United States of America acting through the Agency for International Development (A.I.D.). This letter and its attachments may be supplemented or modified by subsequent Project Implementation Letters (FILs).

I. The Project - Article 2

The project aims at strengthening selected Indian institutions and human resources responsible for management and use of surface irrigation systems and the water they deliver. Efforts in training and associated institutional development will be financed under this project. The overall cost of the project, estimated to be \$79.2 million, will be met by an A.I.D. contribution of \$51 million (\$41 million grant and \$10 million loan) and by the Cooperating Country's contribution of \$28.2 million. The foreign exchange cost, estimated at \$34,610,000, will be wholly grant financed. Local currency costs of the project are estimated at \$44,590,000. These costs will be financed by GOI and participating states in the amount of \$28.2 million and by A.I.D. in the amount of \$16,390,000 (Loan of \$10 million and Grant of \$6,390,000). Attachment B (consolidated summary of project's local currency costs for life of project) exhibits GOI, and A.I.D. contributions to meet local costs of the project by each line item of the project. Attachment C (project's local currency financing by source) specifies the percentages for sharing the expenditure incurred against each of the sub-cost categories listed under each of the line items.

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Grant funds may be used to defray cost of services of contracted expatriate consultants, procurement of imported experimental and test equipment and instruments, travel and per diem during off-shore training and the Water Resources planning and Management Component and project evaluation.

Grant funds may also be used to finance the local currency cost of procuring library books, part of operational costs of adaptive research activities and experiments (under Training and Professional Development Component of the Project), indigenous equipment, Indian technical consultants, renting facilities where so reflected in the project budget and training (under Water Resources Planning and Management Component of the project).

Loan funds may be used to defray rupee costs relating to staff salaries, part of the cost of adaptive research activities (under Training and Professional Development component of the project), seminars, workshops, publications, temporary buildings (under Action Research component of the project) and equipment for Water Resources Planning and Management component of the project.

II. Special Covenants - Article 6, Section 6.1

Pursuant to this section of the Loan and Grant Agreement, the Cooperating Country agrees to the following:

(a) ensure continued coordination between the Central Government and states, between Central Ministries of Irrigation and Agriculture and between counterpart state departments and state training institutes;

(b) encourage collaboration between state training institutes and engineering and agricultural universities and management institutes;

(c) effect, whenever feasible, adjustments to organizational structure, authorities and procedures to facilitate improved design and operation of irrigation systems and improved agricultural production;

(d) ensure continued funding and support by the Cooperating Country and state governments for the training institutes and action research studies after the completion of the project;

(e) ensure that the state and central employees and officials trained under this project will, as far as possible, be retained in or assigned to positions concerning irrigated agriculture in accordance with established bonding requirements;

(f) make available personnel and budgets needed for implementation of this project to the participating state governments as and when required.

III. Procurement Source - Article 7

A. Foreign Exchange Costs - Section 7.1 (Loan Funds)

Pursuant to this section, the source and origin of U.S. dollar procurement of loan-funded goods and services will be those countries included in Code 941 of the A.I.D. Geographic Code Book as in effect on the date orders are placed or contracts entered into for such goods and services. At present Code 941 includes the United States and any other independent country in the Free World^{*/}, except for India (for the purpose of this Assistance) and the following countries:

Europe

Andorra	Iceland	Norway
Austria	Ireland	Portugal
Belgium	Italy	San Marino
Denmark	Liechtenstein	Spain
Finland	Luxembourg	Sweden
France	Malta	Switzerland
Germany, Federal	Monaco	United Kingdom
Republic of	Netherlands	Vatican City
(including West		Yugoslavia
Berlin)		

Other

Afghanistan	Iran	Saudi Arabia
Angola	Japan	Singapore
Australia	Kuwait	South Africa
Bahrain	Libya	Syria
Canada	Mozambique	Yeman Arab
Cyprus	New Zealand	Republic
Gabon	Qatar	United Arab
Greece		Emirates
Hong Kong		

^{*/}Free World excludes the following areas or countries:

USSR, Albania, Bulgaria, Czechoslovakia, German Democratic Republic, Estonia, Hungary, Latvia, Lithuania, Romania, Poland, Vietnam, North Korea, People's Republic of China, Mongolia, Laos, Cambodia, and Cuba.

B. Foreign Exchange Costs - Section 7.1 (Grant Funds)

Pursuant to this Section, the source and origin of U.S. dollar procurement of grant-funded goods and services will be the United States (Code 000), except as A.I.D. may otherwise agree in writing.

C. Local Currency Procurement Costs - Section 7.2

Pursuant to this section, the source and origin of local currency loan-funded and grant-funded goods and services shall be India.

D. Definitions

1. Source and Origin

With respect to equipment and materials, "source" is the country from which such equipment and material is shipped to India or India itself if the equipment and materials are located therein at the time of purchase. However, where the equipment and materials are shipped to India from a free port or bonded warehouse in the form in which received therein, "source" means the country or territory from which the equipment or materials was shipped to such free port or bonded warehouse. "Origin" is the country in which such equipment or material is mined, grown or produced. A commodity is produced when through manufacturing, processing, or assembly, a commercially recognized new commodity results that is substantially different in basic characteristics, or in purpose, or utility from its components.

2. Goods and Services

Goods are considered as a produced commodity. Services are primarily identified with professional, technical and procurement and construction service contracts. Services are also commodity-related such as insurance, ocean freight and/or incidental services. Insurance means a policy of insurance including marine liability, or any performance or other bond eligible for financing. Incidental services could be for such items as equipment installation and personal training in connection with equipment.

The application of source and origin criteria to the three types of commodity-related services is as follows. In the case of insurance, the source and origin is the country in which such insurance is placed. In case of incidental services the source and origin is the country to which the personnel or firm providing the services belong. In case of ocean freight the source and origin is the country of the flag registry of the vehicle.

3. Indigenous Goods

a. Goods that have been mined, grown, or produced in India through manufacture, processing, or assembly are eligible for financing.

b. Goods produced with imported components, in order to qualify as indigenous, must result in a commercially recognized new commodity that is substantially different in basic characteristics or in purpose or utility from its components. Any imported component from a non-free world country makes the indigenous commodity ineligible for A.I.D. financing.

4. Shelf Item Procurement

a. Goods which are normally imported into India and kept in stock in the form in which imported for commercial resale to meet a general demand in India shall be deemed to be of Indian source for purposes of financing under this Agreement, subject to the following:

(i) Shelf Items Imported from Code 941 Countries

Shelf items are eligible for financing under this Grant, if they have their origin in the United States or in a country included in Code 941.

(ii) Shelf Items Imported from Other Free World Sources

Shelf items having their source and origin in countries included in Geographic Code 899 (any area or country in the free world, excluding the Cooperating Country itself. See Section III.A. above for definition of "Free World") but not in Geographic Code 941, are eligible for financing if the price of one unit does not exceed \$5,000. For goods sold by units of quantity, e.g., tons, barrels, etc., the unit to which the local currency equivalent of \$5,000 is applied is that which is customarily used in quoting prices. The total amount of imported shelf-item purchases from Free World countries other than Code 941 may not exceed ten percent of total local costs financed by A.I.D. for the project, or \$25,000, whichever is higher.

(iii) Shelf Items Imported from Non-Free World Sources

Imported shelf items produced in or imported from countries not included in Geographic Code 899 are ineligible for A.I.D. financing.

b. Any imported component from a non-Free World country makes the imported shelf item ineligible for A.I.D. financing.

IV. Disbursements - Article 8

A. Disbursements for Foreign Exchange Costs - Section 8.1

1. Equipment and Materials

Equipment and materials may be procured by A.I.D. on behalf of the Cooperating Country if the latter requests A.I.D. to do so. After the list of equipment and materials is finalized, A.I.D. will arrange for purchases. Payments will be made directly and will be charged to the Grant.

2. Professional and Technical Services

As with equipment and materials, services may be procured by A.I.D. on behalf of the Cooperating Country if the latter requests A.I.D. to do so. After the scope of work and other terms relating to these services are finalized, A.I.D. will arrange for contracting. Payments for technical services will be charged to the Grant.

3. Training

A.I.D. will arrange for training for Cooperating Country candidates approved for training in the United States. The costs of training will include: (a) round trip international costs to the U.S.A., (b) program costs of trainers and training facilities, maintenance allowance and travel within the U.S. Payments for these costs will be made directly by A.I.D. and charged to the Grant. See Attachment A for guidelines.

B. Disbursements for Local Currency Costs - Section 8.2

Reimbursement of costs incurred by project entities

Most local currency costs to be financed under this project will be incorporated into the development plan of either the Government of India or of one or more of the participating state governments or institutions. For costs so budgeted, project financing will be provided on a reimbursement basis using standard local currency reimbursement procedures. Reimbursement procedure specified in this PIL shall be applicable for expenditures incurred upto July 31, 1985. A separate PIL will specify the procedure to be followed for claiming reimbursement of expenditures incurred under the project after July 31, 1985.

Disbursement for local currency costs incurred (excluding identifiable taxes which are ineligible for A.I.D. financing) by the Cooperating Country for procuring goods and services required for implementation of the Project will be made upon the Cooperating Country's submission periodically of the original and three copies of voucher SF 1034 to A.I.D., New Delhi, showing the amount claimed in Indian Rupees and certified by an authorized official of the Cooperating Country (See Attachment D). Each reimbursement claim shall bear a control number.

The first such claim should be numbered, in the case of Grant funds, as AID-G1 and subsequent claims as AID-G2, AID-G3, etc., and, in the case of Loan Funds, as AID-L1, and subsequent claims as AID-L2, AID-L3 and so on. The supporting documents pertaining to the reimbursement claim shall be retained by the Cooperating Country and filed and indexed in such manner that they can be easily retrieved for review and inspection by A.I.D. officials. The Voucher SF-1034 shall be supported by a summary statement of expenditure incurred and classified according to budget cost categories/sub cost categories as shown in Annex 1 to Attachment D. Each summary statement of expenditure shall bear the following certification:

"Certified that expenditures shown in Column 3 were actually incurred during the period covered by this request for reimbursement and all the supporting documents have been retained by the project for review, inspection and audit by A.I.D. representatives as and when requested. It is further certified that the amount reimbursable by A.I.D. as shown in column 6 has been arrived at by applying the percentages specified for sub cost categories in Attachment C to PIL No. 2 dated _____."

(Signature of authorized representative)

(Name and Designation)

Reimbursement requests for expenditures incurred shall be furnished by each state or institute and IRMIC to the Department of Economic Affairs who after their review and certification of the same shall furnish such requests to A.I.D., New Delhi. It should be noted that separate reimbursement requests are to be made for claims of Loan and Grant funds. Each state or institute while furnishing its reimbursement requests to DEA shall furnish a copy of the same to IRMIC for their review and records.

A.I.D., New Delhi will make local currency reimbursements in accordance with the payment procedure outlined in DEA letter D.O. No. F.2(4)-AID/79 dated July 19, 1979 and confirmed by A.I.D., New Delhi letter dated August 1, 1979.

C. Terminal Dates for Request for Disbursement

Pursuant to Article 3, Section 3.3(c) of the subject Agreement, no disbursement will be made after June 30, 1991, nine months after the Project Assistance Completion Date (PACD) of September 30, 1990.

V. General Covenants - Annex 2, Article B

A. Utilization of Goods and Services - Section B.3.

Goods and services financed under the project may not be used to promote or assist a foreign aid project or activity associated with or financed by a country not included in Code 935 of the A.I.D. Geographic Code Book. Code 935, as in effect on the date of this letter, includes all countries in the Free World, including the Cooperating Country itself. See Section III.A. above for definition of "Free World".

B. Taxation - Section B.4.

Any identifiable taxes, tariffs, or duties charged by the Cooperating Country on any commodities (equipment, materials, or other goods) or services imported into India and financed by A.I.D. are for the account of the Cooperating Country and are not eligible for financing under the subject Loan and Grant Agreement.

C. Reports, Records, Inspection, Audit - Section B.5

Section B.5 of the Project Agreement reserves for A.I.D. the right to monitor project activities at any reasonable time, to visit sites where project activities have been or will be underway and to engage in inspections of project books, records and activities. These rights are crucially important to the effective conduct of A.I.D. financed projects and to the exercise of mandatory responsibilities imposed on all USAID Mission by U.S. statute and by worldwide A.I.D. regulations. It is imperative, therefore, that the Cooperating Country facilitate all reasonably requested arrangements pursuant to the exercise of these responsibilities.

The type of reports required and the frequency at which they are required will be as mutually agreed between A.I.D. and IRMIC.

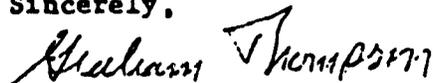
VI. Procurement Provisions - Annex 2, Article C.

Eligibility Date - Section C.2

No goods or services may be financed pursuant to orders or contracts firmly placed or entered into prior to July 30, 1983.

We look forward to working with you and to assisting in every way we can to assure a successful program.

Sincerely,



Graham C. Thompson

Chief

Office of Project Design and
Portfolio Management

Attachments:

- A. Guidelines for Training.
- B. Consolidated Summary of Project's Local Currency Costs for Life of Project.
- C. Project's Local Currency Cost Financing by Sources (Percentage sharing of costs).
- D. Voucher SF-1034.
- E. Consolidated Summary of Project's Foreign Exchange (U.S. Dollars) Costs for Life of Project.

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Attachment A

Guidelines for Training in U.S.A. of Personnel Under the Provisions of the Irrigation Management & Training Project

Cooperating Country would request A.I.D., New Delhi, to arrange for the training of its personnel in the disciplines covered for financing under the Grant portion of the Loan and Grant Agreement. Cooperating Country request will be accompanied by a completed biographical data (Annex 1 to this attachment) of the candidate or candidates desired to be trained in the United States. A.I.D., based on Cooperating Country request and after finalizing arrangements with the U.S. institutions for training of the Cooperating Country personnel as requested, will issue the PIO/P (See Annex 2 to this Attachment). All further arrangements, travel, visas, maintenance payments, insurance, etc. will be arranged or coordinated by A.I.D.

IRRIGATION MANAGEMENT AND TRAINING PROJECT (386-0484)Consolidated Summary of Project's Local Currency Costs
for Life of Project
(000s of Dollars)

	GOI	A. I. D.			TOTAL (GOI&AID)
		Loan	Grant	Total	
1. Training & Prof. Development	14,647	6,378	1,726	8,104	22,751
2. Action Res. Studies	5,022	1,369	1,096	2,465	7,487
3. Systems for Tech. Transfer	1,496	704	1,100	1,804	3,300
4. Organizational and Procedural Changes	153	97	110	207	360
5. Water Res. Planning Management	2,300	200	200	400	2,700
6. Project Evaluation	-	-	30	30	30
7. Educational Institutions	3,290	692	1,838	2,530	5,820
8. Contingency	1,292	560	290	850	2,142
T O T A L	28,200	10,000	6,390	16,390	44,590

Note:

The above schedule is prepared after adjustment within cost categories in data given in Attachment C to Annex 1 of the PROAG without any change in the overall contributions under this project.

IRRIGATION MANAGEMENT AND TRAINING PROJECT (386-0484)
Project's Local Currency Cost Financing by Sources GOI/State A.I.D.
 (Percentage sharing of total costs)

	<u>A. I. D.</u>		<u>R E M A R K S</u>
	<u>GOI</u>	<u>Loan Grant</u>	
I. <u>Training and Prof Dev.</u>			
a) Salary & O.M.			For IRMIC GOI's share is 20% and A.I.D.'s is 80% of the total costs.
Expenses of Staff	68	32	
b) Project Equipment	75	-	25 For IRMIC 100% costs will be grant financed by AID
c) Library	-	-	100
d) Adaptive Research	-	68	32
e) Tech. Assistance (Local)	-	-	100
f) Seminars, Workshops, Conferences, Publications	-	100	-
g) Local Training for Staff	100	-	-
h) Land & Buildings including Furniture & Office Equip.	100	-	- In Maharashtra GOI/State Share to AID will be 41:59. (AID will not share any land acquisition cost).
i) Rental of facilities (Bldgs.)	-	-	100% Only for Rajasthan and IRMIC
j) Vehicles & Other Physical Contingencies	100	-	-
II. <u>Action Research</u>			
a) Infrastructure modifications (including land leveling, water courses and drainage etc.)	100	-	-
b) Salaries and O&M expenses of staff	68	32	-
c) Equipment	-	100	-
d) Tech. Assistance (I) salaries & travel	-	-	100
e) Temp. Bldgs. Hostel	-	100	-
f) Workshop documents publications	-	100	-
g) Vehicles and other physical contingencies	100		

IRRIGATION MANAGEMENT AND TRAINING PROJECT (386-0484)
Project's Local Currency Cost Financing by Sources GOI/State A.I.D.
 (Percentage sharing of total costs)

	<u>GOI</u>	<u>A. I. D.</u> <u>Loan Grant</u>	<u>R</u>	<u>E</u>	<u>M</u>	<u>A</u>	<u>R</u>	<u>K</u>	<u>S</u>
<u>III. Systems for Tech. Transfer</u>									
a) <u>Tech. Transfer Unit</u>									
1) Salaries and O&M expenses	68	32							-
b) Printing & Publication of) Irrigation Mgt. Literature)									
c) <u>Equipment & Materials</u>)	-	-							100
1) Videos)									
ii) Video Tapes & Films)									
d) Tech. Assistance)									
e) Training for Tech. Transfer)									
<u>IV. Organizational & Procedural Changes</u>									
a) Salaries of staff for in-) teraction between village) level/block level/state)	68	32							-
level organizations and) water users Association)									
b) Training)									
c) Organizational & Procedural) Pilot tests and special) studies)	-	-							100
d) Tech. Assistance (Local))									
e) Publications)									
<u>V. Educational Institutions</u>									
a) Vehicles & other physical) contingencies	100	-							-
b) Project Equipment	-	100							-
c) Library	-	-							100
d) Prof. Staff Salaries &) other O.M. expenses	100	-							-
e) Adaptive Research	-	-							100
f) Staff Training local) travel & seminars	-	-							100
g) Tech. Transfer (seminar)	-	-							100
h) Tech. Services (Local)	-	-							100

IRRIGATION MANAGEMENT AND TRAINING PROJECT (386-0484)
Project's Local Currency Cost Financing by Sources GOI/State A.I.D.
 (Percentage sharing of total costs)

	A. I. D.		R	E	M	A	R	K	S
	GOI	Loan Grant							
<u>VI. Water Resources Planning & Mgt.</u>									
a) Buildings)									
b) Air Conditioning)	100	-	-						
c) Furniture)									
d) Equipment: Computer	-	100	-						
e) Tech. Assistance (Local))									
f) Training)			100						
<u>VII. Evaluation</u>			100						

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Standard Form 1034 September 1979 Treasury Form 9908		PUBLIC VOUCHER FOR PURCHASES AND SERVICES OTHER THAN PERSONAL				VOUCHER NO.
U.S. DEPARTMENT, BUREAU, OR ESTABLISHMENT AND LOCATION Mission Director USAID, American Embassy West Building Chanakyapuri New Delhi 110 021			DATE VOUCHER PREPARED CHECK/DEBIT NUMBER AND DATE ACCOUNT NO., NUMBER AND DATE		BUDGET F.O. FUND DATE INVOICE RECEIVED DISCOUNT TERMS PAYEE'S ACCOUNT NO.	
PAYEE'S NAME AND ADDRESS Government of India Ministry of Finance Department of Economic Affairs New Delhi						
SHIPPED FROM			WEIGHT		GOVERNMENT BILL	
NUMBER AND DATE OF ORDER	DATE OF DELIVERY OR SERVICE	ARTICLES OR SERVICES <small>(Enter description, item number of contract or Federal supply schedule, and other information deemed necessary)</small>	QUANTITY	UNIT PRICE <small>COST PER</small>	AMOUNT	
AID Loan No.* 386-T-236		Request for reimbursement pursuant to Section 8.2 of the Irrigation Mgt. & Training Project Loan and Grant Agreement dated July 30, 1983 as per summary statement of expenditures attached. I certify that the reimbursement claimed/advance requested here is just and correct and that payment has not been received. Signature _____ Designation _____ Date _____				
(Use continuation sheets) if necessary; (Payee must NOT use the space below)					TOTAL	
PAYMENT:		APPROVED FOR	EXCHANGE RATE	DIFFERENCES		
<input type="checkbox"/> COMPLETE <input type="checkbox"/> PARTIAL <input type="checkbox"/> FINAL <input type="checkbox"/> PROGRESS <input type="checkbox"/> ADVANCE		= \$	= \$ 1.00			
		BY:				
		TITLE	Amount verified, correct for (Signature or initials)			
Pursuant to authority vested in me, I certify that this voucher is correct and proper for payment.						
		(Authorized Certifying Officer)		(Title)		
ACCOUNTING CLASSIFICATION						
*In case the reimbursement request is for Grant funds then replace Loan No. by Grant Funds (386-0484)						
PAID BY	CHECK NUMBER ON TREASURER OF THE UNITED STATES			CHECK NUMBER ON (Name of bank)		
	CASH DATE			PAYEE'S		
1 When stated in foreign currency, insert name of currency. 2 If the ability to certify and authority to approve are combined in one person, one signature only is necessary; otherwise the approving officer will sign in the space provided, over his official title. 3 When a voucher is received in the name of a company or corporation, the name of the person writing the company or corporate name, as well as the capacity in which he signs, must appear. For example: "John Doe Company, per John Smith, Secretary", or "Treasurer", as the case may be.					PER TITLE	

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IRRIGATION MANAGEMENT AND TRAINING PROJECT (386-0484)
 Summary Statement of Expenditure Incurred During
 the period _____ to _____. (data in nearest Rs.)

Annex 1 to Attachment D
State: _____
 AID Funds: Loan/Grant
 (prepare separate summary
 statement to distinguish
 loan from grant)

Budget Cost Category Sub-Cost Category	Life of Project Budget	Expenditure Incurred		Reimbursable by A.I.D		
		This Period	Cum from In- ception to...	%	From To	Cum from Inception
(1)	(2)	(3)	(4)	(5)	(6)	(7)

I. Training and Prof. Dev.

- a) Salary & O.M.
Expenses of Staff
- b) Project Equipment
- c) Library
- d) Adaptive Research
- e) Tech. Assistance (Local)
- f) Seminars, Workshops,
Conferences,
Publications
- g) Local Training for Staff
- h) Land & Buildings in-
cluding Furniture
& Office Equip.
- i) Rental of faci-
lities (Bldgs.)
- j) Vehicles & Other
Physical Con-
tingencies

SUB-TOTAL

II. Action Research

- a) Infrastructure modi-
fications (includ-
ing land leveling,
water courses and
drainage etc.)
- b) salaries and O&M ex-
penses of staff
- c) Equipment
- d) Tech.Assistance(I)
salaries & travel
- e) Temp. Bldgs. Hostel
- f) Workshop documents
publications

SUB-TOTAL

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IRRIGATION MANAGEMENT AND TRAINING PROJECT (386-0484)

Summary Statement of Expenditure Incurred During
the period _____ to _____. (data in nearest Rs.)

Annex 1 to Attachment D
State: _____

AID Funds: Loan/Grant
(prepare separate summary
statement to distinguish
loan from grant)

Budget Cost Category Sub-Cost Category	Life of Project Budget	Expenditure Incurred		Reimbursable by A.I.D		
		This Period	Cum from In- ception to...	%	From To.....	Cum from Inception
	(2)	(3)	(4)	(5)	(6)	(7)

III. Systems for Tech. Transfer

- a) Tech. Transfer Unit
 - i) Salaries and O&M expenses
 - b) Printing & Publication of Irrigation Mgt. Literature)
 - c) Equipment & Materials
 - i) Videos)
 - ii) Video Tapes & Films)
 - d) Tech. Assistance)
 - e) Training for Tech. Transfer)
- SUB-TOTAL

IV. Organizational & Procedural Changes

- a) Salaries of staff for interaction between village level/block level/state level organizations and water users Association)
 - b) Training)
 - c) Organizational & Procedural Pilot tests and special studies)
 - d) Tech. Assistance (Local))
 - e) Publications)
- SUB-TOTAL

IRRIGATION MANAGEMENT AND TRAINING PROJECT (386-0484)

Summary Statement of Expenditure Incurred During
the period _____ to _____. (data in nearest Rs.)

Annex 1 to Attachment D
State: _____

AID Funds: Loan/Grant
(prepare separate summary
statement to distinguish
loan from grant)

Budget Cost Category Sub-Cost Category	Life of Project Budget	Expenditure Incurred		Reimbursable by A.I.D		
		This Period	On from In- ception to...	%	From To.....	On from Inception
(1)	(2)	(3)	(4)	(5)	(6)	(7)

V. Educational Institutions

- a) Vehicles & other
physical contingencies
- b) Project Equipment
- c) Library
- d) Prof. Staff Salaries &
other O.M. expenses
- e) Adaptive Research
- f) Staff Training local
travel & seminars
- g) Tech. Transfer (seminar)
- h) Tech. Services (Local)

SUB-TOTAL

VI. Water Resources Planning & Mgt.

- a) Buildings)
- b) Air Conditioning)
- c) Furniture)
- d) Equipment: Computer
- e) Tech. Assistance)
(Local))
- f) Training)

SUB-TOTAL

VII. Evaluation

TOTAL I to VII

"Certified that expenditures shown in column 3 were actually incurred during the period covered by this request for reimbursement and all the supporting documents have been retained by the project for review, inspection and audit by AID representatives as and when requested. It is further certified that the amount reimbursable by A.I.D. as shown in column 6 has been arrived at by applying the percentages specified for sub cost categories in Attachment C to FIL No. 2 dated _____.

(Signature of Authorized Representative)

(Name & Designation)

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IRRIGATION MANAGEMENT AND TRAINING PROJECT (386-0484)

Consolidated Summary of Project FX^{1/}
Costs for Life of Project

(000's of U.S. Dollars)

	<u>GOI*</u>	<u>A.I.D. Grant Funds</u>	<u>T O T A L</u>
1. Training & Prof. Development	-	10,870	10,870
2. Action Res. Studies	-	7,650	7,650
3. Systems for Tech. Transfer	-	600	600
4. Organizational and Procedural Changes	-	140	140
5. Water Res. Planning Management	-	7,400	7,400
6. Project Evaluation	-	- 70	70
7. Educational Institutions	-	2,800	2,800
8. Contingency	-	5,080	5,080
<u>T O T A L</u>	-	<u>34,610</u>	<u>34,610</u>

^{1/}FX - Foreign Exchange (U.S. Dollar Costs)

* Based on data given in Attachments to Annex 1 of the PROAG.

activities and experiments, Indian technical consultants, seminars, workshops, conferences and publications and renting facilities where so reflected in the project budget.

Para 3 on page 2 of PIL No. 2 is revised to show that loan funds may be used to defray rupee costs of project equipment, furniture and office equipment, temporary buildings under Action Research Component of the project, as specified in Attachment B to this PIL.

It may be noted that 100 percent expenditure on staff salaries and O&M expenses, vehicles and O&M expenses on equipment shall be borne by the Cooperating Country/participating states. Expenditure on land and buildings (excluding the cost of land acquisition) shall be shared between the cooperating country and A.I.D. in the ratio specified in Attachment B to this PIL.

Attachment C exhibits "Revised Consolidated Summary of Project FX Costs for Life of Project".

II. Disbursements for Local Currency Costs - Section 8.2
Reimbursement of costs incurred by project entities.

Procedure for claiming reimbursement of local currency expenditures eligible for A.I.D. financing will be the same as specified in PIL No. 2 dated August 7, 1985.

Except as stated above all other provisions of PIL No. 2 remain in full force and effect and that all the conditions and provision of subject agreement remain unchanged.

Sincerely,

Graham Thompson
Graham C. Thompson
Chief
Office of Project Development

- Att:
- A. Revised Consolidated Summary of Project's Local Currency Costs for Life of Project.
 - B. Project's Local currency Cost financing by Sources (Revised Percentage Sharing of Costs Effective August 1, 1985).
 - C. Revised Consolidated Summary of Project's Foreign Exchange (U.S. Dollars) Costs for Life of Project.

Appendix B

PROJECT IMPLEMENTATION LETTER #17



NEW DELHI, INDIA

UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

June 19, 1990

Shri S. Varadachary
Joint Secretary
Department of Economic Affairs
Ministry of Finance
North Block, New Delhi - 110001

Subject: Water Resources Management and Training Project (386-0484)
Project Agreement dated July 30, 1983
Project Implementation Letter (PIL) No. 17
Extension of project Assistance Completion Date

Dear Shri Varadachary:

The purpose of this PIL is to extend the project Assistance Completion date (PACD) of the subject Project Agreement.

Per your D.O. letter No. 2(5)-AID/81, dated March 26, 1990, A.I.D. has reviewed your request for a two year PACD extension of the subject project. With the issuance of this PIL, A.I.D. hereby agrees to extend the PACD by two years, from September 30, 1990 to September 30, 1992.

Except as stated above, all other conditions and provisions of the subject Project Agreement remain unchanged and in full force and effect.

Sincerely yours,

Robert N. Bakley
Director

1999V/GHOSH

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Appendix C

SCOPE OF WORK

for the Final Evaluation of
The Water Resources Management and Training (WRMT) Project
(386-0484)

Article I Title

Final Evaluation of the Water Resources Management and Training (WRMT) Project (386-0484)

Article II Objective

The contractor shall undertake the final evaluation of the WRMT project and submit the report to USAID/India in accordance with the Statement of Work (SOW) and other terms of reference specified here.

Article III Statement of Work

See Attachment 'A (1)' for the Statement of Work which describes the following:

- i) Project details
- ii) Project purpose and goal
- iii) Project activities
- iv) Progress to date
- v) Evaluation purpose
- vi) Evaluation issues
- vii) Evaluation methods and procedures

Article IV Report

The contractor will prepare a report which will cover all issues listed in the statement of work (Article - III) in the following format required by AID:

- i) Executive Summary
- ii) Project Identification Data Sheet
- iii) Table of Contents
- iv) Body of the report
- v) Appendixes

The executive summary and the body of the report will include the following sections:

- i) Description of the project to be evaluated
- ii) Purpose of evaluation
- iii) Evaluation issues
- iv) Evaluation methods and procedures
- v) Evaluation team and time table

- vi) Evaluation findings (issue-wise)
- vii) Recommendations and lessons learned

The contractor will conduct debriefings with the concerned officers from NRM, PDPS and the front office(s) of USAID and the GOI officials on major findings, conclusions, recommendations and lessons learned.

Two copies of a draft report will be submitted to the Chief, PDPS/PPE, USAID/India at least 3 working days prior to the departure of the team. One original and 10 duplicate copies (along with diskette) of the final report will be submitted by the contractor to the Chief, PDPS/PPE within 10 days of the receipt of AID's comments on the draft report.

The evaluation team leader will complete the abstract and narrative sections of the AID Evaluation Summary form and submit the final revised report with the additional time allocated for him in the contract.

Article V **Relationships and Responsibilities**

The evaluation team will consist of 4 members, out of which 2 will be from the U.S. and 2 from India as shown below:

U.S. Consultants

- i) Scientist with specialization in institutional development, training, research and education activities,
- ii) Water Resource Engineer with specialization in integrated development of river basins

Indian Consultants

- i) Management specialist with specialization in management irrigated agriculture and farmer organization
- ii) Irrigation Engineer with specialization in water management

All specialists should have experience in evaluation of similar projects preferably in Asia and familiarity with USAID or WB type of evaluations.

The U.S. specialist in institutional development with strong evaluation background will act as a team leader and responsible for finalizing the report and submitting it in required form and number within 10 days of receipt of USAID comments.

The evaluation team will receive guidance and support from the Project Officer/Chief, NRM Office on project-related matters and from the Evaluation Officer/Chief, PDPS/PPE office on evaluation-related matters during the period of evaluation.

Article VI **Performance Period**

The evaluation will begin o/a January 13, 1992 for a period of 50 days. The contractor will provide a draft report and debriefing for USAID/India and submit the final report

within 10 days from the receipt of comments from USAID/India.

The tentative time schedule will be as follows:

<i>Activity</i>	<i>Workdays</i>
Reviewing documents	4
Briefing with evaluation team	1
Preparing work and travel plan	4
Discussions with AID and GOI officials	3
Site visits to selected institutes	21
Preparing the draft report	10
AID debriefing and comments on draft report	2
Revision of draft report	5
Total	<u>50</u>

A detailed time-schedule will be prepared by the evaluation team in consultation with project and evaluation officers of USAID/India.

In addition to 50 workdays, the team leader will work for 5 more days in USA on finalizing the report in the light of comments received from USAID.

Article VII Work Days Ordered

The work days ordered, therefore, would be as follows:

	<i>Position</i>	<i>Workdays</i>
i)	For the team leader	55
ii)	For three team members (3 x 50)	150
	Total	<u>205</u>

Article VIII AID Illustrative Budget

Article IX Special Provisions

- A. Duty Post: US Sites 2 days
New Delhi and Indian sites 48 days
- B. Language requirements and other required qualifications: None
- C. Access to classified information: The contractor shall not require or have access to any government classified documents.
- D. Logistical Support: USAID/India will provide background material to the consultants upon or before arrival in India. The contractor will be responsible for providing the entire secretarial and logistical support.

STATEMENT OF WORK

1. About the Project to be evaluated

1.1 Project Details

The basic details of the project to be evaluated are as follows:

<i>A. Dates</i>	<i>B. Funds</i>
i) Project agreement : 07/30/83	i) USAID Grant : \$41 million
ii) Original PACD : 09/30/90	ii) USAID Loan : \$10 million
iii) Revised PACD : 09/30/92	iii) GOI Contribution : \$28.2 million
iv) TDD : 06/30/93	iv) Total : \$79.2 million

1.2 Project Purpose and Goal

India's irrigation potential is about 113 million hectares. At the end of the VIIth plan India has been able to create irrigation potential in 78 million hectares. There is, however, a gap of 8 million hectares between the potential created and potential utilized. If this potential is fully utilized and irrigation systems are made more effective and productive, the agricultural productivity can increase from about 1.7 tons to 4 or 5 tons per hectare on irrigated land.

The purpose of this project is to strengthen the institutional capability (both at state and national levels) to plan, design, construct, operate, manage and maintain efficient and productive irrigation systems. Through this, the goal is to increase agricultural productivity and rural incomes in India.

1.3 Project Activities and Expected Outcomes

In order to achieve the project purpose, 11 Water and Land Management Institutes (WALMIs) at the State Level, Central Training Unit (CTU) at the national level and interdisciplinary water management units at 3 Engineering and 2 Agricultural Universities (AUs) are set up to carry out the following activities:

- i) To organize professional development and training in irrigation management and water resource planning and development,
- ii) To conduct action and adaptive research,
- iii) To develop systems for technology transfer,
- iv) To initiate organizational and procedural changes, and
- v) to promote specialized studies, collaborative research programs, Indo-US collaborative linkages in ground water area and faster awareness about the latest technological developments in water resources both at federal and state levels through workshops, seminars and conferences.

As a result of these activities the following outputs are expected:

- i) Developed state and national capability to plan and manage water resources of major river basins as integrated systems.
- ii) Upgradation of professional skills in all phases of irrigation systems,

- iii) Adoption of a systems approach which considers the interactive effects of engineering, agronomic and social components,
- iv) Reduction of water losses within individual irrigation systems and development of more effective water distribution systems,
- v) Increased participation of farmers in deciding location of canal outlets, location and size of water courses and field channels and in operation and maintenance of the system,
- vi) Shift in the management focus from "administering" water to "meeting farmers' needs," and

1.4 Progress To Date and Mid-term Evaluation

With assistance from USAID and World Bank (WB), the Government of India (GOI) both at central and state levels, is responsible for the implementation of the above mentioned activities. During the period of implementation, the following expatriate and host country contractors/consultants provided technical assistance to WALMIs and CTU:

- i) Louis Berger International, Inc. (LBII) and Water and Power Consultancy Services (India) Ltd. (WAPCOS) to State Training Institutes (STI),
- ii) Harza Engineering Co., (HEC) and Consultancy Engineering Services (CES) to CTU, and
- iii) Education Development Center, Inc. to WALMIs at Aurangabad and Udaipur.

WALMIs in 11 states and centres at Agricultural and Engineering Universities in 4 states as shown below are being supported by A.I.D. except the physical infrastructure at 6 WALMIs (starred) by the World Bank.

State	Location of WALMI	University/Location
1. Maharashtra	• Aurangabad	Ag. Univ., Rahuri
2. Gujarat	* Anand	M.S. Univ., Baroda (Engg.)
3. Rajasthan	Kota	Ag. Univ., Udaipur
4. Madhya Pradesh	Bhopal	--
5. Tamil Nadu	* Trichy	Anna Univ., Madras (Engg.)
6. Andhra Pradesh	Hyderabad	--
7. Uttar Pradesh	• Okhla & Lucknow	--
8. Bihar	Patna	--
9. Orissa	• Bhubaneswar	--
10. Kerala	Kozikode	--
11. Karnataka	• Dharwad	--

(See the Map for location)

The CTU is located in Maharashtra State, currently at Pune but permanently at Nagpur. It has conducted 3 short-term and two long-term courses and trained over 150 professionals.

Out of \$51 million funding from AID, about \$34 million was expended as of September 30, 1991. Almost 52% of funds have been utilized for providing technical assistance through expatriate and host country consultants with a view to strengthen institutional capability in the areas of training, research, technology transfer and organizational and procedural changes.

Under the training program offered so far, about 500 professionals have received training in the U.S. and over 12,000 field engineers and

farmers have received training in India at WALMIs and other centers. Interactive Video Disk (IVD) has been introduced as a training technology. Action research has encouraged interdisciplinary approach and farmers' participation and studies on organizational and procedural changes are under consideration for necessary follow-up actions and policy changes. Computers, software and computerized models have been introduced and used for both training and research purposes.

During the last 8 years, WALMIs, other Centers, and CTU have been established; infrastructure and staff capabilities have been developed to a considerable extent; training and research as well as technology transfer activities have been in progress. The Central and State governments are supporting and ready to support activities initiated under the project on a sustained basis. Accordingly, sustainability and long-term plans for integrated and interdisciplinary approaches to irrigated agriculture are being developed. These approaches are appreciated by planners, and practitioners concerned. Further organizational and procedural changes are likely to be introduced shortly to ensure optimal utilization of institutional capabilities and accelerate the process of technology transfer firms.

The mid-term evaluation of training activities was conducted in January 1988 to review project progress and implementation process and suggest mid-course corrections. Several recommendations were made to improve the curriculum, selection of trainees, methodology of teaching and training of trainers, feed-back and evaluation procedures, intra and inter-institutional and departmental coordination and organizational and procedural changes to ensure transmission and utilization of knowledge, skills, capabilities, technologies and approaches at various levels. Appropriate follow-up actions have been taken based on these recommendations.

2. About the Final Evaluation to be conducted

2.1 Evaluation Purpose

The purpose of this final evaluation is to determine the extent to which the project has been able to achieve the stated outputs, purpose and goal and recommend reorientation and on-course correction by USAID and GOI, particularly on the following issues:

2.2 Evaluation Issues

The central issues and key questions are listed below:

I) State and national level institutions

Central Issue: What is the extent to which institutional capability is developed under the project?

- Key Questions:**
- i) How are the institutes responding to training and research needs?
 - ii) What is the extent to which institutions are developed to meet these needs in future at state and national levels?
 - iii) What is the replication potential of such institutional capability building program in the remaining Indian states in future by

Government of India with their own funds?

- iv) What additional non-project funded assistance is desirable for promoting institutional growth after the project terminates?

II) Staff Capabilities

Central Issue: What is the extent to which the training and research staff has developed their professional skills and capabilities to manage training and research activities on their own in future?

- Key Questions:**
- i) How competent and confident are the professional staff at institutions established to manage training and research programs on their own?
 - ii) Do they have enough support available to further develop and utilize their professional skills and manage the program on their own?
 - iii) What types of assistance and changes are required to further develop and utilize their professional skills and capabilities?

III) Action and Adaptive Research

Central Issue: What is the extent to which action/adaptive research carried out under this project has enhanced the capability of professionals for better planning and management of water resources for higher agricultural productivity?

- Key Questions:**
- i) How relevant and useful is the action/adaptive research carried out in the institutes?
 - ii) What are the ways in which these researches have enhanced the capability of irrigation professionals for integrated planning and management of water resources for agricultural productivity?
 - iii) How useful and effective are the farmers' organizations developed under action research in different institutes?
 - iv) What immediate and continued technical and financial assistance are desirable and what are their likely sources other than USAID to promote the development of farmers' organizations as instruments of accelerating privatization of management of irrigated agriculture through participatory management approach? What will happen if the desired assistance is not provided or provided in lesser quantities?

IV) *Systems of Technology Transfer*

Central Issue: What is the extent to which skills and technologies transferred under the project through training and research activities have been applied and found to be useful by the professionals and farmers?

- Key Questions:**
- i) How relevant and useful are the systems of technology transfer developed under the project to professionals and farmers?
 - ii) How cost effective are these systems and what is their replication potential?

V) *Organizational and Procedural Changes*

Central Issue: What is the extent to which specific plans/recommendations have been developed and followed to accommodate new technologies and operational concepts?

- Key Questions:**
- i) How feasible and replicable are the recommendations developed for organizational and procedural changes?
 - ii) How should this activity be pursued in future?

VI) *Role of Consultants*

Central Issue: How relevant and useful has been the technical assistance provided by expatriate and local contractors/consultants to CTU, WALMIs and AUs under the project?

- Key Questions:**
- i) Specify the areas of technical assistance provided so far.
 - ii) How relevant and useful is the technical assistance provided and methodologies adopted by consultants for desired outputs?
 - iii) What are the problems involved and constraints experienced on the efficient and effective utilization of technical assistance through consultants?
 - iv) How could technical assistance be more profitably and effectively utilized?
 - v) What are the areas which need more thrust during the remaining LOP and thereafter, and what are the likely funding sources other than USAID?

VII) *Net Impact*

Central Issue: How significant is the net impact of training, research and other activities carried out by the institutes under this project on professionals in terms of upgradation of skills, adoption of systems and interdisciplinary approach, shift in the management focus from "administering water" to "managing water"?

and "meeting farmers' needs," improvements in the efficiency and productivity of irrigation systems and participation and involvement of farmers in deciding, operating and maintaining the irrigation systems?

- Key Questions:*
- i) Which project activities have produced the maximum net impact? How?
 - ii) Which factors have influenced the net impact of project activities and how?

VIII) *Coordination and Linkages*

Central Issue: How successful have been the efforts to ensure coordination and linkages within and between the concerned institutions and departments to produce synergistic impact of activities initiated under the project?

- Key Questions:*
- i) What are the mechanisms developed to promote intra and inter-institutional and departmental coordination?
 - ii) How strong and sustainable are these mechanisms developed under the project?
 - iii) What further efforts are needed to strengthen such mechanisms and linkages in future and what are potential funding sources other than USAID?

IX) *Future Direction*

Central Issue: What are the innovative ways in which institutional capabilities can be further developed and utilized on a long-term and sustainable basis?

- Key Questions:*
- i) Are the institutions created viable and government commitment strong enough to support them in future?
 - ii) Is there a need for similar institutions in other states and the necessary (GOI) commitment to support them?
 - iii) Is there need for adding newer functions or activities, serving clients outside the government, forging linkages with private sector and raising internal resources or revenues in future to ensure sustainability?
 - iv) What is the future perspective and direction for institutions established under the project?
 - v) What should be the role of state and central government, donors and consultants in future?

X) *Recommendations and Lessons Learned*

Central Issue: What are the principal recommendations and lessons

learned both for USAID and GOI which require follow-up actions in the near future?

- Key Questions:**
- i) What are the specific lessons learned from this project for both USAID and GOI?
 - ii) What are the specific recommendations on the issues listed which require immediate and continued follow-up action by USAID and GOI?

2.3 Evaluation Methods and Procedures

In order to examine these central issues and key questions and make specific recommendations to USAID and GOI, the following methods would be required i.e.,

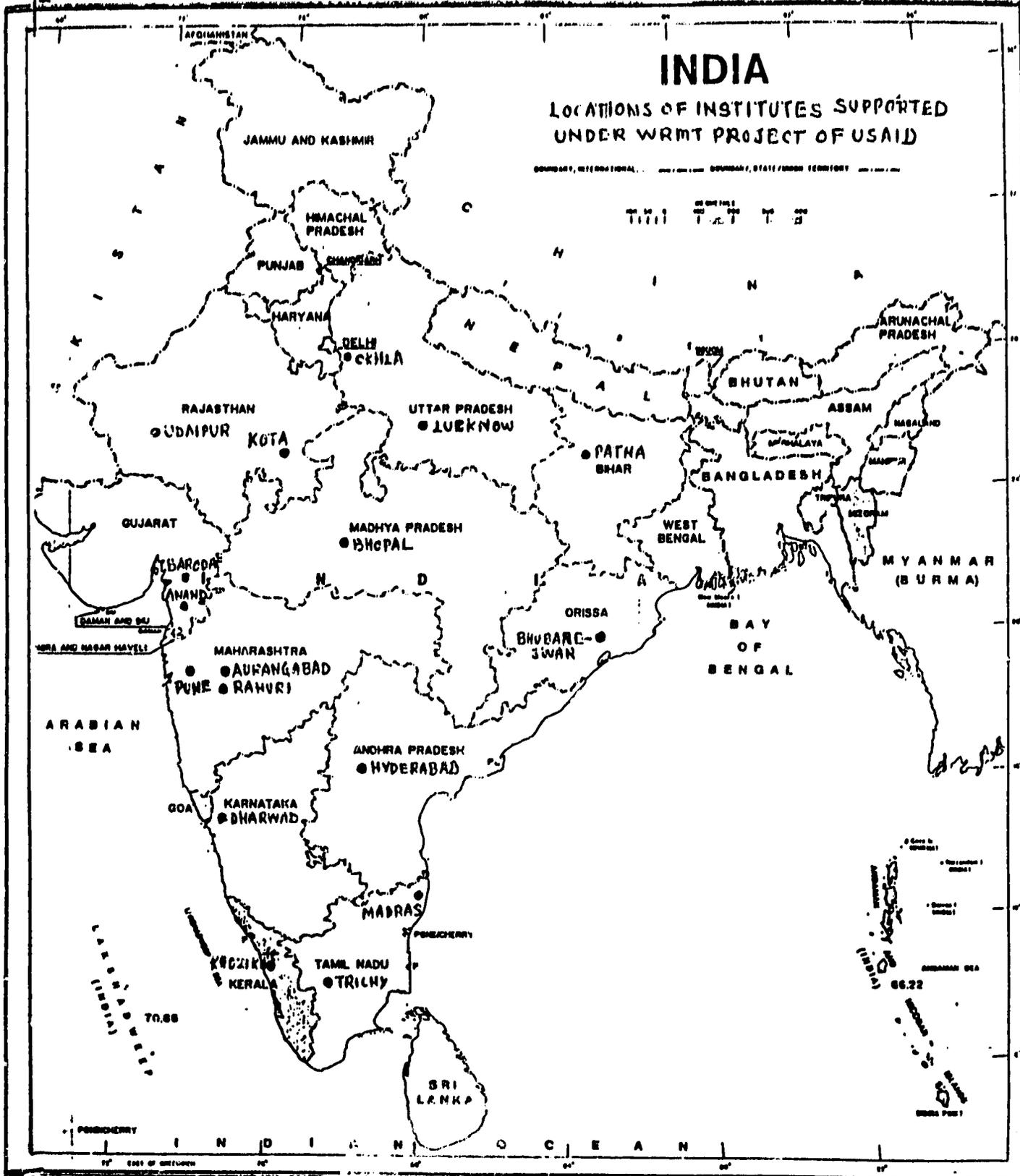
- I) Use of available data and documents such as
 - Project paper
 - Annual monitoring reports
 - Annual workplans for institutes
 - Annual reports and financial statements for institutes
 - Contracts with expatriate and local consultants
 - Manuals & Modules prepared by contractors
 - Mid-term evaluation report on training
 - Benchmark, socio-economic, diagnostic and O&P studies conducted
 - Minutes of Advisory Committee Meetings such as Joint Project Management Committee (JPMC), Technical Advisory Committee (TAC) etc.
- II) Site visits to selected:
 - Institutes (WALMI, CTU, AU etc.)
 - Action/adaptive research sites
 - Groups of beneficiaries and farmers
- III) Interviews and discussions with concerned persons from:
 - Central and State Government departments
 - Institutes (WALMIs, CTU and AUs)
 - The group of contractors and trainers providing inputs
 - Professional and farmer trainees
 - Front office and staff of the USAID Mission

The essential documents per 2.3 (I) above will be made available to evaluation specialists for review on their arrival in Delhi (India) and the rest afterwards.

For site visits, the evaluation specialists will have to cover at least 5 WALMIs developed at various stages while ensuring geographical representation i.e., Maharashtra, Gujarat, Tamil Nadu, Bihar and Madhya Pradesh. In the first 3 states, AUs can also be covered simultaneously. In addition to this CTU at Pune will have to be visited as the only national institute. From these selected institutes, the evaluation team will have to visit some action/adaptive research sites where impact of project activities is most significant.

Before these site visits, the evaluation team will conduct interviews and discussions with central and state government officers concerned.

They will conduct group interviews and discussions with professionals (trainers and researchers) and past trainees at the selected sites and institutes, and concerned officials and non-officials at action/ adoptive research sites. Keeping the evaluation issues and questions in view, the team will have to develop its own interview protocol for systematic and uniform probes.



any part of this map with the permission of the Surveyor General.
 The names of India extend from the sea to a distance of two miles from the coast.
 The names of the States and Union Territories are as they appear on the map.
 The names of the States and Union Territories are as they appear on the map.
 The names of the States and Union Territories are as they appear on the map.

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Appendix D

SUMMARY RECORD OF THE 17TH TAC MEETING OF THE USAID ASSISTED WRM&T PROJECT HELD AT LUCKNOW ON THE 9TH AND 10TH MAY 1991

The meeting was held under the chairmanship of Shri M.S. Reddy. The list of participants is at Annexure I. While no representative attended from MPAU, Raigarh, Director, WALMI, Madhya Pradesh has requested leave of absence.

Shri Ranvir Ahuja, Special Secretary, Government of Uttar Pradesh presented a welcome address. He informed that work on construction of residential accommodation is in an advanced stage and the construction of institutional building will commence soon. Reporting on the progress of WALMI he informed that up to March 1991, training has been imparted to 5005 persons at all levels in irrigation department/agricultural department/CADA, farmer leaders etc. Action Research work has been taken up in Agra Canal Command in Mathura district. He hoped that the deliberations by this committee would lead towards speedy development of the institutes.

Shri M.S. Reddy also welcomed all the participants and took up the agenda items for discussion.

- ITEM 1 CONFIRMATION OF THE MINUTES OF THE 16TH TAC MEETING
The minutes were taken as confirmed.
- ITEM 2 FOLLOW UP ACTIONS ON THE ITEMS OF THE 16TH, 15TH AND 14TH TAC
MEETINGS
As per Annexure II.
- ITEM 3 APPROVAL OF TAC FOR PARTICIPATION IN SHORT TERM TRAINING
COURSES/SEMINARS/CONFERENCES ABROAD OTHER THAN THOSE ALREADY
APPROVED IN THE 14TH TAC MEETING
- The following additional programmes were approved by the TAC.
- a) Environmental Planning and Management (September 30 - October
11, 1991) - USA.
- b) International Seminar and Exhibition on Efficient Water Use
(October 21-25, 1991) - Mexico City.
- c) Eighth Afro-Asian Regional Conference of ICID on Land & Water
Management in Afro - Asian Countries (November 18 - 29, 1991)
- Thailand.
- d) Forty Third International Executive Council (IEC) meeting of
ICID and 16th European Regional Conference on "European
Strategies for Irrigation Drainage & Flood Control" (June 21 -
27, 1992) - Hungary.

- e) Fifth International Drainage Workshop at Lahore (February 8-15, 1992) by Pakistan Water and Power Development Authority and ICID.

The following short term courses approved earlier by the 14th TAC have been approved as request courses. Nominations have already been called for.

- i) Remote sensing in Agriculture (June 9 - July 6, 1991) - USA.
ii) Main system irrigation scheduling (July 7 - 20, 1991) - USA.
iii) Participatory Approach to Action Research (July 31 - August 21, 1991) - USA.
iv) Training of Trainers for Agriculture (August 6 - September 14, 1991) - USA.

Suitable nominations will be called for, for programmes (a) to (e) mentioned above.

(Action: IRMIO and all institutes)

ITEM 4 PRESENTATIONS BY LBII/WAPCOS CONSULTANTS

- a) Dr. Brown - STI Sustainability.
b) Dr. Jagdish Narain - Institutional development of STIs.
c) Dr. Wiser - Strengthening and formalizing linkages.
a) DR. BROWN -STI SUSTAINABILITY

The main point highlighted by Dr. Brown was to establish demand for STI services, unlike at present, where an STI offers a list of courses for the trainees to choose from. This could perhaps be achieved by introducing an idea of staff policy development in the Irrigation Department, so that the demand for training comes from the Irrigation Department to provide specific courses to meet their needs. He advocated setting up of Human Resources Development Cells in Government departments to streamline the training needs.

(b) DR. JAGDISH NARAIN - INSTITUTIONAL DEVELOPMENT OF STIs

Dr. Narain highlighted certain essential requirements for institutional development of STIs like infrastructural facilities on campuses, demonstration farms, hostels for trainees, staff quarters, community centres etc. Apart from these physical facilities, he advocated that STIs should be a registered society. Directors to have a tenure of 3 to 5 years, STIs to have 50% core faculty & 50% deputationists to be treated at par with the core faculty with UGC scales and uniformity in designations. He further discussed that WALMI should plan their available time, so that each faculty member has balanced work load and teaching hours.

(c) DR. WISER - STRENGTHENING AND FORMALIZING LINKAGES

Dr. Wiser's presentation mainly dealt with strengthening and formalizing linkages between STIs, Universities/Research Institutes. The main points brought out by him were:

- a) Provision for identification of qualified STI faculty as University faculty.

- b) Methods by which the STIs make available to the University, programmes such as TOT, which are developed for the STIs.
- c) Programmes by which STI faculty can pursue PC degrees.
- d) Approval of STI as a site at which University research could be conducted.
- e) Means of coordinating the action research programmes of the STI with the research programme of Universities and Research Institutes.
- f) Identification of University or Research Institute personnel to work with the STI action research programmes on a continuing basis.
- g) Identification of retiring faculty who may be used as consultants by the STIs.

Comments of the participants on the above presentation

Dr. Brown's proposal was generally appreciated. However, there were reservations on his proposal to set up a Human resources Development cell in Irrigation departments to streamline training needs. Secretary, Irrigation being the Chairman with some other Secretaries also as members of the Governing Council, the programmes of the STIs do get looked into by irrigation and other departments. Creating a cell of this kind would mean OPC in the departments.

Most of the States are having similar structure for Irrigation departments and therefore, to study OPC in isolation for individual states as done at present may not be desirable. IRMIO, WAPCOS & LBII should organize a general study on OPC in Irrigation departments, which could bring out specific departures in some states. The report could be presented to a meeting of Chief Secretaries with Secretary (WR) as Chairman. It could even be put up to the National Water Board for discussion.

(Action: IRMIO, CWC, LBII/WAPCOS)

On Dr. Narain & Dr. Wiser's presentations, the main comment was on the functions vis-a-vis the faculty character of STIs. Since the IMTIs are not expected to carry out research or Postgraduate training, their core staff may not be able to excel professionally and the STIs may have to depend on the universities for excellence in faculty. A large core staff and strong inter-linkages with universities are not therefore consistent with each other. In this context, the rationale by which 50% core faculty has been proposed needs to be reviewed. It was decided that LBII/WAPCOS (Mr. Tom Kajer, Training Specialist) and Mr. Buch, Director, WALMI, Gujarat would deliberate on this issue and prepare a paper on the consistent rationale including the functions, linkages and core faculty norms. One or two specific STIs may be taken as case studies for this purpose.

(Action: LBII/WAPCOS, WALMI, Gujarat)

It was also observed that the STIs should have a programme (a calendar of events) for at least 3 years, so that faculty/guest faculty requirements could be worked out in advance for the smooth running of the training courses. It was also pointed out there was no standardization pertaining to training at different levels. LBII/WAPCOS agreed to host a one day workshop on this topic on 25th July 1991 in continuation to the workshop on 24th July 1991 on the future of the future of the IM&T Project. The linkages with Universities should be stepped up taking advantage of locational facilities wherever possible. However, the distance should not be a factor.

(Action: All Institutes, LBII/WAPCOS)

ITEM 5 PUBLICITY ON AIR/TV ABOUT STI/UNIVERSITY ACTIVITIES

The proposal of IMTI, Trichy that messages from STIs may be telecast/broadcast through TV/Radio networks, so that they reach all corners of their respective state was appreciated. Director, WALMI, Aurangabad informed that news on their WALMI is being broadcast in regional language twice a month for a duration of 30 minutes. There is a regular committee to plan such programmes.

Trichy could take up the matter with AIR/TV on similar lines for getting their programmes transmitted. However, in case of any difficulty, CWC will certainly help. Director, WALMI, Aurangabad also informed that in primary education, topics regarding water management were not covered. He informed that they could write some lessons for junior classes. STIs could get in touch with NCERT in this regard.

(Action: IMTI, Trichy and WALMI, Aurangabad)

ITEM 6 GENERAL POINTS

a) Chief Engineer, IRMIO stated that notice to attend STC/Governing Council meetings is generally very short. It should come well in advance along with the agenda, so that IRMIO could also participate.

(Action: Participating Institutes)

b) During the course of discussion, on speedy utilization of funds, Shri Arora of USAID stated that new states could be covered under this programme even at this stage provided they could utilize the funds within the available time.

(Action: IRMIO, CWC)

c) While various STIs, LBII/WAPCOS and educational institutions had brought out a number of publications on relevant topics, there was no comprehensive catalogue/index of all these publications. It was opined that LBII/WAPCOS would get such an index giving information about such publications, including the publisher, brief contents, subject-wise classification, key words etc for easy retrieval. The index would be distributed widely and if possible, 2 sets would be obtained for records of CWC/MOWR.

(Action: LBII/WAPCOS)

ITEM 7 18TH TAC MEETING

The 18TH TAC meeting will be held at Madras, Anna University on August 22 - 23, 1991. Director, Centre for Water Resources, Anna University has offered to host this meeting.

The meeting ended with a vote of thanks to the chair.

ANNEXURE II

FOLLOW UP ACTIONS ON THE ITEMS OF 16TH, 15TH AND 14TH TAC MEETINGS

Water Resources Day 1991

Only 7 states namely Gujarat, Tamil Nadu, Karnataka, Maharashtra, Madhya Pradesh, Rajasthan and Uttar Pradesh had responded as under:

Name of State	No. of places where WR day is proposed to be observed by the STIs	No. of places where WR day already Observed	Total
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Gujarat	10	-	
Tamil Nadu	9	-	
Uttar Pradesh	74	1	75
Kerala	6	1	7
Madhya Pradesh	3	1	4
Maharashtra	5	-	
Karnataka	20		

The response was not very encouraging. The participating institutes should plan to observe Water Resources Day at good number of places even up to June 1991 and send a report to IRMIO, CWC.

(Action: Concerned institutes)

ITEM 3 SPEEDY UTILIZATION OF FUNDS AND CLAIMING REIMBURSEMENTS

The overall budget for 1991-92 as projected by various institutes was of the order of Rs. 26.26 crores. The institutes informed that by and large they do not anticipate financial constraints this year by way of restricted budget allocation as had happened last year. After extensive discussion it was found that there is no alternative but for the STIs to pursue and convince their respective Governments about the requisite flow of funds which are fully reimbursable by the USAID

While reviewing the status of expenditure, it was observed that the programme on action research component was low and should be boosted up and necessary consultancy should be obtained from LBII/WAPCOS as required.

(Action: Participating Institutes, LBII/WAPCOS & USAID)

ITEM 4 LBII/WAPCOS DRAFT WORK PLAN UP 2 TO SEPTEMBER 1992

The comments on the draft work plan of LBII/WAPCOS were received from only 4 states namely Gujarat, Madhya Pradesh, Bihar and Maharashtra and these are summarized as under:

- (a) The work plan to be made more specific and addressed to the identified weak areas of various institutes.
- (b) The consultancy requirements to be finalized itemwise for each STI in consultation with the Directors and then the distribution of man months be made in LBII work plan.

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- (c) Quarterly monitoring and review to make mid course correction if necessary.
- (d) Gujarat and Maharashtra have suggested that technical assistance for new topics like water harvesting, automation of canals, sustenance of WALMIs, watershed management, farmers' organizations - legal problems etc. may also be covered.

LBII/WAPCOS agreed to review the work plan in light of the above comments, after ascertaining the needs of STIs. The other institutes may also send their views by the end of May 1991 to enable LBII/WAPCOS review/update their work plan accordingly.

(Action: LBII/WAPCOS and remaining institutes)

ITEM 5 WORK PLAN 1991 - 92 AND 1992-93 UP TO SEPTEMBER 1992

Director, IMT apprised the TAC about the general lacuna found in the various work plans. The educational institutions have made provisions under the head "land and buildings." This head is not applicable to the educational institutions as per PIL - 3 and therefore their work plan needs suitable modifications. STC/Governing Council approval have been indicated by WALMIs Madhya Pradesh, Maharashtra, Tamil Nadu, Bihar, Karnataka and MPAU, Rahuri only. Other institutes may obtain the same and indicate. WALMI, Madhya Pradesh and Karnataka may depute a person to discuss their work plans, as these require thorough revision. Andhra Pradesh may send details of training courses to be run, list of equipment to be procured under action research.

The comments of LBII/WAPCOS, USAID are also awaited on the work plan 1991-92. The participants were advised to expedite the above.

WALMI, Karnataka has asked for a flexibility to transfer funds from one component to another or from one item to another under the same component in case there is some saving under one component or an item. TAC was of the view that this may not pose any special difficulty. However, in such a case, a revised work plan may be prepared and got approved by IRMIO/USAID.

WALMI, Gujarat has proposed the taking up of integrated watershed management project in collaboration with a non-government organization, namely Aga Khan Rural Support Programme (AKRSP), in view of their specialization in this area. The project identified for this activity is Tilipada in District Bharuch. The overall cost of this project is Rs. 40.16 Lakhs, of which Rs. 19.92 lakhs is proposed to be contributed by USAID and the rest by the beneficiary and AKRSP. The outlay for 1991--92 is proposed as Rs. 8 lakhs under action research. The proposal was described by Shri Buch, Director, WALMI, Gujarat to the TAC. TAC approved the proposal in principle. The other institutes also were advised to take up similar studies on watershed development and allied aspects.

The proposal of WALMI, Madhya Pradesh regarding approving and funding by USAID of additional testing facility of micronutrient studies in 9 different centres of Madhya Pradesh was also discussed. The agenda states that the appropriate micronutrient are essential for higher agricultural productivity under both irrigated as well as rainfed farming, especially due to high input technology in irrigated areas. The Governing Board is stated to have approved a provision of Rs. 67.63 lakhs at the rate of Rs.7.25 lakhs per centre for 9 centres. USAID was of the view that the equipment procured under USAID programme are supposed to be located and used in WALMIs' research

programmes only and not for the state as a home. He further informed that the instruments already purchased have not been fully utilized by certain institutes. This was discussed at length with other institutes also who were of the view that the instruments could be located outside in the universities/research institutes for associated research programmes of WALMIs.

After extended discussions, TAC was of the view that although the relevance of micronutrient testing facility to the project is acceptable, Madhya Pradesh should justify the purchase of these equipment in large numbers with reference to their requirements. This may be further discussed by the JPMC who may take a suitable decision in the matter.

(Action: Concerned Institutes, LBII/WAPCOS, IRMIO and USAID)

ITEM 7 EIGHTH TOT PROGRAMME

Since the validity of vigilance/medical certificates is only six months, some of the institutes expressed that this should be extended to one year so that these are not required to be revalidated at the time of processing the study tour abroad. The TAC decided that the validity period of these certificates cannot be extended to one year as per the norms of the Government of India and if there is any difficulty in getting them again, the institutes may submit these only at the time of processing of cases for study tour/training programme abroad. However, in such a case, the sponsoring authority should satisfy themselves that the persons nominated are likely to be cleared from vigilance angle, medical problems and are eligible for a training/study tour abroad as per the Government of India guidelines before their sponsorship to the component of training in India itself.

Director, WALMI, Maharashtra asked the participants to send the nominations for the 8th TOT expeditiously so that he could plan the entire programme commencing 24th June to 2nd November 1991.

Regarding the 9th TOT Programme, he expressed some financial constraints. He was advised to fix the dates for the 9th TOT so that it is completed before September 1992. This was agreed to by Director, WALMI, Maharashtra.

(Action: Participating Institutes and Director, WALMI, Maharashtra)

ITEM 9 PRESENTATION BY LBII/WAPCOS ON THE FUTURE OF THE IM&T PROJECT BEYOND SEPTEMBER 1992

In the earlier TAC, it was decided that a lead paper be prepared by LBII/WAPCOS as a pre-requisite to preparing a national level guideline on irrigation management. TAC advised LBII/WAPCOS to discuss this issue again with Shri Buch for more specific ideas to prepare a lead paper. This should be completed in about six month's time. Shri Pendse of WALMI, Maharashtra suggested a one day workshop to discuss the lead paper.

Regarding phase II of the programme, Chief Engineer, IRMIO suggested to have some informal discussions with USAID, LBII/WAPCOS to chalk out a broad guideline. This was agreed to.

In this connection, it was decided to have a one day workshop on the future of the IM&T Project. LBII/WAPCOS agreed to host this workshop at Delhi on the 24th July 1991. Dr. Stofkoper mentioned that proposals for phase II part of the programme could be finalized by October 1991.

(Action: LBII/WAPCOS, Director, WALMI, Gujarat)

ITEM 10 PRESENTATION BY MR. MALONEY, CONSULTANT, LBII ON SOCIAL ASPECTS OF WATER MANAGEMENT

Only Gujarat and Madhya Pradesh have commented on the documents circulated by Mr. Maloney. Chairman, TAC advised that the remaining institutes may send their feedback by the end of May 1991. Alternatively, it will be considered that they have no comments to offer and the proposals made are acceptable to them.

(Action: Concerned participating institutes)

ITEM 11 ORGANIZING NATIONAL WORKSHOPS ON TRADITIONAL/WELL DEVELOPED FARMERS ASSOCIATIONS/SOCIETY

i) WALMI, Karnataka informed that their Government has approved the proposal to hold a national workshop on beneficiary participation in Vijayanagar channels in Karnataka for two days at Munirabad - a place close to the existing channels. The exact dates will be intimated.

TAC observed that so far the progress on training of farmers and lower level functionaries has not been very encouraging and steps are to be taken to step up this activity. As of March 1991, about 7042 farmers and about 1758 field level functionaries have been trained. TAC felt that it should not be difficult to achieve a target of 20,000 at the rate of 2000 per STI. Some institutes stated that they are training the trainees from Agricultural/CADA departments, who in turn train the farmers and lower level functionaries while some stated that they are training nodal farmers only as it was very difficult to directly train large number of farmers. All WALMIs were advised that training of farmers may be included in a larger way in the activities of STIs.

(Action: Participating Institutes).

ii) Evaluation Studies on CAD Projects
Referring to Ministry of Water Resources's observation, the TAC reiterated that the primary function of STIs was only to train in-service personnel of Irrigation/Agriculture/CADA departments to take up such activities rather than STIs taking up this work directly. However, if some STIs wish to take up such studies, they are free to do so.

Regarding involvement of CADAs in activities of WALMIs, the participants expressed that they are already involved through training programmes in which CADA personnel also participated.

ITEM 12 FREQUENT TRANSFERS OF WALMI DIRECTORS

IRMIO informed that as per the decision taken in the 16th TAC meeting, the Governments of Bihar, Orissa, Rajasthan and Karnataka have already been addressed by the Chairman, TAC to take suitable action to stop frequent transfer of WALMI Directors in the interest of sustained development of their respective STIs.

ITEM 13 PRESENTATION BY STIs INDICATING THEIR DEVELOPMENTAL ACTIVITIES AND ACHIEVEMENTS

WALMI/IMII of Uttar Pradesh and Tamil Nadu shared their

developmental activities and achievements with the TAC participants.

ITEM 14 GENERAL OBSERVATIONS BY IRMIO

i) Director, IMT stated that the quarterly progress reports were not being received in time from some STIs, namely Andhra Pradesh, Orissa, Uttar Pradesh, M.S. University. Moreover, the formats circulated earlier are not being followed by Bihar. They were advised to ensure timely submission of these reports in the prescribed formats.

ii) Regarding sending material for newsletter to LBII/WAPCOS regularly, only Madhya Pradesh, Tamil Nadu and CTAE, Rajasthan have identified nodal officers. Other STIs may also do so.

(Action: Concerned Institutes)

FOLLOW UP ACTION ON ITEMS OF 15TH TAC MEETING

ITEM 3.2 CONSTITUTION OF ACTION RESEARCH TEAMS

LBII/WAPCOS apprised the TAC about the present status and stated that if any other STI desires to have consultancy in any discipline, they would be able to do so. WALMI Bihar indicated that they may require consultants since about 10 action research proposals were under consideration. LBII/WAPCOS assured that they will be in a position to provide necessary consultancy to them.

(Action: Participating Institutes, LBII/WAPCOS).

ITEM 3.5 ESTABLISHING INSTITUTIONAL NORMS AND GUIDELINES FOR STIs

See item 4 on pages 2, 3 & 4 - presentation by LBII/WAPCOS consultants.

LBII/WAPCOS

- | | |
|---------------------|-------------------------------------|
| 1. Mr. J. Stofkoper | Team Leader/LBII |
| 2. Mr. M.B.G. Tilak | Team Leader/WAPCOS |
| 3. Mr. J. Brown | Institution Development/LBII |
| 4. Mr. W.C. Bell | Main System Specialist/LBII |
| 5. Mr. K.V. Raju | Social Scientist/WAPCOS |
| 6. Mr. J.C. Baxter | Action Research Coordinator/Winrock |
| 7. Mr. T.O. Kajer | Training Specialist/Winrock |
| 8. Mr. E.H. Wiser | University Programs/Chemonics |
| 9. Mr. C.P. Maloney | Social Scientist/Sheladia |
| 10. Dr. R.J. Narain | Institutional Development/WAPCOS |
| 11. Mr. Rangachari | OPC Specialist/WAPCOS |
| 12. Dr. C.S.S. Rao | Training Consultant/WAPCOS |
| 13. Dr. Krishna Pal | Deputy Chief Engineer/WAPCOS |

EDC (Education Development Center, Inc.)

- | | |
|-----------------------|-----------------|
| 1. Mr. Edward Robbins | Project Manager |
| 2. Mr. Bose | Project Manager |

Consultants

- | | |
|----------------------------|-----------------------------------|
| 1. Dr. Bradley W. Parlin | Professor/IIRCD, Logan, Utah |
| 2. Dr. Jack Keller | Irrigation Consultant/Logan, Utah |
| 3. Dr. John A. Replogle | Research Engineer, USWCL, Arizona |
| 4. Mr. Stephan Christopher | Sociologist/Sheladia |

Central Water Commission (CWC)

- | | |
|-------------------------|----------------|
| 1. Mr. P.B. Parabrahmam | Chief Engineer |
| 2. Mr. B. Pyda Raju | Chief Engineer |
| 3. Mr. R.S. Choudhary | Chief Engineer |

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- | | |
|-------------------------|---|
| 4. Mr. S.S. Iyer | Chief Engineer |
| 5. Mr. M.K. Sharma | Director, Gates Design |
| 6. Mr. D.G. Chatwone | Director |
| 7. Mr. R.V. Rao | Director |
| 8. Mr. M.E. Haq | Scientist, National Institute of Hydrology |
| 9. Mr. S.C. Sud | Director, Reservoir Operation Department |
| 10. Mr. T.S. Bathija | Superintending Engineer, Upper Yamuna
Circle |
| 11. Mr. D.R. Krishnapal | Deputy Chief Engineer |
| 12. Mr. A.D. Mohile | Chief Engineer, IRMIO |
| 13. Mr. P.D. Goel | Director |
| 14. Mr. Kempaiya | Director |

Ministry of Water Resources

- | | |
|---------------------|------------------|
| 1. Mr. M.A. Chitale | Secretary |
| 2. Mr. M.S. Reddy | Member, CWC |
| 3. Mr. V. Rajgopal | Deputy Secretary |

Ministry of Economic Affairs

- | | |
|---------------------|------------------|
| 1. Ms. Sumati Mehta | Deputy Secretary |
|---------------------|------------------|

Planning Commission

- | | |
|------------------------|----------------------|
| 1. Mr. B.N. Navalawala | Advisor (Irrigation) |
|------------------------|----------------------|

Central Ground Water Board

- | | |
|--------------------|----------------------|
| 1. Mr. S.C. Sharma | Director & Secretary |
|--------------------|----------------------|

World Bank, New Delhi

- | | |
|---------------------|---------------------|
| 1. Mr. C.J. Perry | Senior Economist |
| 2. Mr. Anant A. Pai | Irrigation Engineer |

Ford Foundation, New Delhi

- | | |
|-----------------------|-----------------|
| 1. Dr. John S. Ambler | Program Officer |
|-----------------------|-----------------|

C: ANAND

WALMI

1. Mr. M.G. Raichur	C.E. & Director
2. Mr. K.M. Dave	Lecturer
3. Mr. B.N. Dholakia	Deputy Director
4. Mr. P.D. Dhru	Lecturer
5. Mr. A.G. Dixit	Assistant Professor
6. Mr. D.K. Dobaria	Lecturer
7. Mr. O.T. Gulati	Professor
8. Mr. D.J. Joshi	Lecturer
9. Mr. V.M. Joshi	Assistant Librarian
10. Mr. C.L. Patel	Professor
11. Mr. K.N. Patel	Deputy Ex. Engineer
12. Mr. V.A. Patel	Assistant Professor
13. Mr. V.B. Prajapati	Assistant Engineer
14. Mr. P.N. Purohit	Account Officer
15. Mr. B.J. Raval	Soil Laboratory
16. Mr. J.L. Shah	Assistant Professor
17. Mr. P.L. Shukla	Assistant Engineer
18. Mr. A.M. Vagehla	Joint Director
19. Mr. B.D. Vyas	Soil Survey Officer
20. Mr. M.S. Zaman	Assistant Professor

D: BARODA

M.S. University

- | | |
|---------------------------|--|
| 1. Professor P.M. Modi | Director, Water Resources Engineering and Management Institute |
| 2. Mr. G.S. Parthasarathi | Professor |
| 3. Mr. D.T. Shete | Reader |
| 4. Mr. H.M. Patel | Lecturer |

E: PUNE

Central Training Unit (CTU)

- | | |
|--------------------------|---|
| 1. Mr. N. Suryanarayanan | Chief Engineer (Now Joint Secretary, MOWR, Delhi) |
| 2. Mr. S.A. Bhanagay | Director |
| 3. Mr. R.L. Qazi | Director |
| 4. Mr. R.B. Walimbe | Deputy Director |
| 5. Mr. N. Ramgopal | Deputy Director |
| 6. Mr. S.K. Sahu | Deputy Director |
| 7. Mr. Rajan Nair | Deputy Director |
| 8. Dr. Prabhakar | Professor Coordinator |
| 9. Dr. Karmakar | Professor Coordinator, University of Poona |

F: RAHURI

Mahatma Phule Agricultural University

- | | |
|------------------------|---------------------|
| 1. Dr. S.S. Magar | Head of Department |
| 2. Dr. V.S. Pawar | Training Officer |
| 3. Mr. S.D. Dahiwalkar | Assistant Professor |
| 4. Mr. J.R. Kadam | Assistant Professor |

5. Mr. S.U. Bhoite	Assistant Professor
6. Mr. N.N. Firake	Assistant Professor
7. Dr. S.N. Shinde	Professor (Agronomy)
8. Dr. K.R. Sonar	Professor (Soil Science)
9. Mr. B.B. Khot	Assistant Professor
10. Mr. A.S. Patil	Assistant Professor
11. Mr. S.D. Patil	Professor

G: AURANGABAD

WALMI

1. Mr. M.D. Pendse	Director
2. Mr. S.B. Varade	Deputy Director
3. Mr. M.M. Patwardhan	Faculty
4. Mr. D.G. Holsambre	Faculty
5. Mr. P.V. Purandre	Faculty
6. Mr. M.S. Palaskar	Faculty
7. Mr. D.H. Pawar	Faculty
8. Mr. A.R. Suryavanshi	Faculty
9. Dr. S.G. Bhogle	Professor
10. Mr. T.K. Gaike	Faculty

H: MADRAS

Anna University

1. Dr. M. Anandkrishnan	Vice Chancellor
2. Dr. N.V. Pundarikanthan	Director, Centre for Water Resources
3. Mr. R. Mohandass	Project Manager
4. Mr. C.R. Balagopal	Agronomist

I: TRICHY

Irrigation Management Training Institute (IMTI)

- | | |
|------------------------|----------------------------|
| 1. Mr. K. Pandey | Chief Engineer, Director |
| 2. Dr. R. Kulandaivelu | Professor & Joint Director |

J: BHUBANESHWAR

Government of Orissa

- | | |
|---------------------|-------------------|
| 1. Mr. B. Senapathy | Engineer In Chief |
|---------------------|-------------------|

WALMI

- | | |
|----------------------|----------|
| 1. Mr. B.S.N. Murthy | Director |
| 2. Mr. K.M. Sahukar | Faculty |
| 3. Mr. J. Sahoo | Faculty |
| 4. Mr. Deepak Das | Faculty |
| 5. Mr. S.N. Panda | Faculty |
| 6. Ms. P. Mohanty | Faculty |

K: PATNA

WALMI

- | | |
|------------------------|---------------------|
| 1. Mr. R.S. Sinha | Director |
| 2. Mr. L.P. Srivastava | Professor |
| 3. Mr. A.K. Varma | Professor |
| 4. Mr. J. Asgar | Reader |
| 5. Mr. S.K. Verma | Reader |
| 6. Mr. Y.K. Rastogi | Reader |
| 7. Mr. D.P. Singh | Assistant Professor |

- | | |
|--------------------|---------------------|
| 8. Mr. L.B. Roy | Assistant Professor |
| 9. Mr. G.G. Dixit | Research Officer |
| 10. Mr. S.B. Sinha | System Manager |
| 11. Mr. R.K. Sinha | Senior Consultant |

Government of Bihar

- | | |
|--------------------|---|
| 1. Mr. J. Singh | Minister (Water Resources) |
| 2. Mr. V.S. Dubey | Secretary, Irrigation and Water Resources |
| 3. Mr. Prabhakaran | Development Commissioner |
| 4. Mr. P.P. Sharma | Area Development Commissioner, Sone |
| 5. Mr. I.N. Sinha | Engineer In Chief, Water Resources |

Department

Bihar College of Engineering

- | | |
|------------------|--|
| 1. Dr. T. Prasad | Director, Centre for Water Resources Studies |
|------------------|--|

Appendix F

ITINERARY

Final Evaluation
Water Resources Management & Training (WRM&T) Project
(386 - 0484)

A. Members of Evaluation Team

- | | | |
|-----------------|-------------|---|
| 1. Richard Wall |] Group 'A' | Note: Group A & B will travel together during Feb. 1-8 and Feb. 16-23 but they will travel separately during Feb. 9-15. |
| 2. A. Sunder |] | |
| 3. Roy Elmore |] Group 'B' | |
| 4. A. Das Gupta |] | |

B. Itinerary/Field Visits (During February 1-23, 1992)

MODE	PLACE & TIME(HRS) (Departure-Arrival)	GROUP(S)	CONTACT PERSON	HOTEL (Single Room)	AID STAFF ACCOMPANYING	DATE
Feb.1	IC-817 Delhi (0620-0905 hrs.)	A & B	-	-	BRP	
	Car Anand (1100 - 1300 hrs.)	A & B	M. G. Raichur (WALMI)	WALMI Guest House (5)		
Feb.4	Car Anand - Baroda (1600 - 1800 hrs.)	A & B	P. M. Modi (M.S. Univ.)	Welcome Vadodara (5)	BRP	
Feb.6	IC-690 Vadodara - B'bay	A & B		President (4)		
Feb.7	Train Bombay - Pune	A & B	N.Suryanarayanan (CTU)	Executive Ashok (5)	DRA	
Feb.10	Car Pune-Rahuri (0800-1000 hrs.)	A	S. S. Magar (Ag. Univ)	Univ. Guest House (3)	GP	
Feb.12	Car Rahuri- Aurangabad	A	M.D.Pendse (WALMI)	Aurangabad Ashok(3)		
Feb.15	IC-491 Aurangabad- Bombay	A	-	-		
Feb.15	IC-274 B'bay-Calcutta (1600-1815 hrs.)	A	-	Airport Ashok (2)		
Feb.16	IC-544 Calcutta-BBS (1045-1140 hrs.)	A	B.S.N.Murthy (WALMI)	Kalinga Ashok (2)		

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DATE	MODE	PLACE & TIME (Departure-Arrival)	GROUP(S)	CONTACT PERSON	HOTEL (Single Room)	AID STAFF ACCOMPANYING
=====						
	Train	Pune-Bombay	B	-	Centaur (1) R.Elmore only	GP
Feb.10	IC-572	B'bay-Madras (0830-1015 hrs)	B	N.V.Pundari- kanthan (Anna Univ.)	Connemara (2)	GP
Feb.12	IC-501	Madras-Trichy (0700-0745hrs.)	B	P.Krishnaraj	Femina (3)	
Feb.15	IC-504	Trichy-Madras	B	-	Park Sheraton (3)	
Feb.16	IC-543	Madras-BBS (0615-0830 hrs)	B	B.S.N.Murthy (WALMI)	Kalinga Ashok (2)	
=====						
Feb.19	IC-543	Bhubaneshwar- (0900-0955 hrs)	A & B	-	-	
Feb.19	IC-810	Calcutta-Patna (1220-1445 hrs.)	A & B	R.S. Sinha (WALMI)	Patliputra Ashok (5)	DRA
Feb.23	IC-810	Patna-Delhi	A & B	-	Hyatt Regency (4)	
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Appendix G

**NATIONAL WATER POLICY
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NATIONAL WATER POLICY

The need for a national water policy

- 1.1 Water is a prime natural resource, a basic human need and a precious national asset. Planning and development of water resources need to be governed by national perspectives.
- 1.2 It has been estimated that out of the total precipitation of around 400 million hectare metres in the country, the surface water availability is about 178 million hectare metres. Out of this about 50% can be put to beneficial use because of topographical and other constraints. In addition there is a ground water potential of about 42 million hectare metres. The availability of water is highly uneven in both space and time. Precipitation is confined to only about three or four months in the year and varies from 10 cm in the western parts of Rajasthan to over 1000 cm at Cherrapunji in Meghalaya. Further, water does not respect state boundaries. Not merely rivers but even underground aquifers often cut across state boundaries. Water as a resource is one and indivisible rainfall, river waters, surface ponds and lakes and ground water are all part of one system; water is also a part of a larger ecological system.
- 1.3 Floods and drought affect vast areas of the country, transcending state boundaries. A third of the country is drought-prone. Floods affect an average area of around 9 million hectares per year. According to the National Commission on floods, the area susceptible to floods is around 40 million hectares. The approach to the management of drought and floods has to be coordinated and guided at the national level.
- 1.4 Even the planning and implementation of individual irrigation or multi-purpose projects, though done at the state level, involve a number of aspects and issues such as environmental protection, rehabilitation of project-affected people and livestock, public health consequences of water impoundment, dam safety etc. On these matters common approaches and guidelines are necessary. Moreover, certain problems and weaknesses have affected a large number of projects all over the country. There have been substantial time and cost overruns on projects. In some irrigation commands, problems of water logging and soil salinity have emerged, leading to the degradation of good agricultural land. There are also complex problems of equity and social justice in regard to water distribution. The development and exploitation of the country's groundwater resources also give rise to questions of judicious and scientific resource management and conservation. All these questions need to be tackled on the basis of common policies and strategies.
- 1.5 The growth process and the expansion of economic activities inevitably lead to increasing demands for water for diverse purposes: domestic, industrial, agricultural, hydro-power, navigation, recreation, etc. So far, the principal consumptive use of water has been for irrigation. While the irrigation potential is

estimated to have increased from 19.5 million hectares at the time of Independence to about 68 million hectares at the end of the sixth plan, further development of a substantial order is necessary if the food and fibre needs of a growing population are to be met. The country's population which is over 750 million at present is expected to reach a level of around 1000 million by the turn of the century.

- 1.6 The production of foodgrains has increased from around 50 million tonnes in the fifties to about 150 million tonnes at present, but this will have to be raised to around 240 million tonnes by the year 2000 A.D. The drinking water needs of people and livestock have also to be met. In keeping with the objectives of the International Drinking Water Supply and Sanitation Decade Programme (1981-1991), adequate drinking water facilities have to be provided to the entire population in both urban and rural areas and sanitation facilities to 80% of the urban population and 25% of the rural population by the end of the decade. Domestic and industrial water needs have largely been concentrated in or near the principal cities, but the demand from rural society is expected to increase sharply as the development programmes improve economic conditions in the rural areas. The demand for water for hydro and thermal power generation and for other industrial uses is also likely to increase substantially. As a result water which is already a scarce resource will become even scarcer in future. This underscores the need for the utmost efficiency in water utilization and a public awareness of the importance of its conservation.
- 1.7 Another important aspect is water quality. Improvements in existing strategies and the innovation of new techniques resting on a strong science and technology base will be needed to eliminate the pollution of surface and ground water resources, to improve water quality and to step up the recycling and reuse of water. Science and technology and training have also important roles to play in water resources development in general.
- 1.8 Water is one of the most crucial elements in developmental planning. As the country prepares itself to enter the 21st century, efforts to develop, conserve, utilize and manage this important resource have to be guided by national perspectives. The need for a national water policy is thus abundantly clear; water is a scarce and precious national resource to be planned, developed and conserved as such, and on an integrated and environmentally sound basis, keeping in view the needs of the States concerned.

Information
system

2. The prime requisite for resource planning is a well developed information system. A standardized national information system should be established with a network of data banks and data bases, integrating and strengthening the existing Central and State level agencies and improving the quality of data and the processing capabilities. There should be free exchange of data among the various agencies and duplication in data collection should be avoided. Apart from the data regarding water availability and actual water use, the

system should also include comprehensive and reasonably reliable projections of future demands for water for diverse purposes.

Maximizing
availability

- 3.1 The water resources available to the country should be brought within the category of utilizable resources to the maximum possible extent. The resources should be conserved and the availability augmented by measures for maximizing retention and minimizing losses.
- 3.2 Resource planning in the case of water has to be done for a hydrological unit such as a drainage basin as a whole, or for a sub-basin. All individual developmental projects and proposals should be formulated by the States and considered within the framework of such an overall plan for a basin or sub-basin, so that the best possible combination of options can be made.
- 3.3 Appropriate organizations should be established for the planned development and management of a river basin as a whole. Special multi-disciplinary units should be set up in each state to prepare comprehensive plans taking into account not only the needs of irrigation but also harmonizing various other water uses, so that the available water resources are determined and put to optimum use having regard to subsisting agreements or awards of Tribunals under the relevant laws.
- 3.4 Water should be made available to water short areas by transfer from other areas including transfers from one river basin to another, based on a national perspective, after taking into account the requirements of the areas/basins.
- 3.5 Recycling and re-use of water should be an integral part of water resource development.

Project
Planning

- 4.1 Water resource development projects should as far as possible be planned and developed as multipurpose projects. Provision for drinking water should be a primary consideration. The projects should provide for irrigation, flood mitigation, hydro-electric power generation, navigation, pisciculture and recreation wherever possible.
- 4.2 The study of the impact of a project during construction and later on human lives, settlements, occupations, economic and other aspects should be an essential component of project planning.
- 4.3 In the planning, implementation and operation of projects, the preservation of the quality of environment and the ecological balance should be a primary consideration. The adverse impact, if any, on the environment should be minimized and should be off-set by adequate compensatory measures.
- 4.4 There should be an integrated and multi-disciplinary approach to the planning, formulation, clearance and implementation of projects, including catchment treatment and management, environmental and ecological aspects, the

rehabilitation of affected people and command area development.

- 4.5 Special efforts should be made to investigate and formulate projects either in, or for the benefit of, areas inhabited by tribal or other specially disadvantaged groups such as Scheduled Castes and Scheduled Tribes. In other areas also, project planning should pay special attention to the needs of Scheduled Castes and Scheduled Tribes and other weaker sections of society.
- 4.6 The planning of projects in hilly areas should take into account the need to provide assured drinking water, possibilities of hydro-power development and the proper approach to irrigation in such areas, in the context of physical features and constraints such as steep slopes rapid run-off and the incidence of soil erosion. The economic evaluation of projects in such areas should also take these factors into account.
- Maintenance and Modernization 4.7 Time and cost overruns and deficient realization of benefits characterizing most irrigation projects should be overcome by upgrading the quality of project preparation and management. The under-funding of projects should be obviated by an optimal allocation of resources, having regard to the early the early completion of on-going projects as well as the need to reduce regional imbalances.
- 5.1 Structures and systems created through massive investments should be properly maintained in good health. Appropriate annual provisions should be made for this purpose in the budgets.
- 5.2 There should be a regular monitoring of structures and systems and necessary rehabilitation and modernization programmes should be undertaken.
- Safety of structures 6. There should be proper organizational arrangements at the national and state levels for ensuring the safety of storage dams and other water-related structures. The central guidelines on the subject should be kept under constant review and periodically updated and reformulated. There should be a system of continuous surveillance and regular visits by experts.
- Groundwater development 7.1 There should be a periodical reassessment on a scientific basis of the ground water potential, taking into consideration the quality of the water available and economic viability.
- 7.2 Exploitation of ground water resources should be so regulated as not to exceed the recharging possibilities, as also to ensure social equity. Ground water recharge projects should be developed and implemented for augmenting the available supplies.
- 7.3 Integrated and coordinated development of surface water and ground water and their conjunctive use, should be envisaged right from the project planning stage and should form an essential part of the project.

- 7.4 Over exploitation of ground water should be avoided near the coast to prevent ingress of sea water into sweet water aquifers.
- Water allocation priorities**
8. In the planning and operation of systems, water allocation priorities should be broadly as follows;-
- Drinking water
 - Irrigation
 - Hydro-power
 - Navigation
 - Industrial and other uses.
- However, these priorities might be modified if necessary in particular regions with reference to area specific considerations.
- Drinking water**
9. Adequate drinking water facilities should be provided to the entire population both in urban and in rural areas by 1991. Irrigation and multipurpose projects should invariably include a drinking water component, wherever there is no alternative source of drinking water. Drinking water needs of human beings and animals should be the first charge on any available water.
- Irrigation**
- 10.1 Irrigation planning either in an individual project or in a basis as a whole should take into account the irrigability of land, cost-effective irrigation options possible from all available sources of water and appropriate irrigation techniques. The irrigation intensity should be such as to extend the benefits of irrigation to as large a number of farm families as possible, keeping in view the need to maximize production.
- 10.2 There should be a close integration of water-use and land use policies.
- 10.3 Water allocation in an irrigation system should be done with due regard to equity and social justice. Disparities in the availability of water between head-reach and tail-end farms and between large and small farms should be obviated by adoption of a rotational water distribution system and supply of water on a volumetric basis subject to certain ceilings.
- 10.4 Concerted efforts should be made to ensure that the irrigation potential created is fully utilized and the gap between the potential created and its utilization is removed. For this purpose, the command area development approach should be adopted in all irrigation projects.
- Water rates**
11. Water rates should be such as to convey the scarcity value of the resource to the users and to foster the motivation for economy in water-use. They should be adequate to cover the annual maintenance and operation charges and a part of the fixed costs. Efforts should be made to reach this ideal over a period, while ensuring the assured and timely supplies of irrigation water. The water rates for surface water and ground water should be rationalized with due regard to the interests of small and marginal farmers.

- Participation of farmers and voluntary agencies 12. Efforts should be made to involve farmers progressively in various aspects of management or irrigation systems, particularly in water distribution and collection of water rates. Assistance of voluntary agencies should be enlisted in educating the farmers in efficient water use and water management.
- Water quality 13. Both surface water and ground water should be regularly monitored for quality. A phased programme should be undertaken for improvements in water quality.
- Water zoning 14. Economic development and activities including agricultural, industrial and urban development, should be planned with due regard to the constraints imposed by the configuration of water availability. There should be a water zoning of the country and the economic activities should be guided and regulated in accordance with such zoning.
- Conservation of water 15. The efficiency of utilization in all the diverse uses of water should be improved and an awareness of water as a scarce resource should be fostered. Conservation consciousness should be promoted through education, regulation, incentives and disincentives.
- Flood Control and management 16. There should be a master plan for flood control and management for each flood prone basin. Sound watershed management through extensive soil conservation, catchment-area treatment, preservation of forests and increasing the forest area and the construction of check-dams should be promoted to reduce the intensity of floods. Adequate flood-cushion should be provided in water storage projects wherever feasible to facilitate better flood management. An extensive network for flood forecasting should be established for timely warning to the settlements in the flood plains, along with the regulation of settlements and economic activity in the flood plain zones, to minimize the loss of life and property on account of floods. While physical flood protection works like embankments and dykes will continue to be necessary, the emphasis should be on non-structural measures for the minimization of losses, such as flood forecasting and warning and flood plain zoning, so as to reduce the recurring expenditure on flood relief.
- Land erosion by sea or river 17. The erosion of land, whether by the sea in coastal area or by river waters inland, should be minimized by suitable cost-effective measures. The States and Union territories should also undertake all requisite steps to ensure that indiscriminate occupation and exploitation of coastal strips of land are discouraged and that the location of economic activities in areas adjacent to the sea is regulated.
- Drought management 18.1 Drought-prone areas should be made less vulnerable to drought-associated problems through soil-moisture conservation measures, water harvesting practices, the minimization of evaporation losses, the development of the ground water potential and the transfer of surface water from surplus areas where feasible and

appropriate. Pastures, forestry or other modes of development which are relatively less water-demanding should be encouraged. In planning water resource development projects, the needs of drought-prone areas should be given priority.

18.2 Relief works undertaken for providing employment to drought-stricken populations should preferably be for drought proofing.

Science and
Technology

19. For effective and economical management of our water resources, the frontiers of knowledge need to be pushed frontiers of knowledge need to be pushed forward in several directions by intensifying research efforts in various areas, including the following:-
- hydrometeorology;
 - assessment of water resources;
 - snow and lake hydrology
 - ground water hydrology and recharge;
 - prevention of salinity ingress;
 - water-harvesting;
 - evaporation and seepage losses;
 - economical designs for water resource projects;
 - crops and cropping systems;
 - sedimentation of reservoirs;
 - the safety and longevity of water-related structures;
 - river morphology and hydraulics;
 - soils and material research;
 - better water management practices and improvements in operational technology;
 - recycling and re-use;
 - use of sea water resources.

Training

20. A perspective plan for standardized training should be an integral part of water resource development. It should cover training in information systems, sectoral planning, project planning and formulation, project management, operation of projects and their physical structures and systems and the management of the water distribution systems. The training should extend to all the categories of personnel involved in these activities as also the farmers.

Conclusion

21. In view of the vital importance of water for human and animal life, for maintaining ecological balance and for economic and developmental activities of all kinds, and considering its increasing scarcity, the planning and management of this resource and its optimal, economical and equitable use has become a matter of the utmost urgency. The success of the national water policy will depend entirely on the development and maintenance of a national consensus and commitments to its underlying principles and objectives.

Appendix H

THE SOCIETIES REGISTRATION ACT, 1860 (Act No. 21 of 1860)

An Act for the Registration of Literary, Scientific
and Charitable Societies
(21st May, 1860)

Preamble - Whereas it is expedient that provision should be made for improving the legal condition of societies established for the promotion of literature, science or the fine arts, or for the diffusion of useful knowledge, the diffusion of political education, or for charitable purposes;

It is enacted as follows:

1. Societies formed by memorandum of association and registration.

Any seven or more persons associated for any literary, scientific or charitable purposes; or for any such purpose as is described in section 20 of this Act, may, by subscribing their names to a memorandum of association, and filing the same with the (Inspector General of Registration) form themselves into a society under the Act.

2. Memorandum of association. The memorandum of association shall contain the following things (that is to say):-

The name of the society.

The objects of the society.

The names, addresses, and occupations of the governors, council, director's committee, or other governing body to whom, by the rules of the society, the management of its affairs is entrusted.

A copy of the rules and regulations of the society, certified to be a correct copy by not less than three of the members of the governing body, shall be filed with the memorandum of association.

3. Registration and fees. Upon such memorandum and certified copy being filed, the (Inspector General of Registration) shall certify under his hand that the society is registered under this Act. There shall be paid to the (Inspector General of Registration) for every such registration a fee of fifty rupees, or such smaller fee as the State Government may from time to time, direct; and all fees so paid shall be accounted for to the State Government.

4. Annual list of managing body to be filed. Once in every year, on or before the fourteenth day succeeding the day on which according to the rules of the society, the annual general meeting of the society is held; or, if the rules do not provide for an annual general meeting, in the month of January, a list shall be filed with the (Inspector General of Registration) of the names, addresses and occupations of the governors council, directors, committee or other governing body then entrusted with the management of the affairs of the society.

4-A. changes in managing body and rules to be filed. (1) Together with the list mentioned in Section 4, there shall be sent to the Inspector

General of Registration a statement showing all changes during the year to which the list relates in the personnel of governors, council, directors, committee or other governing body to whom the management of the affairs of the society is entrusted and also a copy of the rules of the society corrected up-to-date and certified to be a correct copy by not less than three of the members of the governing body.

(2) a copy of every alteration made in the rules of the society, certified to be a correct copy by not less than three of the members of the governing body, shall be sent to the Inspector-General of Registration within fifteen days of the making of such alteration.

5. Property of society how vested. The property, movable and immovable, belonging to a society registered under this Act, if not vested in trustees, shall be deemed to be vested, for the time being in the governing body of such society by their proper title.

6. Suits by and against societies. Every society registered under this Act may sue or be sued in the name of the President, Chairman, or Principal, Secretary, or trustees, as shall be determined by the rules and regulations of the society, and, in default of such determination, in the name of such person as shall be appointed by the governing body for the occasion:

Provided that it shall be competent for the person having a claim or demand against the Society, to sue the President or Chairman or Principal Secretary or the trustees thereof, if on application to the governing body some other officer or person be not nominated to be the defendant.

7. Suits not to abate. No suit or proceeding in any Civil Court shall abate or discontinue by reason of the person, by or against whom such suit or proceedings shall have been brought or continued, dying or ceasing to fill the character in the name whereof he shall have sued or been sued, but the same suit or proceeding shall be continued in the name of or against the successor or such person.

8. Enforcement of judgement (or decree) against society. If a judgement (or decree) shall be recovered against the person or officer named on behalf of the society such judgement (or decree) shall not be put in force against the property, movable or immovable, or against the body of such person or officer, but against the property of the society.

The application for execution shall set forth the judgement (or decree), the fact of the party against whom it shall have been recovered having sued or having been sued, as the case may be, on behalf of the society only, and shall require to have the judgement (or decree) enforced against the property of the society.

9. Recovery of penalty accruing under bye-law. Whenever by any bye-law duly made in accordance with the rules and regulations of the society, or, if the rules do not provide for the making of bye-laws, by any bye-law made at a general meeting of the members of the society convened for the purpose (for the making of which the concurrent votes of three-fifths of the members present at such meeting shall be necessary), any pecuniary penalty is imposed, for the breach of any rule or bye-law of the society, such penalty, when accrued may be recovered in any court having jurisdiction where the defendant shall reside, or the society shall be situate, as the governing body thereof shall deem expedient.

10. Members liable to be sued as strangers. Any member who may be in arrear of a subscription which, according to the rules of the society he is bound to pay, or who shall possess himself of or detain any property of

the society, may be sued for such arrear or for the damage accruing from such detention, injury, or destruction of property in the manner herein before provided.

Recovery by successful defendant of costs adjudged.- But if the defendant shall be successful in any suit or other proceeding brought against him at the instance of the society, and shall be adjudged to recover his costs, he may elect to proceed to recover the same from the officer in whose name the suit shall be brought, or from the society. and in the latter case shall have the process against the property of the said society in the manner above described.

11. Members guilty of offenses punishable as strangers. Any member of the society who shall steal, purloin, or embezzle any money or other property or wilfully and maliciously destroy or injure any property of such society, or shall forge any deed, bond, security, for money receipt or other instrument, whereby the funds of the society may be exposed to loss, shall be subject to the same prosecution, and, if convicted, shall be liable to be punished in like manner, as any person not a member would be subject and liable to in respect of the like offence.

12. Societies enabled to alter, extend or abridge their purposes. Whenever it shall appear to the governing body of any society registered under this Act, which has been established for any particular purpose or purposes, that it is advisable to alter, extend or abridge such purpose to or for other purposes within the meaning of this Act, or to amalgamate such society, either wholly or partially with any other society such governing body may submit the proposition to the members of the society in a written or a printed report, and may convene a special meeting for the consideration thereof, according to the regulations of the society;

but no such proposition shall be carried into effect unless such report shall have been delivered or sent by post to every member of the society ten days previous to the special meeting convened by the governing body for the consideration thereof, nor unless such proposition shall have been agreed to by the votes of three-fifths of the members delivered in person or by proxy, and confirmed by the votes of three-fifth of the members present at a second special meeting convened by the governing body at an interval of one month after the former meeting.

12-A. Change of name. Any number not less than three-fifths of the members of any society registered under Section 3, may, subject to the provisions of Section 12-B, change its name.

12-B. Notice of change of name. (1) Notice in writing of every change of name signed by the Secretary and by seven members of the society changing its name shall be sent to the Registrar.

(2) If the proposed name is identical with that by which any other existing society has been registered or, in the opinion of the Registrar, so nearly resembles such name as to be likely to deceive the public or the members of either society, the Registrar shall refuse to register the change of name.

(3) Save as provided in sub-section (2), the Registrar shall if he is satisfied that the provisions of this Act in respect of change of name have been complied with, register the change of name and the change of name shall have effect from the date of such registration.

13. Provision for dissolution of societies and adjustment of their affairs. Any number not less than three-fifths of the members of any society may determine that it shall be dissolved, and thereupon it shall be

dissolved, and thereupon it shall be dissolved forthwith or at the time then agreed upon, and all necessary steps shall be taken for the disposal and settlement of the property of the society, its claims and liabilities, according to the rules of the said society applicable thereto, if any, and, if not, then as the governing body shall find expedient:

Provided that, in the event of any dispute arising among the said governing body of the members of the society the adjustment of its affairs shall be referred to the principal Court of original civil jurisdiction of the district in which the chief building of the society is situate, and the Court shall make such order in the matter as it shall deem requisite:

Assent required. Provided that no society shall be dissolved unless three fifths of the members shall have expressed a wish for such dissolution by their votes delivered in person, or by proxy, at a general meeting convened for the purpose.

Government Consent. Provided that, whenever any Government is a member of, or a contributor to, or otherwise interested in any society registered under the Act, such society shall not be dissolved, without the consent of the Government of the State of registration.

14. Upon a dissolution no member to receive profit. If upon the dissolution of any society registered under this act there shall remain, after the satisfaction of all its debts and liabilities, any property whatsoever, the same shall not be paid to or distributed among the members of the said society or any of them but shall be given to some other society, to be determined by the votes of not less than three-fifths of the members present personally or by proxy, at the time of the dissolution, or in default thereof, by such Court as aforesaid;

Clause not to apply to Joint Stock Companies. Provided, however, that this clause shall not apply to any society which shall have been founded or established by the contribution of shareholders in the nature of a Joint Stock Company.

14-A. Disposal of property of a dissolved society. Notwithstanding anything contained in Section 14 it shall be lawful for the members of any society dissolved under Section 13 to determine by a majority of the votes of the members present personally or by proxy at the time of the dissolution of such society that any property whatsoever remaining after the satisfaction of all the debts and liabilities shall be given to Government to be utilized for any of the purposes referred to in Section 1.

15. Member defined. For the purposes of this act a member of a society shall be a person who, having been admitted therein according to the rules and regulations thereof, shall have paid a subscription, or shall have signed the roll or list of members thereof, and shall not have resigned in accordance with such rules and regulations.

Disqualified members. But in all proceedings under this Act no person shall be entitled to vote or be counted as a member whose subscription at the time shall have been in arrear for a period exceeding three months.

16. Governing body defined. The governing body of the society shall be the governors, council, directors, committee, trustees or other body to whom by the rules and regulations of the society the management of its affairs is entrusted.

17. Registration of societies formed under other Acts. Any company or society established for a literary, scientific or charitable purpose and registered under the Indian Companies Act, 1913 (VII of 1913), or under the

Companies Act, 1956 (1 of 1956) and not registered under this Act may, at any time hereafter, be registered as a society under this Act:

Provided that no such company or society shall be registered under this Act unless an assent to its being so registered has been given by three-fifths of the members present there personally or by proxy, at some general meeting convened for the purpose by the governing body.

In case of a company or society registered under the Indian Companies Act 1913 (VII of 1913) or the Companies Act, 1956 (I of 1956), the directors of the said company or society, as the case may be, shall be deemed to be such governing body.

In the case of a society not so registered, if no such body shall have been constituted on the establishment of the society, it shall be competent for the members, thereof, upon due notice, to create for itself a governing body to act for the society thenceforth.

18. Such societies to file memorandum, etc., with Inspector General of Registration. In order to any such society as is mentioned in the last preceding section obtaining registry under this Act, it shall be sufficient that the governing body file with the 2[Inspector General of Registration] a memorandum showing the name of the society, the objects of the society and the names, addresses and occupations of the governing body, together with a copy of the rules and regulations of the society certified as provided in section 2, and a copy of the report of the proceeding of the general meeting at which the registration was resolved on.

19. Inspection of documents. Any person may inspect all documents filed with the 2[Inspector General of Registration] under this act on payment of a fee of one rupee for each inspection; and any person may require a copy of extract of any document or any part of any document, to be certified by the Inspector General of Registration, on payment of 32 paise for every hundred words of such copy of extract; and such certified copy shall be prima facie evidence of the matters therein contained in all legal proceeding whatever.

20. To What societies Act applies. The following societies may be registered under this Act.

Charitable societies, the military orphan funds or societies established at the several presidencies of India, societies established for the promotion of science, literature, 1[Industry, agriculture] or the fine arts, for instruction, the diffusion of useful knowledge, the diffusion of political education, the foundation or maintenance of libraries or reading-rooms for general use among the members or open to the public, or public museums and galleries of paintings and other works of art, collections of natural history, mechanical and philosophical inventions, instruments or designs.

21. Penalty for non-compliance of Section 4 or making a false entry. (1) If the President, Secretary or any person authorized in this behalf by a resolution of the governing body of the society fails to comply with the provisions of section 4, he shall be punished with fine which may extend to five hundred rupees and to a further fine not exceeding fifty rupees for each day during which the default is continued after conviction for such offence.

(2) If any person wilfully makes or causes to be made by any false entry in, or from any statement or copy of rules or of alteration in rules sent to the Inspector-General of Registration under Section 4-A, he shall be punished with fine which may extend to two thousand rupees.]

22. Trial of offenses. No Court inferior to that of a Magistrate of the first class shall try any offence under this Act.]

23. Cancellation of registration in certain cases. (1) Notwithstanding anything contained in this Act, the Inspector-General of Registration may, by order in writing, cancel the registration of any society registered under this Act whose office has ceased to be in the State of Bihar by reason of the reorganization of States or change of the office from the State of Bihar to another State or whose activities are subversive to the objects of the society:

Provided that the Inspector-General of Registration shall, before passing any order, make such inquiry as he considers necessary:

Provided further that no order of cancellation of registration of any society on the ground of the activities of the society being subversive to the objects of the society shall be passed until the society has been given a reasonable opportunity of showing cause against the action proposed to be taken in regard to it.

(2) An appeal against an order made under sub-section (1) may be preferred in such manner, within such time and to such authority as may be prescribed and such authority shall consider and dispose of such appeals in the prescribed manner.

(3) The decision of the appellate authority under sub-section (2) shall be final.

24. Power of the State Government to make rules. (1) The State Government may, after previous publication, make rules not inconsistent with this Act for carrying out the purposes of this Act.

(2) In particular and without prejudice to the generality of the foregoing power, the State Government may make rules:

(a) prescribing the form of the register of societies, and the mode in which entries relating to registration are to be made therein and the mode in which such entries are to be amended or notes made therein:

(b) regulating the filing of documents received by the Inspector-General of Registration:

(c) prescribing the authority before whom and the time within which an appeal shall be preferred under sub-section (2) of section 23 and the manner in which such appeals shall be considered and disposed of;

(d) prescribing conditions for the inspection of original documents;

(e) regulating grant of copies of document; and

(f) providing for any other matter for which there is no provision or insufficient provision in this Act and for which provision is, in the opinion of the State Government necessary for giving effect to the purposes of this Act.

(3) Every rule made under this section shall be laid as soon as may be after it is made, before each House of the State Legislature while it is in session for a total period of fourteen days which may be comprised in one session or in two successive sessions, and if, before the expiry of the session in which it is so laid or the session immediately following, both Houses agree in making any modification in the rule or both Houses agree that the rule should not be made, the rule shall thereafter have effect only in

such modified form or be of no effect, as the case may be, so however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that rule.

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Appendix I

TRAINING DELIVERY METHODS

The following discussion of methods provides ways to improve the delivery of training. They are called "rules of thumb" and should not be considered as absolute rules.

The overriding principle (the biggest rule of thumb) for training is this:

EVERYTHING IN TRAINING HAS AN EFFECT, INTENDED OR NOT

Everything that happens in a training setting has a positive or negative effect on the learning process. Unintentional interventions can distract (noisy room, bad lighting). It is the trainer's job to ensure that everything taking place in the training course is intentional and designed to enhance learning or lead to the planned learning objectives.

PHYSICAL ARRANGEMENTS OF TRAINING SPACE

Discussion

Significant communication opportunity is lost when the participants are arranged in rows - theater style.

The consequences of seating in rows are these:

- o participants have to look at the back of people's heads instead of at their faces.
- o Trainers cannot maintain eye contact with all of the trainees or gain it quickly.
- o Arranging the training space in a way that creates the impression of a school classroom tends to cause participants to unconsciously revert to being dependent learners rather than the independent adults they really are.
- o Open exchange of views among participants is not easy when seated in rows; the communication tends to flow up front to the trainer and back to individuals rather than around the group.

Breakout space is training jargon for space to locate participants in small groups, that is, when the large group is broken out into small groups.

* Adapted from "TRAINING METHODS" by Daniel B. Edwards (Training Resources Group) Training Program Review, National Irrigation Administration, Accelerated Agricultural Project Appendix C. Prepared for USAID Mission to the Philippines and NIA under ISPAN Activity No. 682C, June 1990.

The lack of break out space-

- o Tends to encourage lecture-oriented training designs because there is little space in which to conduct exercises and discussion in small groups;
- o Makes it hard to have discussions;
- o Keeps attention focussed on the trainer instead of on all the resources in the room.

The level of noise in the training rooms can create a great deal of stress on the trainees and trainer. It also makes it hard to hear without shouting or using a microphone. Microphones tend to separate the group from the trainer and unnecessarily formalize the training climate.

Rules of Thumb

- o Training space (as differentiated from "conference" space) should always be arranged so that most participants can see each other face to face most of the time, and also see the trainer. This requires a room big enough for an open-ended horseshoe, or a three-sided rectangle (U-shape) or five or six tables¹ arranged in a fan shape with five or six chairs at each table.
- o Sufficient training space should be provided for the group to break up into small task or discussion groups on a regular basis.
- o Training rooms need to be secured away from roadways or equipment yards to avoid distracting sounds. The floor or ceiling should have sound-absorbent material on it (reed mats will work). Microphones should not be needed if a room is set up correctly and measures have been taken against sound intrusion.
- o Trainer should avoid using standing desks (lecterns) on a raised platform. Standing desks and platforms send the message that the trainer has all the information, and the trainee is only a passive recipient of that information.

¹The fan shape of four or five tables with people seated at each table provides the advantage that tasks can be given in the middle of a lecturette for a quick discussion around the table. Each table can become a mini-work group. This can save disruption in group movement, yet effectively meet the requirement of eye contact, for the most part.

SETTING THE LEARNING CLIMATE

Discussion

The "learning climate" in trainer jargon is the learning atmosphere, or readiness to learn that is created in a training group. Trainers can almost feel the difference of a positive and well-established learning climate as opposed to a recalcitrant, hostile, or tired group. The learning climate must be set or created and maintained for each training session and the overall training course. The learning climate is affected by all the things that happen in training, positive and negative, but mostly it is affected by the way the trainers interact with the participants. If trainers talk with participants as equals, the participants will respond in kind as responsible adults (or at the level of maturity they have attained). Conversely, if trainers talk down to participants, the group will do many of the things that dependent learners do.

Rules of thumb

- o The participant is "my client" is the orientation that professional trainers need to keep in mind when talking with participants. The role of the trainer is to avoid creating dependence. As such, the participants should have a say in the use of training space and should regularly provide feedback to trainers on their performance.
- o TOT programs need to stress that the clients are all adults and should be treated as such. General assumptions regarding adult learning should be reviewed during the TOT. These can be found in the book: The Adult Learner, A Neglected Species by Malcolm Knowles.

ENERGIZERS AND ICE-BREAKERS

Rules of Thumb

- o The climate-setting activity (ice-breaker) must be specifically designed to connect or lead into the subject of the training course; otherwise, it becomes a game unrelated to the learning and can even detract from the purpose.
- o Specific climate-setting activities for training sessions should be designed with clear intent and for appropriate effect. The climate setting should be written into the design of the trainer guide or instructor manual

INTERACTIVE TRAINING TECHNIQUES

Discussion

Training courses are often designed with heavy and long lectures. Most communication goes one way--trainer to group. It seems to be the norm to "put across" content material.

All learning research indicates that the least effective way to deal with content is through lectures. The most effective way involves participants with the material so that they work with the content (hear, see, and do); thus, they literally "teach themselves" the information while the trainer serves to facilitate and correct or coach.

The term "lecturette" in training jargon means a short lecture-discussion that has a high degree of two-way communication. Briefly explained material is presented on flip charts (there is always a visual component) and interspersed with questions and interaction. A lecturette should be 30 minutes or less because the attention span of learners with this type of format is about twenty minutes.

Rules of Thumb

- o No one should stand before a training group and talk for more than thirty minutes. If the material cannot be understood within that time, the wrong methodology has been selected to train the material. The thirty-minute limit could be lengthened to forty-five if good visuals are used and if 50 percent of the material involves participant discussion and interaction.
- o Most material now provided in the form of lectures should be converted to case studies that contain information and exercises for small groups to work with and present. For each module, a series of case studies, or a "continuing story" case often be constructed.²
- o A conference activity held in a training setting (such as elections, reports, planning) should not be considered training and does not follow these rules of thumb. When the conference activity is mixed with training, the training program should be separate and the room rearranged for the training activity.

²A reference on the recommended type and form of case study can be obtained from A.I.D. by requesting a copy of Training Guide for a Management Development Program in Water and Sanitation Institutions, Technical Report No.59, 1989, from the WASH Project, 1611 N. Kent Street, Room 1001, Arlington, Virginia 22209. This manual contains training exercises, case studies, and a complete training design in management development.

VISUAL AIDS

Discussion

Training programs use visual materials such as Flowcharts, Overhead Projectors, Chalkboards and handout materials. The use of visual material is important and very effective means to convey information.

In some instances; however, the visual aid can be distracting, or not used to advantage. The amount of chalkboard writing is once a case in point. A great deal of time is sometimes used by the trainer to write lecture points on the chalkboard (school teacher style) while the group waits (and talks with each other) or copies the material in a copybook.

One visual training aid that is a trainer's mainstay--is the flip chart easel with newsprint or manila paper.

Flip chart stands have several advantages:

- o They can be moved around the room and used for small group tasks.
- o Written material on the flip chart can be removed and stuck to the wall, to be referred to several times or to be left as an important reminder.
- o All lecturette material can be written in short form (on newsprint), and thus seen by the participants (material is easier to learn when it can be seen as well as heard). The trainer can also refer to it (easier to remember what to say and also maintain eye contact when material is on view).
- o Participants can use flip charts to organize their presentations to the full group.

Rules of Thumb

- o Each training centre should have numerous light-weight flip charts, easels and pads and several magic markers.
- o The chalkboard should be used minimally or not at all.
- o All lecturette material should be presented using a flip chart (if the lecturette is too long to fit on a flip chart, too much talking is going on, and not enough participant-centered methods are used).

TRAINING OBJECTIVES

Discussion

There are a number of schools of thought on training objectives. Industrial performance-instruction approaches (such as represented by Robert Mager) stress the importance of measurable, conditioned, specific, clear end statements for a session. These usually even require that "action" verbs only be used: list, state, articulate, demonstrate, instead of know, be able to, understand.

Other schools of thought on training objectives are less rigorous and work on the basis of general learning objectives that are as clear and specific as possible. The performance-instruction school of thought is appropriate for very technical training requirements in which measurement is important. The more-general school is used for training relating to management, supervision, and problem solving.

Both views on training objectives, however, require that the trainer be clear about what needs to be trained and that this be clearly communicated to the trainees at the beginning of each session, and checked in some way at the end of a segment.

Rules of Thumb

- o Each training session should begin by telling participants what they are going to learn and why. The training objectives should be written on flip charts and pasted on the wall for easy reference by the training group.
- o At the end of each session, learnings and applications of the learnings should be reviewed, and the objectives should be referred to again.

FEEDBACK MECHANISMS IN TRAINING SESSIONS

Discussion

In process training, evaluation in open-ended format is important. Feedback -

- o Keeps the training relevant and targeted to the appropriate levels.
- o Helps the trainers know if they are coming across correctly.
- o Provides ideas on how to focus, sharpen, and improve the training designs.

- o Lets the trainees know that the trainers are listening and consider the trainees valuable, adult assets to the training process

Rule of Thumb

- o At least once a week during a training course a half-hour should be set aside at the end of the day to openly ask the group "how's it going", and "what can we do to improve what you are getting?" The least threatening way to do this is to form small groups and ask them to list positive and negative things the trainers can do or should know about the program. The feedback is solicited from each group (instead of from the individual) and is recorded on the flip chart. Recording is important so that it is clear that input is heard and taken into account. The trainers should not answer or defend themselves but simply listen.

CO-FACILITATION

Discussion

Most trainers work alone before a group. Many trainers, however, have said that it is difficult to manage and deliver training by themselves. Co-facilitation means true "team training". Two trainers stand before the group most of the time, or one is walking around or closely involved on the side while the focus is on the speaker. Co-facilitation means that information given by one trainer is added to by the other, flip charts are managed by both, and lead and support functions are exchanged from session to session. It takes good pre-planning and a pre-designed session in order to co-facilitate. Co-facilitation will probably improve training planning if done consistently.

Rules of Thumb

- o One trainer paraphrases while the other writes on the flip chart. The writer should be sure that the actual words of the group are written down, unless the words paraphrased by the other trainer are to the satisfaction of the trainees.
- o A technical trainer explains specific content while a training specialist helps with visuals and then gives an exercise to the group that illustrates or allows the group to use the technical material.
- o Whenever one trainer does not see, hear, or understand what someone says or does, the other trainer intervenes and clarifies when appropriate.

Appendix J

BIBLIOGRAPHY OF TRAINING DELIVERY MATERIALS

Attached is a list of books on training delivery to be used by WALMI and CTU librarians in creating Training Resource Sections in their libraries. Those books marked with asterisks (*) should be given priority. At the very least each institution should have copies of the *Training and Development Handbook*, Julius Eittington's *The Winning Trainer*, Donald Kirkpatrick's *Evaluating Training Programs*, and Margoli's *Instructing For Results*.

Adler, Nancy. *Women in Management Worldwide*. Armonk, N.Y.: M.E. Sharpe, Inc.

Argyris, Chris. *Management and Organizational Development: The Path from XA to YB*. N.Y.: McGraw-Hill, Inc.

Bass, Bernard. *Leadership and Performance Beyond Expectations*. N.Y.: The Free Press.

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- Myers, Isabel. *Gifts Differing*. Palo Alto, Calif.: Consulting Psychologist Press, Inc.
- Naisbitt, John. *Megatrends 2000*. N.Y.: William Morrow and Company, Inc.
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- Quick, Thomas. *Training Managers So they Can Really Manage: Confessions of a Frustrated Trainer*. San Francisco: Jossey-Bass, Inc.
- Raudsepp, Eugene. *More Creative Growth Games*. N.Y.: G.P. Putnam's Sons.
- Reddy, W. *Team Building: Blueprints for Productivity and Satisfaction*. Alexandria, Va.: NTL Institute for Applied Behavioral Science.
- Shafritz, Jay. *Classics of Organization Theory*. Chicago: The Dorsey Press.
- Senge, Peter. *The Fifth Discipline: The Art and Practice of the Learning Organization*. N.Y.: Doubleday.

Sikes, Walter. *The Emerging Practice of Organization Development*. NTL Institute for Applied Behavioral Sciences.

*Suessmuth, Patrick. *Ideas for Training Managers and Supervisors; Useful Suggestions, Activities, and Instruments*. La Jolla: University Associates, Inc.

Suzuki, Norihiko. *Management Development in Japan*. West Yorkshire: MCB University Press, Ltd.

Weisbord, Marvin. *Productive Workplaces Organizing and Managing for Dignity, Meaning and Community*. San Francisco: Jossey-Bass, Inc.

Appendix K

PROJECT IMPLEMENTATION LETTER #7



UNITED STATES AGENCY for INTERNATIONAL DEVELOPMENT

NEW DELHI, INDIA

July 7, 1988

Shri K. A. Krishna Moorthy
Under Secretary
Department of Economic Affairs
Ministry of Finance
North Block, New Delhi

SUBJECT: Irrigation Management and Training (IM&T) Project (386-0484)
Project Agreement dated July 30, 1983
Project Implementation letter (PIL) No. 7
Revision of: (i) Management & Administrative Procedures; (ii)
Project Illustrative Budget; and (iii) Project Name

Dear Shri Krishna Moorthy:

Between August and December of 1986, a joint team of the Ministry of Water Resources (MWR) and USAID carried out an intensive review of the IM&T project activities and progress. During the past year AID has been reviewing the recommendations of the team and with the MWR and the Central Water Commission (CWC), has jointly revised project objectives, management and administrative plans and the project budget. These plans and revisions have been discussed in a meeting between representatives of CWC, MWR, DEA, and USAID. At that meeting, it was agreed that the revised project plans and the decisions of the joint meetings would be formalized in a Project Implementation Letter to be issued by AID.

This PIL No. 7 constitutes the formalization of those project decisions and the specification of the revised project objectives and the improved management and budget plans. PIL No. 7 also revises the earmarking of project budget that has been obligated to date. Commitment of project funding will be accomplished through the issuance of separate PIL(s) approving individual Annual State Implementation Plans (ASIPs) or appropriate contracting/training documents. Attachment C of this PIL No.7 provides the revised life-of-project budget for AID's contribution to the project and Attachment D of this PIL No. 7 provides the revised budget for the AID project funding that has been obligated to date.

In addition, in order to reflect substantial clarifications and revisions to project activities and objectives, as well as the development of a water resource management component of the project, PIL No. 7 renames the project as the "Water Resource Management and Training Project"(WRM&T).

A. SPECIFIC OBJECTIVES: We have carefully reviewed and revised the specific objectives of the project taking into consideration our detailed discussions and reviews during this past transition year. These objectives will serve as a principal element in organizing project activities and priorities. Project objectives will be periodically reviewed during the course of project implementation and revised as necessary based on the lessons learned from implementing the project. The details of these revised project objectives are provided in ATTACHMENT A of this PIL No. 7.

B. REVISED MANAGEMENT AND ADMINISTRATIVE PLANS: Management and administrative arrangements detailed hereunder will streamline implementation and eliminate redundant approvals and reviews. With the issuance of this PIL No. 7 AID agrees that, per section 9.2 of the subject project agreement, upon receipt of the name and the specimen signatures of the Deputy Secretary, MWR, the Chief Engineer (IRMIC), and the Chief Engineer (Systems Engineering) or the persons acting in those positions, these individuals will be accepted as Additional Authorized Representatives for the project. AID also agrees to the development of:

1. Annual State Implementation Plans (ASIPs): Each of the participating States will be responsible for the development of an ASIP for the activities to be financed by the WRM&T project. The designated responsible state agency will be assisted, as required, in the development of such ASIPs by WRM&T project funded consultants [e.g. Louis Berger International Inc. (LBII) and WAPCOS]. These ASIPs will provide:

- a) a listing of all the activities to be implemented during Indian Fiscal Year (IFY);
- b) identify implementing agency(ies) responsible for completion of each of the activities mentioned in the ASIP;
- c) a proposed annual budget; and
- d) a workplan for activities including: (i) training requirements and needs for participant training (either U.S. or third country); (ii) equipment to be procured or financed by the project, with responsibility for contracting, during the IFY which is covered by the ASIP; and (iii) a description of any required technical assistance, its duration and proposed timing.

The ASIPs will be reviewed by the concerned State Departments of Irrigation and/or Agriculture and by the State Technical Councils (STC). These ASIPs, will also confirm the availability of funds for the programme in the State Budget. Thereafter State Departments will forward the ASIPs to the Ministry of Water Resources/IRMIC for approval and onward transmission to AID. AID will then review the ASIP and provide its approval with the issuance of a letter to the MOWR/IRMIC and the designated representative of the project committing the funds.

2. National Level Policy Issues: National level policy issues related to the subject project will be dealt with directly by the Ministry of Water Resources (MWR).
3. State Level Issues: Irrigation management and training issues which are common to all the State-Level project activities will be addressed during periodic meetings of a Technical Coordination Group (TCG). The TCG is to be made up of specialists from both the States and the Center as well as from USAID and/or the AID project funded contractors (Louis Berger and WAPCOS).
4. Participation of Additional Institutions: With the issuance of this PIL No. 7, AID agrees to reimburse eligible project related costs of the following institutions: (i) The Central Board of Irrigation and Power (CBIP); (ii) The Central Ground Water Board (CGWB) in collaboration with the U.S. Geological Survey (USGS); (iii) The International Irrigation Management Institute (IIMI) and (iv) Other CWC and MWR Technical and Scientific Exchange activities. In consultation with the MWR and the Central Water Commission (CWC) Annual Implementation Plans (AIPs) for project funded activities will be developed for each of the institutions and programs named above. An approval letter will be issued to commit the project funds based on these AIPs and related costs will be reimbursed by AID in accordance with the procedures set forth in PIL No. 2, as modified by PIL No. 3.
5. Administrative Clearance Procedures: The details of the jointly revised procedures for obtaining consultants, carrying out participant training outside of India and importing required equipment under the project are provided in Attachment B of this PIL No. 7. A summary of these modified procedures follows:
 - a) Technical Assistance requirements: The States and other participating organizations will identify technical assistance requirements in their ASIPs. The Joint Project Management Committee (JPMC) will review the detailed scopes of work and qualifications of the technical consultants. Local Consultants to be hired under the project will be contracted by WAPCOS. Overseas Consultants, will be contracted by LBII and will require clearance by the Ministry of Home Affairs and the Ministry of External Affairs. The MWR will obtain these clearances and advise the Department of Economic Affairs, Ministry of Finance and LBII that the appropriate clearances have been secured.
 - b) Participant Training: Participant Training requirements to be funded by the project will be identified in the ASIPs. The Project contractors (LBII & WAPCOS) will provide assistance to the States in the identification of appropriate courses. The IRMIC, will administratively review the nominations for participant training and will forward the names to the MWR. MWR will advise DEA who in turn will advise USAID of the selection of the candidates.

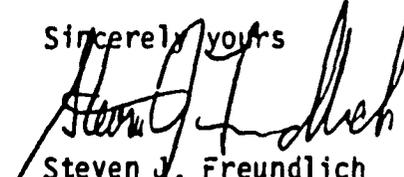
c) Procurement of Equipment: Equipment to be imported under the project will also be identified in the ASIPs. The project funded contractors will assist the states to develop the specifications for imported equipment. The MWR will obtain the required clearances and certifications as specified in Attachment B of this PIL No. 7.

C. BUDGET PLAN: Revised budgets for the project are provided in Attachment C & D of PIL No. 7. AID hereby agrees to provide project funding for Central Programs to be carried out by the MWR, CWC and other central organizations such as Central Groundwater Board, Central Board of Irrigation and Power, the CWC and MWR Scientific and Technical Exchange Program and other irrigation and water resource management organizations. The detailed activities and budgets for such organizations will be provided in AIPs and approved by an authorized representative of either the MWR or CWC.

This Project Implementation Letter No. 7 will be effective immediately. All references to the IM&T project including those in the Project Agreement, Amendments to the Agreement, various PILs and correspondence shall mean the "Water Resources Management & Training Project".

All other terms and conditions of the subject agreement remain unchanged.

Sincerely yours



Steven J. Freundlich
Director (Acting)
Office of Projects

Attachments

- A. Specific Project Objectives
- B. Detailed Administrative Procedures
- C. Revised Illustrative Summary of Project Costs for Life of Project
- D. Illustrative Summary of A.I.D. Contribution for the Grant & Loan Component of the Project

WATER RESOURCES MANAGEMENT & TRAINING PROJECT (386-0484)

Specific Objectives

The Water Resources Management & Training (WRM&T) Project provides resources and support to improve managerial, technical and institutional capabilities for increasing productivity of India's water resources. The overall goal is increased agricultural productivity and improved rural incomes through more effectively managed water resources, irrigation main systems and water distribution networks. The WRM&T Project strengthens the human and institutional capability to plan, design, manage and maintain efficient and productive water resource systems for irrigation.

There are both National and State-level objectives of the WRM&T Project:

A. National-Level

1. Support for the Ministry of Water Resources, including CBIP, CWC and CGWB, to deal with current irrigation and water resource issues through appropriate studies, and through technical exchanges with international irrigation water resource institutions. To do this the project will:
 - ° Place and fund senior officials of these organizations to take part in issue-specific policy level short-courses and workshops;
 - ° Provide topics, specialized assistance and funding to carryout studies on critical irrigation and water resource issues and to conduct national symposia and seminars on them;
 - ° Provide institutional grants to establish professional relationships between the International Irrigation Management Institute with the Ministry of Water Resources and select State irrigation organizations; and
 - ° Provide for technical exchange between the U.S. and Indian water resource institutions.
2. Develop a national-level capability for water resource system analysis, management and planning in India, by:
 - ° Partial funding of a central training institute and computer center;
 - ° Training of trainers in U.S. institutions; and
 - ° Provide technical specialists to develop curriculum and training materials, and teach initial courses.
3. Expansion and improvement of the Central Board of Irrigation and Power's (CBIP) information network and center by:
 - ° Providing of computer hardware and software for a technical information system;

- Providing specialized assistance in information system development and operation; and
- Establishing technical information centers in other regions at appropriate centers.

B. State-level

The project assists eleven states through WALMIs, four state universities and other state training and research organizations to:

1. Strengthen selected, existing state training, academic, and research, irrigation/water resource organizations to address priority state irrigation water resource issues.

Specialist assistance, dialogue and grant-funding is provided to:

- strengthen capabilities of WALMI and other state organizations to identify priority irrigation and water resource management problems;
- develop the state capabilities for water resource planning;
- develop technical and support links among WALMIs and other state organizations with relevant water resource and irrigation management organizations;
- improve the technical analysis and evaluation/monitoring abilities of State irrigation departments;
- modernization of irrigation division related to "Planning and Operations";
- develop the capability to analyze economic and financial returns to irrigation system investments; and
- improve the interactions between irrigation system management and farmers.

2. Develop self-sustaining state training and operational research capabilities at training institutions in eleven major irrigation States.

Specialist assistance, equipment procurement and infrastructure development to:

- improve the planning, preparation, implementation and evaluation of training curricula;
- develop a training of trainers and faculty training program in India;
- adapt and transfer specific training courses from the U.S. to India;

- introduce modern training methodologies and pedagogical techniques, including audio-visuals and micro-computer technologies;
 - develop a formal evaluation program and develop evaluation linkages with concerned departments to ensure the relevance, specificity and utility of training;
 - initiate and institutionalize action-oriented (operational) research capabilities tied to training; and
 - improve training facilities and equipment.
3. Establish irrigation management education at M.S. University, Baroda, Anna University, Madras, Sukhadia University, Udaipur; and MPA University, Rahuri.
- Specialist assistance and grant funds to:
- improve the academic curriculums and materials;
 - provide research opportunities for graduate students;
 - carryout relevant irrigation and water resource management research;
 - provide specialized training for faculty members; and
 - provide training and research equipment.
4. Initiate organizational and management studies in irrigation in the participating States to:
- conduct manpower assessments;
 - analyze administrative and management procedures, rules, regulations; and
 - conduct job assessments, revise job descriptions and practices.
5. Develop socio-economic monitoring and evaluation expertise at selected WALMIs, research organizations, universities and institutions in Andhra Pradesh, Maharashtra, Rajasthan, Bihar and Uttar Pradesh.
6. Develop micro-computer capabilities to improve the design, operation and management of Irrigation Departments in selected States.
7. Introduce management training into the curriculum of Irrigation Departments' Staff Colleges in Maharashtra and Madhya Pradesh.
8. Special studies and research - water resources economics, irrigation systems communications, hydrology and drainage related to systems beneficiary roles and responsibilities, computerization & modelling and remote sensing application in Water Resources Development & Management.

ADMINISTRATIVE PROCEDURES

TECHNICAL ASSISTANCE - CLEARANCE PROCEDURES

1. States develop Annual Plans with support from project contractors (LBII/WAPCOS). Annual Plans are approved in the States. Contractors develop technical requirements and qualifications of consultants with states to support their activities and submit to MWR.
2. The Joint Project Management Committee (JPMC) selects individuals consultants based upon the Annual Plan requirements.
3. WAPCOS contracts Indian technical consultants.
4. A. Short Term Overseas Consultants. MWR will select short term expatriate technical consultants and inform DEA, Home Affairs and External Affairs. LBII will contract technical consultants on receiving clearance of DEA.

B. Long Term Overseas Consultants. MWR will select expatriate consultants for long term positions and obtain necessary clearances of Home Affairs and External Affairs.

MWR will inform DEA after clearances are obtained. LBII will contract long term specialists on receiving clearances of DEA.

Outside Training - Clearance Procedures

1. States, Project Institutions, and other Organizations propose training in their annual plans and identify, nominate, and approve candidates. Contractor provide assistance in identifying training courses and IRMIC administers clearances required at the centre.
2. A. For State Candidates
MWR selects and forwards to DEA

B. For CWC, MWR and other candidates MWR selects and forwards to DEA.

Annual plans will be developed and used as the basis for approval of CWC, MWR and other participating Organizations' candidates. Both MWR and CWC will follow existing internal clearance procedures for expatriate training.
3. DEA will notify USAID of candidates selection. A copy of the selection list will be forwarded to the contractors LBII and WAPCOS.
4. Participants Training Officer (USAID) processes the requests (the contractors will provide administrative support in the near future for USAID processing as the volume of training candidates increase to the extent necessary).

Outside-Equipment - Clearance Procedures

1. State Organizations prepare equipment requests with support from project consultants. State Technical Council review and approve.
2. Equipment lists are submitted to MWR to obtain Not Made in India (NMI) and Duty Exemption Certificates from:

Ministry of Education
(Clearance for books)

Director General
Technology
Development
(equipment)

Department of
Electronics

A general Duty Exemption Certificate for all project equipment will be requested from the Ministry of Finance. This general Duty Exemption Certificate will facilitate specific NMI and Duty Exemptions.

3. Contractors procure, insure and ship.
4. Local forwarding agent coordinates customs clearance and forwarding to States.
5. State institutions review and accept shipments.

Special Studies/Activities - Clearance Procedures

All State activities and studies will be approved by State Technical Council. States will also provide budget and implementation arrangements and schedules in Annual State Plan.

Other studies and activities to be carried out with Central Project Funds will be reviewed and approved by GOI and communicated to USAID.

1. If an activity requires an advance of funds, the Financial Advisor, MWR will review and approve.
2. Contractors will assist IRMIC in monitoring the activity if necessary.

IRRIGATION AND WATER RESOURCES MANAGEMENT AND TRAINING PROJECT
(386-0484)

Revised Illustrative Summary of Project Costs for Life of Project

(In 000's of U.S. Dollars)

	GOI	A. I. D			Total	Total AID	Total (GOI+AID)
		Loan LC	Grant LC	FX			
1. Training & Prof. Dev.	13,400	6,800	3,520	11,580	15,100	21,900	35,300
2. Action Res. Studies	6,039	760	1,800	5,000	6,800	7,560	13,599
3. Information Dissem. (Tech. Transfer)	2,200	-	1,400	1,500	2,900	2,900	5,100
4. Organizational and Procedural Changes	258	-	170	650	820	820	1,078
5. Water Res. Planning Management	1,760	690	190	6,310	6,500	7,190	8,950
6. Educational Ins.	3,090	1,200	1,950	-	1,950	3,150	6,240
7. Central Programs							
CWC & MWR Scientific and Technical Exchange Program	250	-	100	900	1,000	1,000	1,250
IIMI	125	-	-	500	500	500	625
CGWB - USGS	115	-	-	1,000	1,000	1,000	1,115
CB Training	500	-	-	2,500	2,500	2,500	3,000
CBIP	200	250	250	400	650	900	1,100
*Special Studies	30	-	200	-	200	200	230
*Evaluations	50	-	75	200	275	275	325
*Monitoring	100	-	300	60	360	360	460
Sub-total	<u>1,370</u>	<u>250</u>	<u>925</u>	<u>5,560</u>	<u>6,485</u>	<u>6,735</u>	<u>8,105</u>
8. Contingencies	<u>83</u>	<u>300</u>	<u>45</u>	<u>400</u>	<u>445</u>	<u>745</u>	<u>828</u>
TOTAL:	28,200	10,000	10,000	31,000	41,000	51,000	79,200

* Funds for Evaluation, Monitoring and Special Studies will be disbursed directly by USAID.

LC: Local Currency Costs
FX: Foreign Exchange Costs

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IRRIGATION AND WATER RESOURCES MANAGEMENT AND TRAINING PROJECT
(386-0484)

Illustrative Summary of AID Contributions for the Grant Component

(In 000's of U.S. Dollars)

	Tech. Asst.	U.S./T.C Trng.	Inctry Trng.	Equip- ment	Others AID	Total
1. Training & Prof. Dev.	1,600	3,500	600	300	1,700	7,700
2. Action Res. Studies	2,500	460	100	40	300	3,400
3. Information Dissemination (Tech. Transfer)	750		250	380	120	1,500
4. Organizational and Procedural Changes	211		2		187	400
5. Water Res. Planning Management	1,200	800	83	700	700	3,483
6. Educational Ins.	584		525	215	406	1,730
7. Central Programs						
CWC & MWR Scientific and Technical Exchange Program	530					530
IIMI	265					265
CGWB - USGS		265	265			530
CB Training		650	650			1,300
CBIP	100				245	345
Special Studies	110					110
Evaluations					145	145
Monitoring	190					190
Sub-total	<u>1,195</u>	<u>915</u>	<u>915</u>	<u>-</u>	<u>390</u>	<u>3,415</u>
8. Contingencies					72	72
TOTAL:	8,040	5,675	2,475	1,635	3,875	21,700

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Attachment-D to PIL No: 7
Illustrative Summary of AID Contributions for the Loan Component

(In 000's of U.S. Dollars)

	Tech. Asst.	U.S./T.C Trng.	Inctry Trng.	Equip-ment	Const.	Others	Total
1. Training & Prof. Dev.			51	2,000	5,250	92	7,393
2. Action Res. Studies	20	0	1	230	500	13	764
3. Water Res. Planning Management	0	0	0	90	600		690
4. Educational Ins.				700			700
5. Contingencies						453	453
TOTAL:	20	0	52	3,020	6,350	558	10,000