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AN ASSESSMENT OF THE DIAGNOSTIC ANALYSIS WORKSHOPS:
A Review of the Materials and Methods Used in 1984
Sri Lanka DA Workshop and
Follow-up with Former Trainers and Participants in Sri Lanka,
Bangladesh and India

David W. Kahler and John C. Pontius, Consultants
Creative Associates, Inc.
with assistance from
Bradly W. Parlin, Utah State University and
John P. Comings, World Education, Inc.

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EXECUTIVE SUMMARY

The Diagnostic Analysis Workshops provide a valuable means for delivering short-term training that encourages interdisciplinary inquiry into water management issues. The workshops also provide participants with a program that is action-oriented and practical. The seven workshops conducted to date have engaged agronomists, engineers, economists, sociologists and women in development practitioners in a unique form of dialogue between disciplines. The influence of the DA workshops is readily observable in each of the countries where the workshops have been held--Bangladesh, India and Sri Lanka.

An appraisal of a training program's merit and information about its goals, outcomes and impact depend on collaboration among all partners involved in the assessment. This document describes the pre-workshop preparation, training implementation, and post-training and follow-up stages of the Diagnostic Analysis (DA) workshops as carried out by Colorado State University (CSU) under the Water Management Synthesis II Project. Information for the assessment was gathered from questionnaires sent to co-trainers and participants in the first six DA workshops conducted by the Water Management Synthesis I and II Projects in Bangladesh, India and Sri Lanka, observations made by an assessment team during a DA workshop in Sri Lanka in the summer of 1984, face-to-face interviews with former DA participants and co-trainers, USAID field staff and host-country officials in Sri Lanka and Bangladesh, and data collected from USAID staff in India.

In the early stages of the assessment, a team composed of WMS II core training staff and outside consultants identified the components of a typical DA workshop as: in-country negotiations and preparations, preparation for

training at CSU, in-country orientation, formal classroom training, preparation for field study, field study, report preparation, follow-up and impact analysis. At the same time a list of issues for study were identified for each component. For purposes of analysis, these components were then grouped into three major categories of activities: pre-training, training and post-training which provide the general outline for the assessment report.

Because of the late decision to evaluate the 1984 Sri Lanka DA workshop, several procedural changes occurred. No one from the WMS II core team was involved as an assessment team member in the on-site evaluation in Sri Lanka. Face-to-face interviews were not conducted in India although three DA workshops had been held there. Sufficient time was not available to obtain government approvals for members of the assessment team to interview former trainers and participants face-to-face.

Major recommendations of the assessment focus on:

- o highlighting areas of involvement and cooperation between the contractor, USAID missions and AID/W to enhance the pre-training planning process;
- o providing funding for formalizing co-trainer involvement in pre-training orientation activities, revision and further development of training material, and enhancing training capabilities;
- o developing a more even mix of presentations among the five disciplines represented in the DA: engineering, agronomy, economics, sociology and women in development;
- o increasing the participatory nature of the training methods and materials used in the DA workshops; and
- o developing more formalized institutional strategies for training of trainers and formative evaluation.

In assessing the impact of DA workshops on former co-trainers and participants, the long-term effects of the DA workshops were examined at the

personal and institutional levels. At the personal level, past workshops were seen as having had major influence on co-trainers' and participants' attitudes about water management issues. Many former participants stated that participation in the DA workshops had widened their discipline-bound view of what the problems were as well as how one could go about dealing with those problems. At the institutional level, the adoption of DA concepts has begun in modified form in all three countries involved. An assessment of past DA workshop efforts shows that the workshops have been valuable in providing interdisciplinary training in irrigation management in developing countries.

Appendices to the assessment report include copies of questionnaires used in the mail-out survey of former trainers and participants; a list of critical issues to be examined in the DA review (identified in 1983 discussions); guidelines for revisions of the "Teamwork" video; a list of training resources; a list of key DA workshop events to be monitored by a formative evaluation system; and a job description and qualifications for a WID co-trainer.

INTRODUCTION

An appraisal of a training program's merit and information about its goals, activities, outcomes, impact and costs depend on collaboration among all partners involved, not just the funding agency or the training institution. In the case of the assessment reported on in this document, the concern was with the improvement of the Diagnostic Analysis workshops conducted by Colorado State University under the Water Management Synthesis II Project. The process and format of this appraisal, while facilitated by the authors of this document, is the result of a partnership of those who make up the staff of the Water Management Synthesis II Project, Diagnostic Analysis workshop participants, and the authors.

The Diagnostic Analysis workshops represent a valuable means of providing short-term training to water management specialists in developing countries. With its emphasis on the benefits of interdisciplinary understanding and co-operation in identifying problems in irrigation systems, analyzing data and probing for solutions, and its action-oriented approach, the Water Management Synthesis Project has had an impact on the thinking and practice of water management specialists in the three countries where Diagnostic Analysis (DA) workshops have been held. Engineers, economists, sociologists, agronomists and women in development practitioners have become increasingly aware of the roles which each discipline plays in identifying water management issues while participating in DA workshops.

In focusing on what goes on during a DA workshop and how participants found the DA concept of use in their work, contact was made with former participants in India, Bangladesh and Sri Lanka. Initial contact with those

who had attended the six workshops prior to July 1984 was made through a mail-out questionnaire. Preliminary contact was followed by field visits to Sri Lanka and Bangladesh in July-August 1984 to interview a sample of former trainers and participants face-to-face. No follow-up visits were conducted in India due to lack of Government of India approval for researchers to do field work in the time allotted for the visit. Instead, data was collected on the impact of the DA workshop from USAID staff in India. A DA workshop in Sri Lanka (July 23-August 18, 1984) provided the assessment team with the opportunity to experience a DA workshop in progress.

The assessment activity itself provided a unique opportunity for cooperation between nonformal education and training specialists and technical specialists from other disciplines in designing an evaluation activity responsive not only to the training institution's needs but also to those of the funder, AID/W, USAID missions and host-country organizations. The assessment activity was funded by Science and Technology/Agriculture, Science and Technology/Rural and Institutional Development, and Asia Bureau/Technical Resources and carried out by the Nonformal Education Field Technical Support Project funded by Science and Technology/Education.

SECTION I: HISTORICAL CONTEXT

A. Introduction

Between 1981 and the end of 1984, the Water Management Synthesis Project (WMS I and II) has conducted seven interdisciplinary Diagnostic Analysis workshops in Sri Lanka (1982, 1983 and 1984), India (1981, 1982, and 1984) and Bangladesh (1983). Colorado State University has held the major responsibility for planning and implementing the workshops under the WMS

Project. The basic objectives of the Diagnostic Analysis are to train water management personnel:

- "to understand the operating irrigation system so as to recognize both its values (the good features or benefits) and its constraints (the problems or factors which restrict efficient operation); and
- to order constraints according to priority based on pre-determined criteria."*

Diagnostic Analysis (DA) methodology contains six primary activities used in examining an irrigation system and in identifying its values and constraints. They are, in order of treatment in the workshop: (1) establishing preliminary objectives, (2) conducting a reconnaissance, (3) revising objectives, (4) executing detailed studies, (5) carrying out an interdisciplinary analysis and synthesis of data, and (6) preparing discipline and interdisciplinary reports. These steps often overlap or occur simultaneously.

B. Evolution of the DA Workshops

Although the basic objectives and the basic training methodology have remained the same for all seven workshops, the range of training contexts and participants have varied greatly, thus necessitating, in some instances, considerable modification of training objectives and some adaptation of training materials. This section describes the evolution of the DA workshops under WMS I and II.

The elements of each workshop have been organized into three major components: formal classroom presentations, preparation for detailed studies, and a detailed field study which includes the preparation of discipline and

*Lowdermilk, M.K. et al. Diagnostic Analysis of Irrigation Systems, Volume 1: Concepts and Methodology. Fort Collins, Colorado: Water Management Synthesis Project, Colorado State University, 1983, p. 15.

interdisciplinary reports on findings. Seven to ten days are spent on the initial formal classroom presentations which are largely of a lecture format with accompanying video presentations. Four to six days are then devoted to preparing teams for the field work component and include a reconnaissance period and additional in-depth discipline training if necessary. The detailed interdisciplinary study and the preparation of both discipline and interdisciplinary reports constitute the remainder of the workshop.

Disciplines traditionally represented in the teams include agronomy, on-farm engineering, irrigation engineering, economics, sociology and women in development. The latter category, women in development, was instituted beginning with the 1983 Sri Lanka DA and has been included in the last three DA workshops.

Although past DA workshops have varied in their allocation of time for each of the above mentioned components and disciplines depending on specific workshop objectives, each workshop has included the three components in one form or another. For example, the 1984 Sri Lanka DA concentrated on the training of field level staff as data collectors for a longer term research effort. As a result, more time was spent on preparation for the field work component and the composition of field research teams with less time spent on the preparation of discipline and interdisciplinary reports. In the 1984 India DA (Madya Pradesh) workshop, the emphasis was on the preparation of a workplan for subsequent action as a major output of the DA. In that instance, more time was spent in data collection and data analysis in order to better inform the decision making which went into the preparation of the workplan. In the 1983 Sri Lanka DA workshop, which was the only one to have participants come from the same administrative unit, considerable effort centered on using

the existing administrative structure to promote the DA approach to studying problems in irrigation systems. As a result, more time was spent in analyzing data from an interdisciplinary perspective, on examining support mechanisms which could be put to use when participants returned to their work sites, and in looking for ways in which to strengthen each individual discipline's contribution to the interdisciplinary approach.

This variation in workshop settings and audience has been the source of rich experience and challenge for the contractor, CSU. The challenges have come not only at the planning stage but also during implementation. As the training organization, CSU has opted for situational modification of its training approach and methods which has taken the form of reactive rather than proactive decision making. While stop-gap efforts have facilitated dealing with immediate issues, such efforts to change or modify the training approach have not, on the whole, received further attention. Those conducting the workshop have benefitted from the immediate action taken while trainers in subsequent workshops have not necessarily done so. WMS II trainers have, over time, realized the need to take a comprehensive look at the training they do in the DA workshops.

Prior to moving to a discussion of the mandate of the current assessment of the DA workshop, short descriptions of the seven Diagnostic Analysis workshops are presented. In each, the contexts, participants, training objectives, and desired outputs of workshops are reviewed. These descriptions have been derived from discussions with WMS II staff, former trainers and participants, host country officials and USAID field staff associated with past and current DA training efforts. The following information and additional points are summarized in a chart following the individual workshop

descriptions. The chart includes a summary of decision points by DA workshop and action taken.

Gujarat (WMS I): 1981, middle-level staff from a range of water management schemes; major objective was to create an awareness of the DA concept and how it could be used to improve water management practices; detailed field studies of two irrigation systems; final workshop report issued by WMS I with input of one Indian co-trainer.

Rajasthan (WMS I): 1982, middle-level water management specialists from a range of water management schemes and organizations; major objective was to introduce the DA concept and show its use in studying problems in irrigation schemes; detailed studies in one irrigation system; final report issued by WMS I with input from Indian co-trainers. Co-trainers were identified in advance and participated in planning exercises at CSU prior to the training.

Sri Lanka (WMS II): 1982, middle-level water management specialists from a range of water management organizations; major objective was to introduce the DA concept and show its use in studying problems in irrigation schemes; detailed field studies in two systems; final workshop report issued by WMS II with input from Sri Lankan co-trainers. Co-trainers were identified in advance and participated in planning activities in the U.S. prior to the workshop.

Bangladesh (WMS II): 1983, middle-level agricultural and irrigation specialists from a variety of organizations involved in research and development work in the irrigation field; major objective was to introduce the DA concept and its use in improving the management of irrigation schemes; detailed studies of multiple tube well sites; final

workshop report issued by WMS II with input of Bangladeshi co-trainers. Co-trainers were identified in advance and participated in pre-training and planning exercises at CSU prior to the DA workshop.

Sri Lanka (WMS II): 1983, lower middle-level water management personnel from contained administrative units within the Mahaweli Authority; major objective was to introduce the DA concept and show its use in studying problems within participants' work organization; constituted first time the DA was done with representatives of disciplines coming from one organization and returning to work sites within the same organization; detailed studies of one irrigation system; final report issued by WMS II with input from Sri Lankan co-trainers. Co-trainer selection was not made until after the workshop began and co-trainers were not involved in pre-training planning exercises. Co-trainers traveled to U.S. for preparation of final report.

Madhya Pradesh (WMS II): 1984, middle-level water management and agricultural specialists; major objective was to introduce the DA concept as a means of studying problems within a water management scheme and show its use in contributing to the development of a work plan for a future water management project; detailed studies of one irrigation system; draft work plan prepared in India with Indian co-trainers and final report prepared by workshop trainers and issued by WMS, without co-trainer participation at CSU. As in the case of the 1983 Sri Lanka workshop, co-trainers for the '84 India workshop were not chosen until the workshop and did not participate in pre-training planning exercises in the U.S. prior to the workshop.

Sri Lanka (WMS II): 1984, lower-level field staff, the majority from one water management authority, the remainder from services associated with the water management authority; major objective of the workshop was to train field staff to serve as data collectors on a long term data collection exercise preliminary to the GOSL and USAID proceeding with a large scale rehabilitation project of a local water management scheme; detailed field studies in one irrigation system; no final report issued, rather the end product was a core staff trained in doing long-term, water management related research modeled after the DA approach.

In each workshop, the DA has concentrated on the following:

- introducing the DA concept to individuals who have had some involvement in water management projects, either directly or indirectly;
- actively engaging workshop participants in field exercises which have required the collection of field data using an interdisciplinary approach, the analysis of data and report preparation; and
- informing decision making on water management issues with data collected from field settings.

The Water Management Synthesis Project has provided a co-ordinator for each workshop, as well as several of the trainers. WMS has also recruited trainers from other departments at CSU, from other Consortium for International Development (CID) member institutions and from a larger pool of candidates. These have, in most cases, included individuals with LDC experience.

EVOLUTION OF DIAGNOSTIC ANALYSIS WORKSHOPS

Workshop/Data	Objectives	Methodology	Materials	Staff	Decision Points	Action
1. Gujarat, 1981 (Synthesis I)	<ul style="list-style-type: none"> - Objectives negotiated by CSU - Research and training - Study of two Irrigation systems 	<ul style="list-style-type: none"> - Formative workshop, i.e., six weeks experimentation with both methods and materials 		<ul style="list-style-type: none"> - Three CSU trainers - No co-trainers 	<ol style="list-style-type: none"> 1. Need for co-trainers 2. Need for co-trainer travel to U.S. for planning prior to workshop. 3. Need for videos 4. Need for training manuals 5. Need to concentrate on only one irrigation system during field study 6. Earlier site selection. 	<ol style="list-style-type: none"> 1. Instituted co-trainer concept for next DA with travel to U.S. for planning activities. 2. U.S. for planning activities. 3. Adopted lecture format with video tapes to supplement. 4. Began work on Vol. 1 and Vol. 2 training manuals. 5. Planned for study of only one system. 6. No action.
2. Rajasthan, 1982 (Synthesis I)	<ul style="list-style-type: none"> - Objectives negotiated by CSU - Research and training - Study of one Irrigation system 	<ul style="list-style-type: none"> - Lecture format in initial segment followed by field studies - Co-trainers invited to U.S. for planning (2 weeks) - Co-trainers to U.S. for report preparation after workshop 	<ul style="list-style-type: none"> - Videos - Draft manuals 	<ul style="list-style-type: none"> - Larger yet incomplete CSU teams - Partial host-country team 	<ol style="list-style-type: none"> 1. Full team necessary, i.e., trainer for each discipline 2. Need for organized orientation/training for trainers and co-trainers 3. Need for additional video tapes (agronomy & social sciences) 4. Need for additional lead time for negotiation and preparation and earlier site selection 5. Need to prepare guidelines for report preparation 6. Need for senior official workshop 	<ol style="list-style-type: none"> 1. Enlarged CSU team to include all disciplines 2. Incorporated graduate students into core team to build institutional capacity. 3. Produced agronomy, economics and sociology video tapes 4. Firmed up negotiation and in-country planning procedures and earlier site selection 5. Prepared guidelines for report preparation 6. No action
3. Sri Lanka, 1982 (Synthesis II)	<ul style="list-style-type: none"> - Objectives negotiated by CSU - Research and training - Study of two Irrigation systems 	<ul style="list-style-type: none"> - Lecture for most initial segment followed by field studies - Sri Lankan coordinator and co-trainers to U.S. for planning and preparation of final report 	<ul style="list-style-type: none"> - Videos - Draft training Manuals 	<ul style="list-style-type: none"> - Complete U.S. team - Complete host-country team including coordinator 	<ol style="list-style-type: none"> 1. Need to provide participants with outlines and goals for discipline and interdisciplinary report preparation 2. Site selection prior to workshop 3. Need for training team involvement 	<ol style="list-style-type: none"> 1. Prepared outlines for participants to use in preparation of discipline and interdisciplinary reports. 2. Sites selected prior to workshop. 3. Team involvement in site selection and negotiations.

EVOLUTION OF DIAGNOSTIC ANALYSIS WORKSHOPS continued

Workshop/Date	Objectives	Methodology	Materials	Staff	Decision Points	Action
Sri Lanka 82 (continued)					(preferably coordinator and one team member) in site selection and negotiations with USAID missions and host-country organizations.	4. Established separate coordinator position for subsequent workshops 5. Action at time of next DA. 6. No action.
4. Bangladesh, 1983 (Synthesis II)	<ul style="list-style-type: none"> - Objectives negotiated by CSU - Research and training Study of several tube irrigation sites 	- Same as Rajasthan '82	<ul style="list-style-type: none"> - Videos - Draft training materials did not arrive until after training was completed 	<ul style="list-style-type: none"> - Full U.S. team - Full Bangladeshi team including coordinator 	<ol style="list-style-type: none"> 1. Need for revisions in training manuals. 2. Need to examine methodological issues in pre-workshop orientation of trainers 3. Impressions on one site for detailed studies confirmed 4. Need for separate coordinator position confirmed 	<ol style="list-style-type: none"> 1. Revision begun on Vol. I and Vol., Training Manuals 2. More attention given to orientation of new core training staff. 3. Firm decision to study only one site in future. 4. Firm decision to maintain coordinator position as separate.
5. Sri Lanka, 1983 (Synthesis I)	<ul style="list-style-type: none"> - Objectives negotiated by AID/W and CSU - Research and training - Study of one irrigation system 	<ul style="list-style-type: none"> - Lecture format in initial segment followed by Field Studies - Co-trainer travel to U.S. for report preparation - Introduction of microcomputer at training site 		<ul style="list-style-type: none"> - Full U.S. team (except economist) - Co-trainers not selected until workshop began - Part-time host-country coordinator 	<ol style="list-style-type: none"> 1. Incorporate WID as additional discipline (need for input from WID/W) 2. AID/W fix on tentative budget as final costs 3. Need to further develop micro-computer applications for DA 4. Need for mechanism to accommodate AID/W entry into negotiation of DA workshop 	<ol style="list-style-type: none"> 1. WID component incorporated with assistance including WID/W 2. Greater use of grad students to offset costs. 3. Micro used successfully 4. Discussions begin with AID/W regarding

EVOLUTION OF DIAGNOSTIC ANALYSIS WORKSHOPS continued

Workshop/Date	Objectives	Methodology	Materials	Staff	Decision Points	Action
Sri Lanka 83 (continued)						their involvement in setting workshop objectives.
6. Madhya Pradesh, (1984) (Synthesis II)	<ul style="list-style-type: none"> - Objectives set by mission with involvement of AID/W and CSU - Research (and training) - Study of one irrigation system - Production of "workable" workplan for mission. 	<ul style="list-style-type: none"> - Lecture format in initial segments with field studies - No co-trainer travel to U.S. prior or after DA - In-country orientation of co-trainers - Use of micro-computer for data processing, analysis, and storage, and report writing 	<ul style="list-style-type: none"> - Videos - Draft training manuals 	<ul style="list-style-type: none"> - Full U.S. team including co-ordinator - Co-trainers not all selected prior to DA - Full-time Indian co-ordinator 	<ol style="list-style-type: none"> 1. Coordinator must travel to country for negotiations and site selection 2. Expand in-country orientation for co-trainers if no U.S. travel 3. Continue search for ways to improve negotiations process with AID/W and missions involved 4. Need to train U.S. team in use of micro-computer 	<ol style="list-style-type: none"> 1. Establish back up role for coordinator 2. Review in-country orientation procedure 3. Prepare guidelines for negotiations process 4. Conducted training sessions on use of micro-computer prior to DA
7. Sri Lanka (1984) (Synthesis II)	<ul style="list-style-type: none"> - Objectives set by mission and CSU in collaboration with Irrigation Dept. - Training instead of research - Assessment team present for duration of workshop. 	<ul style="list-style-type: none"> - Lecture format with expanded emphasis on reconnaissance - No report prepared - No co-trainer travel to U.S. for planning or report preparation - No in-country orientation for co-trainers 	<ul style="list-style-type: none"> - Videos - Revised training manuals I & II. 	<ul style="list-style-type: none"> - Full CSU teams with coordinator also acting as trainer - Part-time host-country coordinator 	<ol style="list-style-type: none"> 1. Need for selection of co-trainers prior to inception of workshop 2. Possible modification in training strategy (methodology and materials) as workshop objectives change 3. Incorporation of formative evaluation exercises considered 4. Need for senior official workshop 	<ol style="list-style-type: none"> 1. No action. 2. No action. 3. Exercises completed during DA workshop.

WMS II has viewed the project as an institution building process from two perspectives. First, the DA workshops have allowed WMS II to build its own institutional capability by using both senior and junior level staff in DA workshops, thus providing them with valuable field learning experience.

There has also been an interest in developing institutional capabilities within host country organizations and ministries with which it has worked. In no one setting is this more evident than in the case of Sri Lanka where former workshop co-ordinators, trainers and participants now occupy positions at a variety of levels within irrigation schemes and policy making bodies, where former participants have functioned as co-trainers in subsequent workshops, and where the DA concept appears to be firmly established.

C. Mandate of the Assessment

AID/W sponsored the current assessment of the DA workshops to look at ways in which the DA workshops might be improved. AID/W was interested in:

1. charting the evolution of the DA workshops;
2. noting the current objectives of the DA and comparing them with DA workshop outputs;
3. seeking ways in which to improve workshop materials and methods; and
4. searching for ways in which to enhance the overall impact of the DA workshop.

AID specified that the assessment was to be collaborative in nature and include trainers, participants, sponsors and outside observers. In addition, the assessment was to be formative rather than summative with its function being that of guiding and improving the DA workshops rather than just finding things that were wrong or evaluating past efforts alone.

The assessment, which was carried out by consultants contracted by AID/W and an individual from Utah State University who had participated as a trainer in the 1983 workshop, examined the most recent DA workshop in Sri Lanka (July 24-August 18, 1984) in detail. In addition, a mail-out survey of participants and co-trainers from past DA workshops was conducted during late 1983 and carried over into early 1984. To supplement the mail-out survey, interviews were conducted with past co-trainers and participants during the summer of 1984 in Sri Lanka and Bangladesh. Interviews were also conducted with representatives of host country organizations which had participated in past DA workshops, with government officials and with staff of AID field missions in both countries. Data from the workshop observations, the mail-out survey and the face-to-face interviews are incorporated into this report.

D. Limitations of the Study

Limitations of the study include the following:

- As the assessment was designed to provide data for immediate improvement in workshop methods and materials, there was no experimental design nor any attempt to look at more than one DA workshop. Value was placed on the role of observation rather than measurement of participant performance on tests, on trainer-participant interaction, and collection of both trainers and participants about what had gone well, been useful or what needed improvement. As such, the objectivity or subjectivity of the participant-observer could be questioned as would their active role at the workshop.
- Although mail-out questionnaires were sent to co-trainers and participants in all three countries where DA workshops have been held, follow up interviews and on-site visits took place in two, Bangladesh and Sri Lanka. Assessment team members did not receive Government of India clearance for field level research within the time allotted for the activity.
- Personnel changes due to the length of time between the inception of planning for an assessment, the selection of a specific workshop for in-depth examination, and actual

on-site visit to a DA workshop in progress resulted in a lack of continuity among those involved, and deviation from originally planned procedures. No WMS staff member was included in the on-site observation team, assessment team members arrived after the workshop had begun, and the outside team member was present for only part of the DA workshop.

E. Workshop Constraints

The 1984 Sri Lanka DA workshop was confronted with a series of constraints, the impact of which were noticeable during the workshop. Some constraints were budgetary in nature while others were prompted by a change in objectives for the workshop in view of the long term study. A number of constraints are listed below.

1. The 1984 Sri Lanka DA was funded under the WMS II Central Support Technical Assistance fund as opposed to Training and Technology Transfer which was the source of funds for previous workshops. The actual expenditure for the 1984 Sri Lanka workshop reported by CSU was \$62,400 as compared with the average cost of \$155,200 for the three previous DA workshops. Conducting the workshop with 40 percent of the traditional workshop cost led to the elimination of the pre-workshop planning activity, training of counterparts at CSU, and the inclusion of a host country professional and a CSU graduate student as primary discipline trainers.
2. Initially allocated funds for in-country expenditures fell short of meeting the incentive payment for counterpart trainers and food expenses for participants. However, the shortage of funds for the food program was expeditiously remedied by the USAID mission. The uncertainty of receiving compensation for time and expenditures was a priority concern frequently expressed by counterpart trainers and participants.
3. In spite of the Sri Lankan experience with previous DA workshops, participants and counterpart trainers for the 1984 workshop were not selected until shortly before the workshop. The workshop had an unexpected 42 participants as opposed to the planned-for number of 25.
4. Only the economics and agronomy disciplines had co-trainers who were present at the training site full time throughout the workshop. The economist co-trainer also functioned as the co-coordinator. The co-trainer for the main system

engineering discipline was present at the study site about one-third of the total workshop time due to other commitments. The on-farm engineering, sociology and WID disciplines had no counterpart trainers present at the training site. Three different Sri Lankan trainers on a rotation basis filled the trainer position for the on-farm irrigation engineering. Only one of these three individuals had prior experience as a DA trainer.

5. The coordinator for the DA workshop was transferred to Sri Lanka on long-term assignment and arrived in country two weeks before the workshop. Personal obligations affected both preparation and workshop time.

SECTION II: DESIGN OF THE ASSESSMENT

A. Introduction

The assessment was divided into three phases. In the first phase, consultants provided through Creative Associates' Nonformal Education Field Technical Support Project, and an assessment team member from the WMS II staff met with project staff to clarify the stated objectives for the DA workshop. Part of the clarification process involved the identification of critical issues in need of review during the assessment. Another part of that process was the development of a design for the assessment which took into consideration both WMS II and AID/W concerns.

The second phase of the assessment involved a mail-out survey to former co-trainers and participants and a visit to a field site to experience a DA workshop in progress. The mail-out survey was begun in late 1983 and carried over into 1984. The questionnaires used in the mail-out survey were prepared jointly by Creative Associates and WMS II staff. Copies are appended to this report as Appendix A. Two mailings were carried out during that time with a response rate of nearly 40%. The field observations of a DA in action took place from July 24 to August 18, 1984 at Polonnaruwa, Sri Lanka. Presence in the field also allowed for interviewing former co-trainers and participants in

Sri Lanka and Bangladesh to track more clearly the impact which the past workshops may have had.

The third phase of the DA workshop assessment focused on an initial draft of this report and discussions between WMS II core training staff and outside assessment staff. Discussions centered on both evaluation findings and recommendations. Recommendations were discussed in detail, as were possible approaches to implementing them. WMS II has already implemented a number of the suggestions made over the course of the assessment, especially in the areas of pre-training activities, inclusion of more participatory methods and materials, and formative evaluation procedures.

B. An Evaluation Model for the Assessment

A modification of the Actual Component Approach, an evaluation technique developed for use in studying adult non-professional and professional training programs involving several disciplines, was used to examine inputs, processes and outcomes for each component of the DA workshop and to study the relationship between each component. Initially, the technique calls for a systems analysis of the training program to identify the components of the system. Then, the inputs into each component, the processes used to implement activities of each component, and the outputs are examined in relationship to what has been proposed under the objectives of the training. The appropriateness of the inputs and processes are then compared to the proposed outputs, and the relationship of an output of one component as the input of another component is assessed. The final product of the Actual Component Approach is a description of training as a system, the breakdown of the system into its components, an analysis of each component, and a list of key events

during the training program that should be monitored to maintain quality training.

C. Identifying the DA Workshop Components for Study

In the first phase of the assessment, a systems analysis produced the diagram on the following page of the major elements of a DA workshop. These elements were grouped under three components for examination during the DA workshop assessment: elements which figure in a pre-training component, those which constitute the delivery of the DA training, and those which are of a follow-up or post-training nature. Each component is first treated in the ideal in the next three sections of the report. That discussion is followed by an analysis of activities involved in the 1984 Sri Lanka DA workshop. The "ideal" draws heavily on a temporary systems approach to short-term professional training.

SECTION III: PRE-TRAINING PHASE

A. Introduction

In the pre-training phase, the various partners in a training effort (the participants' work organization, the training institution and the funding agency) are linked together in building a picture of what the training is to be, what resources will be necessary and how participants will be trained. The success of a training program is often determined during the pre-training or planning phase as each partner's role is defined.

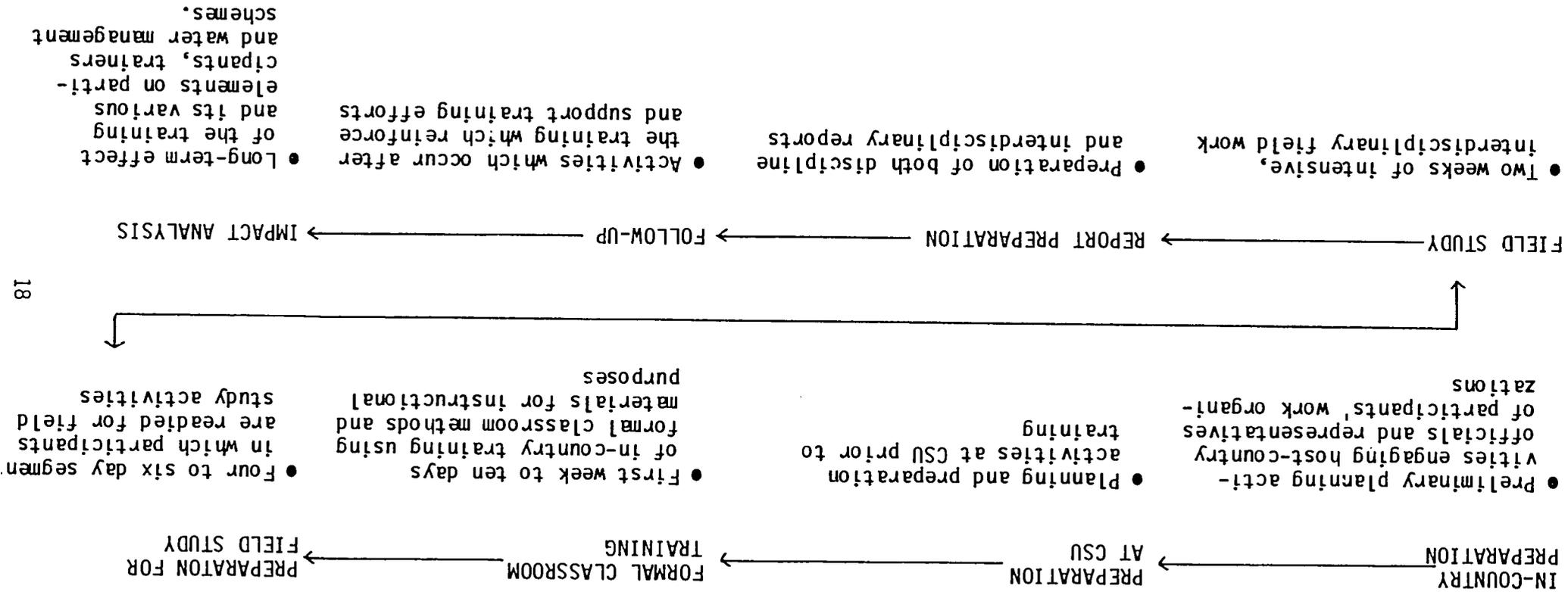
Section III discusses pre-training activities. The section focuses first on the general goals and processes used for establishing workshop objectives through negotiation with host country organizations and sponsoring

organizations; logistical planning; preliminary decision making about trainers, training materials and methods to be used; selection of co-trainers and participants; training of co-trainers; and in-country orientation for the training team. An analysis is then offered of pre-training activities leading up to the 1984 Sri Lanka DA workshop.

B. General Goals and Processes for Training

1. Goals of the pre-training phase. The framework used for examining the elements which comprise the pre-training phase is a general one which is the basis for many training programs similar to the Diagnostic Analysis.

MAJOR ELEMENTS OF THE WORKSHOP



Developing a viable training strategy depends in large part on the training organization's (in this case, CSU's) ability to clarify both training objectives and the means for carrying out the training and to relate the two. The end results of this part of the training process are clear indications of each part of the training task, including full knowledge of the resources of time, skills and the necessary facilities.

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

2. Clarifying training goals. In the external strategy, the concern is with questions of:

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

It is at this early point that much training fails. This is often not because of the efforts of the training institution, but rather it is due to lack of precision in specifying training goals on the part of the participants' work organization or the organization sponsoring the training activity. Goals for change (or training goals) must be precisely defined at this point to provide the training institution with guidelines for developing the training program and to enable the work or sponsoring organization to measure participants' progress. In training of the nature of the DA workshop, the training institution does not set the goals for change. National and

organizational policies set these goals. The training institution has the task of responding to those goals by developing a training program which is responsive and realistic. A critical part of the training institution's task is that of clearly defining for the work organization the part that training can play in the achievement of goals for change.

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

4. Developing relationships with work organizations. The success of the pre-training phase depends on the kinds and levels of relationships which are established between the training institution and host country government and participants' work organizations. There are at least five steps which bring the work organization or the organization sponsoring the training and the training institution into a closer working relationship during the initial stages of the pre-training phase. These are depicted in a chart on the next page.

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

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

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

6. Selecting a training strategy. Selecting a training strategy (methods and materials) is directly related to the objectives of the training to be delivered. One training strategy is usually not appropriate when objectives change from workshop to workshop. This is evidenced in the figure* and discussion which follows.

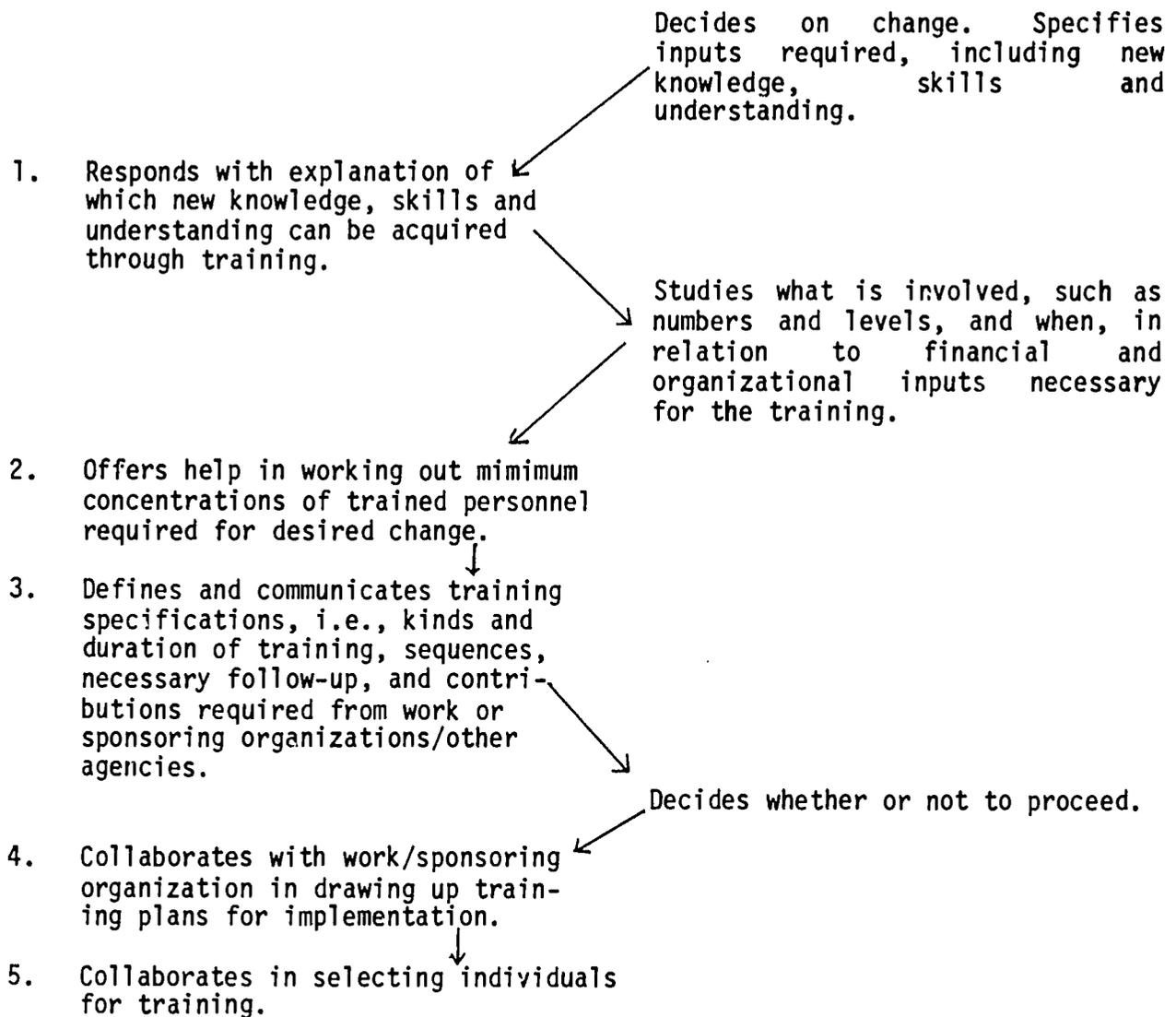
Six training strategies are plotted along two axes. The vertical axis delineates the subject matter that participants are to learn, with one extreme pointing toward learning about a specific task or body of knowledge or

*Adapted from Lynton and Pareek, Training for Development, Kumarian Press, 1978, p. 36.

External Strategy: Five Steps Prior to Training*

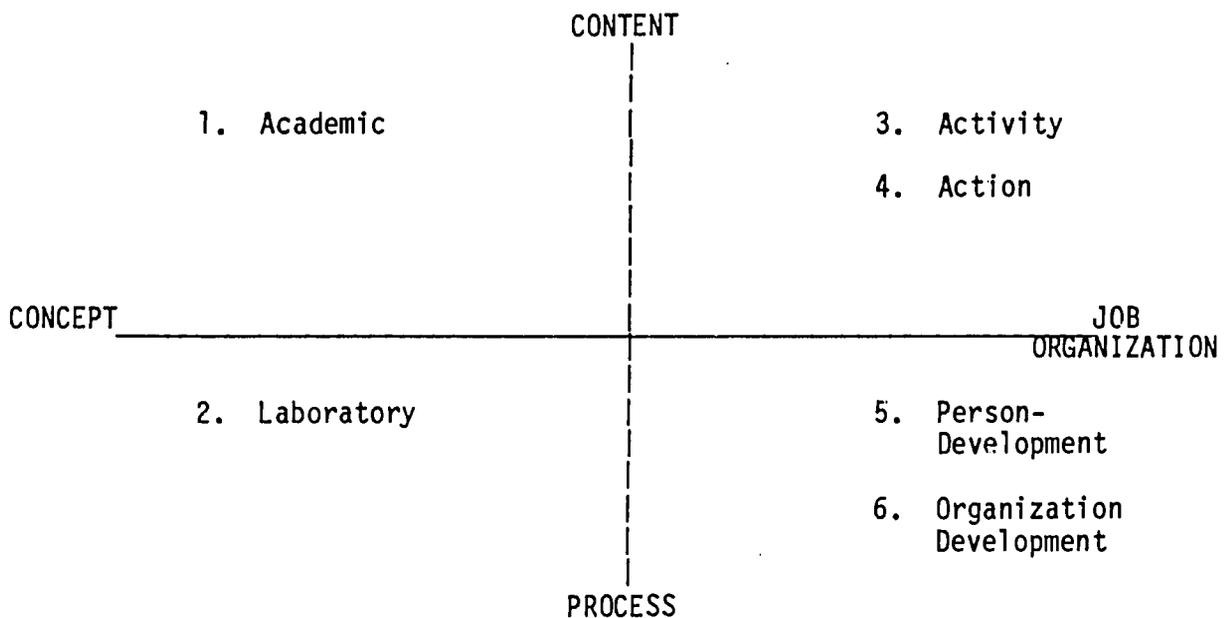
The training institution

The work organization (or organization sponsoring the training)



*(Modified from Lynton and Pareek, op. cit. pp. 40ff)

"content," while the other extreme of the axis tends toward general understanding and insight into how things function, or process. The horizontal axis establishes the primary use of the training. One extreme is depicted as "concept" (Is training to be used for formulating new concepts?), while the other is labeled "job" (Is training to improve action directly?).



The distinctions in practice among the six strategies in the diagram above are not always so clear. The distinctions are useful to highlight six different approaches to training, each with its reference points in differing training objectives. Each strategy choice has possible application to the Diagnostic Analysis workshop.

The academic strategy. Transmitting content and increasing conceptual understanding are the major foci of the academic strategy. Primary methods are lectures, seminars and individual reading and preparation. Training goals are incorporated into a syllabus to be covered during the course of the training. The academic strategy makes two assumptions: that knowledge can be passed effectively from those who know to those who do not know and that

participants can translate abstract generalizations into improving their actual performance in real-life situations. Major action steps include constructing a syllabus to be covered in the program and preparation of examinations to test for participants' knowledge and understanding.

The laboratory strategy. This strategy is removed from the job and work organization. It provides an opportunity to gain insight and skill from direct experience with and manipulation of certain elements under controlled conditions and can be used to improve skills of social interaction. It gives weight to process and not to content, i.e., how things are to be accomplished, not what is to be accomplished. The strategy is based on two assumptions: that it is good psychologically for participants to experience reality in an artificial setting and that participants will be able to translate this experience and learning to actual life situations. Action steps include freeing participants from usual expectations and norms and helping them understand their own behavior and develop new habits for transfer into job settings.

The activity strategy. The activity strategy emphasizes practice in a particular skill in view of improved performance on a specific job. This approach is found in many apprenticeship situations, understudy or counterpart training programs. Training takes place on the job so transfer of learning is not in question. Two assumptions guide the strategy: that the skills required by the organization are part of the job being trained for and that the participant will be able to conceptualize his activity for himself and thus be able to deal with any additional job-related needs which arise. The strategy leaves to chance questions of individual motivation and

collaboration. Action steps include analyzing skills to be trained for, dividing them into parts, and preparing practice tasks and teaching aids.

The action-program strategy. In this strategy, the focus is on an activity strategy for a group, department, or other social system. It is akin to the activity strategy and is based on the same assumptions. Care should be taken not to let the "action" part of the program take over to the detriment of an understanding of working procedures. In programs where there are pressures for concrete results, the tendency prevails for trainers to take over and do the work, with participants reverting to an observer role. As a result the primary goals suffer at the expense of secondary goals. Preoccupation with results can cause trainers to lose sight of the learning which is to take place, with resultant loss of motivation and skill development for participants. Basic assumptions are that working in the field develops individuals and that individual skills and organizational needs will mesh. Action steps include preparation of field programs and engaging participation according to fixed schedules.

Person-development strategy. The emphasis is on improved individual competence in a range of tasks and situations in the person-development strategy. Methods include field training, simulation, critical incidents and case studies. Basic assumptions are that training in job requirements and an emphasis on process will help participants develop general skills and understanding. It is also assumed that the work organization will support the individual in using newly acquired understanding and skills on the job. Major action steps include the identification of training needs and preparation of simulated training data.

Organization-development strategy. The major emphasis in this strategy is to improve the organization and not just the individuals working in it. Time is spent studying organizational needs and working with small groups within the organization on addressing those needs. Assumptions underlying the strategy are that attention to organizational needs as a process leads to an understanding of ways in which to improve the organization with organizational change resulting in individual change. Action steps include a survey of organizational needs, determination of groups for training and working on organizational requirements.

C. Implementation of Pre-training Goals in WMS II's 1984 Sri Lanka DA Workshop

This part of Section III looks at the methods and means used to establish and implement pre-training goals for the 1984 Sri Lanka DA workshop. What was done is compared with the discussion of the steps involved in an ideal pre-training phase presented in the preceding pages.

1. Establishing workshop objectives. One aspect of developing a training program is of such importance that nothing can and should happen before it is resolved: the objectives of the workshop need to be determined. In the "ideal" situation presented in the previous sections this activity was discussed as being primarily the responsibility of the participants' work organization, the major client for most training activities. The training institution's role is twofold: that of the facilitator of discussions on objectives and questioner to clarify training goals and objectives.

Discussions about the proposed 1984 Sri Lanka DA took place between the umbrella organization, the Ministry of Lands and Land Development, and representatives of WMS II and USAID/Colombo. At that level, general

objectives of the DA workshop were discussed as all parties had previous exposure to the DA concept and experience with two DA workshops held in Sri Lanka in 1982 and 1983.

A new element in the discussions was the special focus which the 1984 DA workshop was to take: the training of a cadre of researchers who would be involved in long-term data collection activities on several irrigation schemes in Polonnaurwa District, including the Parakrama Samudra Scheme (PSS). Data collected during the long-term study is to be used for forthcoming irrigation system rehabilitation projects in Polonnaurwa District.

Discussion resulted in agreement among the three parties to proceed with the planning of a modified DA workshop which would have the usual general objective of the DA workshop, that is, to introduce the concepts and procedures used to conduct interdisciplinary investigations of existing irrigation systems. A second objective, that of training a cadre of local individuals within the PSS in the DA approach in order to facilitate their integration into a long-term data collection team, was also agreed on.

Early discussions and communication included talks with local officials about the DA workshop and workshop objectives. During those discussions, the training institution, WMS II, the umbrella organization, the MLLD, and the funding agency, USAID/Colombo, defined the resources which would be necessary at the local level. This discussion included the types of individuals that the three groups hope to involve in the DA workshop. Recruitment of workshop participants was to remain the responsibility of local authorities, while logistical support for participants was among the MLLD's tasks.

Through meetings with senior and local officials, WMS II began a two-way process and established who the partners were in the collaborative effort.

The same meetings helped identify necessary logistical and human resources for the training effort. In the case of the 1984 Sri Lanka DA workshop, these meetings clearly identified the disciplines to be represented, the desired number of participants for each discipline, and a clear indication of the amount of time participants would be away from their job assignments. Early meetings underscored the roles the training was to have in facilitating both immediate, and long-term tasks. Perhaps most importantly, initial meetings created an awareness of what the DA concept was about, what the benefits were, and how DA concepts could be used as a general management tool within irrigation systems.

Agreement on objectives for a DA workshop was understood by all parties as organizational commitment. Such agreement ensures that the work organization is informed at both central and local levels, and that, particularly at the local level, the organization is ready to grant leave for workshop participants.

2. Selecting a training strategy. The addition of a new objective to those for the 1984 DA workshop changed the focus of the workshop from a research-oriented exercise to a training exercise for long-term data collectors.

Trainers discussed this change in focus--and in objectives--during planning meetings in the spring of 1984 and again prior to arriving in-country. On the basis of these discussions, a decision was made to not change the basic training strategy from the approach used in past DA workshops. The training strategy was also discussed with officials within the MLLD as well as with USAID/Colombo. The general consensus was that the strategy would be adequate given the objectives of the proposed workshop.

3. Selecting trainers and integrating them into the core training

team. In DA workshops, it has been a matter of policy to include new trainers in the training team. The manner in which new trainers are oriented to the team is important to the team as well as to the results of the workshop in which they work. A team is a system of individual parts that rely on all of the other parts to ensure that planned results are achieved. A new team member needs to know what the expected results of team's efforts are; what methods and resources the team has to work with; and what the other parts of the team are and how they operate. The existing team members need to have the same information about the new member: his or her expectations of them; the new member's vision of the proposed training; and how the new member will go about his or her work.

Training organizations often have archives which they make available to new team members. Sometimes seminars are held to orient team members to each other and to specific workshop objectives and plans. In most cases, new team members are thoroughly briefed on what is expected of them and what role they are to play on the training team.

In the 1984 Sri Lanka DA workshop, one new member was included in the WMS II training team. As no funds were available for an indepth orientation at CSU prior to the workshop, no formal team orientation was conducted. Four trainers had participated in previous DA workshops in Sri Lanka (two in 1982 and three in 1983) with one of them having played a co-ordination role in both of the past workshops held there. As the new team member was at CSU, he was able to interview former and present WMS II team members about past workshops. The new team member was able to go over materials which belonged to a former trainer and had been used in his discipline in the past.

4. Organizing methods and materials. During planning sessions at CSU, core team trainers reviewed workshop objectives, organized workshop methods and materials, and devoted considerable discussion to the possible implications of the change in focus of the workshop. A decision was made to use existing videos and training materials, particularly those which had proved successful in the 1982 and 1983 Sri Lanka DA workshops as well as new materials (especially videos) based largely on Sri Lankan examples and video tape footage. A number of new tapes had been developed in the past year and many of them had been voiced over in Sinhala for use in Sri Lanka.

5. Logistical planning. Logistical planning for the 1984 DA was begun at the time of the CSU co-ordinator's visit to Sri Lanka in March, 1984. At that time, discussions were held with the MLLD and with USAID/Colombo to identify the level of resources necessary for the workshop. This information was in turn communicated to local authorities when site visits were made in March, 1984. More detailed logistical planning took place on a regular basis between USAID/ Colombo and the MLLD with CSU staff being involved by telephone or cable communication.

6. Selecting participants and co-trainers. Selection of participants and co-trainers is a complicated process. Not only are there questions of suitability of individuals for training, but one must also be prepared to deal with the organizational convenience, or lack of it, regarding participation of both co-trainers and participants. The selection of both should ideally include not only plans for coverage for co-trainers and participants while they are away from their job assignments but also for their re-integration into the work place at the end of training.

Selection and training of co-trainers. Before co-trainers are trained, their role in the Diagnostic Analysis Workshop needs to be determined. This determination of role relates back to several previous steps in the pre-training process: establishing objectives, identifying resources, deciding on methods, and co-trainer selection. In the 1984 Sri Lanka DA, these steps received varying degrees of attention by the team and host-country organization due to a number of constraints. As co-trainers had not been selected by host country officials prior to workshop start-up, there was no pre-workshop orientation or training in specific DA issues. As a result, co-trainers played a minimal role in the first week of the workshop. As the workshop progressed, this role expanded.

What role did co-trainers play? In the 1984 DA, co-trainers' roles varied according to the portion of the workshop, the co-trainers on hand at the training site at one time, and the increased familiarity trainers gained of co-trainers' abilities as the workshop progressed. Some co-trainers presented lectures, while all helped translate trainer presentations during the workshop. By doing so, co-trainers generated lively workshop discussions.

During the preparation for field work portion of the DA workshop, co-trainers often had additional responsibilities when they were on hand at the training site. For example, co-trainers helped facilitate small group discussions, made small group presentations on discipline-specific issues, and made logistical arrangements for the smaller groups.

During the detailed field study portion of the workshop, co-trainers helped monitor participants' work as they carried out interdisciplinary field work.

Selection of participants. In selecting participants, the work organization often demonstrates its views of the training enterprise, or, its lack of information on the training enterprise. The work organization must regard training as worthwhile and demonstrate that view to participants whom it is freeing up to attend training. In the case of the 1984 Sri Lanka workshop, many local organizations informed participants about the workshop one or two days before the workshop began. In some instances, this notification came without any explanation of what the DA workshop was to be about, or any statement of workshop objectives--either short or long-term. This lack of information proved to be both confusing and disconcerting to some workshop participants.

When such a process is used, workshop organizers risk having participants arrive at the training site with few expectations and little motivation. If participants interpret their organization's actions as demonstrating little value for the workshop, the participant may enter with the same views. Trainers and workshop planners need to be aware of the effect of what the participant sees in the action or inaction of his or her work organization on their motivation to participate.

7. In-country orientation. In-country orientation sets the stage for the training which is to follow. Trainers gather at the training site to review methodological preparations for the workshop, information on participants, availability of resources, and information on the site which is to be studied during the workshop. This is a period of fine-tuning, when trainers and co-trainers add refinements to both the training strategy and the training methods.

The in-country orientation for the 1984 Sri Lanka DA workshop took place at several places. Host government officials were met in Colombo. At the training site, the training team visited the PSS system to get an idea of the possibilities of the system as a training site. The team assessed available local resources and determined the additional logistical support that was needed.

As mentioned earlier, selection of co-trainers was not completed until the workshop was underway. For this reason, co-trainers did not participate in an in-country orientation. Complete information on participants was also not available during orientation sessions.

8. Planning for formative evaluation. The pre-training phase should allow ample time for planning for formative evaluation. Formative evaluation is, by definition, evaluation which is corrective in nature and deals with the "form" of the workshop. By including planning for evaluation in this early stage, trainers internalize the value and need for evaluating what they are doing on a day-to-day basis. Formative evaluation is done with an eye towards the improvement of training delivery and meeting workshop objectives. The period to be evaluated could be a training session or a day of training and should not be so long that there is no opportunity to address issues which arise. In the case of the DA workshop, formative evaluation might best take place several times during each portion of the workshop, and not just at the end of a portion. Formative evaluation must be timely and must trigger timely action to be useful to a training situation.

SECTION IV: TRAINING PHASE

A. Introduction

This section examines the methods and materials used during the three parts of the 1984 Sri Lanka Diagnostic Analysis workshop: the formal classroom training phase, the preparation for detailed field study phase and the detailed field study phase. Workshop methods are considered in light of the way in which they were used, the level of participation which they encouraged, and their contribution to workshop objectives. Materials used in each of the phases of the DA workshop are examined in view of their intended and actual use, their appropriateness for the training audience and their contribution to the achievement of workshop objectives.

B. Formal Classroom Training

The formal classroom training portion of the 1984 Sri Lanka DA Workshop lasted from 7/23/84 to 7/30/84 although there were additional discipline-specific sessions over the next five days.

Although there were no written behavioral objectives for this portion of the training, the assessment team identified the following as the behavioral objectives for the formal classroom activities:

1. Participants will learn about and be able to explain the basic concepts underlying Diagnostic Analysis and the Development Process.
2. Participants will be able to describe the irrigation system in which the Diagnostic Analysis will take place.
3. Participants will be able to describe how disciplines other than their own analyze an irrigation system.
4. Participants will gain a basic knowledge of the interdisciplinary mode of thinking and discuss its potential application to the study of an irrigation system.

The following discussion relates classroom activities to these behavioral objectives.

1. The classroom and its use. In the formal classroom portion of the DA workshop, a classroom setting was used to provide lectures to participants or to provide them with a space in which to view video tapes. During an average day, participants were presented with six hours of lectures. On the sixth day of the formal classroom portion of the DA workshop participants had an opportunity to be engaged in a learning activity other than a lecture.

The following schedule is typical of this portion of the DA:

7/25/84

Pakistan: Investments in Water Management (video and discussion)

Crops and Cropping Practices in Polonnaruwa (guest lecture)

Social Organization of Irrigation (video and discussion)

Role of Sociology in Development in Diagnostic Analysis (lecture)

Role of Women in Diagnostic Analysis (lecture and video)

Role of Economics in Diagnostic Analysis (video and lecture)

Two-thirds of the lectures were delivered by the core training team. Twenty percent of the lectures were presented by Sri Lankan guest speakers and the rest were presented by Sri Lankan co-trainers.

2. Classroom methods: means and ends. An accepted process of developing a training program is to first determine the goal(s) of the program then develop a set of objectives based on the goal(s). Then, the training institution identifies those activities that will most effectively achieve the training objectives.

Without commenting on content it is still possible to identify those types of activities that will best achieve specific categories of objectives. The objectives listed earlier for the formal classroom portion of the workshop can be classified within the following five categories or types of objectives.

1. Help with internalizing learning;
2. Exposure to new ideas and methods;
3. Experiments with behavior;
4. Membership in new reference groups; and
5. Intensive learning.

If one compares the types of activities or methods used effectively to achieve these categories, the lecture method rates high in only one category, exposure to new ideas. Lectures rate low in their effectiveness in reaching the other four categories. Other training methods fare much better than lectures. Simulations, such as role playing, and games, for instance, rank high for intensive learning and low only on exposure to new ideas and methods. Case studies rank high for each of the above noted categories. Lectures are most effective when used in conjunction with other classroom activities.

Training in English for a non-native English speaking population is often problematic. Initially there was doubt as to the English ability of participants in the workshop. Thirty percent of them proved quite capable in English. Those who were proficient were able to explain some ideas to their colleagues. As well, co-trainers translated difficult concepts into Sinhala. Handouts were also used to convey lecture content. The handouts also gave participants something to refer back to or to follow during lectures.

Since the lecture method depends on participants' ability to understand what is being said, problems occurred not so much around the use of English, but with the level, complexity and specialization of the language used in the lectures. The lecture method assumes that trainer and participant are on the same "wavelength"; culturally relevant examples are one method of establishing this wavelength. Because the lecture method keeps information abstract, listeners can misunderstand what is being explained without appropriate

referential grounding. Understanding is aided by grounding new ideas in the culture of the people to which the ideas are being presented. When culturally relevant examples were used to explain a concept, the appreciation was noticable and participants remarked on how useful the explanations had been.

In conversations with the assessment team, participants stated that they were able to easily follow those lectures on discipline(s) with which they were familiar. When lectures on a discipline in which they had no background were presented, they noted some confusion and misunderstanding. Participants also commented on not understanding how the interdisciplinary process was to work during the next segment of the workshop. Reports presented after the team reconnaissance indicated that there was some misunderstanding of the purpose of Diagnostic Analysis. There was a tendency to identify solutions rather than to identify problem areas as a first step in the DA Development Model.

3. Participation. For Diagnostic Analysis to work as a concept, participants need opportunities to work together and with the training team. Working together means getting to know each other. Trainers were introduced to the participants, but participants had no formal opportunity to introduce themselves to each other or to the trainers until the sixth day of the formal classroom portion of the workshop. Trainers and co-trainers assumed that the participants all knew each other when this was not the case.

Team work is an important theme in this portion of the DA workshop. The subject was approached through lectures, a video tape and through learning games. The latter provided an effective demonstration of the need for teamwork. Additional culturally relevant examples of how people can work

together would be helpful. Suggested guidelines for a revised video tape on teamwork are presented in Appendix C.

The training team worked hard to develop discussions which involved participants. This was achieved, in part, by interactive use of videos and the use of co-trainers as discussion facilitators in Sinhala. Active involvement of participants encouraged questioning and greater sharing of information, both items which are crucial to learning.

4. Contributions to objectives. Two of the objectives noted earlier were achieved by the end of the formal classroom segment of the DA. They were:

- participants will be able to explain the basic concepts underlying the Diagnostic Analysis and the DA Development Process, and
- participants will be able to describe the irrigation system in which the Diagnostic Analysis will take place.

The DA workshop is not designed to teach details of irrigation engineering to non-engineers or to train non-economists in economic analysis techniques, but participants did become more familiar with these subjects. Although the objective of initiating an interdisciplinary mode of thinking was achieved to a great extent by the end of the formal classroom portion of the workshop, there is room for further improvement.

5. Discussion. The formal classroom portion, of the DA workshop presented ideas which for the most part were new to workshop participants. Lectures used to present these ideas to the participants were well organized and well delivered. Two major discussion points regarding the formal classroom portion of the DA workshop did emerge.

First, integration and sequencing of discipline presentations during the formal classroom segment was uneven. While the interdisciplinary approach

received mention in lectures, as did teamwork, there was little opportunity for participants to experience or witness either. The number and length of presentations by discipline varied. If the workshop is designed to stress one discipline over another, this should be explained to participants. If the DA workshop is to give equally billing to all disciplines, that too should be explained. The sequencing and integration of workshop material can subtly communicate biases to participants which may not be the organizers' intent, or which may reinforce already existing biases held by participants.

Second, greater use of participatory training methods would help this portion of the DA workshop. Participants need to feel more a part of the workshop. They should receive an orientation to the workshop which includes workshop objectives, introductions of trainers and participants, and daily agendas. Participatory activities can support lectures and foster social aspects of learning. Participatory activities will not only have people working together, but can help clarify the abstract ideas of teamwork and the interdisciplinary approach.

C. Formal Classroom Training: Materials

This section reviews the materials used during the formal classroom portion of the 1984 Sri Lanka DA workshop from 7/23/84 through 7/30/84. The analysis discusses:

- the actual and intended use of materials;
- the appropriateness of the materials given the objectives of the presentations;
- the ways in which the materials encouraged participation;
and
- the contribution of the materials to the realization of training objectives.

Materials used during the week included video tapes, overheads, slides, hand-outs, lecture notes, two training manuals and supplementary reading materials. The video tapes and the training manuals were produced by WMS II and had been used in previous DA workshops. The overheads were produced by individual trainers as were certain of the handouts, which were largely based on lecture notes. Handouts were also supplied by guest lecturers. The slides were commercially supplied by groups in the US and elsewhere (International Rice Research Institute, Philippines). Supplementary reading materials consisted of WMS publications and those which individual trainers made available from other sources. Due to limited financial resources, the latter were not provided to the entire training group.

1. Intended and actual use of the materials. Materials were used as an extension of and reinforcement for the lecture method used in the formal classroom training in the DA workshop. A brief synopsis of the use of each follows:

- Video tapes: Videos were used in three ways: in the place of lectures, interactively with lectures/discussions, and as reinforcement for points made in a lecture. When the videos were used in the place of lectures, there was little discussion which followed the video to link it to previous presentations or to those which were to follow. Interactive uses of video with a lecture/discussion went well, but need more practice before all trainers are comfortable using videos in that mode. Videos were used most successfully as reinforcement following lectures.
- overheads: There was considerable creative use of overheads so that participants, who demonstrated a limited ability in English, would grasp the technical nature of the presentations. Most of the overheads were simply done, hand-drawn and in multiple colors to accentuate various intervening factors in the discussion. There were instances in which the overheads were poorly reproduced and not readable. As a result, they were of little help to workshop participants.
- slides: The slides used in the formal classroom portion of the DA workshop incorporated both graphics and actual pictures to

communicate the agronomy-related information to the larger group. The narration given by the trainer was clear and appropriate, thus facilitating the comprehension of the visual messages being projected.

- handouts and lecture notes: There was uneven use of handouts and Lecture notes in the workshop. This ranged from guest speakers who arrived with printed handouts for each participant (thus facilitating the understanding of his presentation which followed the handouts closely) to handouts supplied a day or two after the presentations. When handouts were distributed in the latter fashion there was often no explanation of what was being given out other than an indication of who the author was.
- training manuals: The training manuals were perhaps the most underused training material during the formal classroom presentations. This is not to say that there was not reference to the manuals, but there were not sufficient directives to read any one section, or to ask participants to refer to certain sections prior to a forthcoming lecture or presentation. The training manuals, especially in their revised format, offer a rich source of information. More importantly they can provide direction to an audience which may have strong reading comprehension abilities while their listening comprehension may be quite low. The training manuals also contain a full explanation of the development model used in the DA and the role of each of the disciplines in carrying out an interdisciplinary field study of water management problems.
- supplementary reading materials: Supplementary reading materials were made available on a discipline by discipline basis during the formal classroom portion of the DA workshop. The materials which were distributed were technical in nature, all were in English, and were accepted as being state-of-the-art. Because the materials were distributed on a discipline by discipline basis, the distribution was uneven, with some disciplines receiving more material than others. While material distributed to participants significantly increased the amount of documentation at their disposal, the unevenness, and the lack of understanding as to why certain disciplines received more than others, contributed to misunderstandings among participants.

2. Appropriateness of materials. In addressing the issue of appropriateness of training materials used during the formal classroom training, four factors have been considered. They are:

- did materials address the content issues announced for the session;
- were the materials at an appropriate level of language for an audience for whom English was a second language;

- were the materials visually clear; and
- were the materials culturally appropriate.

Addressing content issues. Trainers did a good job of addressing content issues through the materials used in the formal classroom presentations of the DA workshop. This was aided through translation of key concepts into Sinhala by co-trainers and guest speakers (especially when handouts were in English). Several videos were voiced over in Sinhala. In addition, presentors were available to explain materials and specific content issues after their presentations.

There was agreement between trainers and observers that content presentations could be enhanced by:

- the inclusion of more materials in Sinhala;
- by revisions of some of the video tapes; and
- by the inclusion of additional supplementary materials for participants.

Level of language. During formal classroom presentations, some participants stated that they did not understand the presentations being made. For some participants, this was due in part to the newness of the material being presented. For others, difficulties in understanding were related to participants' low level of comprehension of English. Some participants noted that the translations made by co-trainers and guest speakers were invaluable to their understanding of the technical content. The Sinhala videos were found to be the most useful, although several participants commented that the narration was too fast for a listener inexperienced with the technical content of the tape.

Trainers, especially those with past DA workshops experience, were adept at modifying their presentations and speaking at a speed which enhanced participants' ability to understand their presentation. As the first week of training progressed it was noticeable that the level of comprehension increased as participants became more sure of themselves and developed a better understanding of workshop procedures and content.

Visual clarity of materials. Handouts were locally reproduced, many of them having been prepared from stencils cut at the training site. The training manuals, WMS supplementary materials and trainer supplied supplementary materials were all of good quality reproduction. As there was only one screen and since the group was large, some participants were as far as 30 feet from the 18" television screen used for viewing the videos. The unanticipated increase in the number of participants from 25 to 40 contributed to this problem. While the picture was clear and the sound good, the graphics included in the videos were not readable in the back of the training room. When the videos were used in smaller group settings few problems were noted. There were no problems with projection either on the overhead projector or the slide projector other than the general quality of some overheads.

Cultural appropriateness of materials. During the formal classroom training, the training staff did an excellent job of relating those training materials which they had produced to local culture and local water management practices. The adaptation process was not as successful with the videos, excepting those which used footage shot in Sri Lanka in 1983. The tapes in Sinhala, and those with Sri Lankan footage, were popular among participants and were viewed by participants, as promoting a reliable picture of local

practices or practices which local organizations would wish their staff to follow.

Encouragement of participation. The materials used during the first week of the formal classroom training did not adequately encourage the active participation of those attending the DA workshop. The learner's role was more passive in nature.

During the first week of the DA workshop, few participants spoke or contributed to the discussion on a regular basis. Participants' contributions came, for the most part, as reactions to translations which were given by co-trainers or guest speakers rather than to presentations made by trainers. Trainers frequently asked if there were questions or comments. While this reluctance might be due to participants' shyness, their language ability, or the newness of the concepts and content being presented, an additional question might be one of whether or not the materials and methods used invited maximum participation from the audience.

Adding to participants' level of knowledge. There was no doubt after the first week of the formal classroom portion of the DA workshop that the methods and materials had added to participants' level of knowledge about the concept of the Diagnostic Analysis approach to studying problems in irrigation schemes. There was a greater level of reinforcement of participants' present knowledge in some disciplines than in others. This was due, to a great extent, to participants' subject matter expertise. Physical scientists, namely engineers and agronomists, had stronger backgrounds in their disciplines than did the social science participants.

3. Contribution of materials to objectives. Briefly stated, behavioral objectives for the formal classroom portion of the DA workshop were that:

- participants be able to explain the basic DA concepts;
- participants be able to describe the irrigation system in which the DA workshop was taking place;
- participants be able to describe how disciplines other than their own would describe constraints and values of an irrigation system and;
- participants be able to discuss the interdisciplinary mode of thinking and its potential applications to an irrigation system.

The following paragraphs discuss the contribution of the materials used during this portion of the DA workshop (videos, overheads, slides, handouts, lecture notes, training manuals and supplementary reading materials) to the realization of the above mentioned objectives.

Choice of materials. All materials used during this portion of the DA were used as reinforcement for the lecture method. Videos and slides, in particular, as well as lecture notes and other printed handouts, all contributed to increasing participants' understanding of the concepts being presented during the formal classroom portion of the DA workshop.

The training manuals, in their recently edited form, provide a rich training resource for use in the formal classroom portion of the DA workshop. When used in conjunction with lecture presentations they can be a powerful tool. Few trainers used on the training manuals extensively for pre-lecture reading assignments or as reference for participants to follow-up on after a lecture. The same is true for supplementary reading materials which were used.

Lecture notes were helpful for participants. The most useful were those which were made available at the time of the lecture and thus provided participants with an outline to follow while the lecture was in progress.

Use of materials in relation to objectives. Most materials contributed toward helping participants develop abilities in explaining the DA concept and in understanding how their individual disciplines would approach the identification of values and constraints of irrigation systems through detailed field study. Few of the materials used in the formal classroom portion of the DA workshop contributed toward an understanding of the interdisciplinary mode. Although materials may have invited inquiry, they did not encourage dialogue; both are requisites for working in an interdisciplinary mode.

Integration of materials with presentations. Overall, the integration of materials with presentations did not do as much as could have been done to strengthen the contribution of the materials to the objectives for this portion of the workshop. At times, reference was made to materials which did not exist or which were yet to be typed. At other times materials were distributed with no reference being made to their connection to past or future presentations, or to the fact that they were not related to the presentation which was in progress. Some videos were shown without a an introduction relating them to wrokshop concepts. As a result, participants questioned why they were to watch the video or when the video would be discussed.

At the same time, several trainers did an expert job of integrating materials with their presentations, thus contributing to realization of the objectives for specific presentations. Overheads were used creatively as reinforcement for critical or key concepts, particularly in the engineering

discipline. The materials were very much in keeping with the engineering presentation: they were clear and concise, each had a limited amount of information which it communicated, and overheads were produced using local terms and examples.

Clarity of materials. For materials to make an optimal contribution to the achievement of workshop objectives, they must be clear, both visually as well as linguistically. Some overheads contained too much printed and graphic detail to be grasped in the short time in which they were projected. When combined with the fact that they were poorly reproduced, the overheads presented problems for workshop participants.

The level of language used in the videos, in both Sinhala and English, presented additional problems for some participants. Several participants found the English very hard to follow, especially in the more technical presentations. They also found the Sinhala audio too fast for complete understanding of tapes which contained a large amount of new information and discipline concepts.

4. Discussion. Assessment team members gathered participant reactions to materials used in this segment of the training through interview and observation. There was an interest in learning if participants could recount or relate the substance of presentations, and whether they thought that the concepts and content were culturally appropriate. In general, the reaction was favorable. When issues were raised, they were concerns shared by several participants.

First, participants were interested in having access to all training materials. If the approach was to be interdisciplinary, participants felt that a larger number of materials should be made available across disciplines.

A second concern voiced by participants had to do with the video tapes. Many participants felt that a video of 20 or more minutes was too long to hold their attention, especially those whose English was poor. Participants noted that they learned most from the videos which were short and in Sinhala. For participants who had a good comprehension of English, the information contained in the tapes was not adequately grasped when they were not discussed after viewing.

A third issue had to do with the level of English. At the outset, it appeared that few participants understood the lecture presentations and grasped the concepts behind the DA approach. Trainers modified their presentations and training materials, and relied on co-trainers to act as translators and as resource people. Participants felt that it was the trainers' responsibility to modify or to simplify technical content to a level where all participants understood what was being presented.

D. Preparation for Detailed Studies: Methods

The preparation for detailed studies portion of the DA workshop took place from 7/30/84 to 8/4/84. The behavioral objectives for this portion of the workshop, as determined by the assessment team, were:

1. Participants will learn about and be able to describe the tools/methods used by their discipline (economics, engineering, agronomy, sociology, and WID) to study an irrigation system.
2. Participants will be able to carry out a reconnaissance survey in both a disciplinary and interdisciplinary manner.
3. Participants will plan for an interdisciplinary study of an irrigation system.

The following discussion relates the training methods used in this portion of the workshop to the objectives and activities listed above.

1. The classroom, the field site and their use. During this portion of the DA workshop, the classroom and field sites were both used in a manner that encouraged participation and action from workshop participants. The primary method of learning during this portion of the workshop was small group discussion by discipline (i.e., economics, agronomy, engineering, sociology, or WID). Each discipline group was led by a member of the WMS II team in the discussion of the field research tools and methods for that discipline.

Participants went into the field twice to make use of the tools they had learned about in their discipline discussion groups. The first visit to the field was done by discipline group while the second was carried out by interdisciplinary teams. The teams constituted for this activity were those that would carry out an interdisciplinary detailed field study during the last portion of the workshop.

During the preparation for detailed studies portion of the workshop, participants were to experiment with the interdisciplinary approach, to find out how it worked, and to sort out what should be the main question(s) for their field study. The general schedule for the week was as follows:

7/30 am Field Reconnaissance by discipline teams
pm Discipline group discussions: field reconnaissance
7/31 am Discipline group discussions: methods
pm Discipline group discussions: methods
8/1 am Field Reconnaissance by interdisciplinary teams
pm Interdisciplinary teams prepare report on field reconnaissance
8/2 am Interdisciplinary teams present reports to whole group on field reconnaissance
pm Disciplinary groups discuss methods
8/3 am Discipline group discussion: methods
pm Discipline group discussion: methods
8/4 am Discipline group discussion: methods and preparation for detailed study
Interdisciplinary teams plan field study

2. Methods: means and ends. Participants were involved in an active learning atmosphere during this portion of the workshop. Trainers made good use of participants' skills and abilities and drew upon participants' knowledge to develop questionnaires. Small group work by both discipline and interdisciplinary teams evidenced an interest on the part of the trainers in the participants and their abilities. As a result, the workshop became a center of enthusiasm and participants worked hard at understanding what was presented to them.

Co-trainers played an active part in explaining the concepts being discussed with participants. Small group discussions enabled those with greater understanding to explain concepts to other participants unable to follow what was being said. The direct interaction of WMS II trainers with participants resulted in the use of a less complex level of English to facilitate participant understanding.

Field experiences during this portion of the workshop were extremely useful. Participants came to understand what was required of them in the field study, and how to perform in that capacity. The field experience gave participants an opportunity to put into practice what they had learned in the formal classroom portion of the DA workshop. As one participant stated, "Learning by doing is better."

3. Participation. For the Diagnostic Analysis to work as a concept and in practice, participants must have an opportunity to work together with each other and with the training team. This portion of the DA workshop provided a unique opportunity for participants and trainers to work together in small groups. Discussion groups provide two way communication with

trainers and participants being able to gauge what each other knew as well as establishing what was expected in the detailed studies.

4. Contributions to objectives. The behavioral objectives for this portion of the DA workshop were achieved in part. At the end of the week, participants sampled by the assessment team were able to describe tools and methods used by their discipline to collect data about an irrigation system. Participants were also able to go into the field and collect data. Although their ability to function in an interdisciplinary manner had been tested further experience was needed.

5. Discussion. This portion of the workshop was marked by a high level of participation. During this portion of the DA workshop, there was a general coming together of participants and a willingness to work together that could be directly attributed to their increased involvement in the training and learning process. Participants made significant input into the development of research instruments developed by the discipline groups. As well, co-trainers were more active in translating, demonstrating, and explaining ideas, equipment, and concepts to participants.

Specific issues which were addressed during this phase of the DA workshop were:

The expanded use of co-trainers was noticeable during the preparation for detailed studies phase of the DA workshop. How co-trainers' skills are used is important not only in this portion of the workshop, but throughout.

Many resources which participants brought to the DA workshop were stressed during this portion of the workshop. At this juncture in the workshop, it is important for participants to feel some ownership for the activities they will be doing during the detailed field study. Ownership of

the instruments they use to collect data is important and can be achieved by providing participants with an opportunity to contribute to their creation.

E. Preparation for Detailed Studies: Materials.

1. Use of materials. The learning materials used during the second portion of the workshop were similar to those used during the first portion (video, manuals, slides, and handouts) with the addition of data gathering equipment such as flumes. Video tapes were used by the engineering, economics and agronomy disciplines. Slides were used by the agronomy discipline with other disciplines sitting in on the slide presentations when time permitted. Specialized manuals were distributed by the engineering and economics disciplines. Handouts, especially formats for tabulating or organizing information, were provided by the WID, sociology, and economics disciplines. The agronomy and engineering disciplines made use of special equipment so that participants could practice with equipment before using it in the field.

Video tapes were used mainly to illustrate methods that engineers, economists and agronomists use to gather data and analyze it. For example, a series of videos was presented to the engineering discipline about measurements engineers make on irrigation systems and how to analyze the data gathered through those measurements. An additional video discussed land leveling. Participants in the economics discipline were presented with a series of videos on farm management tools and concepts such as production functions.

Manuals were used in support of video presentations or participants were referred back to training manuals which were distributed during the first week of the DA workshop. The manuals were important as they provided participants with references for several concepts presented in the videos.

Participants in the agronomy and engineering disciplines had an opportunity to experiment with the equipment they would be using in the field studies. Participants thus got a chance to see how soil samples should be taken or how a flume should be set. These opportunities to use equipment were generally near to the training site, but not at sites for the detailed field studies.

2. Appropriateness of training materials. The materials used varied widely as to how well they addressed the content issues of this portion of the DA workshop. A major concern was the level and relevance of the video tapes. In some instances, the video tapes used in discipline specific presentations presented information which may be beyond current capabilities of participants. Yet they served to widen participants' horizons.

The slides used by the agronomy discipline were, for the most part, appropriate to what was being attempted during this portion of the workshop. The agronomy co-trainer ensured that much of what was being said in accompaniment to the slides was being understood. Some of the slides themselves were probably not as useful as they could have been as they were produced for western U.S. agriculture. However, it could be successfully argued that concepts basic to U.S. agriculture can be generalized to a certain degree to agriculture elsewhere.

Manuals specific to engineering were handed out during this portion of the workshop. Although some of the manuals dealt with subjects that the participants may never deal with, others seemed relevant and appropriate to the tasks that the participants would face in the future.

The equipment used for the agronomy and engineering discipline groups was appropriate as far as the participants' role in the DA workshop is concerned.

3. Encouragement of participation. The materials used during this portion of the training were used in a participatory and an interactive manner. Both videos and slides were used interactively and generated good discussion. Handouts generated discussion and participation, especially in the way they were used by the trainers. Finally, the equipment was very much a discussion starter and generated a great deal of interest and activity.

4. Contribution to objectives. The learning materials used in this segment of the DA workshop contributed to the achievement of the first objective mentioned above as all materials were used in support of discipline skills and knowledge. The second objective was achieved in so far as the materials helped participants gather data. The materials used during the second portion of the workshop contribute indirectly to achievement of an interdisciplinary approach to analysis of an irrigation system.

5. Discussion. Although many of the materials used in preparing participants to go into the field worked very well, the video tapes posed problems because of questionable cultural and technical relevance. If land leveling tapes are to be used, an attempt should be made to scale them to current practices. If English is the language used in the video tapes, it might be wise to use speakers of Asian English: Indian, Sri Lankan, or Malaysian varieties.

Many of the activities during this week took place in small groups. There was only one board on which to write and each trainer could have used it at the same time. A useful material that did not appear during this week and which could have been put to good use was a flip chart or newsprint.

F. Detailed Field Study and Data Analysis: Methods

1. Objectives. The final segment of the 1984 Sri Lankan Diagnostic Analysis workshop consisted of a detailed field study and data analysis by interdisciplinary and disciplinary teams. This segment lasted two weeks and had the following behavioral objectives, as determined by the assessment team:

1. Participants will be able to use the tools of their discipline to collect data in the field;
2. Participants will be able to carry out an interdisciplinary field study;
3. Participants will be able, by discipline, to tabulate and do simple analysis and synthesis of data collected in the field; and
4. Participants will be able to synthesize discipline data into an interdisciplinary team report.

There were two distinct parts to the field study segment: (a) collection of data and (b) report preparation and delivery. During the detailed field study, teams consisting of an economist, sociologist, irrigation engineer, agronomist and a member of the WID component spent most of their day in the field interviewing and collecting data on selected sites in the Parakrama Samudra System (PSS). Each afternoon, study teams returned to the training site to discuss the day's events in disciplinary groups. The detailed field study took five days. Report preparation took four days, with two days spent in discipline groups analyzing and synthesizing data and two days preparing and delivering interdisciplinary reports.

2. Field study methods. The field study was carried out by six interdisciplinary teams each consisting of six or seven people. Six general sites were selected on one main channel of the PSS. The sites represented the head, middle and tail of the system fed by one main channel. Where possible,

engineers selected field channels at the head and tail of the study site. Along the field channels, rice fields were selected from the head to the tail of the field channels. The agronomists studied the selected rice fields. Irrigation channels from the main channel to the field as well as on-farm irrigation systems were studied by the irrigation specialists. The households that worked the selected rice fields became the focus of the social science components of the interdisciplinary teams.

The main question for the study was determined to be the distribution of water in the system under study. The question was determined by asking the interdisciplinary teams, after their field reconnaissance and before their detailed study, to list by team, a set of questions they wished to study as a team. These lists were read by the CSU team coordinator to the participants in plenary. The coordinator then selected a general question based on the lists.

During their time in the field, teams were observed to be more separated than the word "team" would imply. Engineering and agronomy participants were in or around the rice fields and the social science people were at homestead sites, usually quite a distance from the rice fields. Teams were only together while going to the field or coming from it. Thus, there was little time for discussion or sharing information while actually in the field.

During the field study, trainers and co-trainers visited each group. Trainers and co-trainers had vehicles which allowed them to divide up and visit both rice fields and homesteads. Trainers were available to help participants in carrying out interviews and collecting irrigation and agronomic data if necessary.

On their return to the training facility each day, the study teams broke into disciplinary teams to discuss data collection problems and refine questionnaires. No time was regularly scheduled for participants to process or discuss as a field study team the information they had collected.

3. Data analysis methods. During the data analysis and synthesis part of this segment of the DA workshop, field study teams were divided into discipline groups. First, they tabulated data, did basic analyses of the data and then synthesized the data. Procedures used in this portion of the DA workshop varied both according to method and technology used and according to the amount of input participants had in developing formats for tabulating and synthesizing information. There was a difference among disciplinary groups as to the completeness of participant understanding of the procedures being used and why they were being used. These differences were seen as a direct result of how various trainers dealt with the development of data tabulation formats and their use. A general observation was that the more participant input there was at this point, the greater the participants' level of understanding of the data analysis process.

When the discipline analysis and synthesis of data was completed, interdisciplinary study teams regrouped to write their reports. Teams were provided with a series of questions to be answered and issues to be discussed in order to facilitate the preparation of an interdisciplinary final report. The format was as follows:

I. Introduction

A short description of the study site with a map.

II. Water Distribution

A. Factors affecting water distribution within the study site
(observed and measured)

B. Impact of water distribution on productivity and income

- level of input utilization
- household water supply
- cropping pattern and intensity (highland and lowland)
- crop management practices
- yield
- land tenureship
- rules of water distribution with the D channel
- home garden contribution
- water application practices

III. Some Topics in Need of Further Detailed Studies in Order to Plan System Rehabilitation.

On the final day of the workshop, reports of the detailed studies were presented to the larger group by each study team. This reporting exercise was important and well done. Participants evidenced a high degree of ownership of their presentations. One group dealt with their presentation creatively by using the format they were given as a departure point rather than as a directive and produced a highly interdisciplinary report.

4. Methods: means and ends. The detailed field study and the way it was conducted gave participants an opportunity to put into action and internalize much of the training they had received in earlier portions of the workshop.

The actual learning of measurement and data collection methods progressed very well during this segment of the workshop. Trainers and co-trainers worked hard to help participants resolve specific discipline-related problems through discipline team meetings. As a result field experience was much richer.

The detailed field study helped participants internalize content issues stressed earlier in the workshop. A participant during the field study remarked that, "This field study is helping me very much to learn how to do

things that will be important later." Although integrated teamwork and the interdisciplinary approach were reinforced through the methods used during the detailed field study, interdisciplinary teams needed additional time to function optimally.

5. Participation. This portion of the workshop was heavily participatory with interaction being the rule rather than the exception. In study teams and discipline groups, participants had ample opportunities to question trainers and to enter into discussions with them. Trainers and co-trainers were available to help participants with both data collection and data analysis.

There was, however, one exception to this rule. The process for determining the field study question was not carried out in the participatory fashion in which it was begun. Study teams were asked to list questions they felt important to study based on the reconnaissance. The trainer leading the study question selection process distilled all participant questions into one question. To the assessment team it appeared as if a main question had been pre-selected for the study and that participants had been led into a process directed toward ratification rather than discussion.

The data tabulation, analysis, synthesis and report writing process was viewed as very important by participants. Originally, this process was not to be included, as workshop planners thought the participants would not be able to do the work. As the workshop progressed, trainers decided participants were not only capable, but should have the opportunity to try to process the results of their field work.

6. Contribution to Objectives. The methods used during this segment of training appeared to be well integrated with the behavioral objectives of

the segment. By the end of the field study, participants were able to use, with varying levels of ability, most of the data collection tools of their disciplines. This difference in abilities had more to do with individual backgrounds and commitment to use of the tools than with activities during the field study.

Although field study activities contributed to greater cross discipline awareness among participants, there was little regularly scheduled time for participants to come together as interdisciplinary study teams and discuss their field studies. By comparison, disciplines were brought together and held focused discussions led by trainers on field experiences. This tended to focus attention more on disciplinary activities than on the interdisciplinary focus of the detailed field study emphasized by the DA model. This change in focus was made in order to better prepare workshop participants for discipline data collection and for the preliminary analysis anticipated for the first phase of the two-year study of the Polonnaruwa irrigation systems.

Activities surrounding data processing helped participants achieve a basic understanding of what was involved in data processing. Yet, many participants did not understand the "why?" of data processing. In discipline groups where participants helped to create data processing formats, they progressed further in the understanding of this procedure than participants who did not help generate the formats they used. The process of synthesizing discipline-specific data into an interdisciplinary report was based on the use of a series of questions, developed by the trainers, and helped participants organize and present field study data on a team.

7. Discussion. The third and final portion of the DA workshop was characterized by intense activity. Trainers and co-trainers worked together

to help participants carry out field work. Participants achieved new levels of knowledge and skills in research design, data collection and report preparation. Data processing activities gave participants concrete experience directly related to their involvement in research for the long term rehabilitation project. Data synthesis and report preparation provided DA workshop participants with an opportunity to experience the results of the interdisciplinary approach.

G. Detailed Field Study: Materials.

While there was less reliance on handouts, overheads and videos during this portion of the workshop, other learning materials were used throughout the field study. The materials used during the field study included: equipment (agronomy, on-farm/off-farm engineering), and data collection instruments. While these may seem unusual as learning materials, one of the objectives of the field study was for participants to be able to use the data collection tools of their disciplines.

1. Use of materials. The learning materials were used at the field sites, both by participants on their own and with trainer assistance. Trainers rotated from team to team assisting with the work of all disciplines.

2. Appropriateness of training materials. The materials used during the detailed field study segment were appropriate to the content of the field study portion of the DA workshop. Although the equipment used by the agronomists and irrigation specialists might not always be the equipment they have at their disposal during their regular jobs, it was equipment they would use should they participate in the long-term studies.

3. Encouragement of participation. Materials were participatory in nature. Everyone could make use of the tools related to their discipline and

did so. Some materials were developed with varying levels of participant input. The presence or absence of participant input contributed to the participants' understanding of the tools as well as their willingness to use them. This became more important as data was processed.

4. Contribution to objectives. The materials used during this portion of the DA fit well with the objectives of the detailed field study. Additional materials could have facilitated discussions of the field study experience and contributed more to generating an interdisciplinary approach.

H. Special Training Issues

1. Women in Development Component. A Women in Development Component was added to the other discipline presentations in the 1983 Sri Lanka DA workshop. Since then, the component has been implemented three times, twice in Sri Lanka (by the same trainer) and once in India. During the 1984 Sri Lanka DA workshop, the opportunity existed to examine the WID component "under the microscope" to better understand the content presented, the methods used in presenting WID content, the materials and procedures used for preparing the WID participants for field work, and the integration of the women into interdisciplinary teams.

The Participants. Five women constituted the WID component for the Polonnaruwa workshop. One was from the Women's Bureau in, Colombo. Another was from Matale, on loan from the Plan Implementation Office. Both were not residents of the study area. Three others were residents of the area. They represented the Land Commissioners' Office (colonization officer), the Agriculture Department (agriculture instructor), and a local office of the Ministry of Plan Implementation (actually co-operating with Women's Bureau, Colombo). All spoke English with varying degrees of proficiency and exhibited

a wide range of levels of comprehension of English. In addition, a part-time co-trainer, a representative of the Women's Bureau in Colombo, was present at the workshop for two days spread over three visits to the training site. She visited field sites once during the workshop. None of the participants had direct experience in water management issues nor had any of the five been involved in disciplinary or interdisciplinary field studies in the past.

Content. The content presented in the formal WID presentations included information intended to first sensitize the audience to the role of women in agricultural production and more specifically in paddy production and other areas peripheral to water management issues.

A rationale for inclusion of a women in development component in an interdisciplinary approach to studying water management problems was presented. By starting with women's participation in the food cycle, the presenter highlighted participants' knowledge of the activities of Sri Lankan village women in the planting, cultivation, harvesting, and marketing of food crops. Discussion then shifted to areas of women's involvement where data is not so readily available, such as crop management. As data are speculative in this area, the likelihood of women's involvement and the need to research this area was stressed. The DA approach was suggested as one means of obtaining data which could substantiate the role of Sri Lankan village women in crop management. In discussing the objectives for the WID component, the first two objectives were noted as being shared by all five disciplines involved in the workshop, i.e., professional development in the area of water management issues for all present and contact with other disciplines. The third objective, identifying women's part in agriculture was explained as an area of interest to all of the other disciplines.

A number of areas in which data on women's role in irrigated agriculture were presented. These included:

Demographic Data

Irrigated System

- Data on irrigated crop production system
- Kinds of women's activities
- Women's role in decision making
- Women's level of knowledge about extension services
- Women's perceptions about farming constraints

Household System

- Patterns of income
- Patterns of expenditure
- Household labor demands

Data on women's participation can help other disciplines understand that what goes on in the household system affects the level of women's activities on the irrigated system. (For example, activities in the household system might add income which is then expended on outputs for the irrigated system. Or, the amount of labor expended in the household system might constrain the women's available time on the irrigated system.) Each example was related to the other disciplines to show their interconnectedness with the WID component. A six minute video highlighting the WID component, and which includes footage shot in Sri Lanka during the summer of 1983, reinforced the role of data generated by the WID component as being supportive of the work of other disciplines involved in the DA.

WID-specific presentations made only to the WID component consisted of:

- a presentation on conducting social research on women;
- a presentation on women's participation in development;
- discussion of guidelines on areas of interest for the field study;
- construction of a questionnaire for use in the preliminary field reconnaissance;

- formulation of a questionnaire for use in the detailed interdisciplinary field study; and
- discussions on field research and data analysis methodologies; and
- actual field work.

In addition to WID-specific presentations, the WID participants were involved in presentations and discussions presented by other discipline trainers.

2. Costs and Ethics. Farmers are often the objects of research both in developed and lesser developed countries. They are asked to participate in interviews or respond to questionnaires. The question of how farmers benefit from this is often not asked. If it is asked, the answer is likely to be in the nature of: "The farmer benefits from research results." or "The farmer benefits from the educational programs built on the results of research." However, a question remains: does the farmer recognize this as a benefit? Such benefits are often too far removed from the farmer's situation for her or him to recognize any benefit at all.

The costs of surveys or interviews are not simply the budgeted or accounting costs for the implementation of research. The farmer's opportunity cost is very real; he or she often must take time off from work to participate in an interview or answer a questionnaire.

In the case of the detailed field study of the 1984 Sri Lanka DA workshop, approximately 36 farm households were the subjects of the six survey teams. As well, many other people whose roles relate to the distribution of water in the Parakrama Samudra System were interviewed. For each household as much as 1/2 to 1 person days of labor were forgone to participate in the survey (farmer, farmwife, and other family labor opportunity costs). In the

language of economics these represent some of the externalities of the DA workshop. If farmers are expected to absorb these externalities what do they stand to gain for their costs?

This is not simply a rhetorical question. Not only is there the issue of costs to the farmer involved, there is an ethical issue here as well. Workshop participants, the training institution, and others stand to gain from this experience. Yet, the farmers gain only another topic of conversation.

There are ways in which farmers could gain from such an experience, not simply in what they will perceive as indirect gains from the irrigation system's rehabilitation, but in ways that they might perceive as real gains. For example, farmers could be introduced into the extension network if there is an apparent educational problem.

SECTION V: POST-TRAINING PHASE

A. Introduction

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

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

This section looks at post-training issues of follow-up and evaluation. Attention is paid to the inclusion of pre-testing and post-testing mechanisms in the training program, as well as the inclusion of formative evaluation methodologies for improving training.

B. General Goals and Processes For Post-Training Activities

1. Providing Support After Training. In the post-training or follow-up phase, organizers and the training institution find themselves first faced not with support or evaluation issues. Rather, at this point in the chronology of

training they must often deal with what Miles* calls redressing the imbalances of the training program. These are:

- input overload: Trainers may have attempted to include too much information and activity in the program or, training tasks may have been scheduled at the end of the course without giving trainees time to "wind down" before leaving the training site. Reports on fieldwork often fall into this latter category. As a result, trainees can feel exhausted and discouraged over what they have not learned. Or, another behavior often exhibited is that participants return to their jobs unable to comfortably move back into their work.
- unrealistic goals: Often, participants and trainers set unrealistic goals at the outset of a training course. Further, they fail to alter them during training when it becomes obvious that the goals are unrealistic given participants' skills. As a result, trainees can return to their job sites with a feeling that their superiors need to be trained in order to understand them, or they return to work unclear as to what they can apply from their recent experience. In short, the value of the training is placed in question by those closest to it---the participants.
- alienation: Participants form new reference groups during training thus moving away from previously held ones based on their job sites. This gap often occurs in programs which stress new attitudes or values, or new approaches to the work tasks, and are especially noticeable when attempts to apply program learnings are frustrated by a nonresponsive job environment.
- linkage failure: Effectively linking training with work depends on the work organization's involvement in the design of the program and establishment of training specifications. The work organization must be prepared not only to allow participants to leave for training but also for their return.

These four imbalances and the problems associated with them can and should provide the impetus for change in future training programs. An organization's ability to correct these imbalances in future programs will depend on the evaluation system it has in place and that system's ability to

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

"send up the flags" at the appropriate moments. An evaluation system which is formative in nature rather than summative allows the training institution to learn while experiencing, not just learning from experience.

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

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

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

- pursuing joint activities on the job with the work organization, thus directly reinforcing training content;
- maintaining contact with participants from a distance through correspondence, newsletters or intermediaries such as funding agencies; or
- providing refresher and further inservice training courses either at the work organization or the training institution.

Although these three levels of contact form a logical approach to follow-up or support, there is wide agreement that these are rarely carried out in a systematic manner. Many training institutions view the development

of post-training contacts as part of their primary tasks. As the maintenance of post-training contacts has economic ramifications, the approach chosen should be clearly outlined with program objectives and goals precisely defined.

C. Post-Training Activities for the 1984 Sri Lanka DA.

In the 1984 Sri Lanka DA workshop, considerable attention was given to issues of follow-up and providing for support after the workshop ended. This was necessary in light of workshop participants having been trained as researchers for a long-term field research activity associated with rehabilitation efforts in Polonnaruwa District. Follow-up and support mechanisms were implemented at the time of pre-training planning activities, were reinforced during training, and were highlighted in a one-day workshop for local administrators and government officials two days after the DA workshop finished.

In the case of planning for support and follow-up at the time of pre-training activities, the training institution involved representatives of the Ministry of Lands and Land Development and local officials in discussions about the workshop. Each contact stressed that the DA training was the first step in a process which would include in-depth research for the AID-funded rehabilitation project. Discussions highlighted the need for thorough training of a cadre of individuals who were already familiar with Polonnaruwa irrigation schemes and who could, in turn, be involved in the long-term effort.

The DA workshop began with issues which related to the how participants were to be employed, under what conditions, and with what amounts of release time unresolved. During the workshop, the team discussed the long-term research effort with participants, but not in definite terms. During the last

weeks of the workshop, it became clear that there might be constraints on workshop attendees' participation in the long-term effort.

With these constraints in mind, trainers successfully implemented training exercises during the last week of the workshop which provided them with;

- an indication of the level of participants' interest in being involved in the long-term effort; and
- an estimation of the amount of time which participants thought they would be able to devote to the effort; and
- the elaboration of a list of support needs which participants felt would have to be addressed prior to their leaving their current positions.

With this information in hand, the team planned for the necessary support which participants would need between training and the start-up of long-term research efforts. Training exercises provided training staff remaining in-country a list of issues to be dealt with in collaboration with local officials prior to any subsequent in-service training or refresher courses for DA workshop participants.

A one-day workshop for government officials and administrators provided representatives from participants' work organizations with a thorough explanation of the content presented in the DA workshop, workshop methods and organization. Findings of the detailed studies were presented by co-trainers. Their presentations were reinforced by discussions involving local farmers who highlighted the needs of farmers and the benefits to be derived from the long-term rehabilitation project. The workshop included a presentation by representatives of the MLLD (Colombo) and USAID who outlined the scope of work of the long-term research activity and the preliminary plans and schedule for the rehabilitation project. At the end of the workshop,

training staff solicited local administrators' support for the inclusion of DA workshop participants in the longer-term effort.

D. Evaluation and Program Planning

1. Introduction. This section of the report deals with evaluation as the management of training. Evaluation is not viewed as an end in itself, something to engage in because it is intrinsically good. Rather, evaluation provides for greater program choice and for rapid response to needs for improvement. Evaluation can be a tool in improving total operating efficiency as well as providing clients with more effective programs. The type of evaluation discussed in this section are known as formative evaluation: evaluation for program improvement. This aspect of evaluation should be most useful to DA Workshops.

2. Developing a formative evaluation system. An evaluation system for a multiple component training program like the DA workshop demands more information inputs than a pre-test and post-test system can offer. Trainers and participants must feel that the training system is both flexible and responsive, yet well designed and implemented. Trainers must look closely at each day's activities to gauge how they contribute to workshop objectives and correct or redirect efforts where necessary. Trainers need an opportunity to plan and evaluate themselves jointly and individually. Participants need a forum for offering their views on training activities and materials.

Formative evaluation is the continual evaluation of all elements of the training program while in progress. It is concerned with the basic question of how each element of the program can be examined so it contributes to program involvement. Feedback is essential in formative evaluation as it provides the information for decision making and change.

An effective and efficient system of formative evaluation within the Diagnostic Analysis workshops should seek information from the participants in the training course and the training team, including both core trainers and host-country and co-trainers. Both groups will have differing sets of expectations which they will use as a measure of training success.

Some of the questions that might be answered by participants would include the following:

- What new information and skills did I acquire during the training?
- How will this new information and skill be of use to me on the job?
- What was the most valuable information or skill that I learned during this session?
- How would I improve this session?
- What was the objective of this session and was it achieved?
- Were the training materials helpful to me?
- How would I improve the training materials?

As some of what is presented in the DA workshop is abstract, the perceptions of participants about the value and utility of the training course materials and methodology are extremely important. Attention to participants' points of view can provide rich information in helping a training institution tailor make a training course. These questions need to be presented to participants before they have lost touch with what happened during the training period for which data is being sought.

During the workshop trainers and host-country co-trainers should also regularly try to answer the following questions:

- Did participants learn what was expected of them in the time allotted?
- How did participants apply themselves to the training tasks as defined by trainers?

- Did all trainers follow guidelines as specified? If modifications were made, how was that decision reached?
- Were co-trainers sufficiently trained and used as agreed-upon by all trainers?
- Was there a positive working relationship between trainers and co-trainers? Between trainers and participants?
- Were the materials, which were used, effective in all situations? If not, which ones presented problems?
- Was the training objective(s) achieved?
- What went well during the training session?
- How would one improve the training session?

To be effective formative evaluation must be timely. The set of questions above will generate data for immediate use by trainers in modifying the training program as it is in progress. Mechanisms will need to be developed for gathering this information and for channeling it directly into the modification process.

Formative evaluation as a measurement of impact. Program impact can be defined as the economic, social, environmental and individual consequences (results) of program-induced learning and practices. These consequences or end results emphasize the impact of training on program participants. Ideally, evidence of program impact is expressed in terms of whether desired end results occurred, plus detection of any side-effects. However, without assurance that clientele have attained a certain level of performance or practice because of program-induced learning, attributing desired end results to a particular training program may be meaningless. There is the need to determine whether utilization of the skills, knowledge and attitudes presented at a DA workshop have been put into practice by former workshop participants.

Evaluation allows one to examine the influences of a training program on participants. Post-training evaluation, preferably after the elapse of enough time to allow utilization to occur, should provide an indication of what went well with a particular training and what needs improvement. The data being sought by the evaluation could be quantitative or qualitative. Given the nature of the DA workshop and its objectives, what is important about the data to be sought is that it provide information to aid in decisions regarding workshop design and implementation.

Information for this broader approach to formative evaluation should be sought from all those involved with the design and implementation of the workshop, i.e., the USAID mission and/or the host-countrywork organization(s); the participants in the course; and the training team including both WMS II trainers and host-country co-trainers. Each of these groups offer a different perspective of the training and its success based on their expectations of results.

Among the questions that might be addressed to sponsoring or work organization(s) are the following:

- What changes are noticeable in participants' performance on-the-job?
- What changes in participants' attitudes about the training course content have been noticed since their participation in the course?
- What were participants' reactions to their experiences in the DA?
- Have participants put any of the DA concepts to work since attending the course?
- Has participation in the course generated any new requests for training?

- What expectations were there of participants as a result of their being in the DA and were these expectations met?

It is likely that some time will have to elapse before these questions can be answered. There are a variety of mechanisms that might be used for obtaining answers to these questions. Questionnaires or interviews by trainers are two methods which could be used. The process of obtaining answers to these questions is an excellent way for maintaining contact with work organizations and sponsoring organizations. This is important to any effort to "track" participants and identify workshop results.

Course participants should be contacted for impact information. Among the questions that might be asked of them are:

- What new information did you acquire during the DA workshop?
- How have you used the information or skill(s) you acquired during the DA on-the-job?
- Were the training methods used in the DA ones which you will be able to model in presenting the concepts of the DA to colleagues or others?
- How were you treated in the course? Were your ideas and input respected?
- How have you been treated since leaving the course? Was it easy to return to your job after having spent so much time away?
- Would you attend a similar course in the future? What should be changed about it?

Again a variety of mechanisms can be used to obtain the answers to these questions. The answers are probably best sought after some time has elapsed after training so that participants will have had an opportunity to put into practice what they have learned.

WMS II trainers and co-trainers should be debriefed as soon as possible after the training is over. The set of questions that was developed under the

last section, formative evaluation, could be used at this time as well. There might be other questions that could be added to this list, but what is important is to get the trainers debriefed before they have but too much time between themselves and the workshop.

Summary. The foregoing has stressed the need for a system to evaluate and track participants to reveal the results of training activities. The information obtained from evaluation efforts should be reviewed by all involved with a particular workshop: host-country work organizations, sponsoring organizations, participants and trainers. Information should be archived and reviewed by WMS II staff to identify possible implications for future DA workshops.

E. 1984 Sri Lanka DA Workshop Evaluation Efforts.

There are two major approaches used by the WMS II training teams in evaluating their work during the DA workshop. The first involves the administration of a pre-test during the first day of the DA workshop and a post-test at the end of training activities. The second evaluation method used in the workshop is an informal one involving trainers in staff discussions and in discussions with participants. Evaluation efforts after the DA workshop, and upon the team's return to the US, usually include a written and verbal debriefing with Project administrative staff at CSU.

1. Pre-test and Post-test. The pre-test, which was developed collaboratively by workshop trainers during their in-country orientation sessions, consisted of 42 questions and was administered to all workshop participants on the first day of the workshop. The test consisted of multiple choice and open-ended (fill in the blank) questions. Questions were constructed by each member of the core training team and were presented in

handwritten form on half sheets of paper taped to the walls. Test questions were posted around the hallway with several tools and pieces of equipment which participants were asked to identify. Participants were then instructed to pass by each question, read it, and respond to it.

Results of the pre-test were then reviewed with participants on the second day of the training. A chart containing percentages and averages for each of the disciplines was posted on a chalkboard and reviewed by the workshop co-ordinator. In his explanation, he noted that the purpose of the pre-test was to show participants how they had performed prior to the workshop. Participants were told that this information would be used as a measure to show them how much they had learned when a post-test would be administered at the end of the workshop. He indicated that the organizers were hoping for scoring in the 80% to 100% on the post-test.

No post-test was administered to workshop participants during the workshop.

2. Informal workshop evaluation activities. Several staff discussions were held, with only one of them being called by the workshop co-ordinator for evaluation purposes. In that meeting, the immediate situation was assessed and changes were made in the workshop format for the following day to accommodate problems which had arisen.

Three evaluation sessions were conducted by the assessment team at the request of the training staff. The first, which came after the first week of the training workshop, involved a formative evaluation exercise, The Itemized Response Technique. The technique requires that trainers exhaust all positive issues about the session(s) being evaluated prior to moving to a discussion of what needs to be improved. Each item placed under the improvement category

must be stated in terms of "how to improve...." Trainers found the evaluation exercise of use in helping clarify what had gone well during the first week of the workshop, and what was in need of improvement. They found that the proactive nature of the exercise gave them a new and useful view of evaluation.

Several suggestions for improvement involved minor adjustments in the day-to-day operations of the workshop and contributed to the day-to-day functioning of the DA workshop. These included:

- the posting of changes in the workshop schedule (agenda) which had been provided to workshop participants on the first day of the workshop;
- addressing issues of closure at the end of each session and linking each session with that which preceded or followed;
- review of key concepts presented in long lectures or videos; and
- greater attention to participant and co-trainer feedback.

A second formative evaluation session was conducted by assessment staff during the preparation for field studies portion of the DA workshop. The format was similar to that of the first session and included a discussion of formative evaluation systems. As with the first exercise, the results of the second were visible during presentations the following day.

A third evaluation session was held during the last week of training. At that time, the assessment staff reviewed the points made in the preceding evaluation exercises, discussed the actions taken by training staff as a result of those evaluation sessions, and outlined further observations on the training program and recommendations for action which the training team might take. Effort was made to link these latter discussions to planning for future DA workshops.

3. Discussion. To be used effectively, a pre-test should measure where the participant/trainee is prior to the workshop. Information from the pre-test is used as an indicator of significant gaps in the participants' "store of knowledge" on a given subject. Information on gaps in the participants' knowledge is, in turn, used as the basis for modifying previously prepared training presentations. A pre-test can be used to "fine tune" training presentations.

A second observation relates to the use of pre-test results as a motivational measure. In this DA workshop it was explained to participants that the results of the pre-test would be compared with the results of the post-test to be administered in the last week of training. Eighty to 100% was cited as the trainers' goal for participant performance.

SECTION VI: IMPACT

A. Introduction

This section of the report looks at the impact which the DA workshops have had on former trainers, participants and host country institutions. Impact is discussed at two levels in the following pages: at the personal level and at the institutional level. At the personal level, the concern is with the influence the DA workshop or materials have had on the individual's performance in the work place, change in attitudes attributed to the DA training, and the ways in which the individual may have used DA concepts or materials to approach his or her work tasks. At the institutional level, the concern is with the level of adoption of DA concepts which may have taken place since the DA workshops were introduced.

The data used in this section come from a variety of sources. A mail-out questionnaire was posted to all former co-trainers and participants involved in the first five workshops held under the terms of the Water Management Synthesis I and II Projects. The response rate to that questionnaire was roughly 40%, with 10 co-trainers and 47 participants responding. In addition, interviews were held with 14 former co-trainers and participants in Sri Lanka and 13 former co-trainers and participants in Bangladesh during the summer of 1984. USAID officials in India, Sri Lanka and Bangladesh were also interviewed about the Diagnostic Analysis workshops held in those countries. Most government officials were interviewed in Sri Lanka and Bangladesh. Follow-up interviews with co-trainers and participants were not possible in India as assessment team members could not secure government of India clearance within the time allotted for the study.

In preparing this section, use has been made of an initial report which detailed the responses to the mail-out survey. That information has been augmented with data collected in face-to-face interviews and trips made to former DA training sites and sites where subsequent training activities based on the DA approach have taken place.

B. Participant Evaluation of the DA Concept and DA Training

In replying to the mail out questionnaires, DA workshop participants were asked a number of questions regarding the utility of the DA concept in general and their respective workshops in specific. In this section, responses to those questions are discussed.

1. Primary goal of DA workshops. An issue which emerged during the design of the original study was whether the DA workshops constituted training on how to do a diagnostic analysis of problems in a water management project or actual research on problems in a water management project. This issue is considered central to discussion on the current approaches used in DA training, at least from the side of the funding agency which has questions regarding the research focus rather than practical focus on the training.

Forty-six (46) of the 47 respondents replied to the question, with 39 (85%) stating they thought the primary goal of the DA workshops was training on how to do a diagnostic analysis in a water management project. The "training" response rates varied from 91% in the 1983 Sri Lanka DA training to 66% in the 1982 Sri Lanka DA workshop.

Four respondents (9%) noted they felt that the primary goal was that of research on problems in a water management project (1982 Sri Lanka, 2; 1983

Sri Lanka, 2). One replied saying the DA workshop was both training and research.

2. Elements of effective interdisciplinary teamwork. One element of effective interdisciplinary team work would appear to be the opportunity to establish an understanding of the DA concept both upward and downward within participants' organizations. Such an understanding would, in large part, be related to the receptivity of one's superiors to implementing DA procedures. Seventeen (17) of 40 respondents (43%) said their immediate superiors had been supportive of helping them implement DA procedures; an additional 18 (45%) noted that their superiors had been moderately supportive. One (3%) replied that his superiors had not been supportive (Rajasthan) and three (8%) (Rajasthan, 1; 1983 Sri Lanka, 2) replied that DA procedures had not been implemented. The response rate on this issue was greatest among respondents (20) from the only workshop to date which has drawn its participants from existing contained administrative units in a water management project (1983 Sri Lanka).

The DA workshop is to provide participants with training in procedures for identifying problems existent in water management schemes but stops short of moving participants to establishing an action plan for dealing with the problems they have identified. Workshop participants were asked if they had been able, since their respective workshops, to promote the establishment of action plans through interdisciplinary team work. Eighteen (39%) replied that they had while 28 (61%) noted that they had not been able to do so.

Of those who replied affirmatively, action plans centered on extension training for farmers and more general planning issues. From the 1982 Sri Lanka

workshop, one participant cited that a planning team consisting of a technical officer and an agricultural instructor was established to deal with water management problems. A 1983 Sri Lanka workshop participant noted that there was a DA program proposed for one system within the irrigation authority for January, 1984 which would use the three teams trained in the 1983 DA workshop. Other affirmative responses linked the DA procedures to action plans which had resulted in the organization of farmers' groups and farmer training, improved efficiency of drainage systems, and the efficiency of water applications and water usage patterns.

Among those who responded that they had not been able to implement action plans, most responses centered on two issues. The individual was no longer working in a water management scheme or there had been little or no opportunity for them to apply what they had been exposed to in the DA workshop. The explanations provided were, in large part, aimed at the bureaucracy to which trainees had returned and which they felt they could not change. Several said that the organizational structure was not suitable for the application of DA procedures. Others noted that they were "too small...in the hierarchy to establish an action plan" or "It is a policy matter and not at my discretion."

It would appear from the responses that follow-up activities are needed if the DA workshop procedures are to be put to use. As one 1983 Sri Lanka respondent replied "According to our policies, I have to work as an agronomist and other officers are doing their job (irrigation, water management, etc.) so I alone can't apply DA procedures without others." Another 1983 Sri Lanka trainee added, "Before using DA procedures in our water management project, it

is important to give a thorough understanding of DA procedures to the employees on the project. But for this, it was not possible to find...financial allocation."

3. Greater farmer involvement. As farmers are to be ultimate beneficiaries of improvements brought about through identification of problems in water management systems, their involvement in DA procedures is thought to be crucial. Respondents were asked to give an example of how DA procedures have contributed toward greater farmer involvement in identifying problems in water management systems. Respondents were asked to cite levels of farmer involvement and indicate the results of their inclusion in the activity.

Twenty-one (21) trainees responded with examples deemed pertinent. Several are reproduced here.

"Farmers readily accepted their responsibility to clean water channels and adopt rotational water issue. They also agreed to change their traditional crop according to the availability of water in the tanks. Two crops were cultivated during the cultivation sessions, which resulted with a better income to the farmers." (1982 Sri Lanka)

"Involvement of farmers in water allocation and distribution of field channel level." (1983 Sri Lanka)

"While doing DA I had to discuss with the farmer as well as other members of his family about the problems they are facing with. Sometimes problem may be a money problem, sometimes it may be a health problem or something else. Therefore by doing DA it gives a chance to look into each and every aspect of farming." (1983 Sri Lanka)

"DA procedures have the view to approach any problem in different aspects such as engineering, agronomical, economical and social. In case of irrigation project, we may get all engineering information from field survey directly from the field. But to get to information regarding social and economic status, we have to maintain direct contact with the farmers." (Bangladesh)

"DA is a direct approach to farmers; so farmers involved and they can put their difficulties nicely. Hence irrigation management can improve." (Gujarat)

"DA procedure has given an insight of problems of farmers and our canal design system needs review. Farmers generally want water at intervals of 15 days. Farmers are generally ready to receive views from irrigation officials and cooperate with them. Timely information of canal scheduling will help them." (Rajasthan)

4. Utility of DA workshop components. The four components of the DA workshop--formal classroom presentations (by expatriate and host country trainers), field work, preparation of the discipline report, and preparation of the interdisciplinary report--were rated on a scale of unsatisfactory to very satisfactory. Table I below presents trainee responses on the question of how the various components of the DA workshop prepared them to implement diagnostic analysis activities at their job site.

TABLE I

Trainee Rating of DA Workshop Components As Preparation for Implementation of DA Procedures at Job Site

<u>COMPONENT</u>	<u>VERY SATIS- FACTORY</u>	<u>SATISFACTORY</u>	<u>NEUTRAL</u>	<u>UNSATISFACTORY</u>
Formal Classroom Presentations	11	29	1	2
Field Work	27	18	1	0
Preparation of Disciplinary Report	15	29	1	0
Preparation of Interdisciplinary Report	14	23	7	2

When one compares the number of very satisfactory and satisfactory responses with data on actual number of respondents (18) who have been able to implement DA procedures since the workshops, a discrepancy is noticed. Of the four explanatory notes provided by those who marked items as "unsatisfactory," two cited difficulties involved in preparing the interdisciplinary report due to lack of time. Two cited lack of understanding among disciplines and one noted that "the team" was not united.

The above mentioned discrepancy carried over into trainees' feelings about what they felt they could and could not do at the end of the respective workshops. Sixteen (16) cited that they felt they could return to their jobs and begin interdisciplinary research activities (1983 Sri Lanka, 10; 1982 Sri Lanka, 2; Gujarat, 2; and Bangladesh, 2). Thirty-one (31) felt that the training had been sufficient to implement all or some of the methods learned (1983 Sri Lanka, 15; 1982 Sri Lanka, 5; Rajasthan, 3; Gujarat, 4; and Bangladesh, 4). Thirteen (13) felt that major changes would have to be made in their organization before they could implement what they had learned (1983 Sri Lanka, 4; 1982 Sri Lanka, 2; Rajasthan, 3; Gujarat, 1; and Bangladesh, 3). Only one respondent (Gujarat) indicated that the DA concepts and methods did not apply to the water management system in which he was working.

5. Utility of DA workshop training materials. In each DA workshop, training materials have been supplied to participants. The materials include Training Manuals (Vol. I and II), Handbooks and Planning Guides. In some workshops the materials have been central to the formal presentations. In others, they have not. Participants were asked to rate how useful the

materials had been on a scale of "have not used them," "not useful at all," "somewhat useful," to "extremely useful." Table II below summarizes the responses.

TABLE II
Usefulness of DA Training Materials

<u>TYPE OF TRAINING MATERIALS</u>	<u>EXTREMELY USEFUL</u>	<u>SOMEWHAT USEFUL</u>	<u>NOT USEFUL</u>	<u>HAVE NOT USED</u>
Training Manuals, Vol. I and II	28	10	0	7
Handbooks	23	16	0	7
Planning Guides	23	10	0	12

Sixty-two (62) percent of those responding rated the Training Manuals extremely useful, while that percentage dropped to 50% for the Handbooks and 51% for the Planning Guides. An examination of responses by workshop showed that 46% of the "extremely useful" responses (13) under Training Manuals were from the 1983 Sri Lanka DA workshop.

If one examines the responses by workshop under the "have not had the opportunity to use," 71% of those who had not used the Training Manuals were from the first four workshops. This same pattern is true for the Handbooks and the Planning Guides (71% and 83% respectively).

Respondents were asked to explain how the training materials had been useful or why they were not useful. Sixteen (16) positive explanations provided by 1983 Sri Lanka trainees constitute the bulk of a very practical

listing of ways in which the training materials have been used since the DA workshop. These include:

- to provide readily available references during the workshops;
- to provide an understanding of conditions prevailing in other countries;
- to assist in planning and management;
- to help in identifying field problems;
- to provide information for day-to-day extension work; and
- to serve as the basis for developing other training materials.

Explanations of why materials had not been useful included:

- non-arrival of training materials;
- transfer of participants to other jobs; and
- no opportunity to use them in a DA context.

From these written explanations it would appear that the training materials have been most useful in situations where DA workshop participants have been able to immediately apply DA concepts to their work situation. This situation appears to have occurred only once during the course of the time covered by the five workshops - the 1983 Sri Lanka DA training.

C. Participants' Suggestions for Modifications in the DA Workshop Design, Methods and Materials

The last six questions on the research instrument were directed toward helping DA workshop participants identify and explain ways in which the workshops might

- become more relevant;
- be of an adequate length to accomplish workshop objectives;
- benefit more from the report writing procedures; and
- be better supported by follow-up activities.

Each of these areas is treated separately in the paragraphs which follow.

1. Relevance. Several issues related to the relevance of the DA training have been alluded to earlier in this report. Among them are:

- the criteria used for selection of participants;
- the practice in the first four workshops of drawing participants from scattered administrative units rather than from contained administrative units; and
- the continuing discussion over the DA workshop as training versus research.

When DA workshop trainees were asked what kinds of modifications they thought would make the training more relevant for them and for their organizations, 37 respondents replied with suggestions. Their replies can be grouped as follows:

- organization issues (including participant selection and length of workshop): 15 (40%)
- materials and methods: 12 (32%)
- evaluation: 5 (14%)
- follow-up (including assignment to appropriate jobs): 5 (14%)

Among some respondents there was a feeling that because the training materials were only in English many participants could not benefit optimally from them. One 1983 Sri Lanka participant noted that materials should be in Sinhala. This same concern, for use of host country languages in training materials, was voiced by participants from the 1982 Sri Lanka workshop as well.

By far the most frequently voiced comments were on participant selection and how greater care in this area could influence relevance. The following quotes from the questionnaires illustrate this point.

"Persons trained in a particular discipline...should be shared in...said discipline." (Gujarat)

"By selecting qualified most suitable persons as participants whom are expected to adopt these procedures in their own command areas of work and assisting them in work itself." (1983 Sri Lanka)

"Participant should be from organizations/institutions involved in irrigation management and should be in a position to practice what they have learned." (1983 Sri Lanka)

"DA workshop should be organized by grouping of the same working crowd who are working together in the projects too. If we select the people for different disciplines from various projects it gives lesser results." (1983 Sri Lanka)

"Trainees from the projects specified should be called and be given contract of working in the project and a particular period to implement what is learnt. It will make participant involvement more effective." (Rajasthan)

2. Length of workshop and accomplishment of program objectives. When asked if they felt that the DA workshop was sufficiently long to accomplish the objectives set forth by the organizers, 26 respondents (58%) replied affirmatively. Nineteen (42%) responded "no." When asked for further clarification, those responding "no" were asked to suggest a more appropriate length for the DA workshop. Most responses fell between a suggested period of six to eight weeks. Others cited the need to span at least one cultivation season, if not two, as they felt more valuable information could be gathered during the extended period. As one 1983 Sri Lanka participant noted

"The duration of the workshop was not sufficient to closely interact with participants of different disciplines as they are

occupied with their work only. Therefore interdisciplinary understanding was constrained at the time of field work and preparation reports."

3. Report preparation. In linking the relevance issue with that of appropriate time to accomplish objectives, several respondents cited particular aspects of the DA workshop which had affected relevance as well as accomplishment of objectives, namely preparation of the disciplinary and interdisciplinary reports. Several respondents felt that the time was inadequate to prepare the two reports and that there was a less than positive impact on participation at those points.

When asked about the usefulness of the final report of their respective DA workshop, 36 (78%) stated that they had not received it. Of the 10 (22%) who had, six had found it very useful.

D. Additional Suggestions and Comments

In a final question, trainees were invited to reply with additional comments regarding the DA workshop and DA procedures. Although responses were diverse, they can yet be grouped according to:

- issues regarding placement after training and opportunities to put DA procedures to work;
- interdisciplinary issues;
- logistical concerns, especially length of the DA training; and
- follow-up and evaluation, both by the Water Management Synthesis Project and USAID.

1. Placement after training. As noted earlier, there was considerable concern expressed by some participants over not having been placed in situations where they could use what they had been exposed to in the DA workshops. As one Rajasthan participant noted,

"The DA workshop is in my view the best workshop that I have attended and is practically oriented which makes it different from other workshops. As no discipline alone can clear up all the problems which are likely to come up after completion of the project, the interdisciplinary team approach is the only right approach to tackle the problem effectively. I am personally very indebted to DA workshop and am waiting very eagerly to get an opportunity to work on the procedures learned. However, till today, I am waiting for that day to come.

2. Interdisciplinary issues. Several participants responded with comments related to the apparent gaps between theory and practice with respect to the interdisciplinary approach.

"Theory of discipline groups to be advanced and instruments to be used should be ready when conducting field work. They should also be reliable. Better interdisciplinary study is needed. (Although we were supposed to do an interdisciplinary study we found that we could not get involved with the other disciplines much at least to understand them in their basic principles)."

"It may be useful to conduct DA workshop each year in order to further train participants getting them involved in organizing the workshop and train personnel who are especially engaged in water management activities."

"Lack of inputs for certain disciplines discussed in the workshop by the organizers, e.g, "women's role in agriculture." (1983 Sri Lanka)

Other 1983 Sri Lanka workshop participants also commented on this gap. Inputs on certain disciplines were lacking, e.g., "women's role in agriculture," as were opportunities to learn from other disciplines.

"Each discipline should be provided with the opportunity of gaining field experiences in other disciplines. For example, sociologist, also should involve in collecting agronomic data to appreciate the work of other disciplines."

3. Logistical concerns. Logistical concerns appeared to center around preliminary or pre-training issues, length of training, and availability of training materials.

On the issue of length of the DA workshop, one 1983 Sri Lanka participant stated:

"The DA workshop should be of enough duration so that an in-depth study could be done and the conclusions arrived at are not vague. It should be localized to a smaller area, and officers involved should be those directly connected to such area. By this, it is intended that officers of all disciplines will be motivated, thereby follow-up action in rectifying such defects subsequently will be eased."

Another participant from the same workshop added,

"The participants must give more time to work with water management staff and they should give extra time to get additional knowledge on the technical side."

These sentiments were also those of a Bangladesh DA participant:

"I think the workshop is very useful and essential particularly for the development of irrigation systems of third world countries. But the duration of workshop is not sufficient to cover all the areas for tackling the existing problems of irrigation systems. So for that reason, the time period for the workshop should be extended for future programmes, so that the problems can be sought out properly and remedial measures can be recommended."

Only one participant commented on the need to shorten the training.

"[The] procedures are nice, but [they] should be made short and sweet."
(Gujarat).

Comments on pre-training issues centered on the selection process and preparation of trainees for what they were to experience. There was concern that the "selling" process on the DA concept should include "heads of departments to which participants belong" (1982 Sri Lanka) and that "more advance training should be given" to participants (1982 Sri Lanka).

Only one participant commented on the need for field training materials to be more readily available. "Instruments to be used should be ready when conducting field work. They should also be reliable" (1983, Sri Lanka).

4. Follow-up and evaluation. There was a general consensus among those responding to this question that more training and follow-up activities were necessary. Comments to this effect came from participants from four of the five DA workshops:

"More training should be held frequently; more workshops to be held in every district; and administrators should also be included as participants" (1982 Sri Lanka).

"The heads of departments to which the participants belong should be kept informed about the proceedings of the workshop, follow-up work and any outcome of the workshop, so that persuasion by such heads of departments to carry out detailed studies on problems identified during the DA workshop may take place" (1982 Sri Lanka).

"Further technical training (at Colorado State University or elsewhere) to at least a team comprised of all disciplines, so that they will be able to handle more complex situations in a DA project" (1982 Sri Lanka).

"After the completion of the DA workshop, a study tour might be necessary so that the participants can visit areas where the Water Management Synthesis project is already working" (Bangladesh).

"There should be a more practical nature pattern of classroom lecture. This should be in different parts of the sponsoring agency so that participants can compare the different water management systems. Follow up of the DA workshop should be in the third country, i.e., a country where the DA was conducted besides the sponsoring and participating country" (Bangladesh).

"Undoubtly, the DA workshop would be very fruitful to the participants for recognizing, approaching and solving different problems. But to have confidence in their work they should get the opportunity to visit any model projects where DA procedures have adopted scientifically. The place may be in the country or abroad" (Bangladesh).

"Some selected participants may be invited by the USAID mission for training in a more extensive way in the USA. They could continue to provide aid to the state/central projects for adopting the same technique in their projects, where the participants trained in DA can work as trainers and continue the channel of the practicing DA procedures" (Gujarat).

"This workshop was very useful for us to identify the problems in our project. I would like to see other project areas to know how this type of training helped them" (1983 Sri Lanka).

"Provisions might be developed for the promising persons for higher studies which might develop their knowledge, skills and efficiencies to conduct a more fruitful DA in the field" (1983 Sri Lanka).

From the responses given, it would appear that participants were aware of the need for concrete outputs from their participation in the DA workshops. Some noted that the program was useful and that it needed to be given to village level officers and administrators as well. One participant noted specific training needs of agronomists (Bangladesh, 1982). Yet, others spoke of the need for greater cooperation between the sponsoring agencies and the participating organizations. Only one person commented on the issue of program evaluation (1983 Sri Lanka). This participant suggested a two tiered evaluation process:

"Disciplinary staff should be evaluated in the field at the beginning and at the end of the DA workshop. When they have commenced work in their project sites evaluation must be done time to time. One can then evaluate the output of the project, after training the staff at different times."

E. Co-Trainer Evaluation of DA Workshop Utility

In a similar questionnaire, former DA workshop co-trainers were asked to rate the various components of the DA training for preparing participants to implement diagnostic analysis activities in their job sites. Nine of the ten co-trainers responded to this question. Few respondents had neutral feelings about the ability of the DA workshops to prepare participants to implement the procedures. At the same time, few respondents rated the DA workshops as "very satisfactory." Table III which follows shows responses of nine trainers by workshop and by component.

TABLE III
CO-TRAINER EVALUATION OF DA WORKSHOP COMPONENTS
(By Workshop)

	<u>Formal Course Presentations</u>	<u>Field Work</u>	<u>Disciplinary Reports</u>	<u>Interdisciplinary Reports</u>
Rajasthan (4 trainers)				
Very Satisfactory		2		1
Satisfactory	4	2	4	2
Neutral				1
1982 Sri Lanka (2 trainers)				
Very Satisfactory	1	1	1	1
Satisfactory	1	1	1	1
Neutral				
1983 Sri Lanka (3 trainers)				
Very Satisfactory	1	1	1	1
Satisfactory	2	2	2	2
Neutral				

Co-Trainers were asked to respond to the question, "At the end of the Diagnostic Analysis workshop, did you feel that (a) participants could return to their jobs and begin interdisciplinary research activities; (b) the training was sufficient for participants to implement some or all of the methods used; (c) major changes would have to be made in the participants' organizations before they could implement what they had learned; or (d) the training was impractical given the constraints of participants' jobs." None of the respondents replied with choice "d." Seven responded with "b" while four responses were offered for both "a" and "c." It is interesting to note

that there was a tendency for respondents to reply with both "a" and "b," while "c" was the only response for three respondents. Of these three, two were individuals engaged in research activities as their current employment.

The questionnaire sought to gather information on the receptiveness of the co-trainers' work organization to the DA concept and procedures, as well as their receptiveness to possible implementation of DA procedures in existing water management schemes. All ten respondents noted positive reactions on the part of their work organizations to both the DA concept and procedures as well as the DA workshops. These reactions were reported as being an interest in adopting the DA procedures and an interest in implementing DA studies. Two co-trainers noted their organization's interest in implementing a DA study prior to their participation in the DA workshop, while six noted this interest occurred after their participation.

When asked to describe the primary goal of the DA workshop, co-trainers were to indicate whether they thought that the DA workshop had been oriented toward training on how to do a diagnostic analysis of problems in a water management project or research on problems in a water management project. Eight of the ten replied with the training option. Two co-trainers, both researchers, replied that it was research on problems in a water management project.

Part of the utility of the DA workshop for both co-trainers and participants is viewed as the application of the DA workshop material and procedures to existing water management activities. co-trainers were asked if they had, since the DA workshop, a continuing professional involvement with DA

training or water management projects in which DA procedures had been implemented. Fifty percent replied affirmatively. One Rajasthan co-trainer had been involved in an irrigation water measurement workshop on the Guda Project in India. One co-trainer from the 1982 Sri Lanka training had continued his involvement in training of technical assistants at an irrigation training institute, while two participants from the 1983 Sri Lanka workshop had been involved as resource people for training courses.

Specific instances of application of DA concepts were discussed with former DA trainers in Sri Lanka and Bangladesh during the summer of 1984. These are reported on later in this section.

F. Co-Trainer Suggestions for Improvements in the DA Workshops

Co-trainers were asked to provide suggestions for improving the DA workshops at the end of the questionnaire. Co-trainers were asked for specific suggestions for improvements. The last question in the DA workshop asked for any further comments which co-trainers wanted to make on either the DA workshop or DA procedures in general. All respondents replied with suggestions on both questions. The responses to the two questions are presented here under headings of suggested programmatic changes and general issues.

1. Suggested programmatic changes. Five co-trainers replied with suggested programmatic changes. Each response is given here verbatim with an indication of which DA workshop the co-trainer participated in.

"More emphasis [should be placed] on practices in the field which will help in understanding the problems faced in water management and which will help in solving the field problems also." (Rajasthan)

"Trainees from specific project areas [who participate] must serve the same project for 5 years and DA procedures [should] be implemented during this five years. Then, only will it be more effective." (Rajasthan)

"A follow-up action should be undertaken to explain the findings to the officials in the project area who were not involved in the DA workshop. Video tapes will be useful. Some corrective measures identified during the DA workshop can then be implemented." (1982 and 1983 Sri Lanka)

"[Place] emphasis more on the interdisciplinary nature by evolving more effective methodology to really integrate disciplines. Currently what happens is "defense of a discipline" rather than interdisciplinary thinking." (1983 Sri Lanka).

"The time period could be extended. Follow-up action by the organization could be taken by asking participants to repeat it (the DA workshop) in other areas of the project. More audio-visual aids and instruments (if used) will help participants in carrying out the program." (1983 Sri Lanka)

One Rajasthan co-trainer suggested that greater attention be given to both the interdisciplinary training and data collection:

"More intensive training should be given to participants about the interdisciplinary subjects which will help in understanding the problems of other disciplines. No farmer is maintaining the farm records, the data collections should be done in the respective seasons which will help in correct diagnosis and its treatment. Detailed basic data about irrigation, agriculture, meteorology should be provided in the beginning."

Another Rajasthan co-trainer cited his concern over what he felt was an uneven emphasis on the factors impinging on water management schemes. He felt "that more emphasis was given on [the] physical factors" to the detriment of operational, managerial and cultural factors. Each of the latter, he noted, "should be given due importance as they affect the irrigation system and water use efficiency. The same co-trainer also cited a need to place "more emphasis... on the correlation of the findings of different disciplines."

This part of the training, he noted "lacks" attention in the interdisciplinary work and in the reports.

2. General issues. The following responses were among the general issues cited by co-trainers:

"DA workshops could be conducted for other problems in the organizations other than water management and show that it is an effective way of solving and remedying complicated problems." (1983 Sri Lanka)

"Success depends on trust worthiness which can be increased by using more competent and knowledgeable persons. Participants should be of a positive attitude and the program should be compatible to the needs of the organization." (Rajasthan)

"To have an effect of the DA workshop in improvement of projects, it is necessary that more DA workshops are organized." (Rajasthan)

"DA procedures should be more simplified so that the same may be explained and adopted by many participants. The procedures need references. So before the start of the workshop (at least a month earlier) the procedures should be sent to the trainers as well as to the trainees for detailed study. [This would allow for] practical implementation during workshop."

One Rajasthan co-trainer summed up his feelings about the DA workshop as follows:

"As an experiment [it] was good enough and more of such activities should be arranged to make the officers and officials understand the importance of improvement of the irrigation projects."

G. Specific Applications of DA Concepts and Procedures

This part of Section VI discusses specific applications of DA concepts and procedures which have taken place in Sri Lanka and Bangladesh since the DA workshops held in 1982 and 1983. Information of these efforts was collected during field site visits in July and August 1984. At that time, discussions

were held with 14 former co-trainers and participants in Sri Lanka and 13 former co-trainers and participants in Bangladesh.

1. DA workshop for mid-level management: Sri Lanka. In their responses to the questionnaire, former DA workshop participants and co-trainers mentioned the need for a training workshop for mid-level managers. Many respondents felt that such a workshop would help "educate" their superiors to the DA concept and make them more understanding of what was involved in implementing what was presented in the DA workshop. To this end, the first DA workshop for mid-level managers was conducted in the summer of 1984, two days after the closure of the Polonnaruwa workshop.

The meeting was billed as a discussion on Diagnostic Analysis of Irrigation Systems, and was conducted by staff of the Water Management Synthesis Project in collaboration with USAID/Colombo, the Ministry of Land and Land Development, and the Training and Management Unit of the Kachcheri, Polonnaruwa. Planning for the meeting included local officials. Invitations to the meeting were posted the week prior to the workshop and included individuals from within local government agencies as well as private sector representation.

The workshop program include a ten minute video tape presentation on the Diagnostic Analysis development model (in Sinhala) as well as a shorter presentation which explained the what and the how of a diagnostic analysis. Presentations were made by co-trainers from the Polonnaruwa DA workshop as well as by CSU staff and representatives of the Ministry of Land and Land Development.

Most importantly, the workshop represented an attempt at sensitizing local officials, in a group setting, to the concepts and procedures involved in the DA workshop, the resource needs for a successful DA workshop, and the need for back-up services when workshop, participants return to their work organizations. In planning the workshop, CSU and ministry staff knew that complete local support was necessary for the long-term research effort and felt that the group meeting was one way of taking the first steps toward securing that support in a timely fashion. Both groups involved in the planning came to realize that the meeting should have taken place prior to the DA workshop, but other commitments precluded that happening.

Local officials who were sampled by the assessment team during the one-day workshop noted that they had found the meeting informative and that they were surprised at the amount of activity which had taken place during the DA. Several attending the one-day workshop stated that they would have liked to participate more fully in specific sessions during the DA, especially those which dealt with farmer organization. They voiced their support for the longer term effort and offered to help the Ministry and USAID in whatever way possible.

2. Home Development Centre Curriculum: System H, Mahaweli Authority.

Among the practical applications of DA concepts and procedures in work settings in Sri Lanka is the inclusion of the DA training approach to problem identification in the curriculum of the Home Development Centres within the Mahaweli Authority. The first application of the curriculum took place at the Nochchiyagama Home Development Centre in System H. System H was the site of the 1983 Sri Lanka DA workshop. The manageress of the center, who also served

as the WID co-trainer for the 1983 workshop, revised the curriculum after participating in the workshop. The curriculum includes opportunities for practical interdisciplinary research at the field level, guest lectures by water management specialists and a focus on women's role in both irrigated and uplands crop production.

Each participant in the center's program is involved in a survey of village level problems, particularly those related to nutrition (and thus food production). After studying nutrition issues in an interdisciplinary fashion, which includes several water management related factors, each team of girls prepares a report and presents its findings to the larger group. Team members then work together in designing action plans for solving the problems identified.

During the Home Gardens and Cattle Raising Module, Home Development Centre participants attend a series of lectures and demonstrations involving water management specialists from the Mahaweli Authority. Topics covered by the Mahaweli staff include water use, irrigation for upland vegetable crops, food crops and cash crops. During the Community Leadership Module, girls learn about settler organizations, social infrastructure at the Project and Block level and how community surveys can be used to gather data for a number of different uses.

It should be noted that other Home Development Centres have closely monitored the recent changes in the Nochchiyagama curriculum, as they are to assist in the implementation of the curriculum on a national basis by the end of 1985.

3. DA-Based Training: Bangladesh. Among visible examples of impact of the DA training workshops is work recently completed in Bangladesh. In the early spring of 1984, former co-trainers and participants gathered in Dhaka to discuss the possibilities of conducting a training workshop patterned after the DA workshop at the Rural Development Academy, Bogra. The objective of the workshop was to integrate training for field level staff involved in the Irrigation Management Programme (IMP), funded by the World Bank, with the Diagnostic Analysis approach to studying water management issues.

The approach chosen by the Bangladeshis was that of having host-country co-trainers from the 1983 DA workshop serve as senior resource people for the training workshop while former participants would take the role of trainers for the two week period. Materials were gathered from both the IMP and DA programs, revised for the field-level audience to be trained, and produced. The Bogra training was more practically oriented than the 1983 DA workshop had been with much less time devoted to classroom training and more time given to looking at water management issues in the field.

The workshop involved participants from field level water management projects in the immediate area surrounding the Rural Development Academy's campus south of Bogra. Participants came for daily training courses and participated in field exercises as well. Participants did not represent all five disciplines usually found in a DA workshop. Rather, they were engineers, agronomists and community development workers from three government agencies: the Bangladesh Agricultural Development Board, the Bangladesh Water Development Board and the Bangladesh Rural Development Board.

All trainers for the Bogra training were interviewed during the summer of 1984 to gather further information on the adaptation process and the

constraints encountered in the implementation phase of the "hybrid" training. The following discussion highlights their comments and concerns.

Adaptation time and process. Trainers involved in the 1984 Bogra training felt that they had had excellent resources on which to draw during the adaptation process: they had been participants in a DA workshop themselves and had access to all former co-trainers from the 1983 workshop. As documentation, they had the two training manuals produced by CSU for the 1983 training, the final report of the 1983 DA workshop, as well as the new training manual used in the IMP training. The only problem encountered was that of the distance and time involved in travelling from Dhaka to Bogra for planning. As a result, much planning was done by telephone or left until the workshop began.

Training design. Prior to the workshop, planners spent time in the field working along side prospective participants to get an idea of their level of knowledge on water management issues and their ability in English (as the training was to be offered basically in English). Planners also attempted to gauge how much time participants would be able to spend away from their jobs without creating an additional problem for them.

On the basis of their observations in the field, planners reduced the projected time for the workshop from four weeks to two weeks. In addition, less time was allotted for classroom training with more time devoted to field exercises. Thus, the reliance on printed training materials and formal lectures was kept to a minimum. Provision was made for the translation of key concepts into Bengali.

Having adequate resource people available at the training site was viewed by all trainers as a very positive aspect of the Bogra training. Not only

could trainers turn to former DA co-trainers for assistance and information, they could also benefit directly in a formative way from their presence. Reducing the amount of classroom training time allowed for more time in the field, time which was spent in helping participants understand key concepts in a hands-on field setting. In the view of both resources and training staff, the training which was offered was truly two-way communication rather than a one sided presentation based on the lecture method.

Evaluation design. As mentioned earlier, the trainers from the 1983 DA workshop conducted by CSU served as evaluators and resource people for the Bogra training. The approach to evaluation in the Bogra training was of a formative nature, with feedback going immediately into improving the workshop design and delivery. Given its field orientation, extensive use was made of participants as providers of evaluation data, a factor which was noted as missing from the 1983 DA.

Initial evaluation comments centered on the need:

- to make improvements in training materials and training strategies prior to additional training;
- to explore ways of securing release time for field level participants, thus freeing them for optimal participation;
- to increase coordination efforts between participating agencies in an effort to facilitate attempts to deal with water management issues, and to actively encourage additional IMP/DA type training.

A formal evaluation report is currently under preparation and is to be issued before December, 1984. The report will discuss the workshop findings in detail and make recommendations for additional training activities linking the IMP and DA training approaches.

4. Impacts, Strengths and Areas for Improvement: India Positive Impacts.

Three workshops have been held in India: Anand, Gujarat (1981); Chittorgarh, Rajasthan (1982); and Bhopal, Madhya Pradesh (1983). In addition, a workshop for 19 Indian trainers was held at Colorado State University during the summer of 1984.

Of the participants trained in the Gujarat and Rajasthan DA workshops, five are now professional trainers at USAID financed State Training Institutes where the DA has become an essential component of the curriculum. Curricula for the five USAID assisted State Training Institutes and four universities, have incorporated DA courses, concepts, principles and procedures.

Diagnostic Analysis studies have been completed by Roorkee University, the Water Land Management Institute (Maharashtra), by the Anna Engineering University (Madras), and the Indian Institute of Management in Bangalore. In USAID's ongoing irrigation projects, five DA workshops and several special DA studies were planned for 1985. USAID/Delhi has provided WMS II Diagnostic Analysis materials for these research activities but the demand continues to exceed the supply. In five states with Irrigation Management action programs for total systems, DA studies are scheduled as the first phase of the programs prior to system interventions and improvements.

As a result of DA training, workshops at two sites, Gambhiri project in Rajasthan and Dowd project in Madhya Pradesh, follow-on development of solutions has or will be done. In Rajasthan, a five km minor has been improved on the basis of DA findings. At the Dowd project, improvements are planned.

*The authors are indebted to Dr. Max K. Lowdermilk, USAID/Delhi his assistance in providing data for this section of the study.

As a result of follow-up work and the dissemination of DA materials and papers, and also as a result of presentations at national and state conferences, the concept of the Diagnostic Analysis is now well known and accepted in India. With each workshop team in India, the strategy has been for participants to hold short meetings with State and Government officials to introduce them to the DA as a concept and as a set of tools which are useful for improving irrigation management. In each instance, these meetings have paid off. Diagnostic Analysis concepts have become an active part of conference proceedings and discussions involving the Central Ministers of Irrigation, as well as state ministers and secretaries of irrigation.

In addition to the Diagnostic Analysis work financed by USAID, six new state training institutes funded by the World Bank have been started. All have requested Diagnostic Analysis materials from USAID.

Strengths of Diagnostic Analysis. Perhaps the most important strength of Diagnostic Analysis in India is that the interdisciplinary mode of action brings irrigation, agriculture and the other disciplines together for the first time. Although the marriage of the disciplines is not immediate, the intense interaction and collaboration for five to six weeks results in valuable new understanding and cooperation.

Additional strengths of the Diagnostic Analysis are viewed as the way in which it introduces participants to management concepts and team work, as well as the introduction of a systems approach to studying problems of various systems. The data generated by the DA training and research is also noted as a strength of the DA as is the way in which DA concepts and approaches can be said for other types of training.

The importance of farmer involvement is also cited as a strength. Recently, a one-week farmer involvement action workshop was held in which reconnaissance methods of the DA and some modified field exercises were used successfully.

The DA is seen as a useful tool in helping professionals sort out symptoms and causes of problems. It also forces them to move beyond the one solution linear type of problem solving which often characterizes current approaches. The DA is viewed as confronting the notion that once a problem is solved it always stays solved. At the same time, the DA is seen as providing professionals with a great deal of satisfaction from their involvement in intensive field activities used in the training.

The DA training was also cited as allowing for innovations. The addition of the Women in Development component to the Ghopal workshop has been instrumental in helping Indian officials understand more about WID as well as the role of women in irrigated agriculture.

Areas for Improvement. Suggestions for improvement in the Diagnostic Analysis training workshops were noted in the following areas:

- Be more flexible in terms of changes that can be made. For example, more focus may be needed on the main system. Can a DA be done using both the main and on-farm system? Could a DA be developed for main system managers, designers, researchers?
- Reconsider using DA only as a demonstration training approach.
- Reconsider the need to have host country staff to visit the USA for a final report. Can it be done in-country with less TA?
- Be more flexible about the end product. In many places, it is more useful to develop an action work plan.

- Reduce the cost, where possible. Especially in a country where the DA workshop has been given before, utilize those already trained and reduce TA staff.
- Assure that those trained will actually utilize the training. In the two earlier workshops in India, there was no program, place or plan to utilize them. Now, five trainers are in the STIs in Gujarat and Rajasthan.
- Develop a follow-on training course on development of solution, assessment of technologies, farmer organization and monitoring of systems.
- Improve follow-up on all participants in DA training and build them into a regular information transfer system.
- Provide more manuals and training materials to Missions for distribution. (The India Mission has made heavy demands on WMSP-II for materials and will continue to do so.)
- Improve and increase the how-to-do it Volume II Manual and greatly improve the management and rural sociology methods part.
- Move beyond DA to development of solutions (DOS). At some point, the practitioner must be ready to provide prescriptions.

SECTION VII: RECOMMENDATIONS

A. Introduction

The DA workshop represents a valuable short-term training strategy for providing interdisciplinary training in irrigation management in developing countries. To improve the implementation and enhance the effectiveness of the DA workshop, this section of the report presents a series of recommendations to improve the methods and materials used in the Diagnostic Analysis workshops. As noted in earlier sections of the report, the mandate of this formative assessment was to :

- chart the evolution of the Diagnostic Analysis workshops;
- note the current objectives and compare them with the DA workshop outputs;
- seek ways in which to improve the materials and methods used in the workshops; and
- search for ways in which to enhance the overall impact of the DA workshops.

The last item implies an overall assessment of the appropriateness and potential of the Diagnostic Analysis workshop in view of which recommendations for enhancing the overall effectiveness of the program can be made. The overall value and potential of the workshop was assessed on the basis of the program structure, materials, knowledge conveyed to the participants and the impact.

Recommendations presented in this section vary in terms of level of effort necessary for their implementation. On one level, there are recommendations that can be achieved with a minimal investment of human and financial resources on the part of the contractor, CSU. Attention to these

suggestions by a WMS II training team can make a major difference in the day-to-day functioning of a DA workshop.

A second level of recommendations requires greater expenditure of human and financial resources, yet expenditures remain modest compared to the possible costs associated with not implementing the recommendations. Suggestions made at this level affect the overall planning and implementation and have long range effects on the impact of the DA workshop.

A third level of recommendations requires a large institutional commitment to change and to providing funds and staff time to implement the suggested changes. Several of these suggestions have to do with sustaining the long-term impact of a DA workshop and increasing LDC government and AID mission co-operation with the Water Management Synthesis II Project.

Recommendations are grouped under the following headings:

- Methodology: Formal Classroom, Preparation for Detailed Studies and Detailed Studies Components
- Materials: Formal Classroom and Preparation for Detailed Studies Components
- Special Training Issues:
 - Integration of New Trainers
 - Formative Evaluation
 - Co-Trainers
 - WID Component
 - Pre- and Post-Testing

This assessment is based on the 1984 Sri Lanka DA workshop. It is appropriate to note that the workshop operated under several budgetary and operational constraints. The funding for this particular workshop was only 40% of the usual funding and did not allow for pre-workshop preparation and

orientation for the training team in the U.S., as has been done for other workshops. Also, the training team had to train 42 participants, as opposed to the original 25 participants planned for. The core training team included one Sri Lankan and a graduate student because of lack of funding. Only two of the five disciplines had full-time counterpart trainers. Thus, team integration, facilities, and co-trainer involvement were limited.

B. DA Workshop Methodology

1. Greater integration of disciplinary subject areas is needed to enhance teaching the interdisciplinary approach (third level). Presentations, videos and reading materials on the development model and diagnostic analysis are designed to set the stage for subsequent input by individual disciplines. Disciplinary focus on physical and socio-economic subsystems received varied degrees of emphasis due to the individual expertise and experience of the trainers, and the inherent differences among disciplines and their relevance to water management. There was a need for improving the degree of integration among the disciplines in the 1984 Sri Lanka DA workshop. Better integration could be accomplished by a closer matching of trainers on the basis of philosophy and work experience, and by increasing planning and meeting times for trainers. More discussions of the course content in view of the workshop objectives and the characteristics of the irrigation system selected for the workshop can enhance the interdisciplinary focus of disciplinary presentations and subsequent field studies.

2. Guidelines on key elements of the interdisciplinary approach should be developed and included in a trainers' guide (third level). To further ensure better integration among disciplines, important elements that

illustrate an interdisciplinary irrigation management study should be identified and listed. These elements should be communicated in every appropriate presentation. Such guidelines would give trainers constant reference to what they ought to be promoting and how to promote it. An interdisciplinary training guide would prove particularly valuable for first-time workshop trainers. The WMS II Project has begun preparing such a guide.

3. Greater use should be made of participatory training methods in the DA workshops (first level). Participatory methods engage the learner, are more effective than lectures relative to the apparent objectives of the DA workshop, and can make concrete such abstract concepts as teamwork and the interdisciplinary approach. Participatory methods can close the distance between and among trainers and participants.

Specific recommendations as related to the 1984 Sri Lanka DA workshop are as follows:

- Use more culturally relevant references, and use participants more as resources.
- Use small group exercises to encourage trainers and participants to become familiar with each other during the first few days of the workshop.
- Consistently post daily agenda and objectives, and explain them at the start and close of each day.
- Clearly communicate the rationale for any changes in the team study program to participants in the event of operational constraints.
- Do more brainstorming and obtain more participant input when preparing the questionnaires.

4. The WMS II Project should develop an institutional training of trainers strategy for improving the overall training capacities of its

training teams (third level). Teaching in a university setting and training adults in short-term training courses LDCs are two very different activities. Each requires different skills. In the 1984 Sri Lanka DA, skills and strategies varied, with some trainers proving more effective than others.

A training of trainers workshop for WMS II trainers could demonstrate how to determine learning objectives, plan training activities to meet them, and develop training materials. WMS II trainers could be provided training in participatory training methods as well as how to develop and use appropriate training materials. WMS II is currently planning such a workshop.

5. There is a need to better integrate the choice of training materials and methods with the objectives of individual presentations (first level). If time and effort are invested in choosing materials that reinforce lecture presentations, basic concepts and knowledge are easier to present. This might be accomplished by:

- identifying the instructional objectives for each session and clearly stating the desired learning outcomes; and
- choosing the methods and materials which best contribute to the realization of the learning objectives and the desired learning outcomes.

6. Procedures and scheduled time for processing field experiences should be more formalized than in current practice. As the DA workshop is currently organized, field study teams have few organized opportunities to process the field experience as a team. Without these opportunities, a team's ability to develop an interdisciplinary perspective is restricted.

This situation could be improved by developing a format which will help the team examine fieldwork from an interdisciplinary perspective at regularly scheduled times. In addition, the interdisciplinary perspective could be

enhanced by designating co-trainers to facilitate team discussion on a day-to-day basis.

7. Existing data synthesis procedures and formats should be further developed and assembled for participant use during the field study. Data synthesis procedures should be used which draw on participants' knowledge and which are understood by all participants. Each person should know the how and why of any format used. Additional training in data interpretation could enhance participants' abilities to develop interdisciplinary reports at the end of the field study period.

C. DA Workshop Materials

1. Greater attention should be paid to the choice of technology for learning materials (third level). Relying on electrical equipment for the 1984 workshop calls into question how applicable the training materials are to a wide range of training settings and necessitates providing back-up materials in case there is a power loss. Time and effort should be devoted to examining and producing back-up teaching/learning materials which do not depend on electrical equipment. Such development might provide participants with training materials to use in subsequent DA-related training activities in the field.

On a more practical level, trainers should never have to be concerned about whether or not writing surfaces are available. There are times when overhead projectors and blackboards are not available. The training team should bring flipcharts and newsprint with them to use if they are not obtainable locally. It should be noted that past experiences of WMS II with the reliability of electricity and audio visual equipment has been good. In

the 1984 Sri Lanka workshop, power failure and equipment breakdown occurred more frequently.

2. Training materials should actively encourage participation, invite learning, and be based on principles of adult learning (third level). Learning materials for the DA workshop should accentuate the action-oriented nature of the DA approach more than was the case in the 1984 workshop. While conveying information on specific concepts is an important part of the DA, it is important to prepare participants to work in an interdisciplinary mode, which may well be new to them. Materials should encourage participation, place value on the participants' level of knowledge, invite action and reflexion, and provide an opportunity to work in both small and large group settings. Above all, materials should provide participants an opportunity to process what they have learned, especially concepts which may be new to them.

Response to this issue requires an institutional commitment by WMS II and financial commitment by the funding agency to hire a training/materials development specialist to work with WMS training staff on the phased development of new and/or revised training materials which address the issues of adult learning and participation.

3. A WID section should be developed for the training manual if the WID component is to be continued in the DA workshops. Although the recently revised training manuals are an excellent resource, they contain no information on the WID component. WID should be approached in the organized way that other disciplines or components are approached. Materials for WID should be developed in both handout and bound manual form. A WID video could be produced to depict how the WID component interacts with other workshop components.

4. Consideration should be given to the production of additional materials in national languages (third level). National language materials can be used effectively to support English language presentations. In addition, materials available in national languages can disseminate information on the DA concept to a larger audience.

5. WMS II needs to revise a number of videotapes and develop new videos and training material (third level). A number of essential videos that are designed to illustrate the concepts and methods of Diagnostic Analysis and the role of various disciplines in DA need to be revised to improve the visibility of diagrams and other visual material. Professional narrators may need to be used to improve the quality and effectiveness of the presentations. In particular, there is a need for developing a videotape on teamwork and for expanding the videotape on the role of women in development. A detailed suggestion for preparing a teamwork video is contained in Appendix C. The WMS II Project previously proposed this action.

D. Special Training Issues

Integration of Trainers

1. More attention should be given to effectively integrating new trainers into the WMS II core training team, thus ensuring that each trainer thoroughly understands DA principles and shares in the basic philosophy of the DA workshop (second level). More effective integration of new trainers into the DA workshop could be substantially enhanced by organizing a data archive focusing on country-specific research literature on water management practices. While the two training volumes produced by WMS II can convey a good idea of the DA approach, there is a need to archive a collection of

handouts, outlines of lecture notes, training exercises and papers presented in previous DA workshops. A central file should be organized for each discipline and made available early enough before departure to facilitate building upon earlier efforts. A follow-up exercise to determine the value and mastery of these materials could be a part of the usual pre-trip orientation for new trainers.

2. WMS II should develop guidelines for trainers' roles and incorporate them into a trainers' guide. Trainers should receive guidelines that identify what is expected of them during each portion of the DA workshop. This will encourage better preparation and consistency. Although guidelines should be kept flexible to meet changing strategies, they should stress methodological differences among approaches suggested for use by the various disciplines. A trainers' guide is under preparation.

3. The WMS Project should consider the value of adding either a part- or full-time training specialist to the WMS II team (third level). Running a training program is a full-time job. A training specialist could coordinate the pre-training phase of training, travel with a content specialist to prospective training sites, and negotiate for logistical and other resource support. The training specialist assist WMS II staff with training methods and with using and developing training materials. The part- or full-time trainer could lead in-house workshops for WMS core training staff on micro-teaching, discussion facilitation, needs negotiation, interactive uses of video, cross-cultural communications, and other pertinent topics. He or she could establish an archive of training materials and methods. At a training site, the specialist could help coordinate the workshop, be responsible for formative evaluation exercises, chair staff meetings, manage

logistical and resource issues, and assist the team with other issues as necessary. He or she could also conduct follow-up to training including evaluating results and measuring impact.

Formative Evaluation System

1. WMS II should institute a formative evaluation system for the DA workshops (second level). Formative evaluation activities should be developed for each phase of the DA workshop--pre-training, training and post-training. A list of important events that should be monitored by a formative evaluation system is contained in Appendix F.

Evaluation data should be collected on a regular basis and stored in an easily retrievable fashion to provide a cumulative record on DA workshops. Evaluative data should be collected regularly on the successes or failures of specific training materials and training methods. Training teams, both WMS II and host country co-trainers, should be regularly debriefed. Participants should be actively involved in the evaluation system which is implemented.

2. Regular staff and planning meetings needed in the 1984 Sri Lanka DA should become a formalized aspect of each DA training workshop (first level). Training staff meetings give trainers the opportunity to examine training activities to determine if objectives are being achieved, to take corrective action when they are not, and to provide for greater consistency throughout the training activity. Staff meetings should include simple formative evaluation exercises which determine what is going well and what needs improvement in the workshop. Staff should meet daily if possible.

Co-trainers

1. Co-trainer travel to the U.S. for pre-training planning and orientation should be reinstated (third level). To reach their full potential as DA workshop trainers, co-trainers should receive in-depth training at CSU. Co-trainers, while at CSU, should build their general capabilities, have adequate time to become sensitive to DA philosophy, and be integrated into the WMS II training team. In addition, spending time at CSU allows co-trainers to contribute to proposed training strategies, thus ensuring cultural relevance. Co-trainers can familiarize themselves with DA workshop methods and materials and have access to the DA archives. During pre-training activities, they could also work with WMS II trainers to develop special learning materials relevant to the host country. This facet of the program requires the cooperation of the host country and the donor agency.

2. If no U.S. orientation is provided, as a second choice, co-trainers should receive an orientation to the DA workshop before the workshop begins (third level). A one- to two-week orientation period for co-trainers should take place in the host country. Workshop and discipline objectives should be reviewed in detail. Trainers should familiarize themselves with the skill and language levels of each co-trainer before training starts. By doing so, co-trainers can make a better contribution to the workshop. However, this approach to co-trainer orientation/preparation probably cannot accomplish the same level of learning and commitment by the counterparts as the first approach.

3. An expanded role for co-trainers during the workshop can contribute to the further development of host country capacities in Diagnostic Analysis (first level). Co-trainers are a valuable resource and contribute

significantly to the success of DA workshops. The role of co-trainers in a DA workshop should be expanded, especially during the classroom segment. Even though the counterpart training team in the 1984 Sri Lanka workshop was incomplete and not present at the training site throughout the workshop, a stronger attempt should have been made to include them in trainers' team meetings whenever possible. Usually, all trainers and co-trainers participate in workshop planning and assessment.

The value of having former co-trainers participate in additional DA workshops offered in their country is significant. By including former co-trainers, several training uncertainties experienced in past DA workshops should be avoided or, at least, substantially lessened. In-country preparation time could be shortened if co-trainers with past DA experience were used. Co-trainers would be more familiar with what was expected of them during the actual workshop, in their role as facilitators and translators, and when using training materials. WMS II tried to accomplish this in both 1983 and 1984 Sri Lanka DA workshops with limited success. Assistance from USAID missions and host country governments is necessary to achieve this.

WID Component

1. More effort should be devoted to building up a library of printed reference materials on the role of women in irrigated agriculture for use in the WID component (second level). The major purpose of the library would be to provide WID participants with reference and training materials on the role of women in irrigated agriculture. This library should include well known WID research and documentation, and training materials tested and proven in the

field. An attempt should be made to identify documents that second language speakers of English can easily read and understand.

2. The Women in Development component should be more fully integrated into the total workshop (third level). All disciplines need to be sensitive to the role of women in irrigated agriculture as WID issues cut across disciplines. Integration could take place by consciously including references to WID during other discipline presentations to the general audience and during discipline-specific presentations to smaller groups of participants.

3. The process for the selection of the WID co-trainer must be strengthened if the WID component is to remain a viable part of the DA workshop (first level). Developing a job description for the WID co-trainer and a list of qualifications for the individual might be one way of helping collaborating LDC organizations to understand the kind of co-trainer needed and the desired qualifications of the individual. A suggested job description and list of qualifications for the WID co-trainer are presented as Appendix E of this report.

Pre- and Post-Testing

1. WMS trainers and workshop organizers should clearly understand the objectives of the pre-test activity prior to its planning and implementation (first level). With objectives for the pre-test clearly in mind, trainers and workshop organizers can plan the optimal use for pre-test results. If the desire is to use the pre-test to identify significant gaps in the participants' knowledge on a particular topic, the pre-test will and should take a specific approach to testing for the knowledge and making plans for using the information to modify training materials and/or methods. If the

objective is to report to participants how they have performed, then the pre-testing should be designed to provide appropriately verifiable test results and be more formally prepared and administered.

At the same time, trainers and workshop organizers should review the pre-test as it is constructed to be sure they are testing for information and performances which are in keeping with the objectives of the DA workshop. Review could be carried out easily at the time of the preparation of the pre-test by discussing workshop objectives with trainers and asking that trainers keep these objectives in mind as they prepare questions for the pre-test. By taking this approach, workshop organizers can assume that all trainers should be working toward the same pre-test goal.

2. WMS II should review alternative methods of pre-testing that may be more relevant or more appropriate, given the specific workshop objectives and the subject matter to be presented in the training activity (second level). A number of alternative methods exist for pre-testing training audiences. For example, role playing and discussion in small groups can "test" a group of trainees' comprehension or lack of comprehension of a concept. Such an approach involves all trainers in monitoring the discussions. Time needs to be allotted for small group presentations of role playing and the processing which is necessary afterwards. The advantages of such an approach to pre-testing are that the stigma of testing is removed, participants are asked to interact in small groups early on in the training, and trainers can begin to gauge the ability of the larger group to function in smaller, non-discipline groups. Another method which might be examined include having co-trainers administer the pre-test in the local language. Testing participants in their own language removes barriers associated with testing in English.

APPENDIX A

Questionnaires for DA Workshop Participants and Co-Trainers

1983-1984

QUESTIONNAIRE FOR DIAGNOSTIC ANALYSIS WORKSHOP PARTICIPANTS

Instructions

As a participant in a past Diagnostic Analysis (DA) workshop, your co-operation in responding to the following questions is greatly appreciated. Please read each question carefully, noting special instructions for each response. If the space provided for a response is insufficient, please continue your response on a separate sheet of paper.

International postal coupons have been enclosed for your convenience in returning your questionnaire, via AIRMAIL, in the envelope provided herewith. Your responses are confidential. In reporting data gathered through this questionnaire, no names will be used.

QUESTIONNAIRE FOR DIAGNOSTIC ANALYSIS WORKSHOP PARTICIPANTS

1. Name:
 2. Address:
 3. Telephone:
 4. Current Position:
 5. Approximate Dates of Training Workshop:
 6. Position at Time of Workshop:
 7. What was your assigned discipline during the workshop?
 - _____ Engineering
 - _____ Agronomy
 - _____ Economics
 - _____ Sociology/Extension
 - _____ Other (Please specify.)
 - 8.a. In what discipline did you receive your professional education or experience?
 - b. How many years have you used this discipline in your organization? _____
 9. At the time of the Diagnostic Analysis workshop were you directly involved in a water management project or scheme?
Yes _____ No _____
- If yes, what were your duties? (Please explain.)

10.a. How would you rate the various components of the DA workshop in preparing you to implement diagnostic analysis activities in your job site?

Formal Classroom Presentations:

1	2	3	4	5
Very				Very
Satisfactory	Satisfactory	Neutral	Unsatisfactory	Unsatisfactory

Field Work:

1	2	3	4	5
Very				Very
Satisfactory	Satisfactory	Neutral	Unsatisfactory	Unsatisfactory

Preparation of Discipline Report:

1	2	3	4	5
Very				Very
Satisfactory	Satisfactory	Neutral	Unsatisfactory	Unsatisfactory

Preparation of Interdisciplinary Report:

1	2	3	4	5
Very				Very
Satisfactory	Satisfactory	Neutral	Unsatisfactory	Unsatisfactory

b. If you marked any items unsatisfactory or very unsatisfactory, would you please explain what were your reasons?

11. At the end of the Diagnostic Analysis workshop, did you feel (check those which are appropriate)

_____ that you could return to your job and begin interdisciplinary research activities;

_____ that the training had been sufficient for you to implement some or all of the methods learned;

_____ that major changes would have to be made in your organization before you could implement what you had learned;

_____ that the DA concepts and methods did not apply to your water management system.

12.a. How would you characterize your superiors' reactions to your involvement/participation in the DA workshop? (check as many responses as are appropriate)

- totally supportive
- interested in adopting DA procedures
- unsupportive
- skeptical about usefulness of DA procedures
- interested in implementing interdisciplinary approach to studying problems in our water management scheme
- ambivalent

b. If your superior was not supportive, please explain what has happened?

13.a. How useful have the training manuals provided to you been in your work? (Check one for each column.)

	<u>Training Manuals Vol. I and II</u>	<u>Handbooks</u>	<u>Planning Guides</u>
Extremely useful	_____	_____	_____
Somewhat useful	_____	_____	_____
Not useful at all	_____	_____	_____
Have not had the opportunity to use them	_____	_____	_____

b. Please explain how the training materials have been useful or why they were not useful.

14. If you were asked to describe the primary goal of DA workshop, how would you characterize this goal? (check only one)

_____ training on how to do a diagnostic analysis of problems in a water management project

_____ research on problems in a water management project

_____ other (Please specify.)

15. How interested have your immediate supervisors been in helping you implement DA procedures?

_____ Extremely supportive

_____ Moderately supportive

_____ Unsupportive

_____ He has not talked with me about it

_____ Other (please specify)

16. Since the DA workshop have you been able to use DA procedures to establish an action plan for dealing with problems in your water management project?

Yes _____

No _____

If yes, please explain in detail. If no, why were you unable to do so?

17. Can you give an example of how the DA procedures have contributed toward greater farmer involvement in identifying problems in your water management project? (Be as precise as possible, citing levels of farmer involvement and results of that involvement.)

18. What would you consider to be the single most important element of effective interdisciplinary teamwork in water resource management? (Check all which are appropriate)

_____ Desire to establish effective communication with all disciplines and farmers

_____ Desire to learn from each other and farmers in particular

_____ Concentration on variables and relationships within one's own disciplines

_____ Respect for the contributions of each discipline

19. How can Diagnostic Analysis Workshop be improved to make it more relevant to the participants and organizations they represent?

20. Is the length of the workshop sufficient to accomplish its objectives?

Yes _____

No _____

If you responded no, please specify a more appropriate length for the workshop _____. (Why?)

21. How would you rate the following Diagnostic Analysis Workshop activities?

	<u>Very Satisfactory</u>	<u>Neutral</u>	<u>Unsatisfactory</u>
The workshop itself	_____	_____	_____
Follow-up by the Water Management Synthesis Project	_____	_____	_____
Follow-up by USAID/Mission	_____	_____	_____

22. Have you received the final report?

Yes _____

No _____

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23. If your answer to question 22 was yes, how do you rate the utility of this report for your country? (circle one)

Very Useful

Useful

Neutral

Not Useful

24. What type of support should the Water Management Synthesis Project provide after the workshop? (please explain).

25. If a review team were to travel to your country in January - February of 1984 would you be available for an indepth interview on your experiences with the Diagnostic Analysis approach to water resource management?

Yes _____

No _____

26. Do you have any additional comments you would like to make about the Diagnostic Analysis workshop or Diagnostic Analysis Procedures?

QUESTIONNAIRE FOR DIAGNOSTIC ANALYSIS WORKSHOP TRAINERS

Instructions

As a trainer in a past Diagnostic Analysis (DA) workshop, your co-operation in responding to the following questions is greatly appreciated. Please read each question carefully, noting special instructions for each response. If the space provided for a response is insufficient, please continue your response on a separate sheet of paper, noting the question to which you are responding.

For those of you overseas, international postal coupons have been enclosed for your convenience in returning your questionnaire, via AIRMAIL, in the envelope provided herewith. Your responses will be considered as confidential. In reporting data gathered through this questionnaire, no names will be used.

1-3/4

QUESTIONNAIRE FOR DIAGNOSTIC ANALYSIS WORKSHOP TRAINERS

1. Name:
2. Address:
3. Telephone:
4. Current Position:
5. Approximate Dates of Training Workshop:
6. Position at Time of Workshop:
7. What was your assigned discipline during the workshop?

- _____ Engineering
- _____ Agronomy
- _____ Economics
- _____ Sociology/Extension
- _____ Other (Please specify.)

- 8.a. In what discipline did you receive your professional education or experience?
- b. How many years have you used this discipline in your organization? _____
9. What was your role (or duties) in the DA workshop? (Please explain.)

10. At the time of the Diagnostic Analysis workshop were you directly involved in a water management project or scheme?

Yes _____

No _____

If yes, what were your duties? (Please explain.)

11.a. How would you rate the various components of the DA workshop in preparing participants to implement diagnostic analysis activities in your job site?

Formal Classroom Presentations:

1	2	3	4	5
Very				Very
Satisfactory	Satisfactory	Neutral	Unsatisfactory	Unsatisfactory

Field Work:

1	2	3	4	5
Very				Very
Satisfactory	Satisfactory	Neutral	Unsatisfactory	Unsatisfactory

Preparation of Discipline Report:

1	2	3	4	5
Very				Very
Satisfactory	Satisfactory	Neutral	Unsatisfactory	Unsatisfactory

Preparation of Interdisciplinary Report:

1	2	3	4	5
Very				Very
Satisfactory	Satisfactory	Neutral	Unsatisfactory	Unsatisfactory

b. If you marked any items unsatisfactory or very unsatisfactory, would you please explain what were your reasons?

12. At the end of the Diagnostic Analysis workshop, did you feel (check those which are appropriate)

_____ that participants could return to their jobs and begin interdisciplinary research activities;

_____ that the training was sufficient for participants to implement some or all of the methods learned;

_____ that major changes would have to be made in the participants' organizations before they could implement what they had learned;

_____ that the training was impractical given the constraints of participants' jobs.

13.a. How would you characterize your organization's reactions to your involvement in the DA workshop? (Check as many responses as are appropriate in both columns.)

<u>Before Workshop</u>	<u>After Workshop</u>	
_____	_____	totally supportive
_____	_____	interested in adopting DA procedures
_____	_____	unsupportive
_____	_____	skeptical about usefulness of DA procedures
_____	_____	interested in implementing DA study
_____	_____	neutral

b. If your organization has been unsupportive, please explain what has happened?

14. If you were asked to describe the primary goal of the DA workshop in which you participated, how would you characterize this goal? (Check only one.)

_____ training on how to do a diagnostic analysis of problems in a water management project

_____ research on problems in a water management project

_____ other (Please explain.)

15. Since the DA workshop have you had any further professional involvement with DA training or water management projects where DA procedures have been implemented?

Yes _____

No _____

If yes, please explain in detail. If no, why were you unable to do so?

16. If you responded affirmatively to question 15, how interested has project management been in helping you implement DA procedures? (Check only one.)

_____ Extremely interested
_____ Moderately interested
_____ Only slightly interested

17. Can you give an example from your own experience of how the DA procedures have contributed toward greater farmer involvement in identifying problems in your water management project? (Be as precise as possible, citing levels of farmer involvement and results of that involvement.)

18. How would you evaluate the preparation you received for your training role? (Circle a response for each item)

	Excellent			Unsatisfactory	
	1	2	3	4	5
Pre-Planning Phase	1	2	3	4	5
In-Country Planning	1	2	3	4	5
Training In Use of Technical Materials	1	2	3	4	5
Training for Field Work	1	2	3	4	5

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19. How would you rate the following Diagnostic Analysis Workshop activities?

	<u>Very Satisfactory</u>	<u>Neutral</u>	<u>Unsatisfactory</u>
Preplanning at Colorado State Univ.	_____	_____	_____
The workshop itself	_____	_____	_____
Report preparation at Colorado State University	_____	_____	_____
Follow-up by WISP	_____	_____	_____
Follow-up by USAID/Mission	_____	_____	_____

20. How can the Diagnostic Analysis Workshop be improved to make it more relevant to the participants and organizations they represent?

21.a. Please rate the utility of the final report for your country. (Check one response.)

_____ Very useful

_____ Not Useful

b. Do you have additional comments on the report?

22. What would you consider to be the single most important element of effective interdisciplinary teamwork in water resource management with Diagnostic Analysis?

_____ Desire to establish effective communication with all disciplines and farmers

_____ Desire to learn from each other and farmers in particular

_____ Respect for the contributions of each discipline

_____ Other (please specify)

23. For those of you overseas, if a review team were to travel to your country in January - February of 1984 would you be available for an indepth interview on your experiences with the Diagnostic Analysis approach to water resource management?

Yes _____

No _____

24. Do you have additional comments which you would like to make regarding the Diagnostic Analysis Workshop or Diagnostic Analysis Procedures?

APPENDIX B

Critical Issues for DA Review (Sept. 1983)

Critical Issues: DA Review

(Notes gathered from interviews at CSU, 9/26-30, '83)

HISTORY

Objective: Discuss DA objectives and present comprehensive overview of evaluation of DA training (including discussion of cost-benefits and cost-effectiveness)

Issues:

1. Historical consciousness
2. Existence of past evaluation documents
3. Relation to other elements of project
4. Washington/Ft. Collins relationship
5. CSU/USU/Cornell relationship
 - philosophies
 - practical applications
 - reports/recommendations
6. Collaboration - philosophical
7. Sociology versus anthropology as source of former impact
8. Cost-benefits/budgets for each DA training/cost-effectiveness

DA PREPARATION/PLANNING (in-country)

Objective: Analyze procedures for communication with USAID missions, host government and AID/Washington for:

- explanation of DA objectives, focus and content of possible DA technical assistance and/or training
- establishments of criteria for development and implementation of DA offerings and participant selection

Issues:

1. Poor communications/understanding about functions of WMSII
2. Non-adherence to establish criteria for participant selection
3. Expectations of what is to be delivered through DA assistance/training
4. Communication of expected outcomes
5. USAID mission and AID/Washington involvement in decision-making/decisions and DA objectives
6. Costs
7. Timetable related to preparation (six months)

DA PREPARATION/PLANNING (as CSU)

Composition of Core Training Team

Objective: Analyze procedures and suggest additional team-building strategies for core training staff (US and host country nationals)

Issues:

1. Non CSU team members
2. Need to increase CSU pool of trainers (Training of trainers)
3. Need to build working team which shares common philosophy
4. Use of host country expertise
5. USAID mission involvement in team composition
6. Core team briefing
7. Cost (travel/involvement of co-trainers)
8. Involvement of junior staff as team members
9. Use of trainers with no partial experience
10. WID - incorporating new disciplines
11. Involvement of individuals from other countries

Adaptation of Training Materials and Methods

Objectives: Develop systematic approach for reviewing existing training materials in order to adapt them to specific technical, cultural and linguistic needs of training sites and funding agencies (USAID missions/AID/Washington)

Issues:

1. Language (level and language of instruction)
2. Use of appropriate technologies
3. Appropriate mix of audio-visual with lecture and print materials (integration)
4. Logistical planning/materials procurement/method of shipment
5. Length of training
6. Core team familiarity with standards training materials
7. Training of trainers

DELIVERY OF TRAINING

Week 1 - In-Class Training

Objective: Review curriculum and suggest ways of efficiency of video, lecture and printed materials used in Week 1 formal training

Issues:

1. Treatment of all areas of expected skill development
2. Level of trainee participation in class activities

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Issues (continued):

3. Consistency in presentation in class activities
4. Acceptance of interdisciplinary approach
5. Anticipated participant/discipline expertise versus real expertise
6. Physical/technical constraints
7. Modeling role of training team
8. Time constraints/scheduling

Week 2-4 - Field Work

Objectives: Review direct training for field work, discipline training and implementation of fields work to suggest most efficient and standardized approach for carrying out activities.

Issues:

1. Training for data collection versus research
2. Developing new research instruments versus adaptation of existing
3. Action research versus research for publication
4. Control over decision-making process
5. Quantity of data
6. Quality of data
7. Availability of necessary equipment for field work
8. Logistical requirements
9. Sociology versus anthropology
10. Interdisciplinary work within teams
11. Role of co-trainers/trainers

Week 5 - Report Writing and Final Report

Objective: Review process for preparation of disciplinary, interdisciplinary and final report(s) in order to design options for report writing segments of DA training

Issues:

1. Data analysis capabilities of co-trainers and trainees
2. Research versus training
3. Research report versus action plan
4. Upper management involvement
5. Development of institutional capabilities
6. Costs (of different options)
7. Field use of computers and other equipment
8. Role of trainers/co-trainers in report preparation
9. Logistical support

IMPACT

Objective: Compare DA objectives to outputs of DA training and assess impact of past DA's on trainee behavior and former behavior via water resource management; middle management acceptance of DA concepts; and improved efficiency of management of irrigation systems

Issues:

1. Institutionalization of DA process/concepts
2. Existence of action plans based DA
3. Trainee non-performance in positions/projects
4. Former involvement
5. Lack of institutional and support mechanisms
6. Reports
7. Lack of information for funding decisions
8. Increased resources to do DA training
9. Training programs to increase impact
10. Existence of networks - co-trainers and/or participants

FOLLOW-UP

Objective: Review follow-up activities and procedures which foster continued use of DA techniques in water resource management.

Issues:

1. Acceptance and institutionalization of training outside CSU
2. Documentation support to DA participants
3. New training interface/support for DA techniques
4. Promotion of DA with USAID missions and AID/Washington
5. In-house evaluation/on-going

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APPENDIX C

Guidelines for "Teamwork" Video Revisions

Guidelines for Teamwork Video Revision

A substantively and technically sound "teamwork" video can contribute substantially to the success or failure of the social science role in the Diagnostic Analysis (DA) workshop. As a media catalyst, the video can foster effective disciplinary and interdisciplinary team building activities. In addition, the video can facilitate a better understanding of the important role that farmer participation and organization can contribute to more effective water management practices. For these reasons, a thoughtful review of the video presently used in the DA program should examine ways in which both substantive and technical components might be improved upon.

Substantive improvement. The video in use should begin with a "sales pitch" that draws upon the well documented successes of participation in a variety of cultural and work organization settings. Such consistency in the research findings of social sciences is rare. Successful experiments at the macrolevel (co-determination in West Germany, workers' management in Yugoslavia) should be briefly discussed. Similarly, microlevel activities (the Volvo experiments in Sweden, the organization of Japanese industries, organization a la William Ouchi and his Theory Z, Peter's and Waterman's In Search of Excellence) which emphasize the efficiency benefits of worker participation could also be helpful in selling the central ideas of teamwork. In short, the "magic black box" should give way to a more thorough going introduction emphasizing the wide ranging benefits that teamwork has brought about in diverse work settings, work groups and cultural milieux.

Water management. Having introduced the "participation hypothesis" in this broad, well documented context, the video can then move toward

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establishing the lessons learned in the cross cultural context to farmer participation in the specific context of water management. Among the many experiments in farmer organization in water management, the following should be reviewed and summarized:

- indigenously managed systems such as the subaks in Indonesia;
- the zanjerias in the Philippines;
- the water management program in Pakistan;
- the USAID start-up program in India; and
- the activities of ARTI and Cornell in the Galoya Project in Sri Lanka.

All provide fruitful, specific examples of farmer participation in water management. All provide ample corps cultural reference to make their inclusion meaningful to any developing country audience.

The discussion could proceed from a "lessons learned" perspective and should be balanced in emphasizing both successes and pitfalls of these well documented experiments (i.e., the efficiency benefits versus the negative consequences or "pseudo-participation," the problem of bureaucratic reorientation, etc). In sum, the substantive level of the video should be more sophisticated and accurately summarize the strengths and shortcomings of farmer participation in water management throughout Asia.

Technical improvements. An instructional media specialist can best address the most effective way to integrate music, diagrams and textual materials. The present video suffers much on this account, all too often lacking continuity between visual and audio activities. Clearly, a substantive specialist and an instructional media specialist must collaborate for an effective outcome.

APPENDIX D
List of Training Resources

Training Resources

- Center for Research and Education. Cross Cultural and Community Involvement Training. The Center for Research and Education, Estes Park, Colorado, 1969.
- John P. Comings. Participatory Communication in Nonformal Education. Center for International Education, University of Massachusetts, Amherst, 1981.
- Catherine Crone and Carmen St. John Hunter. From the Field: Tested Participatory Activities for Trainers. World Education, New York, 1980.
- Larry Nolan Davis. Planning, Conducting, and Evaluating Workshops. Learning Concepts, Austin, Texas, 1974.
- Ronald G. Havelock. The Change Agent's Guide to Innovation in Education. Educational Technology Publications, Englewood Cliffs, New Jersey, 1973.
- John D. Ingalls. A Trainers Guide to Andragogy, Revised Edition. U.S. Dept. of Health, Education and Welfare, Washington, 1972.
- Roger Kaufman and Susan Thomas. Evaluation Without Fear. New View Points, 1980.
- Malcom S. Knowles. The Modern Practice of Adult Education: Andragogy vs. Pedagogy. Association Press, New York, 1977.
- Rolf P. Lynton and Udai Pareek. Training for Development. Kumarian Press, West Hartford, Connecticut, 1978.
- Robert F. Maser. Preparing Instructional Objectives, 2nd Edition. Pitman Learning, Inc. Belmont, CA, 1962.
- Dennis W. Pett, Editor. Audio-Visual Communication Handbook. World Neighbors, Okalahoma City, Okalahoma.
- John C. Pontius. Field Training Through Case Studies. Center for International Education, University of Massahcusetts, Amherest, 1981.
- University Associates. A Handbook of Structured Experiences for Human Relations Training. Vols. I-VI. University Associates, Lajolla, California, 1972.

APPENDIX E

Job Description and List of Qualifications: WID Co-Trainer

WID Co-Trainer for DA Workshop

Qualifications:

BA/BS degree required. Agriculture or social sciences. MA/MS or post-graduate studies desirable in sociology, anthropology, economics, or political science.

Demonstrated interest in issues related to women in development, particularly agricultural projects.

Good English communication skills required; both written and spoken.

Educational background: Either a strong social sciences background with knowledge of agriculture; or, a strong agriculture background with knowledge of sociology.

Work experience: Experience in conducting field-level surveys, supervising field data-collectors, and preparation of technical reports.

Job Description:

WID co-trainer will assist WID coordinator in the training of WID participants in diagnostic analysis concepts and methods.

WID co-trainer will assist in the preparation and translation of a survey questionnaire for obtaining

information relevant to women's roles in irrigated crop production systems.

WID co-trainer will supervise the collection, tabulation, analysis and summary of data by the WID participants.

WID co-trainer will work with co-trainers from other disciplines to integrate WID data into an interdisciplinary report.

APPENDIX F

Key Events for Monitoring by Formative Evaluation System

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KEY EVENTS FOR MONITORING BY FORMATIVE EVALUATION SYSTEM

- Pre-training phase:
 - Negotiations for presentation of DA workshop
 - Involvement of funders, host-country work organizations and training institution
 - Identification of training goals
 - Identification of logistical needs
 - Identification of training site
 - Identification of number of participants to be trained and their characteristics
 - Determination of behavioral objectives for workshop and organizational inputs
 - Selection of training strategy
 - Selection of methods and materials
 - Design of formative evaluation system
 - Identification of training team
 - Identification of CSU co-ordinator and trainers
 - Identification of non-CSU trainers
 - Identification of co-trainers
 - Orientation of trainers and co-trainers
 - Finalization of methods and materials
 - Design of training agenda
 - Training team preparation for departure
 - Identification of all training materials to be taken
 - Double check that all equipment and materials are functional
 - In-country orientation at training site
 - Meeting of training team (CSU and co-trainers) to review strategy, materials, methods, participants, use of equipment and logistical concerns
 - Assignment of specific duties
 - Identify site for field studies and reconnaissance
 - Finalize all logistical needs and assign responsibility
- Training phase:
 - Implementation of training
 - Provide orientation for participants on first day
 - Conduct daily staff meetings for training staff (CSU and co-trainers)

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- Provide evaluation opportunities and incorporate feedback into program improvement
 - Develop training team responsibility for: orientation issues, reconnaissance planning and implementation, liaison with local authorities and field site personnel
 - Devote special attention to team building and discipline learning issues
 - Monitor equipment use and availability, transportation, food systems, housing conditions and participant morale
 - Make provisions for award ceremonies at end of training phase
- Post-training phase
 - Provide adequate base for follow-up activities
 - Assign responsibility to team members for follow-up activities
 - Implement evaluation activities as planned
 - Debrief training staff (both CSU and co-trainers)
 - Collect copies of all training materials for archives
 - Involve work organization and funding agency in follow-up
 - Address specific follow-up issues (provision of additional documentation and equipment, networking, etc.)
 - Prepare final report on training activities
 - Assign responsibilities for report preparation
 - Involve work organization and funding agency in report review
 - Prepare report for distribution
 - Make decisions on how to respond to specific recommendations derived from training experience
 - Implement action strategies for dealing with recommendations
 - Address needs for information on impact of DA training