HIS MAJESTY'S GOVERNMENT

MINISTRY OF WATER RESOURCES

DEPARTMENT OF IRRIGATION, HYDROLOGY & METEOROLOGY

IRRIGATION MANAGEMENT PROJECT

IRRIGATION MANAGEMENT CENTER

LOUIS BERGER/EAST CONSULT/CORNELL UNIVERSITY

KATHMANDU, NEPAL

HIS MAJESTY'S GOVERNMENT

MINISTRY OF WATER RESOURCES

DEPARTMENT OF IRRIGATION

IRRIGATION MANAGEMENT PROJECT

TRAINING REPORT NO 2

CONDUCT AND EVALUATION

OF THE

1987 SHORT TERM OVERSEAS TRAINING PROGRAM

VOLUME I MAIN REPORT

IRRIGATION MANAGEMENT CENTER

S. N. Shrestha, Director, IMC
V. A. Gillespie, TA Research & Training Specialist

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PREFACE

The professional development of His Majesty's Government of Nepal officials in irrigated water management procedures and practices is a major part of the Irrigation Management Center's activities. Within this professional development program, emphasis is placed on the development of the technical and organizational skills needed to get beneficiary farmers to actively participate in the management of their irrigation systems.

The conduct of the 1987 Short Term Overseas Training Program has proved to be an effective means for improving the participants' ability to work on and to solve irrigation management problems. They have also learned that these problems cannot be solved and conditions improved unless they have the ability to elicite active involvement of the beneficiary farmers.

Binod K Aryal
Acting Project Director
Irrigation Management Project

Shanti Nath Shrestha
Director
Irrigation Management Project

EXECUTIVE SUMMARY

The Irrigation Management Center (IMC), a component of the Irrigation Management Project, is responsible for the professional development of HMG/N officials in the procedures and techniques needed to solve their irrigation management problems. An important part of the IMC's professional development program is the sponsoring of short term study tours and training outside of Nepal.

In 1987, the IMC sponsored a total of twenty three participants for seven programs in four countries. Because the professional experience and background of the majority of these participants was in planning and construction, the goal of the 1987 program was to provide training in and exposure to as many aspects of irrigated water management as possible while maintaining a theme directly relevant to the partcipants' job responsibilities. They would then develop the basic knowledge and skills need to:

1) develop and implement improved water management programs, and

2) provide information on more narrowly defined and specific topics to be included in the 1988 Overseas Training Program.

In general, the participants were satisfied with the 1987 program. Among other things, they learned that the problems they face in Nepal are basically the same being faced by their colleagues elsewhere. They also noticed that in all countries and training much time was devoted to implementing water user involvement as one means of solving some of these problems.

LIST OF ABBREVIATIONS

AIT	Asian Institute of Technology (Thailand)
CEC	Continuing Education Center (Thailand)
DOI	Department of Irrigation
DRWRD	Directorate General of Water Resources Development (Indonesia)
FMIS	Farmer Managed Irrigation System
HMG/N	His Majesty's Government, Nepal
IA	Irrigation Association
IMC	Irrigation Management Center
IMP	Irrigation Management Project
ME&F	Monitoring, Evaluation and Feedback
NIA	National Irrigation Administration (Philippines)
O&M	Operation and Maintenance
RID	Royal Irrigation Department (Thailand)
SMD	Systems Management Division
TA	Technical Assistance
USAID	United States Agency for International Development
WUA	Water Users' Association

TABLE OF CONTENTS

(Volume I)

		PAGE
PREFACE		i
EXECUTIVE SUMMARY		ii
LIST OF ABBREVIATIONS		iii
I	INTRODUCTION	1
II	PROGRAM ACTIVITIES	3
III	PROGRAM EVALUATION	21
IV	CONCLUSION AND IMPACT	23

LIST OF ANNEXES

Annex I 1987 Short Term Oversees Training Program
List of Participants, Programs and Countries

Annex II 1987 Short Term Oversees Training Program
Evaluation Workshop Participants

I INTRODUCTION

A THE 1987 OVERSEAS PROGRAM

The Irrigation Management Center (IMC), a component of the Irrigation Management Project (IMP), is responsible for the professional development of His Majesty's Government, Nepal officials in the procedures and techniques needed to solve their irrigation management problems. An important part of the IMC's professional development program is the sponsoring of short term study tours and training outside of Nepal.

For all practical purposes, 1987 was the first year that the IMC organized and conducted a major Short Term Overseas Training Program. The IMC sponsored a total of twenty three participants for seven programs in four countries (please refer to Annex I, Volume I for a complete list of participants, programs and countries).

Because all of the 1987 participants had limited experience with irrigation water management, the program was designed to provide all participants with training in and exposure to a broad range of topics covering all areas of irrigation water management, and, especially for the tours, information in addition to that covered by the specific theme of the tour. This was done with the expectation that this broad exposure would develop their skills and awareness and enable them to provide needed feedback on what specific training programs would be most beneficial to them in the future.

B EVALUATION OF THE 1987 PROGRAM

The benefit and impact of the 1987 Short Term Overseas Program was evaluated in two ways. The first was to review the participants' reports (please refer to Annex I, Volume II, for Study Tour reports and Annex II for Training reports) and through informal discussions to gather additional information on opinions and impacts. A one day Workshop was also conducted in which the participants evaluated the 1987 program and made suggestions for the 1988 program.

The next section presents a brief description of each program and some of the benefits gained. The results of the Evaluation Workshop are then presented.

II PROGRAM ACTIVITIES

A STUDY TOURS

1 Thirteenth International Congress on Irrigation and Drainage

(a) Objective

To provide senior Department of Irrigation (DOI) officials with the opportunity to learn of recent developments in irrigation and drainage and to share experiences with peers and others concerned with irrigation water management.

(b) The Tour

The theme of the congress was "Improving Water Management in Developing Countries". The congress met in Casablanca, Morocco from September 20 through September 27, 1987.

Of special interest to the IMC sponsored participants were two key questions deliberated by the congress : (1) Rehabilitation and Modernization of Irrigation and Drainage Projects for Improving Water Management and (2) Improving Water Management Through Training. The first question explored issues directly relevant to the Systems Management Division (SMD) of the IMP, and the second, issues directly relevant to the IMC.

In addition, a special session was devoted to examining the role and integration of irrigation, drainage and flood control projects in the national development plans of developing countries, and a symposium was held on designing and operating irrigation systems having insufficient capacity to meet peak water requirements. There were also technical visits to irrigation related facilities, an exhibition of irrigated agriculture equipment, and demonstrations of computerized models and management games.

(c) Skills and Awareness Development

The participants noted that the subject of Rehabilitation and Modernization of Irrigation and Drainage Projects for Improving Water Management automatically introduces the matter of water

user involvement in the design, operation and maintenance of irrigation systems. This means that irrigation systems are not merely technical facilities, but socio-technical systems 'open' to the environment and interacting with it.' Just how to incorporate this 'human factor' involvement is complicated. It was pointed out that irrigation agencies must relinquish some of their prerogatives and begin entrusting user groups with responsibilities.

The discussion on Improving Water Management through Training stressed that training must be practical and field-oriented, with as much training as possible taking place in on-the-job situations rather than in the classroom. It was pointed out that the most effective training institutes were not associated with universities, but under the sponsorship of the concerned technical agency. Regarding the operation and management staff, it was noted that their formal education tends to emphasize planning and design with almost no attention given to O&M. It was suggested that it would be useful to orient training programs around the premise that water users and Operations & Maintenance (O&M) staff should be considered a single integrated unit whose objective is optimizing agricultural production.

In general, the IMC sponsored participants learned that the problems they face in Nepal are basically the same problems being faced by their colleagues in other countries. They also noted the fact that much time was devoted to questions on water user involvement.

2 Legislation Study Tour

(a) Objective

To provide the participants with the opportunity to learn of irrigation operations and user involvement legislation and of Water Users' Associations (WUAs) organizational structures and procedures in other countries. To share experiences with peers and others concerned with irrigation operations and user involvement legislation. This is to facilitate developing an effective legal framework for participatory irrigation management and irrigation users' organizations in Nepal.

(b) The Tour

Conducted from August 16 to September 8, 1987 in: Thailand (five working days), Indonesia (six working days), and the Philippines (four working days).

(i) Thailand

The legal framework governing irrigation use is old and no longer appropriate to the existing situation. There is a need to be sure of the implications and consequences of Government assistance to and intervention in Farmer Managed Irrigation Systems (FMISs). In Thailand, assistance and intervention has resulted in the Government taking over many O&M responsibilities.

In systems costing over US$160,000, the Government has tried to limit its involvement to the intake and main and secondary canals. Downstream facilities are the farmers' responsibility. They are trying to turn over to the users those systems costing less than US$160,000.

In general, cost recovery is about 20% of Thailand's O&M costs.

Multipurpose farmer cooperatives play a vital role in organizing farmer irrigation groups. Other inputs of agriculture help to organize and strengthen farmer groups in irrigation projects. This program of multipurpose cooperatives has already improved farm yields.

(ii) Indonesia

Indonesian irrigation systems have a long tradition of Farmer Management. Recently, there has been extensive Government intervention on systems of 500 ha and less, and where this has happened the level of farmer responsibility has gone down to the tertiary level.

Conflict resolution is by consultation, discussion and settlement rather than by adjudication.

The existing legal framework has some special features:

- Water is not owned, not even by the government. Whoever captures water is entitled to use it.

- There are no water charges.

- Government intervention is to improve traditional facilities and to construct main and secondary canals, leaving the tertiary and field channels for the farmers to improve.

- Government intervention to FMISs is without charge.

Indonesia is presently undergoing a controversy over imposing water charges. One group contends that having high yields and agricultural self-sufficiency is sufficient cost recovery. Another group states that the Government can no longer afford to bear the burden fo external debt by itself.

Indonesia is a country with an abundance of water, and it is not a good example for an arid or semi-arid countries.

(iii) Philippines

Every country carries its own legal legacy. Here irrigation water is viewed as a commercial commodity that can be bought, sold, and traded. Where water is viewed as a commodity, it may make the farmer users more prudent. This may be why the Philippines gets approximately 50% payment of its water charges.

(iv) General Lessons

Following are some of the general conclusions that might be drawn from this visit.

- Management of irrigation systems, being deeply rooted in the social and cultural fabric of a society, carries with it a legacy of its own.

- Due to the reasons mentioned above, irrigation systems in any country should be considered to need special treatment. Exchanging experiences, however, greatly facilitates understanding the other culture's behavioral patterns which helps in drawing conclusions.

- In South East Asia, emphasis is on a process of amicable settlement of irrigation issues rather than on adjudication.

- Much depends upon the availability of the resource. If there is an abundance, one can afford to waste or mismanage it. Whereas with scarcity one cannot afford to.

- Irrigation has to be seen as a participatory endeavor between the farmer and the government. No government managed irrigation system can be successful without the farmers' participation. In all three countries visited, efforts have been made to increase the involvement of farmers. It is the farmers who have to take the lead. The government's role is to assist their effort.

- Law should always be a vehicle for development, and it can make headway only when backed by programs. Otherwise, it becomes a nice piece of paper. It is no wonder to find in all three countries that to some extent the legal provisions have become obsolete and have been swayed over by development.

3 Operation of Run-of-the-River Irrigation Systems Study Tour

(a) Objective

For DOI and IMF personnel to become acquainted with the better performing Run-of-the-River irrigation systems in three South East Asian countries so that key factors of the successful programs, with adaptation, can be emulated in planning, designing, constructing and operating Nepali systems.

(b) The Tour

For twenty-five days from August 5 to August 29, 1987 in: Indonesia, Thailand, and the Philippines.

(c) Skills and Awareness Development

(i) Indonesia

The first day was devoted to an orientation by Indonesia's Directorate General of Water Resources Development (DGWRD) in Jakarta. Major points emphasized by DGWRD related to Water User Associations (WUAs) in Bali. This included WUA meetings and

administrative processes; water distribution rules; and agricultural practices.

Numerous projects were visited on both Java and Bali. In addition to discussions on the operation of these systems, discussions were also held on the role of WUAs and on WUA-Agency interaction. For example, the Pemali Comal Irrigation Project. The main and secondary canals were designed by the Government, whereas for tertiary development, planning and design, irrigation personnel consulted the beneficiaries for final approval of the work. Each tertiary block, 70 to 100 ha, has a WUA. The WUA operates the tertiary blocks according to Government policy.

Proper consideration is given to all of the physical facilities and organizational requirements that are necessary for successful irrigation. Performance of the irrigation systems, therefore, is better than in Nepal and attention is given to the farm level. Rarely are the systems mismanaged. This may be because of the good interaction that exists between agency staff and the farmers.

Distribution systems are such that a predetermined quantity of water is delivered. Most systems have lined canals and adequate facilities for the control and measure of flow at all strategic points, including the farm level. Water losses are minimal. If necessary, canal flow is augmented by diverting water from other sources. Where water is scarce, storage systems are developed.

Farmer organizations are strong, and they feel that their well-being depends on the system's performance. Hence, systems are well maintained and operated. The responsibility for O&M is shared between the DGWRD and the farmers.

No water tax is charged by the government. Farmer groups have their own rules for raising the funds needed for running the systems. In some systems, there is only a Government watchman residing at the headwork. He acts as a contact between the Agency and the farmers.

(ii) Thailand

The major points covered during the tour were: planning, O&M manpower requirements, Monitoring, Evaluation & Feedback (ME&F) activities, and communicating with farmers.

Most projects visited were of the storage type. These systems were originally run by the farmers to serve a limited area. The Royal Irrigation Department (RID) improved them. In most cases, a complete system was constructed so that a larger area could be irrigated.

The responsibility for O&M is divided between the RID and the farmers. Main systems of large and medium scale projects are taken care of by the RID and that of small systems by the farmers. On-farm level by O&M is taken care of by the farmers in all types of systems.

Water measurement throughout the entire system is practiced only in some projects. Structures at control points are used for flow measurement, and monitoring is done weekly. Water delivery is based on crop stage and time.

In small scale irrigation systems, the farmers are provided with information and advice by Mobile Units. Project site offices have system status boards displayed. The groundwater system toured is noteworthy. As water is costly, the system is properly planned and managed.

The RID conducts training for field staff and farmers involved in cultivating different crops. Booklets are distributed that explain: system operation, recommended agricultural practices, and rules to be followed for proper irrigation water distribution.

(iii) Philippines

Although national and communal systems existed before, it is only after the creation of the National Irrigation Administration (NIA) in 1964 that policies and strategies were formulated for a major government program to improve the standard of irrigation systems and to expand irrigated areas.

The NIA is divided into functional sectors. The actual implementation of construction and operations is carried out by the Regional Offices. Under the Regional Offices, the Provincial Irrigation Offices construct communal irrigation projects, render O&M technical assistance, and collect fees for pumps and communal systems constructed by the Government.

The NIA has given importance to the development of farmer irrigation organizations. The Community Organizers Program was developed by the NIA to promote the formation of farmers' organizations.

The NIA provides subsidized loans for construction to communal systems. The Irrigation Associations (IAs) have to be registered with the government in order to have legal recognition. IAs are required to contribute 10% of the construction cost. Construction is started only after the IA has signed a contract with the NIA stipulating that the IA will be responsible for system O&M.

To cover the cost of construction as well as the operation cost of irrigation systems, the NIA collects irrigation service fees from the beneficiaries. New collection procedures and strategies presently are being developed to increase collection. Fees are collected through the IAs. The IAs get an incentive payment if the collection efficiency is over 70%.

(iv) General Lessons

Efficient irrigation system management is possible only when the system has the necessary physical facilities and an active irrigation users' association. The best way to achieve efficient system operation is to motivate farmers to participate in management. The implementing agency should consider the farmers' needs and use their knowledge. Building an effective and active irrigation users' association, therefore, needs attention. Building these associations is an intricate process and achieving good results take time.

4 Familiarization with Thailand's Irrigation Training and Training Facilities

a) Objective

For the Director, Irrigation Management Center to gain exposure to training programs, procedures and facilities.

b) The Tour

Five days from July 20 through July 24, 1987, in Thailand.

c) Skills and Awareness Development

The USAID/Thailand Training Office was visited. The Training Officer recommended that IMC study tours and short term training (less than six months) be arranged and funded by project Technical Assistance (TA) because USAID Training Offices are best able to arrange long term training.

Kasetsart University has strong capabilities to conduct training in irrigation water management. There is a highly qualified group within the Faculty of Engineering, and they are able to draw on extension and training methodology experts as well as other experts in the University and from the government. Presently, Kasetsart University does water management training on a contract basis for the RID Training division.

The RID Training Division is about two years old. The Training Division has training sections for Construction, O&M, General Technical, Mechanical and General Administration. It is also responsible for operating the RID Training College which has a 3 year program for Irrigation Engineers.

They are still contracting out all of their training programs. Although the Training division contracts out their training programs and many programs are conducted at project sites, they have a modern four story office building where they prepare reports, plan programs, etc.

The O&M Training Section has developed and conducts three training programs. Their courses for Zonemen, Ditchriders and Agricultural Technicians are each 9 days long. Their course for Water Masters is one month. In 1988, they will start a program for training farm youths. For Project Managers, they conduct seminars on General Administration and Management.

Kasetsart University and RID often use the training facilities of the Government's Agricultural Extension and Training Center, Nakorn Phathom. The Center is used to conduct trainings and to produce training materials for the entire country. The Center is modern and complete. The classroom wing is two stories. Each floor has 6 air conditioned classrooms, each seating approximately 40 people. There are four, three story dormitories. One dormitory

is furnished with VIP apartments. There is also a large and excellent dining facility.

The main administrative building has a large publications room with 4 high speed printing presses; a TV and Video Studio for making training and extension films, a audio recording studio for making tapes and records; and a room for making photographic slides.

The Training Center staff stressed that while quality training could be conducted anywhere (given the availability of needed material and support), quality planning and training material preparation requires specialized, complete support.

The Continuing Education Center (CEC), Asian Institute of Technology (AIT) conducts a variety of short courses that are relevant to IMP's training needs. These courses are scheduled and are usually offered once a year. CEC will, however, arrange to conduct at anytime these courses if the requesting agency or institution will guarantee twelve participants (if fewer are sent the cost is still equivalent to sending twelve people).

The CEC staff stated that a training center's professional staff should consist of a small professional core group of experts. This group is responsible for developing and implementing programs using the talents of a larger group of outside Resource Persons.

In conclusion:

- USAID/Thailand Training Officer recommends that study tours and short term training (less than six months) be handled by project TA because USAID Training Offices are best able to arrange long term training.

- Kasetsart University's training for RID Water Masters concentrates on very few topics. The topics are directly related to the trainees daily job responsibilities. The techniques taught must be easily implemented by the trainees.

- Initially, a training program should concentrate on conducting one course. The course should be conducted repeatedly and improved. When the majority of the trainee population has

taken the course, then it is time to start another training course.

- Staff of the Agricultural Extension and Training Center emphasized that a training center is not an institute or a college. It should have a core staff, equipment and physical facilities to support and disseminate information on training and research programs underway throughout the country.

- A successful Water Users' Group formation program in Thailand is based on making sure that farmers have an economic reason to join together and to operate and maintain the irrigation system. They have found that most beneficiary farmers organize and manage well when they can truly see both main system performance improvement and economic improvement for themselves.

- AIT recommends that a training centers' staff should consist of a small professional core group. The core group is responsible for developing and implementing programs using the talents of a large group of outside Resource Persons.

- Even with excellent physical facilities and equipment, the RID Training Division has concentrated on developing only three regularly conducted training programs. They have done so in order to ensure that the programs will be of a quality to provide true benefit.

B TRAININGS

1 On-Farm Water Management

a) Conducted by

Continuing Education Center, Asian Institute of Technology, Thailand.

b) Duration

From September 7 through October 17, 1987.

c) Objective

To upgrade participants' ability to manage irrigation water by being able to:

- assess irrigation system potential for more economical and efficient operation
- evaluate water management problems at the block and field level
- make effective changes in irrigated agriculture land and water management practices, and
- have an understanding of water management training methods and research strategies in water management involving farmers and irrigation personnel

d) Content

- soil-water-plant relationship and soil moisture retention and uptake
- theory and determination of infiltration and hydraulic conductivity
- over view of On-Farm Water Management
- crop water requirement
- cropping pattern selection, design and testing
- design of On-Farm irrigation systems
- land capability classification
- physical-chemical properties of soil
- soil salinity and drainage
- land levelling
- irrigation scheduling
- evaluation of furrow, border and basin irrigation methods
- water allocation, scheduling and monitoring
- water management for rice and upland crops
- On-Farm extension methods
- economic evaluation of On-Farm irrigation systems
- Socio-economic aspects of On-Farm water management

e) Field Trips

A one day field trip to observe irrigation and agricultural practices in the Central Plain.

A five day practical field exercise to use what was learned in the classroom sessions.

f) Skills and Awareness Development

The training was a good presentation of the benefits of management. Water should be managed to get maximum yields. Yields cannot be increased simply by using more water. It can be increased by delivering of water at the right time, at the right place, and in the right amount. Thailand has started irrigation project management programs, and the results are good.

Land consolidation is a good program, but, in the present situation, it is difficult to do in Nepal. It is costly, and it needs the motivation of farmers (which takes time to obtain) Perhaps it can be started on a small scale somewhere so that farmers can understand the importance of land consolidation.

Soil is an important factor in water management and irrigation planning. The participants learned that the cropping pattern should be adopted to the water availability and the soil condition. They came to know in detail that it is essential to choose the type of crop as per the soil condition.

Participants observed that the Thai WUA program is giving good results. They are convinced of the importance of farmer participation in WUAs in order to get the full benefit from an irrigation project.

Participants are more knowledgeable about: calculating crop water requirements, making an irrigation schedule and evaluating the economics of on-farm irrigation systems and practices.

2 Training on Irrigation Water Management and on the Irrigation Management Information System

a) Conducted by:

National Irrigation Administration and NIACONSULT, Inc, Philippines

b) Duration

From September 26 through November 13, 1987.

c) Objective

(i) Irrigation Water Management portion - To increase participants knowledge and understanding of how to maximize irrigation use by:

- supplying the right amount of water to meet crop requirements
- making more effective use of rainfall
- reducing conveyance, distribution and on-farm losses
- adopting suitable schemes for distributing and applying irrigation water
- reducing drainage problems
- using return flow, and
- developing active participation by irrigators' associations

A secondary objective of the Irrigation Water Management portion of the course was to increase participants knowledge and understanding of how to promote increased production through:

- proper land use
- improved cultural practices, and
- better farm management techniques

(ii) Irrigation Management Information System portion - To increase participants knowledge and understanding of monitoring and evaluation programs through training in the:

- use of Input-Output Monitoring System
- use of Project Benefit Monitoring and Evaluation Systems, and
- use of Irrigation Management Information Systems

d) Content

(i) Irrigation Water Management portion

- data collection and use: hydrometeorological, agronomic, soil, system losses and system maps
- planning for system improvement
- implementing system improvement plans
- assessing and improving plans and schemes for sustained implementation
- main features of water management
- crop-water requirements

- effective rainfall
- conveyance, distribution and on-farm losses
- relationships between irrigation management planning variables
- methods of water distribution

(ii) Irrigation Management Information system portion

- establishing bench-mark agro-socio-economic profiles
- preparing and using agricultural development plans
- monitoring and evaluating agricultural development plans
- planning and using agro-socio studies
- planning and using farm management studies
- developing and using an Irrigation Management Information System

e) Field Trips

To various Regional and Provincial NIA offices and irrigation systems to observe and discuss water management, monitoring and evaluation, and farmer participation,

The following places were visited:

- Angat Maasim River Irrigation System, Bulacan
- Upper Pampanga Irrigation System
- Pantabangan Irrigation System
- Magat River Irrigation System
- Region I, Baguio
- Region III, Batten
- Region IV, Laguna
- Region VI, Iloilo
- Region VII, Cebu
- IRRI

f) Skills and Awareness Development

All participants in an irrigation system have to be alerted to keeping their system operational by practicing proper water management. Instead of increasing irrigated area by new projects, a systematic approach for monitoring existing systems is a means to keep the system operational.

A participatory approach by the beneficiaries in the form of irrigator associations supported by the Philippines Institutional Development Department is required in communal and Government systems. This approach develops a feeling of system ownership among the irrigators which lessens Government O&M costs.

Human resource development through training is a means to improve knowledge, skills and attitudes of personnel.

Last, it was emphasized that by introducing a written water law, it is easier for decision makers to decide the share of water to be made available to the irrigators and to resolve conflicts.

3 Management of Training Centers

a) Conducted by:

Continuing Education Center, Asian Institute of Technology, Thailand

b) Duration

From July 27 through September 4, 1987

c) Objective

To improve technical and financial planning and management capabilities of training center key personnel, and to improve their effectiveness in relating training activities to the overall corporate objectives of the organization.

d) Content

- systematic manpower development
- corporate analysis
- training plans
- job training needs
- job analysis
- cost estimate/budget of training plans and programs
- financial control
- hiring of consultants
- improving communication skills
- office management related to use of computers

e) Field Trips

- King Mongkut Institute of Technology, North Bangkok Campus
- Alta Telecom International Ltd, Bangkok
- Kasetsart University Extension and Training Office, Bangkok
- Institute of Government Administration and Local Development, Bangkok
- Bangsai Irrigation Project
- Kamphaeng Saen Irrigation Project
- Thai Airways, Personnel Development and Training Department, Bangkok

f) Skills and Awareness Development

Human resource development to improve knowledge, skills and attitudes through training is necessary for proper irrigation management. Training must be practical and field oriented, with as much as possible taking place in on-the-job situations other than in the classroom. The training institute, moreover, should be under the sponsorship of the concerned technical agency. Regarding technical agency staff, their formal education emphasizes planning and design with almost no attention given to O&M. It is necessary, therefore, that O&M orientation training programs be conducted.

Efficient irrigation system management is possible only when there is an active irrigation users' association. The best way to achieve efficient system operation is to train the farmers to participate in management. In doing this, the training agency must consider the farmer's needs and must use their knowledge.

It was emphasized that a training center's professional staff should consist of a small professional core group of experts. This group is responsible for developing and implementing programs using the talents of a larger group of outside Resource Persons.

Initial training programs should concentrate on conducting one course. The course should be conducted repeatedly and improved. When the majority of the trainee population has taken the course, then it is time to start another training course. This is done to ensure that the programs will be of a quality to provide a true benefit.

In conclusion, a training center is not an institute or a college. It should have a core staff, equipment and physical facilities to support and disseminate information on training and research programs underway throughout the country.

III PROGRAM EVALUATION

A THE WORKSHOP

The workshop was held on February 12, 1987. Most of the 1987 Overseas Program participants were able to attend (please refer to Annex II, Volume I, for a list of those attending).

First, the Workshop reviewed the activities of the 1987 program. In general, the participants expressed satisfaction with the programs. Some administrative and logistical shortcomings were highlighted and the individuals responsible indicated that any shortcomings would be resolved in next year's program.

It was emphasized that for study tours there had to be more time preparing the group for the tour. At least 2 or 3 days prior to departure, a workshop should be held to inform the participants of the purpose of the tour and what they are expected to achieve. This is to ensure that a focus is maintained throughout the tour.

B 1988 REQUIREMENTS

The remainder of the Workshop was devoted to planning the 1988 Short Term Overseas Program. The recommendations are presented.

1 For the IMP Headquarters Section

- training in irrigation system financial management

2 For the Operations and Maintenance Section

- methodologies for assessing repair and maintenance requirements
- designing simple and economical hydraulic structures
- managing irrigation water under conditions of fluctuating water supply
- monitoring, evaluating and improving on-farm water use
- developing farmer participation in essential structural improvements

3 For the Water Users' Association Section

- developing programs for participatory management irrigation
- WUA organizational design form the WUA perspective
- managing community resources from the socio-institutional perspective

4 For the Monitoring, Evaluation and Feedback Section

- monitoring and evaluation methodologies
- irrigation water requirements and water use; soil moisture physics; and estimation of irrigation scheduling variables
- data gathering and its methods. Also data analysis: water measurement, WUA formation and role in ME&F, and agricultural information

5 For the Irrigation Management Center

- person appointed to be Chief, IMC Training Section, should attend the CEC, AIT Management of Training Centers Course
- planning and design of different types of applied studies
- study methodologies
- data collection and analysis
- sample design
- report preparation and information dissemination
- conducting training needs assessment
- course design and instruction methodologies
- program evaluation

IV CONCLUSION AND IMPACT

A OVERALL PROGRAM GOAL

The professional experience and background of the vast majority of the 1987 Overseas Training Program participants was in planning and construction. Only one or two had previous work experience in irrigation water management. The goal, therefore, of the 1987 Overseas Training program was to provide training in and exposure to as many aspects of irrigated water management as possible while maintaining a theme directly relevant to the participants' job responsibilities. They would then develop the basic knowledge and skills needed for them to:

1 develop and implement irrigation water management programs, and

2 provide information on more narrowly defined and specific topics to be included in the 1988 Overseas Training program

B IMPACT ON SKILLS AND AWARENESS DEVELOPMENT

In general, IMC sponsored participants learned that the problems they face in Nepal are basically the same being faced by their colleagues elsewhere.

They noticed that in all countries and trainings much time was devoted to implementing water user involvement as one means of solving some of these problems.

All of the participants reported that they are more sensitive to the value and need of involving farmers at all stages of planning, design, construction and participation in O&M. Since their return, they have been working to involve farmers more and they have found that it makes their jobs easier. They are also aware of the need to be sure of the implications and consequences of Government assistance to and intervention in FMISs.

For the SMD, DOI, and other HMG/N participants, the training and tours gave them the basic knowledge needed to set directions in their work programs.

It was noted that a successful Water Users' Group formation program in Thailand is based on making sure that farmers have an economic reason to join together to operate and maintain the irrigation system. It was found that most beneficiary farmers organize and manage well when they can truly see both main system performance improvement and economic improvement for themselves.

The participants in the Legislative tour developed an awareness that the management of irrigation systems, being deeply rooted in the social and cultural fabric of a society, carries with it a legacy of its own. a legacy that requires a lot of skill and effort to change. They also noticed that in Southeast Asia the emphasis on a process of amicable settlement of irrigation issues rather than adjudication.

As a general note, the Legislative tour participants noticed that if water is costly. scarce or treated as a commodity, it is managed better.

In one form or another, the subject of training was a part of all of the programs and emphasis was placed on a number of aspects.

Training must be practical and field oriented. Training institutions must be under the sponsorship of the concerned technical agency.

Training programs should be based on the premise that water users and Agency O&M staff should be considered a single integrated unit whose objective is optimizing agriculture.

Training topics should be directly related to the trainees daily job responsibilities. The techniques taught must be easily implemented by the trainees.

Initially, a training program should concentrate on conducting one course. The course should be conducted repeatedly and improved. When the majority of the trainee population has taken the course, then it is time to start another training course.

A training center is not an institute or a college. It should have a core staff. The core group is responsible for developing and implementing programs using the talents of a large group of outside Resource Persons. It should also have the equipment and physical facilities to support all activities and to disseminate information on training and research programs underway throughout the country.

ANNEX I

VOLUME I

1987 Short Term Overseas Training Program

List of Participants, Programs and Countries.

A STUDY TOURS

1) Thirteenth International Congress on Irrigation and Drainage, Casablanca, Morocco

Mr M D Karki, Director General, Department of Irrigation

Mr G N Thakur, Project Director, Irrigation Management Project

Mr M L Agrawal, Project Manager, Mahakali Irrigation Development Project

Mr W J Leatham, LBII TA Team Leader, Irrigation Management Project

Mr J H Breslar, USAID/N Project Officer, Irrigation Management Project

Mr J T Davenport, USAID/N Chief Engineer

2) Legislation Study Tour to Thailand, Indonesia and Philippines

Mr S K Pant, Director, Department of Irrigation

Mr S N Upadhaya, Executive Director, Water & Energy Commission Secretariat

Mr B P Acharya, Under Secretary, Ministry of Water Resources

Dr U Gautam, EAST CONSULT TA Team Member, Irrigation Management Project

3) Operation of Run-of-the-River Irrigation Systems Study Tour to Thailand, Indonesia and Philippines

Mr B K Aryal, Director, Systems Management Division, Irrigation Management Project

Mr A L Shrestha, Chief, Monitoring, Evaluation & Feedback Section, Irrigation Management Project

Mr B D Mandal, Assistant Engineer, Eastern Irrigation Regional Directorate

Mr Ramji Prasad Upadhaya, Assistant Engineer, Command Area Development Project Western Gandak

Mr L P Ghimire, EAST CONSULT TA Team Member, Irrigation Management Project

4) Familiarization with Thailand's Irrigation Training and Training Facilities

Mr S N Shrestha, Director, Irrigation Management Center, Irrigation Management Project

Mr V A Gillespie, LBII TA Team Member, Irrigation Management Project

B TRAINING PROGRAMS

1) On-Farm Water Management Continuing Education Center, Asian Institute of Technology, Thailand

Mr N K Chaudhari, Assistant Engineer, System Management Division, Irrigation Management Project, Field Office, Parwanipur

Mr Binod Poudyal, Acting Engineer, Central Irrigation Regional Directorate

Mr L K Singh, Acting Engineer, Western Irrigation Regional Directorate

Mr Deepak Poudel, Assistant Engineer, Irrigation Management Project

2) Training on Irrigation Water Management and on the Irrigation Management Information System, National Irrigation Administration and NIACONSULT, Philippines

Mr B K Aryal, Director, Systems Management Division, Irrigation Management Project

Mr I C Adhikari, Chief, Operations & Maintenance Section, Irrigation Management Project

Mr S Manandhar, Chief, Applied Studies Section, Irrigation Management Center, Irrigation Management Project

Mr Pashupati Lav, Divisional Engineer, Western Irrigation Regional Directorate

Mr C M Tatar, Divisional Engineer, Narayani Zone Irrigation Development Project

3) Management of Training Center, Continuing Education Center, Asian Institute of Technology, Thailand

Mr S N Shrestha, Director, Irrigation Management Center, Irrigation Management Project

ANNEX II

VOLUME I

1987 Short Term Overseas Training Program

Evaluation Workshop Participants

Mr B K Aryal, Acting Director, Irrigation Management Project

Mr S N Shrestha, Director, Irrigation Management Center

Mr Pashupati Lav, Divisional Engineer, Western Irrigation Regional Directorate

Mr I C Adhikari, Chief, Operations & Maintenance Section, Irrigation Management Project

Mr N K Chaudhari, Assistant Engineer, System Management Division, Irrigation Management Project, field office, Parwanipur

Mr S Manandhar, Chief, Applied Studies Section, Irrigation Management Center, Irrigation Management Project

Mr A L Shrestha, Chief, Monitoring, Evaluation & Feedback Section, Irrigation Management Project

Mr L P Ghimire, EAST CONSULT TA Team Member, Irrigation Management Project

Mr J H Bresler, USAID/N Project Officer, Irrigation Management Project

Mr D Mulligan, Acting LBII TA Team Leader, Irrigation Management Project

Mr V A Gillespie, LBII TA Team Member, Irrigation Management Project