

PD-AAZ-713

NEPAL
Project No. 367-0153

IRRIGATION MANAGEMENT PROJECT MIDTERM EVALUATION REPORT

Kathmandu, April 1989

ISPAN ACTIVITY NO. 646B

ISPAN REPORT NO. 16

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

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The University of Arizona

**Nepal
Irrigation Management Project
367-0153**

ISPAN Report No. 16

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MIDTERM EVALUATION REPORT**

Kathmandu, April 1989

Prepared for the USAID Mission to Nepal
under ISPAN Activity No. 646B

by

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July 1989

Irrigation Support Project for Asia and the Near East
Contract No. ANE-0289-C-00-7044-00, Project No. 3-7631510
is sponsored by the ASIA/Near East Bureau
U.S. Agency for International Development
Washington, D.C. 20523

EXECUTIVE SUMMARY

The Irrigation Management Project (IMP) was initiated as a joint effort of His Majesty's Government of Nepal (GON) and the U.S. Agency for International Development (USAID) to increase the institutional capability of the Department of Irrigation, Hydrology and Meteorology [now Department of Irrigation (DOI)], other GON agencies, and farmer groups to develop and sustain efficient irrigation management practices.

To accomplish its goal, the project established two entities that were expected to be institutionalized within the Department. The first, a Systems Management Division (SMD) would have responsibility for operation and maintenance (O&M), water user associations and organizations (WUA), and monitoring, evaluation, and feedback (ME&F). The second entity is the Irrigation Management Center (IMC), a training and applied studies center. Technical assistance to both entities was to be provided by a USAID-contracted team that included Louis Berger International, Inc., Cornell University, and EAST Consult, a local consulting firm.

Under the SMD, field sites were to be selected as pilot laboratories for the IMP "learning process." In a series of steps, field activities would organize farmers and involve them in implementing a rehabilitation program designed to establish a sustainable set of operation and maintenance procedures under the responsibility of the farmers themselves.

Activities are now in progress in two sites, both "Agency-managed" irrigation systems: the Sirsia-Dudhaura system, in the Terai, and the Hande Tar system, in the hills. The first intervention will establish joint agency-user management; the second will be handed over to farmers completely.

The IMC has been established in temporary quarters at Pokhara, and construction is about

to begin on a permanent site. A number of training activities have been undertaken through the project, some directly through the IMP and others directly in the field. IMC staff are in place and are gaining experience in preparing and implementing training courses and applied studies.

Despite serious technical and staffing constraints, progress in implementing both SMD and IMC has been remarkable. A great deal of credit for the success achieved so far belongs to some dedicated and important staff, who are concerned with promoting the participatory approach to systems management so vital to IMP. Unfortunately, the overall quality of technical assistance support was not commensurate with this high level of commitment.

The Sector Program and other irrigation sector developments have qualitatively changed the environment in which IMP operates, as well as the demands made upon the project. This calls for a project redesign effort to amend the IMP, taking into account original objectives, new opportunities, and experiences to date. This option would take seriously the IMP's original institution building aspirations, modify them according to new sectoral opportunities and DOI's emerging needs, and develop and execute a new plan to achieve them.

SYSTEMS MANAGEMENT DIVISION

Still in an early stage, SMD has made noteworthy progress in developing the capabilities of some components. However, O&M, ME&F, and WUA sections tend to function as separate activities.

Until now the O&M activities have exclusively concentrated on essential structural improvements (ESI), rather than on O&M. Given the significant physical deterioration of the irrigation

systems at both Sirsia-Dudhaura and Hande Tar, implementing the essential structural improvements involved much more work than simply upgrading structures for flow control and water measurement. ESI has been little more than a rehabilitation program. Nonetheless, SMD engineering staff have clearly developed new attitudes toward participatory rehabilitation, and their work in Hande Tar indicates their commitment to adopting new field procedures consistent with these attitudes. However, their overall effort is constrained by limited support staff and their limited *irrigation* engineering experience and training.

The ESI in Sirsia-Dudhaura, based on a negotiated "wish list" from the farmers, has mainly involved canal cleaning, bank reshaping, constructing outlets and distribution structures, lining small sections for flow measurements, and installing new gates at Sirsia headworks. The estimated ESI cost at Sirsia-Dudhaura is Rs. 6,087,622. (Total expenditure as of March 15, 1989 amounts to Rs 3,780,571.) A procedure for contracting works to water user groups has been developed and warrants consolidation. However, innovations or changes in standard operating procedures need to be introduced to make the O&M process easier and more effective.

Hande Tar has suffered from serious landslide damage and has been out of operation for the last two years. Envisaged ESI works involve improving the intake structure, making major repairs of canal sections affected by land slides, and clearing silt, bushes, and small and medium slides from the canal intake to the end. Hande Tar farmers agreed to clean the canal and fulfilled their commitment, but the construction work to be done by IMP has not yet started.

Rather than start field work with a clear concept of desired performance objectives, SMD immediately focused on the civil works aspects of ESI. SMD needs to develop an overall strategy for implementing the O&M learning process in accordance with the project design.

The WUA section is making rapid progress toward developing water user organizations and has gained much experience in a short period of time. Implementation problems are generally identified quickly and corrections made. Water

user organizations have developed skills in mobilizing resources and resolving conflicts at both field sites. Staff appear to be sensitive to local conditions and patient with the implementation of this new concept. However, the section needs now to begin drawing up some general principles and consolidating lessons learned.

The ME&F section has only recently initiated its activities and has not yet coordinated its activities with other sections. It has developed a crop-cutting survey, which has been the section's major reporting vehicle. However, these reports fall short of IMP's information requirements and need to be improved. As part of this improvement, ME&F must become part of the O&M learning process, since the ME&F system should provide everyone in IMP with the information they need to manage and adjust the O&M system as it develops.

Experience gained in Sirsia-Dudhaura indicates that Association Organizers (AOs) working with farmers can improve watercess (water charge) collections by improving assessment records.

The integration of SMD's activities can best be achieved if the division implements the learning process approach. The O&M learning process is designed to develop knowledge about the internal workings of the irrigation networks so that appropriate operation and maintenance plans can be developed and used to spell out clear policies regarding the WUA and agency roles and responsibilities under the joint management and turnover concepts. If undertaken systematically, the O&M learning process should proceed as follows:

- Jointly with farmers, assess current system operations and limitations, determine reasonable performance expectations from interventions, and agree on indicators.
- Establish an operational plan to go into effect after improvements are made, incorporating monsoon and winter conditions.
- Develop agreement with farmers on maintenance requirements and limitations of each party.
- Jointly determine structural improvements required to obtain performance objectives.

- Agree on a division of labor between the agency and farmers.
- Design necessary structures in accordance with future O&M requirements.
- Implement construction with WUA oversight.
- Conduct a joint performance-testing exercise upon completion of civil works.
- Modify structures and/or O&M plans based on performance test findings.
- Monitor O&M plan to improve as needed.

SMD field operations are isolated from regular operations of the Regional Directorates, which limits the institutional learning of both the SMD and the Directorates.

RECOMMENDATIONS

The evaluation team recommends that

- the SMD implement the learning process approach;
- irrigation engineering assistance be provided to the unit;
- field activities be coordinated to provide proper focus on O&M, rather than rehabilitation;
- plans be developed for "phasing out" SMD's activities in each field site;
- assistance be provided to establish a viable ME&F system;
- SMD pay closer attention to synthesizing lessons learned and disseminating them to concerned agencies and departments; and
- steps be taken to integrate SMD and Regional Directorate activities, sanctioned by the DOI Director General.

IRRIGATION MANAGEMENT CENTER

Initial projections for developing the IMC were unreasonably high. Staffing problems have been constant, but there is now a core staff that needs to be strengthened considerably in order to perform as expected.

The importance of IMC activities, particularly training, have brought IMC to the forefront. Between March 1988 and March 1989, IMC organized 21 in-country training activities for 300 participants. Under the out-country component of the training program, 64 irrigation professionals attended a total of 20 short-term activities overseas, including short courses, conferences, and study tours during the year.

IMC has implemented an ambitious program of applied studies. However, time constraints and pressure to meet the 14 committed studies have caused IMC to emphasize quantity over quality. Because their numbers are inadequate to meet current demands, staff face difficulties in carrying out tasks, due to conflicts between research and training schedules. The full-time TA has not demonstrated the necessary research or management skills to create an interdisciplinary research team that can define a strategy and develop a coherent program to meet the objectives of IMC's applied studies section.

Although overall results have been encouraging, further progress is constrained by the fact that the IMC has not yet been institutionalized. Steps have recently made in this direction, however.

RECOMMENDATIONS

The evaluation team recommends that

- the IMC be institutionalized within DOI, under the Development Board Act, and given the flexibility in staffing and budgeting that will enable it to attract and retain highly qualified staff;
- appropriate assistance be given to help staff meet current training demands as well as undertake a staff development program;

- IIMI be invited to implement a cooperative program of staff development in applied studies;
- the IMC draw on external resources to offset staff deficiencies and absences due to long-term training, possibly arranged through close institutional collaboration with an existing water management training institute; and
- the IMC be located in Kathmandu, preferably in close proximity to the proposed training facilities in the new DOI headquarters, and the center at Pokhara developed as the first of a series of regional training centers under the national IMC.

SECTOR PROGRAM

The Sector Program and other irrigation sector developments have qualitatively changed the environment in which IMP operates, as well as the demands made upon the project.

The promulgation of Basic Needs targets has prompted a transformation of the irrigation establishment: a new direction has been articulated that contains the essence of IMP concerns for participation, O&M, and staff upgrading; a Sector Program has been initiated to implement the new direction and achieve Basic Needs targets; a consolidated Department of Irrigation has been created; and new legislation has paved the way for recognizing water user groups and associations.

IMP has contributed substantially to the Sector Program through the training of 22 association organizers (AOs) and overseers and 10 assistant engineers for the Irrigation Line of Credit (IDA) Program and 15 AOs for the Mahakali-II Irrigation Project (IDA); its support to the formulation of the new Irrigation Regulation; and its efforts in sector coordination.

The Sector Program offers opportunities for IMP to implement many of its ideas on a large scale and provide training for engineers and association organizers engaged in the program. Ultimately, the IMC will be called upon to implement the DOI's human resources development program. These opportunities also challenge IMP's ability to respond appropriately within its current framework.

The evaluation team believes that the Sector Program and associated events offer important opportunities that validate IMP concepts and build on IMP experience to date. These opportunities should not be lost.

RECOMMENDATION

The evaluation team recommends that in order to take advantage of the current situation and assist the DOI to undertake its transformation, the IMP be redesigned to incorporate new opportunities and relationships, the project time horizon be extended to at least 10 years, and an appropriate implementation strategy be developed that helps the DOI achieve the complete institutionalization of the SMD and IMC.

PROJECT MANAGEMENT AND TECHNICAL ASSISTANCE

The performance of IMP project management and technical assistance (TA) is the key to success or failure in meeting overall project objectives. The project was designed so that IMP staff, hired through DOI, are responsible for project execution. TA for developing project activities is provided by local and expatriate consultants (Louis Berger International, Cornell University, and EAST Consult). The TA is under contractual obligation to work with IMP/DOI staff on IMP planning and implementation. Specifically, it is to assist in implementing the SMD and establishing the IMC.

IMP's complex and ambitious objectives demand adequate numbers of staff with a high degree of technical competence and innovative spirit. TA is designed to support areas where IMP/DOI staff are weak and to assist them in developing skills they may lack. Providing enough high-quality staff to implement IMP activities has been a continual problem. Operations are running more smoothly now, but the project continues to suffer from manpower shortages, attrition, and deficiencies in technical assistance.

Lack of incentives has been a problem in attracting staff to the project. The project offers no job security, and salaries are based on the standard government pay scale. Highly qualified young engineers, in particular, are likelier to seek employment on more prestigious and lucrative construction projects within DOI.

Project activities demand a mix of different kinds of technical qualifications; engineering, social science, economics, agriculture, training, and research. DOI has taken positive steps to fill IMP/DOI positions with candidates from these disciplines.

Technical assistance has brought invaluable contributions to the project but has failed to provide the needed level of overall technical and intellectual leadership and managerial guidance. Internal relations among project elements and between project and TA staffs need to improve, particularly with regard to lines of authority and accountability.

RECOMMENDATIONS

The evaluation team recommends that

- USAID and DOI seriously review current staffing and implementation strategies in light of current needs, and make appropriate changes;
- communication patterns and lines of authority and accountability within the project be clarified and agreed upon by all parties—DOI, TA, and USAID/N;
- Project Management and DOI ensure that project positions are filled and that staff carry out their required duties;
- USAID and DOI explore ways to provide appropriate incentives to project staff; and
- Project Management develop a clear strategy to consolidate its experience, disseminate lessons learned, and develop linkages to the rest of the sector.

NEW STRATEGIC FRAMEWORK

The IMP Project Paper remains valid as a general guide for USAID involvement in the irrigation sector and, except for an ambitious development plan for the IMC, could be adequate if IMP were to pursue a narrow project approach. However, the irrigation environment has changed so rapidly since project design that keeping the present project focus would waste an important opportunity to help guide those changes.

The Sector Program offers the chance to work on the same issues identified in the Project Paper, but to do so within the expanded, dynamic framework of an agency being transformed. Meaningful input to this transformation process will require a longer time commitment than originally envisioned, as well as additional resources. Most importantly, it will require a different resource package than currently available and new relationships with a number of different players. The project should be redesigned to incorporate these major changes.

Content. Much of the content of SMD attention will remain the same: participation, O&M, resource mobilization, and system management. New concepts, however, would also be added—system turnover, system performance, and management skills. Likewise, the IMC will train DOI staff in technical and organizational skills, foster new attitudes, and undertake applied studies, as originally intended. However, the center will also conduct or oversee induction training for engineers and prepare other career development programs.

Focus. Although project content will be similar, the focus of attention will change markedly. The original Project Paper called for institutionalizing the SMD and IMC. Actual project activities, however, were focused more clearly on consciousness raising and on creating an appreciation of the concepts of participation, O&M, and in-service training, and demonstrating the value of these concepts. Consciousness has since been raised and official policies support IMP concepts; thus, the focus must now *really* turn to institutionalization.

For the SMD, institutionalization means becoming an administrative unit that develops policies, establishes operational procedures, and monitors activities and outcomes in a number of areas:

- participation
- operation and maintenance
- resource mobilization
- turnover
- performance monitoring
- water management

For the IMC, the focus on institutionalization has two dimensions. On one hand, the center will deal with problems related to making itself

a viable training and applied studies entity with qualified, committed staff. This is more challenging than originally conceived because it has been much more difficult to obtain staff than anticipated, while the demand for training far exceeds expectations. Thus, the IMC must both *develop* and *deliver* at the same time. On the other hand, the demand is soon expected to change qualitatively, as the DOI adopts a human resources development program. This broader concept will require IMC to develop planning, programming, and networking capabilities, in addition to those previously identified.

Moreover, an applied studies capability in the new context must go beyond the Project Paper's "rapid appraisals" to include policy analysis and technical trouble-shooting. To incorporate high-quality training and research skills, the IMC will need to evolve an internal division of labor, in which some staff specialize primarily (but not exclusively) in applied studies and others in training.

Approach. The new program will consist of two separate elements: one concerned with the SMD, the other with the IMC. In each case, the approach will be different.

Support to the SMD will cover two areas: continued involvement in field activities and work on policy and administrative issues. The first will continue present SMD activities, with modifications; the second will consist of high-level advisory input separate from, but drawing heavily on, resources made available in the Sector Program.

At first glance it might appear that this assistance will duplicate TA provided through the Sector Program, but such will not be the case. Central-level TA for the Sector Program will assist a number of different components, giving priority to achieving program objectives. In contrast, this effort aims to create a specific unit of the DOI, helping the unit to establish a visible presence in the department, assure the integrity of its purpose, and enhance its efficiency and effectiveness. This unit will be called upon to monitor different elements of Sector Program implementation; it cannot be expected to perform the watchdog function without some measure of independence.

IMC support will include both long- and short-term elements. For training, immediate needs

will be met by mobilizing available resources (Sector Program TA, local and international resource persons) to the extent necessary to prepare and deliver courses. The IMC has already gained experience in using this approach. Long-term staff development needs will be met through staff exchanges with other institutions, national and international; graduate-level training opportunities; and the recruitment of high-quality temporary substitutes. It may be feasible to execute this whole component through affiliation with an existing institution.

The applied studies program will be strengthened through a comprehensive resource-sharing arrangement with an established research institution. This system would provide a resident long-term advisor, short-term specialists, and opportunities for IMC staff to work collaboratively with the institution's staff in other locations.

Resources. The SMD component will include TA, commodities, long-term training, and programmable resources for field exercises. TA should consist of one long-term person directly contracted by USAID, as well as a long-term local team provided through a local contract. Short-term specialists will be obtained through USAID centrally-funded contracts.

The IMC component will include TA, honoraria, long-term training, equipment and supplies, and funds for curriculum development, training resources, applied studies, and dissertation research. TA for training should be arranged, if possible, through a comprehensive agreement with an existing water management/irrigation training institution that would place one of its staff at the IMC on a long-term basis. Short-term resources would be drawn from various sources.

TA for applied studies should be obtained through a cooperative agreement with IIMI, which would place a staff member at IMC on a long-term basis. This person will work directly with IMC staff in an advisory and training capacity, orchestrate the provision of short-term specialists, and arrange for IMC staff to work collaboratively at other IIMI locations. IMP would be responsible for defining terms of reference in collaboration with IIMI.

Implementation. A project redesign team should be fielded as quickly as possible. Simi-

larly, a cooperative agreement should be executed with IIMI for an introductory two-year period. In the interim, a resident training advisor should be contracted for a one-year period, presumably from a university or irrigation management training center. USAID should recruit an O&M engineer for an initial period of 1-1/2 years, and should execute a flexible local TA contract for a longer period.

RECOMMENDATIONS

The evaluation team recommends that

- contingent on suitable institutionalization of the SMD and IMP, USAID should commit itself to provide necessary resources over an appropriate time frame to support the establishment of these two entities as functional DOI units;
- in preparation, USAID and DOI should commission a redesign of the IMP, which would chart out a detailed strategy and

identify an implementation procedure suitable to achieve the institutionalization objectives of SMD and IMC;

- in the meantime, USAID should review existing TA arrangements and consider introducing the following TA package:
 - 1) an O&M engineer, directly contracted, to provide technical leadership and coordinate TA;
 - 2) a cooperative agreement with an established irrigation management training entity to provide a long-term training advisor to the IMC;
 - 3) a cooperative agreement with IIMI to provide a long-term advisor on applied studies;
 - 4) a direct contract with a local consultant to provide both long- and short-term TA;
 - 5) short-term expertise as needed through A.I.D. centrally-funded projects.

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ACRONYMS AND TERMS

ADB	Asian Development Bank
ADB/N	Agriculture Development Bank/Nepal
A.I.D.	U.S. Agency for International Development
AMIS	Agency-Managed Irrigation System
AO	Association Organizer
APROSC	Agricultural Projects Services Center, Kathmandu
DIHM	Department of Irrigation, Hydrology and Meteorology
DOI	Department of Irrigation
ESI	Essential Structural Improvements
FMIS	Farmer Managed Irrigation System
GON	His Majesty's Government of Nepal
HTIS	Hande Tar Irrigation System
GON	His Majesty's Government of Nepal
ICIMOD	International Center for Integrated Mountain Development, Kathmandu
IDA	International Development Association (World Bank)
ILAS	Institute of Agricultural and Animal Sciences, Rampur
IIMI	International Irrigation Management Institute, Sri Lanka
ILO	International Labour Organization
ILC	Irrigation Line of Credit
IMC	Irrigation Management Center (IMP)
IMP	Irrigation Management Project
ISP	Irrigation Sector Program
ISPAN	Irrigation Support Project for Asia and the Near East
JT	Junior Technician
LBII	Louis Berger International, Inc.
ME&F	Monitoring, Evaluation, and Feedback
O&M	Operation and Maintenance
PDSP	Planning and Design Strengthening Project (UNDP)
RID	Regional Irrigation Directorate
SDIS	Sirsia-Dudhaura Irrigation System
SAL	Structural Adjustment Loan
SMD	System Management Division (IMP)
TA	Technical Assistance
TRO	Training and Research Officer (local TA to IMC)
UNDP	United Nations Development Programme
USAID/N	United States Agency for International Development/Nepal
WUA	Water User Association
WUG	Water User Group
WUO	Water User Organization

GLOSSARY

<i>amin</i>	Land surveyor
<i>dhalpa</i>	Gatekeeper (ditch rider)
<i>panchayat</i>	Administrative and political unit
<i>pradhan panch</i>	Elected leader of <i>panchayat</i>
<i>sangh</i>	Water user association
<i>terai</i>	Belt of low plains that covers approximately the southern third of Nepal
<i>toli</i>	Water user group/organization

IRRIGATION SYSTEM CLASSIFICATION (DOI)

<u>Classification</u>	<u>Hill</u>	<u>Terai</u>
Small	< 50 ha.	< 500 ha.
Medium	50-500 ha.	500-5,000 ha.
Large	> 500 ha.	> 5,000 ha.

ACKNOWLEDGMENTS

The Irrigation Management Project evaluation was carried out under the auspices of A.I.D.'s centrally-funded Irrigation Support Project for Asia and the Near East (ISPAN). The evaluation team was composed of Mohamed Ait Kadi, K. William Easter, Jyoti P. Lohani, and Pamela Stanbury supplied through ISPAN; Zenete Franca of IIMI; N.S. Peabody, III of AID/W; and Mahesh Man Shrestha of the GON Department of Irrigation.

The team would like to thank the Ministry of Water Resources, the Ministry of Finance, the National Planning Commission, and the Department of Irrigation for their assistance and support during the course of the assignment.

Many officials of the GIN shared their time and insights with the team. Although there are far too many to list here, a few deserve special mention: Mohan D. Karki, Director General, Department of Irrigation; B.K. Pradham, Acting Secretary, Ministry of Water Resources; P.P. Dahal, Joint Secretary, Ministry of Finance; Binod K. Aryal, Acting Director, IMP; and Rishi Ram S. Neupane, Director, IMC; and their staff.

USAID/Nepal provided outstanding support to the team during a time in which basic transportation was almost impossible to secure. The team is particularly grateful for the assistance and support of Jon H. Breslar, IMP Project Officer, and Ram Thapa, his secretary.

BACKGROUND

1.1 The Irrigation Management Project

The Irrigation Management Project (IMP) was initiated in 1985, as a joint effort of His Majesty's Government of Nepal (GON) and USAID/N. The project goal was to increase the institutional capability of the Department of Irrigation, Hydrology and Meteorology (DIHM) [now Department of Irrigation (DOI)], other GON agencies, and farmer groups to develop and sustain efficient irrigation management practices. Increasing institutional capability was viewed as a means to increase the total agricultural production in Nepal's irrigation systems. Both agency-managed and farmer-managed irrigation systems are included in the project scope.

Project components. To accomplish its goal, the project was to establish two new institutional entities within DOI. The first, a Systems Management Division (SMD) would have responsibility for operation and maintenance (O&M), water user associations and organizations (WUA) and monitoring, evaluation, and feedback (ME&F). Under the SMD, field sites were to be selected for pilot interventions and for use as laboratories for the IMP "learning process." Activities are now in progress in two sites: the Sirsia-Dudhaura system in the Terai area and the Hande Tar system in the hills. A third field site is being selected.

The second component involved establishing an Irrigation Management Center (IMC) designed to conduct training and applied research activities in irrigation management. These activities are to support government agencies in planning and managing irrigation systems. The IMC, now established in temporary quarters at Pokhara in the Western Region, has begun training and research activities. Construction of a permanent facility in Pokhara is scheduled to begin in the near future.

Project implementation. The Department of Irrigation implements the project through temporary and permanent staff assigned to IMP. Staff are recruited through the department under the Ministry of Water Resources.

The project has a large technical assistance component. USAID/N contracted Louis Berger International Inc. (LBII) to provide technical assistance in implementing SMD and IMC project components. Cornell University and EAST Consult, a Nepali firm, provide short- and long-term technical assistance to IMP/DOI staff under subcontracts with LBII.

1.2 The Context of IMP

Country background. Nepal is a rugged and mountainous landlocked country with a surface area of about 147,200 square kilometers (58,000 square miles). The country is bordered by China (Autonomous Province of Tibet) on the north and otherwise surrounded by India. Nepal has an estimated population of almost 18 million, which has grown at a rate of 2.7 percent per year in the last decade.

About 16 percent of the surface area and half of the country's cultivated area of about 3 million ha. lies in the Terai, a strip at the north of the Gangetic Plain. The Terai contains 48 percent of Nepal's population and produces 70 percent of the country's agricultural output. The remainder of the population and economic activity are largely centered in the hills.

Agriculture dominates Nepal's economy. It accounts for 60 percent of gross domestic product and 70 percent of total export earnings, and provides a livelihood to almost 90 percent of a working population estimated at 7 million. Over 90 percent of the cultivated land is used

for foodgrain production, which grew at a rate of 2.2 percent per year over the last decade, resulting in a net reduction of per capita food production during the period. Meanwhile, cash-crop production grew at a rate of 5.2 percent per year.

According to most recent estimates, Nepal has about 832,000 ha. receiving some sort of surface irrigation and approximately 110,000 ha. irrigated by groundwater, out of a total potential irrigable area of 1.8 million ha. under agricultural use. Some 721,000 ha. is irrigated (surface) in the Terai and another 121,000 ha. in the hills.

Although the government has been involved in irrigation development for the last 30 years, irrigation is dominated by farmer-managed systems. Only about 28 percent of the 943,000 irrigated ha. is under agency management. While most of the farmer-managed systems fall into the small-scale category, the agency-managed systems are capital-intensive and mostly of medium to large size (see Glossary for definitions).

Project context. Poor performance of agency-managed irrigation systems is a persistent problem in Nepal. Out of 267,000 ha. covered under agency-managed systems, only 166,000 ha. (60 percent) actually receive water in summer, and only 78,000 ha. in winter. By and large, agency-managed systems have failed to achieve the desired impact on agricultural productivity and income. Three major reasons for this poor performance are system deterioration due to poor maintenance, lack of management effort by DOI staff, and inadequate agricultural support services. The emphasis for many years on large-scale agency-managed systems within the Department of Irrigation has led the department to ignore systems owned and operated by farmers. Furthermore, its bias toward construction has also led the department to neglect the increasingly important questions of management, and operation and maintenance.

The Irrigation Management Project was a response to this situation and a modest initial attempt to help reorganize priorities in the irrigation sector. The government's adoption of the IMP marked a first step toward developing and instilling an awareness of irrigation management issues, both within the DOI and in Nepal's the irrigation sector as a whole. But

when the IMP was initiated in 1985, it was considered yet another project in a portfolio of about 100 supply-driven (and largely construction-oriented) projects of the department. The fact that it was one of the DOI's only two institution building projects (the other being the Planning and Design Strengthening Project of the UNDP) was unappreciated by the department.

Important changes in the sector since IMP's inception. With the advent of the "Basic Needs Program for the Year 2000," the IMP began to receive greater attention. The program statement identifies irrigation as a priority sector for development and IMP emerged as a viable mechanism for strengthening DOI, given its mandate. Projects such as IMP that are oriented less toward construction and more toward institution building now receive much more support from the government than they did when IMP was designed.

The Basic Needs Program was a watershed in irrigation development that brought about many needed changes in the irrigation sector. Some important changes that followed bear on IMP:

- formulation of the Irrigation Sector Strategy and a demand-driven Irrigation Sector Program with World Bank, Asian Development Bank, and UNDP financial assistance;
- splitting of the Department of Irrigation, Hydrology and Meteorology into two departments: the Department of Irrigation and the Department of Hydrology and Meteorology;
- integration into the new Department of Irrigation (Ministry of Water Resources) of irrigation units formerly under the Ministry of Agriculture (i.e., Farm Irrigation and Water Utilization Division) and the Ministry of Panchayat and Local Development, respectively;
- reorganization of the Department of Irrigation into five divisions, among them a Small Irrigation and Water Utilization Division and a Planning, Design, and Research Division, the latter in charge of PDSP and IMP functions;

- creation of District Irrigation Offices as part of a decentralization package with a mandate to implement small-scale irrigation programs through a participatory management approach;
- issuance of a new Irrigation Regulation to institutionalize Water User Associations and Organizations;
- preparation of an action plan for the turnover of projects and for participatory management programs in relation to O&M and cost recovery; and
- intensified sector coordination efforts, following the Irrigation Sector Donor Coordination Meeting in February 1988.

Conclusion. The rapid changes in the irrigation-sector environment since the IMP was designed pose many challenges and opportunities. Sectoral changes have helped validate IMP's concerns and have brought the Irrigation Management Center (IMC) to the forefront. The importance of IMC activities, particularly training, has been considerably enhanced and the irrigation establishment now has high expectations for the IMC. The expectations are indeed overwhelming for a nascent institution only beginning to develop its capabilities.

Equally important is the shift of IMP functions from project to program status. This shift provides a step toward institutionalizing the SMD and IMC functions of the project within DOI. With improved donor coordination and interest in irrigation management issues, there

is now a better chance of pooling resources—both financial and intellectual—to help develop IMP functions.

While many new opportunities exist for IMP, its currently limited ability to respond to these emerging challenges is becoming apparent. The IMP is still learning how to implement the approaches in its mandate. Premature application of IMP lessons nationwide may result in a loss of credibility, and entering into full-scale implementation may also disrupt the critical learning process that IMP is trying to consolidate and build upon. Internally, IMP is still struggling with human resource constraints and has yet to find a permanent home within DOI. There is also growing recognition of the inadequacies of the original project strategy and implementation arrangements, given the dramatic changes in the sector. To avoid being overwhelmed by external demands while at the same time remaining reasonably responsive to the sector needs, IMP will have to develop a selective response strategy and carve out a sectoral niche that is sustainable and mutually compatible with the project's long-term institution building thrust.

With these changes in mind, the midterm evaluation team assessed the progress made in meeting project objectives and examined the ways in which IMP could address the new initiatives arising in the sector. IMP's overarching goals and purpose have not changed during the course of three years. However, IMP has found itself in a new position in the sector and needs to respond accordingly. The midterm evaluation was thus scheduled at a critical and appropriate time in the course of Nepal's irrigation development.

THE SYSTEMS MANAGEMENT DIVISION

The original objectives of IMP's System Management Division (SMD) involved three components: (1) implementing systematic operation and maintenance procedures; (2) facilitating the organization of water user groups; and (3) initiating monitoring, evaluation, and feedback procedures. These components were to be developed in field activities located at three systems operated by DIHM (now DOI). Small SMD units were also to be created at DOI's Regional Irrigation Directorates to support their field activities. The basic thrust was to support DOI as it developed systems management capabilities at different levels.

Currently the project has an SMD unit in Kathmandu that coordinates its field activities, but no presence in the RIDs. Two field sites have been selected for pilot interventions that integrate new management options: joint agency-farmer management and the turnover of management to farmers. The Sirsia-Dudhaura Irrigation System, built some thirty-one years ago, is an agency-managed irrigation system located in the Terai. This system is the focus for improving joint agency-farmer management practices in a potential command area of 2000 ha. The Hande Tar Irrigation System is a hill irrigation system, built some 15 years ago, that has a potential command area of 250 ha. At this site, the system will be turned over to the water users for management.

2.1 Operation and Maintenance

Objectives and expectations. Under SMD the overall objective of operation and maintenance (O&M) activities is to strengthen DOI's capacity to operate agency-managed systems economically and effectively by developing and implementing systematic O&M procedures. To do so, the project established an

applied/action research program to be carried out in the three IMP field sites. The foundation of this program is an O&M learning process that is intended to provide more-detailed knowledge about the internal operations of the irrigation system, document O&M needs, and improve agency and WUA capability for efficient and equitable water distribution. This process starts with joint (farmer/agency) assessment of the system and identification of essential structural improvements, which are intended to upgrade the irrigation channels and structures in order to provide the measurement and control ability to monitor on-line performance and develop effective operation and maintenance plans.

Organization. The O&M activities take place under the supervision of the O&M section chief in the Kathmandu IMP office, who reports directly to the SMD chief. Three engineers and three overseers currently work at Sirsia-Dudhaura; one engineer and one overseer are posted in Hande Tar. Technical assistance is to be provided by local and expatriate engineers from the technical assistance (TA) team.

Activities and achievements. Sirsia-Dudhaura and Hande Tar systems fall under the jurisdiction of DOI's Central and Western Regional Directorates, respectively. IMP's field activities in Sirsia-Dudhaura started in 1986, with the expectation that the Central Regional Directorate would collaborate on the field level through its Parwanipur Canal Division office. However, this collaboration did not materialize: the Parwanipur Canal Division continued to maintain and operate the system without reference to IMP activities underway. Ultimately, Sirsia-Dudhaura was formally "handed over" to IMP in October 1988. Hande Tar was also handed over to IMP, but the local staff of the Western Regional Directorate

(overseer, *amin*, and *dhalpas*) were integrated into the IMP with the understanding that the Regional Director would receive monthly reports on activities in the system. There are no formal linkages between IMP and the Regional Directorates that would allow the directorates to be directly involved in SMD's field activities, nor does IMP have linkages with the recently established District Irrigation Offices.

Until now, the O&M activities have concentrated exclusively on essential structural improvements. Given the significant physical deterioration of the irrigation systems at both Sirsia-Dudhaura and Hande Tar, implementing the essential structural improvements involved much more work than simply upgrading structures for flow control and water measurement. ESI has been little more than a participatory rehabilitation program.

The ESI in Sirsia-Dudhaura, based on a negotiated "wish list" from the farmers, has mainly involved cleaning canals, reshaping banks, constructing outlets and distribution structures, lining small sections for flow measurements, and installing new gates at the Sirsia headworks. An operational plan based on a water rotation between *tolis* (water user groups) is being tested this year.

Hande Tar has suffered serious landslide damage and has been out of operation for the last two years. ESI walk-throughs with farmer representatives and IMP engineers were conducted, and work was planned to improve the intake structure; make major repairs of canal sections affected by landslides; and clear silt, bushes, and small and medium slides from the canal intake to the end. Farmers of Hande Tar agreed to clean the canal and quickly fulfilled their commitment, but the construction work to be done by IMP has not yet started.

Assessment and conclusions. In Sirsia-Dudhaura, the canal cleaning has been done on only part of the main system. The remaining uncleaned portions of the canal substantially reduce the expected benefits from the other structural improvements because of the canal's limited discharge capacity. The lifting mechanism of the newly installed gates at Sirsia headworks is poorly designed and difficult to operate. The head regulators in the main canal have staff gauges upstream and downstream and can be used as flow-measuring structures.

Thus, other measuring devices are not needed in their immediate vicinity and could have been installed in other strategic locations of the system. Given the cross-sectional dimensions of the canals, flumes are more appropriate for regular flow-monitoring in these canals than are current meters in the lined sections. The concrete stoplogs used as check structures are so heavy that the farmers will find them difficult to manipulate. No innovations or changes in standard operating procedures have been introduced to make the O&M process easier.

SMD engineering staff have clearly developed new attitudes toward participatory rehabilitation, and their work in Hande Tar indicates their commitment to adopting new field procedures consistent with these attitudes. However, their overall effort is constrained by limited support staff and their own limited *irrigation* engineering experience and training. They have the will and energy but they need additional support and training for the results of their efforts to be more visible.

The initial identification of structural improvements and the design and placement of the structures at Sirsia-Dudhaura needed a better understanding of the hydraulics of the system and its O&M requirements. Better TA input or collaboration with the Planning and Design Strengthening Project (PDSP/UNDP) in IMP field sites could have been valuable. Engineers actually involved in implementing ESI at Sirsia-Dudhaura need some background in irrigation science, water-control-measurement structures, on-farm water management, and main system operation.

Making the water flow in the canal at Hande Tar requires major construction work in three portions of the main canal, which cannot reliably be achieved during the short period before the monsoon.

The O&M learning process is designed to provide knowledge about the irrigation network's internal workings so that appropriate operation and maintenance plans can be developed and used to spell out clear policies regarding agency and WUA roles and responsibilities under the joint management and turnover concepts. If undertaken systematically, the O&M learning process should proceed in the following steps:

- Jointly with farmers, assess current system operations and limitations, determine reasonable performance expectations to result from interventions, and agree on indicators.
- Establish an operational plan to be put into effect after improvements are made, incorporating monsoon and winter conditions.
- Agree with farmers on maintenance requirements and limitations of each party.
- Jointly determine structural improvements required to obtain performance objectives.
- Agree on a division of labor between the agency and farmers.
- Design necessary structures in accordance with future O&M requirements.
- Implement construction with WUA oversight.
- Conduct a joint performance-testing exercise upon completion of civil works.
- Modify structures and/or O&M plans based on performance-test findings.
- Monitor O&M plan to improve as needed.

Rather than starting field work with a clear concept of desired performance objectives, SMD immediately focused on the civil works aspects of ESI. To date, SMD has developed no overall strategy for implementing the O&M learning process in accordance with the project design.

2.2 Water User Associations

Objective and expectation. A central IMP activity is the development and strengthening of viable water user associations that can assume greater responsibility and authority for operation and maintenance activities. The rationale behind this project activity is that organized farmers will contribute toward more equitable water distribution and greater water use efficiency, will mobilize local resources and resolve conflicts, and will thereby increase agricultural productivity.

According to the Project Paper, the expected outcome is the formation of water user associations that have rules and are supported by their membership. The associations should be able to resolve conflicts, mobilize resources, carry out maintenance work, and communicate effectively with agency staff involved in managing systems under government control. Water user associations are expected to take part in joint system management at Sirsia-Dudhaura; at Hande Tar, the system is to be fully turned over to the farmers.

Project activities. To meet project objectives, two principle sets of activities have been initiated under the WUA section of SMD: (1) Association organizers (AOs) have been placed in the two field sites and are serving as catalysts to facilitate the development of water user associations; and (2) essential structural improvement (ESI) activities have been partly undertaken to increase farmer involvement in system improvements and decision making, and to promote better communication between farmers and agency staff about operation and maintenance responsibilities.

The evaluation team reviewed documentation and visited both field sites to assess progress in carrying out these activities. Activities conducted by the WUA section have been SMD's most successful and promising component to date. At both sites, the AOs have facilitated the formation of water user *tolis* (groups and organizations) and the election of representatives to join system-level *sangh* (associations). At Sirsia-Dudhaura, a total of 15 *tolis* have been established along administrative boundaries, but plans are in progress to reform them along hydrological lines. At Hande Tar, 8 hydrologically based *tolis* have been formed with the assistance of four AOs.

AOs have facilitated farmer involvement in ESI "walk throughs" at both sites. Farmers have taken part in identifying their rehabilitation needs and have reached a consensus with IMP staff on improvements. AOs still face resistance to participation from some *tolis*.

The ESI work appears to be enhancing farmers' communication with agency staff and serves as an effective mechanism for encouraging farmers to contribute group labor to clean and desilt field channels and, in some cases, branch canals.

Resource mobilization was particularly striking at Hande Tar, where farmers were faced with a system that had been inoperative for the last two years and were eager to make the necessary repairs. The evaluation team is concerned that delays in construction are causing farmers to question IMP's commitments. If construction work is not completed before the coming paddy season, it may have serious consequences for the development of water user organizations.

ESI is supposed to be but one part of the O&M "learning process" designed to enhance farmers' capacity to operate and maintain irrigation systems. With O&M staff implementing this process, it will be possible to determine farmers' long-term capacity to take part in system management. Furthermore, clearer objectives regarding maintenance responsibilities under joint management anticipated at Sirsia-Dudhaura, and farmer management anticipated at Hande Tar, would enable AOs to assist farmers appropriately.

The WUA component design was based on participatory models developed elsewhere in Asia, particularly the Philippines and Sri Lanka. As work has progressed at the two IMP field sites, the WUA section has been modified and has fine-tuned its approach to fit Nepal's specific sociocultural context. Furthermore, as work continues at Hande Tar, many of the earlier approaches taken at Sirsia-Dudhaura are being modified to meet the different conditions in the hills.

Some important lessons are being learned and processes refined that need to be documented and synthesized before they are lost. For example, at Sirsia-Dudhaura SMD staff have experimented with awarding work contracts to *tolis*, and "*toli funds*" have been established in which a percentage of the contract profit is put into a revolving fund for further maintenance work by the WUAs. Initially, the contracts were granted to individual *toli* members, but this proved to disrupt the cooperative spirit within *tolis*. Based on this experience, SMD engineers have revised their strategy to award contracts directly to the *toli* groups. In contrast, Hande Tar farmer groups have been unwilling to accept contracts. IMP's experience with contracts provides some useful comparisons both within Nepal and with other Asian countries.

The WUA section has also gained important experience in dealing with pre-existing water user committees formed under the Decentralization Act. The AOs have successfully introduced new hydrologically based organizations that do not conflict with earlier established groups.

Staffing and internal monitoring. The WUA section is under the leadership of a WUA section chief located in Kathmandu. The section has made excellent progress in carrying out its activities due to the high quality of its staff and TA. Unfortunately, both the WUA specialist and the WUA section chief from DOI recently left the project. Other donor projects, such as the Mahakali-II Irrigation Project, offer more-attractive incentives and draw staff away from IMP.

A number of AOs were hired through the Technical Assistance contractor due to delays in recruitment through the Department of Irrigation. More recently, the DOI has created AO positions and fielded people in these temporary "project" positions. Because AOs involve a new concept in participatory management, their integration with other IMP/DOI staff has been slow to develop. There are few incentives to becoming an AO since, at the present time, the position is not regularized and the future is uncertain. Despite the problems in implementing this new concept, the AOs (TA and DOI) working at the project sites are dedicated and committed to project objectives.

The WUA section has been learning and subsequently reformulating the AO role as progress continues. Following the intensive work at Sirsia-Dudhaura, measures are now being taken to reduce the number of AOs and make them responsible for more *tolis*. Contract AOs are now being groomed for supervisory AO positions. The WUA section has gained a better understanding of the qualifications needed for AO and supervisory AO positions.

WUA section staff have initiated ambitious monitoring activities in which AOs provide monthly process documentation and hold monthly meetings to discuss problems and make corrections. Written reports are lengthy and detailed but often do not appear to be used by

other project staff, particularly the ME&F unit or the IMC applied studies team. With increasing frequency, SMD field engineering staff also attend the monthly AO meetings.

In a short period of time the WUA section has gained much experience in developing farmer organizations. The WUA TA has also played an important role in developing the new irrigation legislation based on experience gained in SMD activities. However, the section has yet to begin drawing up some general principles and consolidating general lessons learned.

Conclusions. The Evaluation Team concluded the following:

- The WUA section is making rapid progress toward increasing water user participation at both field sites. Implementation problems are generally identified quickly and corrections made. Staff appear to be sensitive to local conditions and patient with the implementation of this new concept.
- WUA section activities have not been adequately integrated or synchronized with other SMD activities. Lack of coordination is a cause for real concern at Hande Tar, where delays in making physical improvement may result in farmer disillusionment and loss of AO credibility.
- Staff incentives for AOs to remain with the project are low, since no clear policies for future roles and responsibilities have been set. Lack of communication about contract renewals has also led to reduced morale on the part of TA-funded AOs.
- The WUA section has collected a great deal of data but has not begun to consolidate or synthesize its findings or to develop a set of general principles based on lessons learned.

2.3 Monitoring, Evaluation, and Feedback

Objective and expectations. The objective of the monitoring, evaluation, and feedback (ME&F) activities is to provide timely, concise information to those who can bring about changes in the management of irrigation systems. This means that IMP must be flexible

in developing the ME&F system for its project sites. The ME&F system required for a large government project will be much more elaborate than for a small farmer-managed system. In fact, most of the information required to manage a small farmer-operated system may be in the heads of one or two farmers. This issue is important when we consider the ME&F system being developed for Sirsia-Dudhaura and ask if it should be duplicated for Hande Tar.

ME&F is intended to be a tool for DOI and USAID decision-makers and managers. The ME&F system is important because of the process orientation of IMP. "As the operational plan is implemented, considerable adjustment will be required. This is where the ME&F program plays an important role in providing the essential monitoring data that can be evaluated as to whether or not equitable, reliable and timely water deliveries are being achieved" (Project Paper, p.70)

The special problems facing government irrigation in Nepal require a learning process that will lead to the development of new institutional arrangements that better use farmer management inputs. As a final mandate, IMP is to help develop and implement monitoring and evaluation systems within DOI-operated systems. These units are to feature standardized methods and procedures appropriate to DOI needs and provide information for assessing irrigation performance of DOI projects.

The level of information required to do this assessment will be different as one moves up in the management system. For example, at the Planning Commission level, only yields, acreage of crops irrigated, and input use may be needed. Top management of DOI, however, will also need information concerning water flows into the system. At the project level, more-detailed information will be needed about water flows within the system and farmer water demands. Too many times, a lot of data is collected but no information reaches management. Emphasis must be placed on providing concise information appropriate to each level of management.

Activities. Since, of the two projects, only Sirsia-Dudhaura is delivering irrigation water, Sirsia-Dudhaura is the one with an ME&F system. The ME&F staff have helped develop the ME&F system and have identified

information to be collected. They have tested the crop-cutting survey in the fields, starting with the 1987 paddy crop. Finally, the staff are trying to establish it as part of the IMP operation and management plan.

Organization. The ME&F is under the leadership of a chief in the Kathmandu IMP office, who reports directly to the SMD chief. An engineer recently located at Sirsia-Dudhaura is responsible for ME&F field activities, particularly the crop-cutting surveys and water-flow measurements. However, an engineering background does not prepare a person to design and conduct crop-cutting surveys or monitor the WUA. SMD needs a team that includes persons with agricultural and statistical training, besides their engineer.

The IMC staff has also contributed to the ME&F by conducting baseline studies. The study of Sirsia-Dudhaura has been published, while the one for Hande Tar is in draft form. The AOs and WUA have also helped in the ME&F effort by selecting farmers for the crop-cutting surveys and providing information about the WUA's organization and activities.

Achievements. The major achievements of the ME&F field staff at Sirsia-Dudhaura are the five crop-cutting surveys. The sixth survey is now underway for the 1989 wheat crop. A crop-cutting survey has also been completed for the 1988 paddy crop at Hande Tar. Information about water flows is very limited, although 13 portable flumes were supposed to be in place by January 1988, to measure water flows in Sirsia-Dudhaura.

Considerable information has been collected concerning WUAs, which is of interest in both field sites. In the future management will show much less interest in such information, especially after the farmers take over.

Assessment and conclusion. The crop-cutting surveys provide information on crop yields, farming practices, and the percentage of sampled farmers who received irrigation water by source. The procedure for taking the crop cutting is described, but there is no indication of how the interview section of the survey is conducted. In general, the reports are very routinized and follow the same format. Although the crop-cutting survey is a start, it does not provide the information that is really needed. For example,

yields show a decline in 1988 over 1987. Is this because the water management is worse, the water is spread over a larger area, the sampling procedure is poor, or the water supply was low in 1988? In other words, the report must provide information concerning the hectares receiving adequate water supplies by season and crop, as well as interpretation of results obtained, especially unexpected results. Consequently, the ME&F system provides too little information to determine whether the project has increased crop yields and irrigated area. If the ME&F is not significantly improved, it will also be impossible to determine such impacts in the future.

The data collection activities, including those concerning WUAs, do not constitute a concise information system that is useful to different levels of management or that can be adopted for use on different types of irrigation projects. To provide an improved ME&F system, a major emphasis will be needed to determine the minimum information set required to manage the different IMP field sites both now and in the future. The information required for the different sites will likely be somewhat different, since Hande Tar will be farmer managed while Sirsia-Dudhaura is supposed to be jointly managed before it is finally turned over to farmers.

To determine what essential information needs to be collected, the ME&F staff must communicate with both the IMP management and the farmers. Those who are involved in managing irrigation need to explain what information they need. In contrast, the farmers are an important source of information and will be managing the system in the future. Consequently, it is essential that ME&F staff develop good communication at both levels. SMD currently provides no information to farmers concerning likely water supplies for the season. Such information is critical for the farmers if they are to plan their input and cropping schedules effectively.

Another area of concern is the lack of analysis of data generated by ME&F, particularly from crop-cutting surveys. Resources need to be allocated to analyze the ME&F data; otherwise, it will remain data and never become information. If the ME&F data are too weak to use in analysis, then the system must be improved so that people have confidence in the results.

Finally, much more work needs to be done to devise an effective ME&F system that fits these needs before any attempt is made to institutionalize the system in DOI. The current system is in the early stages of development and must be substantially improved before it can be considered a model for replication. This means that management must show an interest in the system and indicate that they are willing to accept and even seek out bad news about their irrigation systems. If they show no such a willingness, the incentives for the ME&F staff are to collect routinely and report data that do not highlight problems.

2.4 Cost-recovery and the Watercess

Objective. The major objective of cost-recovery and watercess (water charge) collections is to provide an added source of funds, particularly for O&M. This is important because of tight government budgets and the desire to give users more responsibility for irrigation projects. It is becoming increasingly apparent that water user involvement in cost recovery and watercess is an important means to gain their participation in system management. In the case of projects turned over to farmers, the WUAs' ability to collect the watercess is critical. If they cannot collect the watercess and mobilize resources, WUAs will be unable to operate and maintain their systems

Organization and activities. Until this year, the Land Revenue Office was responsible for collecting the watercess. Since IMP began work in Sirsia-Dudhaura, collections have improved by involving the water users in the assessment. To determine the extent of watercess collections after the new assessment, the AOs surveyed 236 water users in 13 *tolis*. Of the surveyed users, 77 percent paid their watercess. The remaining 23 percent cited failure to deliver water, lack of funds, and dissatisfaction with the assessment as reasons for nonpayment. Although no earlier samples exist for comparison, a 77 percent payment is much higher than most government-operated systems obtain.

Identifying who really receives water is an important step in improving farmers' willingness to pay the watercess. Another key component is agency interest in collecting fees. In the case

of the two field sites, the Land Revenue offices did not feel they should waste much time collecting the watercess. DOI has recently taken over watercess collection, and it remains to be seen if it will do a better job. Under the present arrangement, an improvement is doubtful because DOI is not organized to collect fees from farmers. During the mid-1980s, DOI collected the watercess for one year but managed to collect only 3 percent of the assessments in Nepal. On the other hand, DOI may now have a greater incentive to collect fees, since the new irrigation regulation allows local water user organizations 25 percent of the collections for O&M. Thus, WUAs will also have an incentive to achieve high rates of collection.

Incentives and ability to pay. Farm incentives are a third key to improving cost-recovery and watercess collection, which are closely related to both improved O&M and farmer participation. When a system delivers water on a timely basis, water users are generally willing to pay for it. Thus, when farmer participation and improved O&M result in a dependable water supply, watercess payments go up. This is particularly true if a direct relationship exists between payments and improved O&M. Fortunately, the new irrigation regulation tries to make this link between watercess payments and O&M expenditures.

Penalties can also be used as an incentive to get farmers to pay their watercess. The Land Revenue Office can sell a farmer's land to cover delinquent payments, but this penalty is felt to be excessive and is never enforced. The only difficulty for farmers delinquent in their payments is that they must clear up these back payments before they pay their current watercess. Thus, a number of farmers in Sirsia-Dudhaura did not pay their watercess because they would also have had to pay their delinquent bills.

Finally, ability to pay is sometimes a factor in nonpayment, particularly for farmers with small holdings, large families, or both. In the case of Sirsia-Dudhaura, only a few farmers in the sample claimed they had no funds to pay. (Part of their inability to pay was related to the fact that they would also have had to pay their delinquent bills.)

Achievements and Conclusions. Improvements in O&M and water delivery will both be key to IMP's continued involvement in cost recovery. However, the major achievement to date has been the improved record of who actually receives water from Sirsia-Dudhaura. This gain appears to have raised the rate of watercess payment to 77 percent, which suggests a significant improvement.

2.5 SMD Process Development

The SMD was designed as an integrated unit to improve the capacity of DOI staff and farmers to implement more effective systems management. The expectation was that O&M, WUA, and ME&F would be integral and synergistic components and that activities in SMD's three sections would be linked and jointly planned to achieve improved systems management. The O&M learning process described in the Project Paper is the key process by which the three SMD components are to be integrated. The learning process provides a means to carry out physical improvements that meet farmers' and agencies' needs, and uses monitoring and evaluation to feed back information on system performance. This feedback allows management to make corrections when needed.

Although still in an early stage, SMD has made remarkable progress in developing some of the components' capabilities. However, O&M, ME&F, and WUA sections still function primarily as separate components. The O&M section has only conducted ESI works. The ME&F section has only recently initiated its activities and has not yet coordinated them with the other sections. The WUA section has made the most evident progress in coordinating its activities with others, but their coordination is still far from satisfactory. Real integration will be achieved only if the SMD implements the learning process approach.

The evaluation team reached these conclusions:

- SMD has not followed the O&M learning process approach outlined in the Project Paper.
- AOs and farmers have no clear sense of what maintenance activities farmers will

assume in the long-run. Without clear expectations, it is difficult for AOs to facilitate the development of specific operation and maintenance activities.

- Water user organizations have developed skills in mobilizing resources and resolving conflicts at both field sites. However, SMD still has a limited understanding of the long-term ability of the organizations to take part in operation and maintenance activities. The WUA section has developed no plans for phasing out site-specific activities.
- The ME&F section has developed a crop-cutting survey that has been its major reporting vehicle. However, these reports fall short of the IMP's requirements and must be improved. As part of this improvement, ME&F must become part of the O&M learning process, for it is the ME&F system that should provide everyone in IMP with the information they need to manage and adjust the O&M system as it develops.
- The AOs working with farmers can increase watercess collections by improving assessment records. This was done in Sirsia-Dudhaura and has been started at Hande Tar.
- In developing the O&M system, SMD has emphasized ESI installation in Sirsia-Dudhaura at the expense of developing an understanding of irrigation system hydraulics.
- In Hande Tar, the WUAs have been developed on schedule and the farmers have completed their part of the rehabilitation agreement. However, the ESI, which were to be installed starting in February, are unlikely to be completed until sometime after the monsoon. This lack of coordination means that farmers' expectations of having irrigation for the wet season crop will be unfulfilled due to IMP's delayed action.
- Effective linkages have not yet been developed among SMD and the Regional Directorates and the newly emerging District Irrigation offices.

3

IRRIGATION MANAGEMENT CENTER

3.1 Objectives, Activities, and Organization

IMP's fourth major objective, as defined in the Project Paper, was "to institutionalize the training and research capabilities required to support government agencies and WUAs in managing irrigation systems."

This objective was to be achieved by establishing IMC, which was to be created as a separate unit within the DIHM (now DOI) and be advised by a Board representing various agencies in the irrigation sector. IMC was to have flexibility in personnel and budgetary processes and a high-quality professional staff. The center was to be responsible for training overseers; assistant engineers and divisional engineers; association organizers; and local, district, and regional government officials involved with irrigated-agricultural production systems. Agriculturalists and farmers were also identified as potential recipients of IMC training. One group of trainees would be the future IMC trainers, representing the disciplines of engineering, sociology, economics, agriculture, management, and communications. It was also proposed that IMC should carry out several types of applied research studies of irrigation systems. Although IMC was being created to support IMP, the long-term rationale was to develop its capability to support all future government programs in irrigation management. IMC was to be located outside Kathmandu, in close proximity to one or more suitable irrigation systems.

IMC was established first near Sirsia-Dudhaura but then moved to temporary premises in Pokhara in 1987. Plans for a new IMC complex have been prepared and construction is scheduled to begin in the near future. However, there are difficulties in attracting staff to live and work in Pokhara, and staff members interviewed during

the evaluation considered that IMC might better be located in Kathmandu, where new DOI training facilities are to be provided in its new headquarters building.

Through a notification, GON has recently assigned IMC a national role in irrigation training. This important development represents a first step toward institutionalizing IMC within the DOI. Now, institutional measures are needed to incorporate IMC formally within the department's organizational structure, with appropriate status and institutional arrangements. IMC can then help formulate policy for DOI's human resource development activities and can also help plan, implement, monitor, and evaluate the activities.

At present, IMC comprises nine posts, three of which (including that of Applied Studies Chief) are vacant. Only the posts of Director and Training Chief are occupied by permanent DOI staff. Temporary staff, all of whom possess only bachelor's degrees in their respective subjects, occupy the remaining positions. In general, staff with academic or professional qualifications in disciplines other than engineering are not appointed to permanent positions in the DOI; if they are appointed, they are unlikely to be promoted to higher grades. A further problem is that, under government regulations, temporary staff may not be considered for long-term higher education and training overseas. These two factors effectively prevent IMC, under present circumstances, from developing a high-quality professional staff trained in disciplines other than engineering.

At present, the aim of achieving flexibility in personnel processes cannot be achieved because IMC must recruit its staff through official government channels, which takes a long time.

IMC is increasingly asked to organize training for irrigation personnel other than IMP staff, particularly in connection with the Sector Program. The center now receives a variety of requests: to help identify, recruit, select, deploy, and train AOs and supervisory AOs; to provide technical supervision and support for farmer organization work; to provide guidance to Regional Directorates on the supervision of AOs' activities; to provide orientation on farmer participation to the technical staff of District Irrigation Offices; to organize special management workshops and seminars on the institutionalization of DOI's new role and objectives; to help develop long-term corporate planning in the DOI; and to assist in reorienting and motivating DOI staff.

These demands may help create the conditions necessary to achieve one goal of IMC, namely, that of attracting users and funding from outside DOI and thus becoming largely self-supporting. The need to comply with government regulations, however, effectively prevents IMC from achieving the kind of budgetary flexibility that would permit it to retain fees from outside organizations for training conducted on their behalf. It is therefore impossible, under present circumstances, for IMC to become even partly self-supporting.

3.2 Training

Objectives and activities. The project envisaged that IMC training would provide new skills for job fulfillment, create awareness, change attitudes, and alter motivations, as well as contribute to the base of training experience and materials available for irrigation systems management in Nepal. The training program would comprise both in-country and out-country training activities.

Between March 1988 and March 1989, IMC organized 21 in-country training activities for 300 participants, occupying a total of 255 days. In addition, the center organized 15 briefing and orientation activities for a total of 227 government officials, IMP staff, and USAID personnel.

Course content and training effectiveness for individual courses have been evaluated, but the

results have not been collated nor have post-training evaluations been carried out. It is therefore impossible to assess the quality or effectiveness of the training program as a whole. However, some feedback on the effectiveness of AO and farmer-to-farmer training and of IMC trainers was obtained through interviews conducted during the course of the evaluation.

Interviews with AOs, engineers, and farmers associated with the Sirsia-Dudhaura system indicated that both the initial and refresher AO training was considered satisfactory. However, AOs recommended that follow-up training programs be scheduled at regular three-month intervals.

Farmers who had participated in the farmer-to-farmer training activity considered it very successful. However, some farmers who had not participated complained that those who had did not share their experience with other community members after their return.

A problem encountered in connection with AO training for the Mahakali and ILC projects is that there are no formal job descriptions for these posts, to provide a firm basis for assessing their training needs and designing an appropriate curriculum. Thus, it is difficult to evaluate the effectiveness of training IMC provides for this group.

Both participants and trainers considered the training-of-trainers programs to have been useful. Both courses were held only recently, and the participants have so far had only limited opportunities to test their newly acquired skills. Nor did the evaluation team have an opportunity to observe the participants in action during a training situation. It will be possible to make a considered evaluation of the training effectiveness only after further time has elapsed.

In carrying out its in-country program, IMC relied heavily on inputs from resource people from various local institutions such as DOI, ICIMOD, IAAS, and APROSC. While IMP learned from others' experiences and concerns, agencies and individuals involved in irrigation management had an opportunity to understand IMP's concepts and processes. This kind of interaction is a good step toward developing a national institutional network in the irrigation sector.

IMP has devoted considerable resources and time to developing a varied program of overseas training, primarily short-term: study tours, specially organized courses, and combinations thereof. These opportunities have provided important incentives for IMP staff to remain on the project, and the training content is clearly reflected in the ideas and attitudes of IMP staff. This program has had a great impact on broadening attitudes and tuning IMP staff into the approaches and experiences of people in other countries who work on similar issues.

During the year, 64 irrigation professionals attended a total of 20 short-term activities overseas—including short courses, conferences and study tours—under the overseas training component of the program. IMP staff have particularly appreciated this varied and imaginative program. One IMC staff member has been sent to the U.S. to study for a Ph.D.

Evaluation of IMC Training Process. IMC staff carried out a formal training needs assessment to help prepare the 1988-89 training program. However, due to DOI's lack of a human resources development unit to facilitate identification of potential trainees and analysis of their roles and job descriptions, the assessment could be done only at a very general level. In an attempt to alleviate the problem, IMC has designed a Training Request Form for use by institutions or individuals requiring training, which can serve as a substitute for a proper training needs assessment in cases where it has been impossible to perform one.

In December 1988, IMC technical assistance staff developed a model training-module format to use in planning all types of training courses. This instrument is to provide a standardized format to properly document completed training program. A draft *Training Module on Training for Trainers* was prepared for testing on the introductory training-of-trainers course held in December 1988, and has subsequently been revised and adopted for regular use. A similar draft *Training Module on Organizing Water Users for Irrigation Management* was prepared for testing on the course for AOs from the Mahakali project, held in January 1989. IMC intends to prepare similar modules for the other regular courses.

To implement the training program, both the IMC and TA staff interviewed during the evaluation said that they used interactive teaching-learning methods and visual aids to facilitate the learning process.

IMC trainers used content evaluation instruments (pre- and post-test) to assess what students learned. However, the results were not communicated to the trainees. IMC staff interviewed made suggestions for improving this activity.

IMC trainers have also designed an instrument to evaluate the training courses in terms of their objectives, learning techniques, trainers' performance, etc. This instrument has been used at the end of all training courses to provide trainer feedback.

Although follow-up program and post-evaluation activities have not yet been implemented at IMC, their importance was discussed with the IMC Director and trainers during the evaluation interviews. Planned follow-up of trainees after their return to work would help them to apply what they have learned, reinforce their learning process, and enhance IMC credibility.

Given the heavy and increasing demands on their skills, IMC trainers have done a good job up to now. The TA staff and ex-trainees interviewed during the evaluation generally agreed that the trainers try hard to perform their tasks effectively. The trainers themselves recognize that they need to improve their abilities still further and, in particular, need an opportunity to obtain higher degrees, since they will be providing training for personnel who have been educated to the trainers' present level.

Conclusions. The evaluation team came to the following conclusions:

- The large number of vacant posts, particularly those for management and communication specialists, have hindered progress in meeting the growing demand for IMC training courses, both for IMC staff and for the irrigation sector as a whole.
- IMC professional staff and technical and administrative support staff currently have no opportunity to obtain higher education and, thereby, upgrade their skills.

- While IMC training activities have, overall, been directed substantially at the target clientele identified in the Project Paper, one target group—the local, district, and regional officials—and one subgroup—the divisional engineers—have as yet received no training specifically directed toward their needs.
- Farmer-to-farmer training has been an innovative component of the IMP. However, participants in the program have not significantly transferred their experience and knowledge to their farming communities.
- Training courses for AOs to be placed outside of IMP have involved no arrangements for continued follow-up. This indicates a failure to integrate field lessons from SMD into the training process.
- The disparities in the amounts of total training input and output accounted for by various client groups during 1988-89, clearly indicate a need for—carefully planning IMC activities; determining training priorities in accordance with overall objectives; and ensuring that planned activities can be implemented within the limits of available resources. The disparities also reinforce the need to recruit additional professional staff and upgrade the qualifications of existing staff as soon as possible.
- The overseas training opportunities offered by the project have had significant impact on staff commitment and enthusiasm, as well as on overall attitudes toward project concepts.
- IMP has been successful in mobilizing local resource people for training activities. This should continue to be an asset as the IMP gets established.

3.3 Applied Studies

In addition to its training activities, IMC has an ambitious plan for its applied studies section. The objective is to carry out applied studies on irrigation issues and problem areas for use by the IMC training unit and the IMP staff, government policy makers, and water user associations.

The rationale behind IMC's applied studies section is that studies will help in selecting sites for improved O&M, will contribute to performance appraisals of field site activities under SMD, will help in assessing GON budget resource availability for irrigated agriculture, and will provide lessons and test solutions for intervention strategies in government- and farmer-managed systems. The studies are designed to be an integral part of IMC by providing lessons for use in training activities.

Organization and activities. IMC/DOI staff are carrying out applied studies with technical assistance by the full-time training and research TA. IMC/DOI Applied Studies Chief recently left his position to join another project, and the position remained unfilled by the time of this evaluation. The TROs hired under EAST Consult are playing a vital role in developing and carrying out studies with the IMC/DOI staff. Cornell University short-term TA has provided periodic guidance and direction.

The first five applied studies have only recently been published. The first studies were rapid appraisals, followed by a study of resource mobilization and two studies at the Sirsia-Dudhaura field site. The latter two were contracted out to IIAS, which completed its assignments satisfactorily. Four new studies are in draft and ten are in the early stages of completion.

Accomplishments. The evaluation team reviewed accomplishments in achieving the applied studies section objectives. An ambitious program was proposed in the Project Paper, but the development of this IMC component is proceeding at a slow pace.

The applied studies section faces serious time constraints due to the over-ambitious commitment to complete 14 studies under this year's workplan, yet the section still lacks the staff and resources needed to carry out the work. IMC staff are committed to carrying out both research and training, but schedules for the two activities often conflict.

A recent report on the applied studies activities by Cornell TA includes many useful comments and recommendations. Staff considered other Cornell TA to be too academic and oriented more toward the local TA than to the IMC/DOI

staff. Staff felt that the full-time training and research specialists assigned to IMC have lacked the technical skills and research background to provide needed assistance in developing the section.

The study of resource mobilization for O&M is of high quality, and its importance is being recognized outside IMP. The study has had an impact on shaping the new water user legislation. The remaining studies are so recent that their usefulness and impact are difficult to determine.

Studies in the pipeline are focusing on SMD field sites which may, if they are of high enough quality, lead to improvements in system management and appraisal of SMD performance. Studies of farmer-managed systems are also being planned for next year. Proposed plans to carry out studies of women's roles in irrigation would make a much-needed contribution.

The applied studies section has not yet refined its methodology, which has been a "cookbook" approach using standard questionnaires and formats that may not always be appropriate to the expected output. Additionally, topics for study have been selected without reference to consistent rationale behind their selection or established priorities. It is unclear whether the studies are relevant to field site problems and perceived gaps in knowledge.

The quality of studies completed and in draft is mixed, at best. Some reliance on recall data and lack of clarity about real and ideal reporting lead to confusion. With poor-quality reporting, it will be difficult to monitor changes in system performance or test solutions to problems. Draft reports are being edited by the Director of IMC and TA, but this is consuming a great deal of scarce time.

Lack of interdisciplinary coordination in data collection and report writing is evident. Within single reports, technical and sociological data are written as separate sections with no interrelationship.

Although a great deal of data on farmer organization activities is being collected through AOs, it is not used by the applied studies section. Lack of coordination with other project staff in defining data needs is resulting in duplicated efforts.

Conclusions. The evaluation team concluded the following:

- A potential exists for developing the applied studies section, and a number of the studies already carried out contain data that may be useful for IMP staff and government policy makers.
- Both the TROs and the IMP/DOI staff are enthusiastic and eager to carry out applied studies, and the IMP/DOI staff are interested in developing their research skills.
- The number of staff is inadequate to meet current demands. Staff face difficulties in carrying out tasks due to conflicts between research and training schedules. Scheduling problems has also reduced interaction between IMP staff and TROs, thus limiting the latter's training function.
- Time constraints and pressures to complete the 14 committed studies are leading to a greater emphasis on quantity than quality.
- The full-time expatriate TA has not demonstrated the necessary research skills to create an interdisciplinary team of researchers that can define a strategy and develop a coherent program to meet the applied studies section objectives.

4

SUPPORT TO THE SECTOR

4.1 Changes in the Project Context

The irrigation development environment has changed rapidly since the inception of the IMP in 1985. The change has redefined the overall status and mandate of the irrigation establishment, thrust IMP concepts from a peripheral position to the heart of the Irrigation Department's new mandate, and created an almost overwhelming demand for insights from project experiences and for services from its nascent institution, IMC. IMP has responded cautiously to avoid being overwhelmed by events beyond its control, but it now finds itself at an important threshold that requires unequivocal statements of intent and farsighted leadership in order to retain its current position.

Basic needs. A major event, which altered the context and thrust of Nepal's development effort, is the launching of its Basic Needs Program in 1987. Aiming at no less than the eradication of poverty by the turn of the century, this program focused on six essential goods and services that included "food" as the most important basic-needs item. Since irrigation is a primary means by which the basic need for food can be met reliably and because it can potentially create substantial employment opportunities, irrigation was identified as a priority sector for development.

The program calls for a three-fold increase in irrigated area, expanding from 0.43 million ha. to 1.25 million ha. in 2000. To meet program demands, the irrigation budget for 1988/89 was raised to Rs. 1,700 million, more than doubling the authorized funding for the previous year without taking into account DOI's implementation and managerial constraints. Notwithstanding the problem of the target, however, the Basic Needs Program has led to a number of important initiatives in the

irrigation sector that have contributed to the evolution of a coherent strategy for irrigation development.

Irrigation sector program. With a view to operationalizing the Basic Needs Program for irrigation, GON formulated an irrigation sector strategy in February 1988 (reformulated in August 1988), the *Working Policy on Irrigation Development for the Fulfillment of Basic Needs*. Unlike the supply-driven program of the past, the new strategy involves farmer-beneficiaries in all stages of the project cycle. Beneficiaries are required to contribute from 7 to 25 percent of the development cost, depending on the unit cost of a scheme, and are expected to assume responsibility for subsequent operation and maintenance of completed schemes. An important adjunct of the sector program is upgrading the agency staff's system management capability, together with building farmer capability for operation and maintenance.

The new sector strategy was announced to a group of donors, who were told that future investments would be coordinated and integrated into the program. Shortly thereafter, the World Bank (WB) and Asian Development Bank (ADB) made significant financial commitments to the program: the World Bank extended an \$8 million Irrigation Line of Credit (ILC), tacked onto the Mahakali-II Irrigation Project and the Asian Development Bank's \$36 million Irrigation Sector Project (ISP). To support them, the UNDP has committed \$3.8 million to an "umbrella" technical assistance called the Irrigation Sector Program Support Grant.

The World Bank's ILC is intended to develop processes and procedures for participatory irrigation development in a few pilot schemes. The schemes, from selected districts, are to be followed by a full-scale sector program sometime

in 1990. However, the Asian Development Bank's ISP is immediately launching a full-blown implementation of the program in the Central and Eastern Regional Directorates. Despite the differences in perception and priorities manifest in their two efforts, the ADB and WB are both committed to adopting an implementation approach that calls for institutionalizing procedures and processes for greater farmer involvement in system management. The size of the programs and the new approach to development are generating a substantial demand for new skills and manpower, such as AOs, that are presently unavailable within the Department of Irrigation.

Structural adjustment program. Concurrent with this basic needs initiative, GON implemented its first Structural Adjustment Program (SAL) to stimulate economic growth while restoring macroeconomic balances. The adjustment program included a wide range of macro and sectoral reforms in the irrigation sector. The policy actions that would be supported in the irrigation sector under SAL-II are related to water user legislation, improved O&M, turnover of small schemes, and coordination of irrigation and agriculture. These activities complement and support IMP objectives and functions.

Internal reform measures. To have a more consistent and sharpened focus in program implementation, GON recently consolidated the irrigation agencies of three ministries into the DOI, under the Ministry of Water Resources. The DOI is thus entrusted with the broader responsibility of sector management. The consolidation was followed by an internal reorganization of the DOI that created a Planning, Design (Training), and Research Division, which includes the IMP and gives primacy to its IMC component (see Annex 4). However, the new structure contains no separate unit for operation and maintenance, into which the SMD might be expected to fit.

As part of the reorganization, the DOI was decentralized by extending its administrative network down to the district level. The District Irrigation Office is now responsible for implementing small schemes through the participatory approach, working under the overall supervision of the Regional Irrigation Directorate (RID).

To promote farmer organization and participation and institutionalize this function, the DOI has adopted a policy of having regular association organizers within the District Irrigation Offices and an AO supervisor within the RID. DOI has already recruited some AOs for the new sector program and also for the Mahakali-II Irrigation Project, the latter indicating that the focus on system management and farmer organization is being extended to large-scale agency-managed systems as well.

The DOI also initiated a Manpower/Human Resources Assessment Study in recognition of its need to acquire new skills and expertise to adapt to these changing roles and responsibilities. Other than IMC, no internal institution can cater to the growing training and research needs of the DOI.

Another effort to strengthen DOI's capability in sector planning and information is the UNDP-funded, WB-executed Planning and Design Strengthening Project (PDSP), which started about the same time as the IMP. The PDSP is intended to formulate an irrigation sector Master Plan and uniform design standards and procedures. The Program Budgeting and Project Monitoring Project, also financed by UNDP, is assisting the DOI with two innovations: introducing the program budgeting concept and processes for improved resource allocation and establishing a management information system within the DOI. What is lacking, however, is the critical mass within the DOI to coordinate several initiatives and development activities.

Broader policy initiatives. Significant changes have also occurred in such policy areas as irrigation legislation, donor coordination, and cost recovery. GON has recently gazetted the new *Irrigation Regulation 2045* (1989) under the Canal, Electricity and Related Water Resources Act, 2024, repealing the previous Canal Operation Regulation, 2031. This legislation responds to the new sector strategy and provides a legal framework for recognition of water users organizations.

The most significant feature of the new legislation is the provision permitting the registration of water users groups under the Association Act, which confers legal status to these institutions. Unlike the Decentralization

Act, which specifies that the user group chairman must be elected *panchayat* officials, the new regulation is free from such stipulations. Consequently, the new regulation is expected to promote more effective and truly representative user organizations.

In joint-managed systems, the regulation allows water user groups, water user associations and water user association coordination committees to assume operation and maintenance responsibilities beyond the tertiary level and to assist the agency staff in watercess (water charge) assessment and collection. It is unclear, however, whether these groups can participate in borrowing, contracting, and resource mobilization, or can own property. These aspects need to be clarified in the proposed manual that will become an integral part of the irrigation regulation.

In the final analysis, the new regulation must be considered a major step toward institutionalizing a participatory approach to irrigation development. It will be a supportive instrument for implementing the new irrigation strategy. Though the timing of the regulation is not very appropriate from IMP's standpoint, since the project is still experimenting with management processes, the new regulation should facilitate IMP's field activities and support its general thrust. What is more important, however, is the fact that the regulation is not very rigid and provides ample scope for experimentation.

Irrigation sector coordination. This is an important area where notable progress has been made in recent years. With the adoption of the sector approach, GON recognized the need for improved sector coordination, which led to the convening of the Irrigation Sector Coordination Meeting in February 1988. That meeting supported the proposed sector strategy and identified the need to coordinate technical assistance activities to assure that they are consistent with the sector strategy. Following the meeting, the GON established an Irrigation Sector Steering Committee to coordinate and monitor the implementation of the new sectoral strategy and to formulate policies and guidelines. It was an attempt on the part of the government to institutionalize sector coordination.

A striking result of the coordination effort is the sector program, and more importantly, the umbrella technical assistance to support the sector program, which was formulated with close interaction and cooperation between GON, IBRD, USAID, ADB, and UNDP. Impressed by the outcome, all parties now show a greater appreciation of coordination and create various opportunities to arrive at strategic consensus, including such formal mechanisms as the Local Aid Coordination Meeting and the (Donor Only) Local Coordination Meeting.

The UNDP has facilitated the process by establishing a project to support coordination efforts. GON is also exploring the "lead donor" concept as a means to coordinate institution building activities in key sectors. Notwithstanding all these developments, however, there are still many areas and issues where coordination is conspicuously lacking (for example, the high level of financial commitment to the Sector Program at such an early stage).

Cost recovery. This is another area receiving attention in recent years, largely prompted by unsatisfactory watercess collection performance and underfunding of operation and maintenance. With improved cost recovery, GON hopes to sustain the current pace of irrigation development and to link watercess collection to O&M funding, at least to some degree. To formulate appropriate cost recovery policies, the GON constituted a task force under the chairmanship of the Secretary of Water Resources, supported by ADB technical assistance.

Currently, the task force is finalizing its recommendations. In the meantime, it has prepared a General Irrigation Management Policy Framework in Relation to O&M Cost Recovery: a strategy to reducing overall government costs by shifting O&M responsibility to water user groups. Small and medium sized schemes would be "handed over," and "participatory management" would be adopted in large schemes, within a ten-year time frame. As an outcome of this exercise, a core group was formed to prepare detailed action plans for a Turnover Program and for a Participatory Management Program. Drafts of the plans are nearing completion.

4.2 IMP Support to Date

Sector program. Many processes and concepts pioneered under IMP, such as using AOs for agency-farmer interaction, organizing farmers into viable groups, monitoring and documenting field-level processes, upgrading system management capabilities of agency staff, and building farmers' capability to assume greater responsibility for O&M have now become integral features of the Sector Program. However, at this stage IMP cannot provide specific implementation recommendations since it is still developing and testing processes. Nor can the project contribute to institutionalizing these processes within the DOI. This is partly because IMP is still a project and has not yet been integrated into the mainstream of DOI activities.

A more visible and direct contribution of IMP, however, is in the area of training. Besides its regular training program in which DOI staff (i.e., outside IMP) are also included, IMC has trained 22 AOs and overseers and 10 assistant engineers for ILC, and 15 AOs for the Mahakali-II Irrigation Project. More training programs for additional AOs and other staff working in the Sector Program are in the pipeline. IMP also assisted the DOI in selecting new AOs. Occasionally, IMP provided AO services to the DOI for organizing farmer groups in irrigated areas. IMP's contribution in terms of applied studies has not been as evident, however.

Irrigation regulations. IMP's contribution to the formulation of the new Irrigation Regulation has been most significant. The project provided direct support in the form of logistics and study tours—Irrigation Legislation South-East Asian Tour, 1987, and Irrigation Legislation South-Asian Tour, 1988. IMP provided perspectives and management concepts, based on its field experiences, to the regulation-making process. Concepts directly borrowed from the IMP field experiments include the following:

- formulating water user groups according to hydraulic boundaries, rather than political boundaries;
- selecting group leaders from WUA membership, rather than from political leadership;

- establishing water user "association" as a second tier in the organization structure;
- have the water user group participate in the assessment and collection of water charges; and
- handing completed irrigation projects over to the users' association.

Most importantly, IMP established an excellent rapport with the Water and Energy Commission, which was responsible for drafting the legislation. As a result, an IMP local TA staff member was appointed to the multidisciplinary team constituted to draft the legislation. This person played a critical role in formulating the regulation.

Now that the regulation has moved from promulgation to field implementation, IMP can further aid the process by helping disseminate the new legislation to DOI staff and policy makers.

Sector coordination. IMP's efforts in sector coordination, though modest, are noteworthy. Its persistent advocacy for the adoption of a participatory approach to irrigation development has had a clear impact on the sector. Capitalizing on the opportunity presented by GON sector strategy, USAID, in particular, contributed to sector coordination and brought irrigation management concerns to bear on the sector program. With its IMP experience, and given the growing role of IMC, on which the two major donors to the irrigation sector—WB and ADB—are banking, USAID has a comparative advantage to play such a strategic role in the sector. Today, more and more agencies involved in the irrigation sector agree on certain irrigation management issues associated with IMP.

However, the sectoral focus has not yet shifted from construction to system O&M. Physical targets continue to be the yardstick of performance and the basis for resource allocation, which has resulted in the creation of a DOI project portfolio that is incompatible with sectoral needs and capacity. However, this may change after PDSP completes the Irrigation Master Plan, which is expected to provide a useful framework within which donor assistance can be more effectively coordinated and utilized. Consistent with the catalytic role of both

activities, IMP and PDSP have established a formal coordination arrangement involving monthly joint-meetings.

Cost recovery. In the area of cost recovery, IMP has emphasized resource mobilization and participation, with complementary concerns for service delivery, formal organization, and equity. The project thus avoids a narrow focus on the financial receipts from water charges. Its message is to create incentives to encourage beneficiary farmers to assume more and more O&M responsibility. This is clearly reflected in the policy framework for irrigation management that was recently issued. In addition, IMP's presence was again conspicuous in the task forces created to prepare action plans for the turnover program and the participatory management program for O&M cost recovery, respectively. The IMP/TA staff who helped draft the new irrigation legislation participated on both task forces.

4.3 Opportunities and Challenges

The DOI's new directions for the irrigation sector constitute an unequivocal validation of the IMP. The major thrusts—emphasis on farmer involvement, agency/farmer communication, system performance, appropriate technology and operation and maintenance—all reflect essential project ingredients; even the new implementation mechanism, AOs, are integral to IMP. Thus, earlier than project designers surely would have imagined, IMP has seen project ideas become official orthodoxy. This prospect presents both opportunities and challenges.

The concepts have been adopted officially by DOI and although they are about to be implemented in new programs, the construction orientation of the Department has not changed overnight. Work has barely started to translate the ideas into DOI procedures, to operationalize and internalize them, and to verify them in the field. Except for IMP sites, these various program elements have not been tried together; thus, DOI staff have a limited basis from which to understand the new directions, let alone put them into practice. IMP has an exciting opportunity to contribute to the many efforts underway to institutionalize the new sectoral approach.

On the other hand, IMP is now challenged both internally and externally: the project faces internal demands to complete the field processes underway in order to conclude its interventions successfully; external demands come from DOI, which wants IMP services for itself and its new sectoral program components, especially AO training. To fulfill its own agenda, the SMD must continue work in the field, *seriously* applying participatory design and management concepts. It must monitor activities and assess results, disseminate them, and then help translate findings and insights into agency processes and standards.

This agenda is still too far from being completed to enable project personnel to advise the rest of the DOI on the basis of experience. At the same time, IMC is still engaged in setting its course and providing basic training to its own staff. Consequently, the center must mobilize and draw on external resources in order to undertake a meaningful service role.

The rest of this section explores some of the opportunities and challenges presented by different elements of the DOI's new sectoral program.

Sector Program and DOI reorganization. The Sector Program and reorganization of the DOI, both responding to the Basic Needs Mandate, offer the most open-ended opportunity to adopt on a country-wide scale most of IMP's approaches and concerns. The full spectrum of Sector Program initiatives is included in the project, albeit on a small scale, and WB, ADB, and UNDP funding documents claim they will draw on IMP experience. More concretely, however, SMD should be able to carve out an important role of overseeing and directing AO activities throughout the country. Moreover, implementation and institutionalization of the Sectoral Program is already generating a great demand for trained and retrained manpower, and IMC has already been identified as the institutional locus for such training.

IMP's first challenge is to take its own rhetoric seriously in the field, to articulate lessons learned and help develop appropriate policies and procedures in such areas as resource mobilization, organizational techniques, system turnover, and performance monitoring. The second challenge, primarily facing IMC, is to

establish a long-term development strategy that enables it to respond to immediate training demands, while strengthening its own capability both to develop and deliver appropriate training programs and to undertake applied studies designed to help the DOI meet current implementation needs and respond to emerging problems.

Both challenges require the appropriate institutionalization of the SMD and IMC, respectively. Given the fact that the DOI was reorganized only last year, it is understandably reluctant to consider further reorganization to create a separate SMD Division. Nonetheless, the creation of at least a Systems Management Unit is required in order to make O&M more than just a slogan. Similarly, IMC needs a secure institutional base.

The current DOI plan is to regularize IMC within the DOI, rather than create an autonomous or semiautonomous unit, as envisioned in the IMP Project Paper. If this is carried out, the DOI will be challenged to establish provisions that enable the IMP to develop and retain a qualified staff.

Structural adjustment program. The SAL-II will undoubtedly require policy changes and DOI programming along important dimensions dear to the IMP, such as legalizing water user associations, improving O&M, improving recurrent cost-recovery for O&M, and improving irrigation/agriculture coordination. These concerns offer an opportunity for the DOI to locate a proper institutional home for SMD, and an opportunity for SMD to help translate policies into practical directives and procedures. A well-established IMC can also seize the opportunity to focus its applied studies program on relevant issues, thereby demonstrating its value.

The challenge is for SMD to move away from what is essentially a rehabilitation strategy, and start and conclude some serious work on O&M and disseminate the results. Similarly, SMD is challenged to develop a more viable focus on irrigated agriculture, one that invites the coordination of various agencies. Beyond the institutionalization question identified above, SAL-II challenges IMC to ensure that its applied studies program tackles important issues and designs the studies to yield useful results.

Irrigation legislation. The new irrigation legislation draws heavily on the IMP experience but also goes beyond IMP practices. IMP can play an important role in assisting the DOI to implement the legislation. On the SMD side, IMP has the opportunity to adopt new provisions in its work at Hande Tar and its third site, as well as to revise practices in Sirsia-Dudhaura, accordingly. At the same time, IMC should be prepared to develop training programs for DOI staff and others in legislative provisions and implementation modes, as well as follow implementation patterns and the impact of this legislation in its applied studies program.

Donor coordination. An important element of the Sector Program is GON's insistence that bilateral and multilateral donors coordinate their activities within GON program framework so that Nepal receives the synergistic benefits of their investments. Such coordination would end the previous practice of requiring the DOI and its predecessors to dissipate efforts by catering to different projects and approaches. USAID was able to play a lead role in realizing donor coordination in the irrigation sector primarily due to its involvement in IMP, because of the similarity between project objectives and methods and those embodied in the Sector Program, and because of the key role envisioned for IMC. The opportunity remains for such involvement as long as USAID remains active in the sector.

However, the subsequently proposed large-scale commitments of other multilateral donors also present a formidable challenge for the IMP and USAID to ensure that critical elements of the IMP approach and the Sector Program are not lost in the process of implementing the program on a national scale. The program requires a significant redirection of the DOI and important changes in DOI staff's attitude and behavior.

If the new participatory approach is implemented seriously, progress undoubtedly will seem slow. The approach will certainly challenge the ingrained patterns of giving primacy to achieving construction targets. The larger the program, the greater the likelihood that the DOI may feel that it cannot afford the new approach and may revert back to "business as usual." Suitable institutionalization of the SMD and IMC will help the DOI make the required internal transformation, and will help

it cope with the changes required by the program. Meanwhile, USAID can help assure the integrity of the process, and clarity of direction, by maintaining its role in the donor forum.

4.4 IMP Options and Implications

The Sector Program and other developments in the irrigation sector have qualitatively changed the environment in which IMP operates, as well as the demands made upon the project. IMP must develop a clear strategy for responding to these unforeseen changes and demands. The evaluation team believes that USAID and the DOI have three principal options for continuing IMP in the current context:

- Consolidate the experience, focus narrowly on original project design objectives of the SMD, greatly reduce aspirations for IMC, and conclude activities on schedule.
- Respond to a few immediate opportunities offered by the Sector Program, particularly in the areas of training and AO monitoring; meanwhile, consolidate the SMD experiences, provide modest assistance to a less ambitious IMC, and conclude on schedule except for long-term training.
- Make a long-term commitment to support the SMD and IMP. Redesign IMP to extend the project period to ten years to permit the project to consolidate the SMD experience; respond to Sector Program needs for operational policy formulation and human resource development, and undertake an institution building program designed to turn the SMD and IMC into viable DOI entities.

Option One: Consolidate. The simplest option is for IMP to proceed in a strict project mode, confining itself to carrying out its agreed mandate and terminating on schedule. The SMD would continue to focus its activities on field sites, picking a third one according to an important management type appropriate to the DOI (such as conjunctive use, joint management in large-scale systems, or multipurpose systems). The division would place a stronger emphasis on synthesizing lessons from its experience and

disseminating them; its AO program would concentrate on training and supervising its own cadre.

Meanwhile, unless there are clearly identified sources of support for long-term input to IMC, which would permit it to expand and upgrade its staff, IMC would also consolidate its position and make the best use of available talents. The center would provide limited training services for internal use and to respond to DOI directives, relying primarily on external resource persons. IMC would cooperate with Sector Program staff and TA in preparing and conducting staff training, but the center's role would be more facilitative and passive than active. The IMC applied studies program would continue modestly with some technical support, confining itself to areas that can feed directly into training activities. Other studies would be commissioned to external institutions or to researchers who affiliate temporarily with IMC.

Implications. This strategy would constitute a retrenchment from original overall expectations, but would serve as a reasonable admission that the project's institution building objectives cannot be fulfilled satisfactorily within the original time frame. Time and resource requirements would not change.

Option Two: Respond Selectively. The second option is for IMP to consolidate its principal learning process work, as indicated above, while responding to selected opportunities for greater Sector Program participation without unduly stressing project financial and human resources. The SMD would introduce new legislative provisions in its field sites and monitor results; it would become more directly involved in issues related to assessments and cost-recovery. The SMD would accept the responsibility of preparing supervisory AOs for the Sector Program, and would provide some general oversight services. With additional input, SMD should be able to provide input to the DOI in developing O&M operational policies.

IMC staffing would increase modestly and staff development would be given greater priority. IMC staff would take a more active role in developing training agendas for the Sector Program, especially for AOs and new engineers, and in follow-up. Staff would work

closely with external resource persons and Sector Program TA staff, who would assume more clearly defined functions as trainers to IMC staff. IMC would receive additional technical support to develop its applied studies capacity. Staff would be substituted for while away on long-term training.

Implications. This option has implications for staffing, resources, and time. Both the DOI and USAID would need to allocate additional resources to IMP. DOI/IMP staffing requirements would increase modestly, and the AO staff would increase beyond immediate project needs in order to assume the supervisor training function. IMC would require more staff overall, as well as temporary professionals who would replace IMC staff while they are away for training. New arrangements would be required to provide appropriate TA for IMC staff development. Finally, the project period may need to be extended to permit IMC staff to complete long-term training programs.

Option Three: Redesign and Reorient. The third option calls for a project redesign effort to amend the IMP, taking into account original objectives, new opportunities, and experiences to date. This option would take seriously IMP's original institution building aspirations, modify them according to new opportunities in the sector and emerging needs of the DOI, and develop and execute a new plan to achieve them.

Initially, SMD field activities and learning processes would continue as identified above. Following its absorption into a central-level Systems Management Unit, or Systems Management Division, SMD would shift from a project to a program approach. SMD would establish an institutional structure that permits it to maintain a field-based program while assuming policy development and oversight functions in areas that relate to participation and O&M. These areas include the following: the AO program, O&M operational policies; system performance assessment; resource mobilization; turnover policies; and operational irrigation/agriculture coordination.

Flexibility in staffing and budget is needed to establish conditions that will enable IMC to attract and retain highly qualified professional

staff and turn IMC into a viable human resources development and research unit of the DOI. IMC would then function as a resource to the DOI, not merely a training center; thus, it would be expected to conduct manpower assessments and plan human resource development programs for the DOI, mobilize external training resources and materials for on-site programs, and identify training opportunities for DOI staff in other locations.

IMC's first task would consist of mobilizing resources to undertake training programs for the Sector Program, DOI, and IMP, using TA resources from available sources as well as the staff of local and international institutions. At the same time, IIMI would be brought in to strengthen the applied studies unit by training staff and helping develop research skills. Then IMC would implement a long-term program for staff development. Integral to this process would be IMC's role as a locus for dissertation research, particularly for Nepalis studying abroad.

IMC staffing would increase gradually, supplemented by visiting scholars and trainers, and through exchanges with other training institutions. When IMC staff are away for long-term training, they would be replaced by high-quality national and international staff. IIMI would place an experienced researcher at IMC to oversee capacity building, and that person would be assisted by local IIMI staff and short-term visits of headquarters staff for specific research input and for IMC training support. Funds would also be available for IMC staff to work collaboratively with IIMI researchers in other countries, as well as with other water management professionals.

Implications. This option can be exercised only after USAID and the DOI make long-term commitments to undertake a joint institution building effort. USAID will need to agree to provide necessary resources over a period of 10-15 years total (to be determined during the redesign process), and the DOI must regularize the SMD and IMC in ways that promise to make the effort worthwhile. This undertaking should be given high priority by the DOI.

5

PROJECT MANAGEMENT AND TECHNICAL ASSISTANCE

The performance of IMP project management and technical assistance (TA) is the key to success or failure in meeting overall project objectives. The project was designed so that IMP staff, hired through DOI, are responsible for project execution. Local and expatriate consultants (Louis Berger International, Cornell University, and EAST Consult) provide TA for developing project activities. The TA is under contractual obligations to work with IMP/DOI staff on project planning and implementation: specifically, to assist with implementing the SMD and establishing IMC.

The evaluation team reviewed documentation and examined the overall performance of project management and TA in meeting IMP objectives. The evaluation focused on staffing, technical capabilities and levels of competence, managerial capabilities, communication with the sector about project activities, and project monitoring. Both IMP/DOI project management and TA were reviewed.

5.1 Staff and Technical Capabilities

IMP's complex and ambitious objectives demand adequate numbers of staff with a high degree of technical competence and innovative spirit. TA is designed to provide assistance in areas where IMP/DOI staff are weak and to help staff develop skills they may lack. Providing the necessary quantity and quality of staff to implement IMP activities has been a continual problem. Operations are running more smoothly now, but the project continues to suffer from manpower shortages, attrition, and deficiencies in technical capabilities.

IMP/DOI. A number of key IMP/DOI staff positions have been replaced in a short period of time. Included are the positions of the Project

Director, the Director of IMC and the WUA Section Chief. The current Acting Project Director continues to direct SMD activities.

Increasingly, demands are being placed on IMC for both training and applied studies, and on SMD to conduct field activities. Because a number of positions remain vacant, the staff is too small to meet these demands. In particular, key positions within IMC need to be filled.

Lack of incentives has been a problem in attracting DOI staff to the project. The project offers no job security and salaries are based on the standard government pay scale. Highly qualified young engineers, in particular, are likelier to seek employment on more prestigious and lucrative construction projects within DOI.

Project activities demand a mix of different kinds of technical qualifications, including engineering, social science, economics, agriculture, and training and research. DOI has taken positive steps to fill these positions. However, lack of experience in hiring people for non-engineering positions has in some cases led to selection of personnel with inappropriate backgrounds and qualifications for the required positions. Within SMD, only one social scientist for the WUA section has been appointed, though the project designs call for two assistants.

IMP/DOI engineering staff are trained and experienced in civil engineering. However, the concepts of farmer participation, water management, and the operation and maintenance learning process are new to them. Based on the evaluation team's discussions with SMD engineering staff, they have shown an increased understanding of these concepts. However, understanding has been more common than action in implementing project field activities.

IMC/DOI staff lack important research and training skills. The training and research staff feel they are asked to do jobs that require greater levels of skill than they possess.

LBII TA. LBII, as the primary contractor, has provided the TA team leader, a training and research officer, contract AOs, and short-term consultants. LBII also experienced serious staffing problems during the first half of the project. The team leader and training and research specialist were both replaced, and team leadership was lacking for several months until a replacement was identified. LBII experienced great difficulty in identifying potential candidates for replacement when positions became vacant.

A total of 15 association organizers were hired on one-year contracts but six subsequently left due to difficulties associated with the work. Incentives for AOs are weak because of their contract status and lack of job security. However, Project Management wisely kept the remuneration levels similar to those for AOs hired by the DOI, so that they would not create a two-tiered status structure.

Short-term consultants for IMC training and research activities have generally been well received and have contributed needed assistance in developing training and research capabilities.

Both the expatriate training and research specialist and his replacement lacked the appropriate skills and research background to contribute effectively to establishing IMC.

The successive TA team leaders have been unable to provide the managerial, intellectual, and technical leadership required of that position. They have spent more of their time in administrative matters than in field-oriented support to SMD or coordination of other TA.

Cornell University TA. Through its subcontract with LBII, Cornell is responsible for training and applied studies TA and water user organization TA. Cornell has provided less short-term consultancies than envisaged and budgeted. Only 29 percent of the allocated TA funds have been spent to date.

The TA provided by the WUA specialist from Cornell has been a critical and irreplaceable input into the project, and a key to the success

of the AO program. Unfortunately, commitments elsewhere permitted him to devote only 25 percent of his time to the project, far less than promised in the contractor's "best and final" offer. Although his irregular and limited schedule made it difficult for him to establish the needed communication with other staff, his recent resignation has been a severe loss to the project. The position needs to be refilled.

Other inputs from Cornell have been less effective. TA for training and applied studies have been of high caliber, but they have spent only short periods in Nepal. IMP/DOI staff felt they could not take full advantage of the Cornell inputs and that some assistance was directed more to a select group of EAST Consult TA, than to them.

EAST Consult TA. TA by a local contracting firm was not envisioned in the original Project Paper but is proving to be a fairly successful means of assisting the project. A total of nine EAST Consult staff act as counterparts to IMP/DOI staff and assist in project implementation. Included are an engineer, a WUA-organizer specialist, a training and research specialist, an agriculturalist, and five training and research officers. The number and disciplinary mix has been adequate to meet most TA needs at the present time.

The TA water user organization specialist provided by EAST Consult has also been a key to the success of the AO program and has worked closely with the Cornell TA. His involvement in developing water user regulations has been an important activity linking IMP with the sector.

The EAST Consult engineering TA met some basic projects needs. However, to really grasp the project's O&M-learning-process aspect and to help IMP change ingrained work patterns and attitudes, a better understanding of irrigation water management issues is required.

The training and research officers hired to help implement IMC activities have, in general, demonstrated their capabilities and have played an important role in developing IMC/DOI staff skills.

Conclusions. Despite problems in overall recruitment and staff technical capability, IMP

has made substantial progress in implementing SMD and IMC activities. The evaluation team concluded the following:

- DOI commitment to IMP has been uneven but is growing. In particular, both DOI and TA staffing were below agreed levels, staff appointments were often inappropriate, and the dedication of individual staff varied greatly.
- Project concepts are highly innovative for Nepal and challenge standard operating procedures. In actual implementation, however, IMP engineering needs to be more innovative. The capability of IMP/DOI staff to implement their tasks has been improving, but they still show limited operational understanding of the project concepts of participatory management and the operation and maintenance learning process.
- The WUA Section has been fortunate to include a staff able to make innovative adaptations of approaches developed elsewhere. Personnel (both TA and DOI) have demonstrated a high degree of skill and commitment in meeting WUA objectives.
- Project incentives—professional, monetary, and otherwise—have been inadequate to generate and maintain the enthusiasm and commitment of IMP staff. Project Management has been caught because USAID cannot sanction the salary supplements commonly paid in construction projects and has been unable to grant the increased field allowances adopted in the UNDP-funded Planning Design Support Project. Thus, IMP has a hard time attracting the best staff, demanding their attention, and keeping them in the field.
- Training opportunities are an attractive incentive, and this has influenced some regular DOI staff to stay on the project. However, long term overseas training is not available to temporary staff; thus, IMC staff in particular have been unable to utilize these opportunities.
- Staffing problems have resulted in leadership discontinuities. Positions have not been replaced quickly and efficiently,

causing difficulties in implementing job tasks effectively.

- TA team leadership and full-time training and research TA have not demonstrated the technical or leadership capabilities necessary to contribute effectively to achieving project objectives.
- Short-term technical assistance has not been as effective as anticipated because activities have been undertaken in limited but intensive periods of a few weeks.

5.2 Project Management

In order to meet the long-term goals of this complex project and integrate project activities into the sector, IMP requires a high degree of clarity of purpose, leadership, coordination, and flexibility. The evaluation team reviewed the degree to which Project Management is able to meet overall project needs in order to permit some general conclusions regarding current project status.

Clarity of purpose. To what extent has IMP management demonstrated a coherent, directed vision of its purpose and goals? IMP principles of farmer participation and local institution building for irrigation management have not always guided practice. For example, the ESI emphasis on construction alone, rather than O&M, has greatly compromised the project's value as a learning experience. Similarly, emphasizing targets for the number of applied studies completed, rather than the quality of the studies themselves, undermines the studies' value as training vehicles for IMC staff.

Leadership. IMP/DOI leadership skills have improved greatly over the life of the project but long-term direction is still urgently needed. Project activities are currently conducted in an administrative mode, with directives from above. However, the project requires a management mode in which plans are developed according to well-understood goals. A vision of what that future will be and how to take the steps to get there are needed.

TA has not provided the necessary team leadership to help set the project direction and developing managerial skills within IMP/DOI.

Attention to day-to-day administrative matters has overshadowed larger programmatic concerns.

TA and IMP/DOI project management are inadequately integrated and lines of authority are unclear. Staff indicated that it was difficult to coordinate activities due to ambiguities in project decision making.

USAID/N has played a significant role in assisting both TA and IMP/DOI project management. The mission has been required to assist in recruiting new TA positions and has given needed direction in linking the project into the Sector Program.

Team building and orchestration. Activities have been undertaken to build a common understanding of the project goals and objectives and to synchronize project activities so as to ensure smooth operation and maximize impact. The project was launched with a "Start-up Workshop," which involved most major players. This has been followed on almost an annual basis by a stocktaking and planning workshop. For example, in March 1989, a workshop was held for staff to examine the original logical framework and develop a sense of team membership. The workshop is expected to foster greater coordinated efforts in project implementation.

Staff evaluations of the workshop were generally positive. However, in initiating SMD and IMC activities, a multitude of factors—weather, red tape, and most importantly, continual changes in IMP staff—have resulted in poorly synchronized implementation. For example, in both Sirsia-Dudhaura and Hande Tar, ESI was not orchestrated vis-a-vis the agricultural calendar. At Sirsia-Dudhaura, the work of AOs and field engineers seems to be increasingly integrated and synchronized.

TA and IMP/DOI staff have not consistently worked together to implement project activities. Due to shortage of manpower and the need to complete activities quickly, TA staff at times conduct work on their own rather than with the IMP/DOI staff whom they are to assist.

Flexibility. Has IMP management responded flexibly to a changing environment? When required, IMP management has fulfilled DOI directives related to implementing the Sector

Program. More flexibility is needed for IMP staff to take part in important sector activities.

Receptivity to change. A number of recommendations have been made to improve project performance by visiting TAs. The evaluation team reviewed the documentation and concluded that many recommendations have been made repeatedly that could benefit the project. Yet a number of such potentially useful recommendations have not been implemented.

Documentation. LBII submits regular trimesteral (every four months) reports to USAID/N on progress in implementing activities. Although during the first two years reporting procedures were not followed systematically and reports were late, reporting procedures are now improving.

Communication and dissemination of IMP results. One of IMP's major objectives is to create an awareness within the sector that management is a critical link between irrigation construction and production. During the first phase of the project, efforts have focused on laying the groundwork and implementing project activities. Project Management has been hesitant to bring its results to the public until true success can be demonstrated. However, demands for information and lessons learned from the project are increasing and as the project enters its second phase, some consolidation of results and dissemination is needed.

Project Management has kept the central office of DOI well informed about IMP activities, and senior staff have been invited to attend IMP workshops. Greater difficulties have been faced in developing links with the Regional Directorates.

Interest in SMD field results and IMC training and research activities is rapidly increasing within the sector as a whole, despite the caution in publicizing IMP activities to date. IMP has prepared a first issue of a newsletter. Once DOI approves the newsletter and IMP releases it, this and future issues of the newsletter should help disseminate information about IMP activities.

Innovation. IMP's contribution to innovations in technical or organizational aspects of its program has been mixed. Work on mobilizing

farmers both for maintenance and for improving water charge recovery by helping establish correct assessment records was remarkably successful, demonstrating the value of the projects innovative AO approach. The AO training and supervision program has been modified frequently, providing an excellent example of the way IMP has learned from its implementation experiences. The project's adoption of farmer-to-farmer training was a significant breakthrough. The ESI component has also responded innovatively to field lessons, but it has concentrated attention on contracting procedures rather than design and O&M. Unfortunately, the innovative spirit borne by a number of committed and qualified staff has not always been sanctioned by the project as a whole.

Budget. The evaluation team reviewed the overall expenditure patterns for the first half of the project and compared them with original projections; few major discrepancies appeared. The project has spent approximately one quarter of its budget.

Conclusions. Despite technical and staffing constraints, good progress has been made in implementing both SMD and IMC. Contributing to this success have been some dedicated and important staff concerned with promoting the participatory approach to systems management

so vital to IMP. USAID/N has maintained an active interest in project implementation as well as sectoral developments. Unfortunately, the quality of TA support did not meet the high level required by the project.

The evaluation team concluded the following:

- IMP/DOI management needs to develop a vision of future project direction, particularly given the rapid changes taking place in the sector as a whole.
- TA has not provided needed team leadership and managerial guidance in directing IMP/DOI staff toward goals. Although the primary contractor is responsible for assisting in overall management, USAID/N has been required to play too large a role in managing IMP.
- Clear lines of authority need to be established between IMP/DOI and TA to reduce the confusion over reporting procedures and decision-making authority.
- The project is now in an excellent position to begin consolidating and disseminating its results to a wider audience. IMP/DOI and TA should build better links with the sector.

6

NEW STRATEGIC FRAMEWORK

The IMP Project Paper remains valid as a general guide for USAID involvement in the irrigation sector. And, except for the IMC's ambitious development plan, it could be adequate if IMP were to pursue a narrow project approach. However, the irrigation environment has changed so rapidly since project design that to keep the original project focus would waste an important opportunity to help guide those changes.

The Sector Program offers the chance to work on the issues identified in the Project Paper, but to do so within the expanded, dynamic framework of an agency being transformed. Meaningful input to this transformation process will require a longer time commitment than originally envisioned, as well as additional resources. Most importantly, it will require a different resource package than currently available, as well as new relationships with a number of different players. The project should be redesigned to incorporate these major changes.

Content. Much of the content of SMD attention will remain the same—participation, O&M, resource mobilization, and system management. New concepts, however, would also be added—system turnover, system performance, and management skills. The IMC will train DOI staff in technical and organizational skills, foster new attitudes, and undertake applied studies, as originally intended. However, the center will also conduct or oversee induction training for engineers and prepare other career development programs.

Focus. Although project content will be similar, the focus of attention will change markedly. The original Project Paper called for institutionalizing the SMD and IMC. Actual project activities, however, were focused more clearly on

consciousness raising and on both creating an appreciation of the concepts of participation, O&M, and in-service training and demonstrating their value. Consciousness has since been raised, and official policies support IMP concepts; thus, the focus must now *really* turn to institutionalization.

For the SMD, this means becoming an administrative unit that develops policies, establishes operational procedures, and monitors activities and outcomes in a number of areas:

- participation
- operation and maintenance
- resource mobilization
- turnover
- performance monitoring
- water management

For the IMC, the focus on institutionalization has two dimensions. On one hand, the center will deal with problems related to making itself a viable training and applied studies entity with qualified, committed staff. This is more problematical than originally conceived because it has been much more difficult to obtain staff than anticipated, while the demand for training far exceeds expectations. Thus the IMC must both *develop* and *deliver* at the same time. On the other hand, the demand is expected to change qualitatively soon, as the DOI adopts a human resources development program. This broader concept will require IMC to develop planning, programming, and networking capabilities in addition to those previously identified.

Moreover, an applied studies capability in the new context must go beyond the Project Paper's "rapid appraisals" to include policy analysis and technical trouble-shooting. To incorporate high-quality training and research

skills, the IMC will need to evolve an internal division of labor, in which some staff specialize primarily, but not exclusively, in applied studies and others in training.

Approach. The new program will consist of two separate elements: one concerned with the SMD, the other with the IMC. In each case, the approach will be different.

Support to the SMD will cover two areas: continued involvement in field activities, and work on policy and administrative issues. The first will continue present SMD activities, with modifications; the second will consist of high-level advisory input, separate from but drawing heavily on resources made available in the Sector Program.

Although at first glance this assistance might appear to duplicate TA provided through the Sector Program, such will not be the case. Central-level TA for the Sector Program will assist a number of different components, giving priority to achieving program objectives. In contrast, this effort aims to create a specific unit of the DOI, helping it to establish a visible presence in the department, assure the integrity of its purpose, and enhance its efficiency and effectiveness. This unit will be called upon to monitor different elements of Sector Program implementation; it cannot be expected to perform the watchdog function without some measure of independence.

IMC support will include both long- and short-term elements. For training, immediate needs will be met by mobilizing available resources (Sector Program TA, local and international resource persons) to the extent necessary to prepare and deliver courses. The IMC has already gained experience in using this approach. Long-term staff development needs will be met through staff exchanges with other institutions, national and international; graduate-level training opportunities; and the recruitment of high-quality temporary substitutes. It may be feasible to execute this whole component through affiliation with an existing institution.

The applied studies program will be strengthened through a comprehensive resource-sharing arrangement with an established research institution. This would provide a resident long-term advisor, short-term specialists, and opportunities for IMC staff to

work collaboratively with the institution's staff in other locations.

Resources. The SMD component will include TA, commodities, long-term training, and programmable resources for field exercises. TA should consist of one long-term person directly contracted by USAID, as well as a long-term local team provided through a local contract. Short-term specialists will be obtained through USAID centrally funded contracts.

The IMC component will include TA, honoraria, long-term training, equipment and supplies, and funds for curriculum development, training resources, applied studies, and dissertation research. TA for training should be arranged, if possible, through a comprehensive agreement with an existing water management/irrigation training institution that would place one of its staff at the IMC on a long-term basis. Short-term resources would be drawn from various sources.

TA for applied studies should be obtained through a cooperative agreement with IIMI, which would place a staff member at IMC on a long-term basis. This person will work directly with IMC staff in an advisory and training capacity, orchestrate the provision of short-term specialists, and arrange for IMC staff to work collaboratively at other IIMI locations. IMP would be responsible for defining terms of reference in collaboration with IIMI.

Implementation. A project redesign team should be fielded as quickly as possible. Similarly, a cooperative agreement should be executed with IIMI for an introductory period of two years. In the interim, a resident training advisor should be contracted for one year, presumably from a university or irrigation-management training center. USAID should recruit an O&M engineer for an initial eighteen months, and should execute a flexible local TA contract for a longer period.

Recommendations

The evaluation team recommends that

- Contingent on suitable institutionalization of the SMD and IMP, USAID should commit itself to provide necessary resources over an appropriate time frame to support

the establishment of these two entities as functional DOI units.

- In preparation, USAID and DOI should commission a redesign of the IMP, which would chart out a detailed strategy and identify an implementation strategy suitable to achieve the institutionalization objectives of SMD and IMC.
- In the meantime, USAID should review existing TA arrangements and consider introducing a TA package with the following components:
 - 1) an O&M engineer, directly contracted, to provide technical leadership and coordinate TA;
 - 2) a cooperative agreement with an established irrigation-management training entity to provide a long-term training advisor to the IMC;
 - 3) a cooperative agreement with IIMI to provide a long-term advisor on applied studies;
 - 4) a direct contract with a local consultant to provide both long- and short-term TA; and
 - 5) short-term expertise, as needed, through A.I.D. centrally funded projects.

7

CONCLUSIONS AND RECOMMENDATIONS

The Irrigation Management Project (IMP) was initiated as a joint effort of His Majesty's Government of Nepal and USAID to increase the institutional capability of the Department of Irrigation, other GON agencies, and farmer groups to develop and sustain efficient irrigation management practices.

The DOI's new directions for the irrigation sector constitute an unequivocal validation of IMP. The major thrusts—emphasis on farmer involvement, agency/farmer communication, system performance, appropriate technology, and operation and maintenance—all represent essential ingredients in the project, and even the new implementation mechanism, AOs, are integral to IMP. Thus, earlier than project designers surely would have imagined, IMP has seen project ideas become official orthodoxy.

The Sector Program and other developments in the irrigation sector have qualitatively changed both the environment in which IMP operates and the demands made upon the project. These changes call for a project-redesign effort to amend the IMP, taking into account original objectives, new opportunities, and experiences to date. This option would take seriously the IMP's original institution building aspirations, modify them according to new sectoral opportunities and emerging DOI needs, and develop and execute a new plan to achieve them.

Systems Management Division

Conclusions

- SMD has not followed the O&M "learning process" approach outlined in the Project Paper.

- In developing the O&M system, SMD has emphasized ESI installation in Sirsia-Dudhaura at the expense of developing an understanding of the hydraulics of irrigation projects.
- In Hande Tar, the WUAs have been developed on schedule, and the farmers have completed their part of the rehabilitation agreement. However, the ESI, which were to be installed starting in February, are unlikely to be completed until sometime after the monsoon.
- AOs and farmers do not have a clear sense of what maintenance activities will be taken over by farmers in the long run. Without clear expectations, it is difficult for AOs to facilitate the development of specific operation and maintenance activities.
- Water user organizations have developed skills in mobilizing resources and resolving conflicts at both field sites. However, SMD still has a limited understanding of these organizations' long-term ability to take part in operation and maintenance activities. The WUA section has not developed plans for phasing out site-specific activities.
- The ME&F section has developed a crop-cutting survey, which has been its major reporting vehicle. However, these reports fall short of IMP's information requirements and must be improved. As part of this improvement, ME&F must become part of the O&M learning process, for it is the ME&F system that should provide everyone in IMP with the information they need to manage and adjust the O&M system as it develops.

- The AOs working with farmers can improve watercess collections by improving assessment records. This was done in Sirsia-Dudhaura and has been started at Hande Tar.
- SMD has not developed effective linkages to the Regional Directorates and the newly emerging District Irrigation Offices.

Recommendations

- O&M field activities should be carried out according to the procedures of the O&M learning process contained in the Project Paper; they should not be limited to ESI works as a rehabilitation program.
- Operation and maintenance policies and objectives, and future roles and responsibilities of farmers and agency staff should be spelled out before AOs are placed in the field.
- TA engineering staff who have a good understanding of irrigation water management should be responsible for helping to implement the O&M learning process.
- IMC should organize an induction training for SMD's O&M field staff in the areas of irrigation science, water control and measurement structures, on-farm water management, and main system operation.
- All SMD field staff working at one site need to have a joint introductory briefing in all aspects of water management, including water user organizations and the more technical aspects of water management.
- Continued efforts should be made to monitor and learn from the IMP experience in developing water user organizations at Sirsia-Dudhaura and Hande Tar. Lessons learned from process documentation need to be reviewed and synthesized for possible transfer to other systems.
- Improved methods of planning and orchestrating the AO activities in light of construction work is required so that construction targets do not override other considerations and promises about physical

improvements are not made that cannot be met.

- A plan needs to be established that coordinates SMD activities and that also determines reasonable phasing out (including time frame and procedures) of site-specific AO activities and develops a viable future role for AOs in the project, district, and region.
- IMP needs to assist DOI in determining a viable future role for AOs in the project, and at district and regional levels.
- While focussing on developing effective project level ME&F and building on the work of past consultants, technical assistance is needed to—
 - 1) work with all project (SMD and IMC) staff to design and develop a management information system that includes selection of a minimum data set and concise report formats appropriate to each management level;
 - 2) assist the ME&F Chief to establish staff training and an appropriate data-collection mechanism; and
 - 3) provide periodic assistance in implementing and refining the system.
- The project should articulate its experience in improving cost recovery by helping farmers update their water assessment records, and should make this information available widely, particularly within DOI.
- AO activities to improve assessment records in collaboration with water user organizations should be continued.
- Institutional arrangements should be made to involve Regional Directorates and the District Offices in SMD's field activities, sanctioned by the Director General, DOI.

Irrigation Management Center

Conclusions

- IMC's development as a national center for irrigation management training seems likely

to be more difficult if it remains in Pokhara, due to these difficulties:

- 1) attracting professional staff to live and work there
 - 2) liaising with the proposed human resources development unit of the DOI
 - 3) providing a continuous program of management training for senior staff in DOI headquarters
- IMC needs to determine training priorities in accordance with overall objectives, and to plan its activities carefully so that they can be implemented within limits of the available resources.
 - Additional professional staff need to be recruited and the qualifications of existing staff need to be upgraded as soon as possible.
 - It is important to make adequate arrangements for follow-up in planning future training courses for AOs.
 - Debriefing sessions need to be organized by AOs after farmer-to-farmer training programs, to ensure that farmers who have participated transfer the knowledge and experience they have gained to other farmers in the community.
 - There is potential for developing the applied studies section, and a number of the studies already completed contain useful data for use by IMP staff and government policy makers.
 - Both the TROs and IMP/DOI staff are enthusiastic and eager to carry out applied studies, and the IMP/DOI staff are interested in developing their research skills.
 - Staffing is inadequate to meet current demands, and conflicts arise between research and training schedules.
 - Time constraints and pressures to complete the 14 committed studies have caused IMC to emphasize quantity over quality.

- The full-time TA has not demonstrated the necessary research skills to create an interdisciplinary team of researchers that can define a strategy and develop a coherent program to meet the objectives of the applied studies section.

Recommendations

- Institutionalize the IMC under the Development Board Act, within the DOI, in order to have
 - 1) flexibility in personnel, that is, be able to hire staff and improve their competencies through short- and long-term training programs in order to maintain a high level of professional qualification;
 - 2) flexibility in budgetary processes, so as to be able to establish training fees and invest in the improvement of training materials, etc.; and
 - 3) the ability to attract other resources and linkages.
- The DOI should consider locating the IMC in Kathmandu, preferably in close proximity to the proposed training facilities in the new DOI headquarters, and developing the Pokhara center as the first of a series of regional training centers under the national IMC.
- IMC should follow the broad irrigation management mandate articulated in the project paper.
- In the short term,
 - 1) IMC should concentrate on meeting the training needs associated with the implementation of a sector program, including induction training on irrigation engineering and management for engineers and AOs;
 - 2) IMC should, over time, develop refresher and specialized programs to meet the human resources development needs of the DOI;

3) skills currently lacking at IMC should be mobilized through existing institutions, such as the Nepal Administrative Staff College and the Agricultural Projects Services Center, as far as possible;

4) IMC should develop a strategy to cope with sector needs.

- Fill the two vacant IMC posts, as well as create and fill additional posts envisaged in the Project Paper, particularly those for specialists in management and communication. These priorities will help enable IMC to meet the growing demand for its services from the irrigation sector.
- Give IMC professional staff opportunities to obtain higher qualifications abroad and the technical and administrative support staff opportunities to upgrade their skills.
- Continue strong support to IMC's applied studies activities, to enhance training activities and contribute to national research efforts, particularly those of DOI. IMC should develop a coherent and focused applied studies agenda that addresses IMP field activities and major sector issues.
- Invite IIMI to place a full-time resident scientist at IMC to develop the necessary intellectual and professional leadership and upgrade staff research capability.
- Develop a network of national and international professionals to whom IMC reports are submitted for review.
- Develop IMC staffing plans to provide the opportunity for some staff to concentrate primarily on applied studies.

Project Management and Technical Assistance

Conclusions

- TA has not provided needed team leadership and managerial guidance in directing IMP/DOI staff toward goals. Although the primary contractor is responsible for assisting in overall

management, USAID/N has had to play too large a role in managing IMP.

- IMP/DOI management needs to develop a vision of the project's future direction, particularly given the rapid changes taking place in the sector as a whole.
- Clear lines of authority need to be established between IMP/DOI and TA to eliminate confusion over reporting procedures and decision-making authority.
- The project is now in an excellent position to begin consolidating and disseminating its results to a wider audience. IMP/DOI and TA need to build stronger links with the irrigation sector.

Recommendations

- USAID should seriously consider the status of its current contract for technical assistance in light of the inadequate performance to date. An alternative to the current technical assistance contract is the following arrangement:
 - 1) team leadership under a Personal Services Contract;
 - 2) support to IMC through a Cooperative Agreement with IIMI;
 - 3) support to IMC's applied studies in training through a Cooperative Agreement with an irrigation/water management training institute;
 - 4) local TA for SMD through a new contract with EAST Consult; and
 - 5) short-term TA through AID/W centrally funded projects
- DOI should review current IMP/DOI staffing in light of anticipated future needs and make changes as appropriate.
- Project and TA staff should clarify and agree upon communication patterns and lines of authority within the project.
- Project Management and DOI should ensure that project positions are filled and that staff carry out their required duties.

- USAID should explore ways to provide incentives to project staff in line with the pattern proposed by UNDP/PDSP.
- Project Management needs to develop a clear strategy for consolidating its experience, disseminating lessons learned, and developing linkages to the rest of the sector.

New Strategic Framework

Conclusions

- Institution building is a lengthy process. The original project design charted a course intended to move from consciousness-raising to institutionalization. Despite problems, IMP has made important strides, generally in the right direction. Progress has been slower than desired, and resource commitments have been lower than anticipated. These shortcomings are not alarming in themselves and would not ordinarily suggest that significant modifications are in order.

However, the project context has changed dramatically as the DOI began to redirect and restructure itself to fulfill its Basic Needs Targets, a process that has validated the basic thrust of IMP and its components but also challenges IMP to turn from a project to a program mode. In order to respond to new opportunities, IMP should be redesigned into a longer-term institution building program. For this, both USAID and DOI must recognize the long-term implications of such a program and must make up-front commitments to carry it through to completion.

Recommendations

- Contingent on suitable institutionalization of the SMD and IMP, USAID should commit itself to provide necessary resources over an appropriate time frame to support the establishment of these two entities as functional units of the DOI.
- In preparation, USAID and DOI should commission a redesign of the IMP, which would chart out a detailed strategy and identify implementation procedures suitable

to achieve the institutionalization objectives identified below.

- The SMD would become a central-level irrigation management unit of the DOI, with the task of developing policies, establishing operational procedures, and monitoring DOI activities and impact in the following areas: participation, operation and maintenance, resource mobilization, system turnover, system performance monitoring, and water management.
- The IMC would become DOI's national human resource development and operational research arm, which would
 - 1) fulfill immediate training needs related to implementing the Sector Program, including induction training for AOs and engineers in irrigation management and organization, and prepare itself to plan and implement human resource development programs for the DOI as a whole; and
 - 2) prepare itself to undertake applied studies to support the DOI's current and future needs, including impact monitoring, policy analysis, technical trouble-shooting, and the identification of emerging problems.
- In the meantime, USAID should review existing TA arrangements and consider introducing the following TA package:
 - 1) an O&M engineer, directly contracted, to provide technical leadership and coordinate TA;
 - 2) a cooperative agreement with an established irrigation management training entity to provide a long-term training advisor to the IMC;
 - 3) a cooperative agreement with IIMI to provide a long-term advisor on applied studies, short term research expertise as needed, and short term training assistance;
 - 4) a direct contract with local consultant to provide both long-and short-term TA; and
 - 5) additional short-term TA through AID/W centrally funded projects.

APPENDIX A

PROGRAM DESCRIPTION/STATEMENT OF WORK

APPENDIX A

PROGRAM DESCRIPTION/STATEMENT OF WORK

I. Activity to be Evaluated:

Project Title: Irrigation Management
Project Number: 367-0153
USAID Funding: \$9 million (grant)
GON Funding: \$4 million
Principal Contracts: Louis Berger/Cornell Univ./EAST Consult
LOP Dates: FY 85 - FY 92
PACD: 15 June 1992

II. Purpose of the Evaluation:

The purpose of this evaluation is to review the performance of the Irrigation Management Project to date, focusing on project activities and their role in achieving project objectives. The evaluation will recommend directions for future implementation, taking into account the objectives of the emerging irrigation sector program and the role IMP is to play in helping to fulfill them.

III. Background:

In August 1985 USAID and the Government of Nepal (GON) signed the Grant Agreement for the Irrigation Management Project (IMP), the purpose of which is to increase the institutional capability of the Department of Irrigation (DOI), other GON line agencies, and farmer groups to develop and sustain efficient irrigation management practices in agency-managed (AMIS) and farmer-managed (FMIS) irrigation systems. To do so, the project would establish within the DOI a Systems Management Division (SMD) responsible for operations and maintenance (O&M), monitoring and evaluation (M&E), and water user organization (WUO) activities; and an Irrigation Management Center (IMC) responsible for training and applied research activities in irrigation management.

Full-scale implementation began in August 1986 with the arrival of the technical assistance team and a "Start-Up Workshop" that brought together the DOI/USAID/TA Project Management Team to review project objectives and the first year's implementation plan. Since then the SMD and IMC have been established under the project and have carried out a number of activities:

Under the Systems Management Division two field sites have been selected for pilot interventions, each with a different management theme. Sirsia-Dudhaura, a Terai AMIS built some thirty years ago, is the focus for improving joint agency-farmer management practices in a potential command area of about 2500 hectares. Hande Tar, a hill system built some 10 years ago, has a potential command of some 250 hectares and is the focus for an agency-farmer turnover. Both systems have been laboratories for the IMP "learning process" that has emphasized

- the establishment of corporate and functional water user organizations, with legally recognized authority and responsibility for O&M;
- the upgrading of organizational and technical skills, for agency officials and farmers;
- the use of "catalytic agents" known as "Association Organizers" to facilitate agency-farmer interaction and overall systems management;
- collective decision-making for identifying "essential structural improvements" (ESI) -- the focal point for improved O&M interventions; and

- process documentation and "monitoring for management" systems that track key project developments and system variables.

Under the Irrigation Management Center, temporarily located at the Western Regional Irrigation Directorate in Pokhara and slated for construction in 1989, several human resource development and policy initiatives have been undertaken in support of project and DOI activities. With a "core" multi-disciplinary staff trained in engineering, agricultural and social sciences, together with a number of outside resource persons and institutions, IMC's accomplishments include

- a wide-range of pre-service/in-service training support for DOI staff and Association Organizers;
- on-site trainings for farmer groups, with interactive "farmer-to-farmer" trainings at AMIS/FMIS systems;
- applied studies in technical areas (cropping systems, baseline studies, operational water requirements, FMIS organization and management) as well as policy matters (resource mobilization for O&M, AMIS/FMIS turnover); and
- the organization of overseas/regional short courses and study tours for project staff and other GON officials, in support of IMP project and policy objectives.

To appreciate these accomplishments one must understand the rapidly changing "irrigation development environment" that has evolved since IMP's inception. Briefly, in 1985 IMP was for the most part viewed as just another project in a DOI portfolio of some 100 supply-driven construction-oriented projects. IMP's distinguishing feature was that it was one of two institution-building projects in the Department -- complementing the newly born UNDP-supported "Planning and Design Strengthening Project" (PDSP). Neither project had a home in the DOI organizational structure, nor were they integrated into the "mainstream" of the Department's implementation activities.

All this changed in 1987 with the advent of the GON "Basic Needs Program for the Year 2000" in which irrigation was targeted as a priority sector for development. What the program stressed was not building more large-scale capital intensive agency-managed schemes, but rather improving the maintenance and management of existing systems, focusing on the construction/rehabilitation of small and medium private and public schemes. This would be done through approaches that were community-based and participatory, relying on labor-intensive appropriate technologies that were cost-effective and sustainable. What followed was (a) the consolidation of irrigation agencies spanning three ministries into the Ministry of Water Resource's Department of Irrigation (November 87); (b) a GON-sponsored Irrigation Sector Donor Coordination Meeting in which donors pledged to support Basic Needs initiatives with a coherent and integrated demand-driven irrigation program (February 88); (c) the reorganization of the DOI and the creation of a Planning, Design and Research Division for IMP and PDSP activities, in support of the sector program (July 88); (d) the reformulation of GON irrigation policies, as outlined in the "Working Policy on Irrigation Development for the Fulfillment of Basic Needs" (August 88); and (e) the signing of the IDA \$8 million "Irrigation Line of Credit" (June 88), the ADB \$36 million "Irrigation Sector Project" (November 88), and the UNDP \$3.8 million Irrigation Sector Program Support Grant for Technical Assistance (forthcoming) -- all in support of the new irrigation sector program.

How does the emergence this program affect IMP? Significantly. In three years the approaches and functions developed under SMD and IMC have gone from project to program status, adding a layer of objectives that goes beyond what the project had originally planned. Many processes pioneered under IMP, such as using AOs for improving agency-farmer interaction, organizing farmers into viable groups for O&M, documenting field-level procedures and activities, and developing decision-making and management skills for agency officials and farmers, have now become an integral

feature of the sector program -- with the expectation that IMP, with its own resources as well as those from the DOI and other donors, will be able to support the sector in these critical areas.

Given this context, and the many institutional and programmatic changes affecting IMP's mandate, an evaluation at this stage of project evolution is essential.

IV. Statement of Work:

A. Objective: The objective of this evaluation is to review IMP performance to date with a view toward (a) assessing progress toward meeting project objectives, (b) recommending an appropriate strategy and program for IMP support to the sector, and (c) determining what changes, if any, need to be made in the project implementation plan to fulfill both project and sectoral objectives. In carrying out this evaluation the team will look at such things as planned targets and outputs, administrative and staffing arrangements, project management and implementation procedures, project monitoring and impact assessment systems, GON and USAID policies affecting implementation, the performance of the technical assistance contractor, and project and program coordination within the irrigation sector, recommending possible changes wherever required.

B. Scope of Work: This evaluation will focus on providing the GON and USAID with input on the following specific concerns:

1. Project Objectives/Operations: In light of project implementation experience and current irrigation policies and programs, are IMP objectives as set forth in the project paper still relevant and accomplishable? Are there any changes in emphasis or priority that would enhance project implementation? How can overall project operations be improved?
2. Institutional Development: The institution-building thrust of IMP, as exemplified in the SMD and IMC activities, is designed to be adaptive to local conditions, appropriate to local capabilities, and sustainable over the long-term. Is this the case? Does the project have a comprehensive and coordinated strategy whereby field activities, human resource development, and applied research are interdependent, mutually reinforcing, and directed toward common ends? Do SMD and IMC have the right structures, statuses, and programs necessary to strengthen the national capacity for irrigation management? Specifically:
 - Have SMD field activities played a role in enhancing the capabilities of the DOI and farmers to better plan, design, construct, operate and maintain irrigation systems? To what extent have "Essential Structural Improvements", viewed as a process to promote effective agency-farmer interaction and decision-making, contributed to improved systems management? Is the intervention approach being developed under SMD field sites transferable to other private and public systems?
 - Are the IMC's training and applied studies programs, which currently focus on supporting project field activities and staff, contributing to DOI human resource development and knowledge-building needs? Is the IMC strategy one of broad institutional-strengthening, i.e. encouraging local capacity-building by promoting the comparative advantages of local professionals and institutions?
 - Has the IMP "Learning Process" contributed to increasing awareness among government entities that improved irrigation management practices are significantly important in making agency-managed irrigation systems productive?
 - SMD and IMC are currently IMP project components. If they are to be sustainable and provide long-term support to the irrigation sector, they need to be appropriately integrated and institutionalized into the Department's organizational structure. Are SMD and IMC on track for such integration? Have

they established effective linkages at the ministerial, departmental, regional, district and project levels?

- What are the appropriate personnel policies, i.e. staff recruitment, professional development, and management, that are needed to sustain the growth and effectiveness of the SMD and IMC programs? To what extent has IMP succeeded in overcoming constraints that existing policies, incentives, and traditional modes of behavior and responsibility place on innovation, experimentation, and management improvement?
- Irrigation is but one input needed to increase agricultural production. What is IMP's role vis-a-vis that of other line agencies in increasing crop production? Should IMP, as a project, establish a separate agricultural unit, or should it integrate expertise and inputs from regular GON programs?

3. Policy Formulation and Support: The project has an ambitious policy agenda designed to assist the GON and Donors in formulating or restructuring policies regarding the legalization of water user organizations, the implementation of participatory management approaches, and the mobilization of those human and financial resources needed to sustain efficient operations and maintenance procedures. Has IMP been effective in helping to formulate and implement policies in these areas? Specifically:

- Have SMD's field and IMC's applied studies initiatives on "resource mobilization for O&M" contributed to a more progressive policy environment with respect to local-level participation and cost recovery issues? Should the project be doing additional policy studies in this area?
- Has IMP support for user group legislation activities under the Water and Energy Commission Secretariat (WECS) and the Ministry of Law and Justice (MOLJ) been effective? Should IMP be playing a role in assisting the DOI to implement new legislation?
- Have IMP activities demonstrated a concern for equity, with regard to such things as essential structural improvements, water distribution, agricultural inputs, human resource development, and other project benefits? Has the project adequately addressed gender-related issues?
- Are there other areas in the GON or USAID policy agenda where IMP could be taking further initiatives?

4. Sector Support and Donor Coordination: The word "sector" did not exist in IMP's or the DOI's vocabulary during project design and the first year of implementation. Now, as the result of the February 1988 Donor Coordination Meeting and the Irrigation Sector Support Program, IMP and USAID have become an integral part of the sector. The challenge now is to define IMP's role in the sector, with the following concerns in mind:

- Do SMD and IMC, as presently staffed and financed, and with regular project activities to implement, have the capability to respond to the water user, training, and applied studies needs within the sector? Within other large agency-managed systems? If not, what other kinds of inputs and directions are required to instill this capability?
- What is the most appropriate and balanced strategy IMP could implement in order to accomplish project activities while at the same time supporting the sector program? Should USAID and the DOI reprogram existing or make available additional project funds and technical assistance to support the sector activities?

- Are the linkages that IMP has made with other DOI- and Donor-supported projects leading to more coordinated programming and implementation of activities within the sector? What further steps could be taken within projects, within the DOI, and among Donors to improve and institutionalize this process?

C. Composition and Qualifications of the Evaluation Team: Carrying out the above scope of work will require a seven-person team, four of whom will be contracted by ISPAN. These four, who are full-time members of the evaluation team, are key personnel under the contract and are responsible for fulfilling the scope of work and coordinating inputs from other team members. Three of them are expatriates, one of whom will be designated by the Contractor as Team Leader. All three should have wide-ranging experience and expertise in irrigation development/management in developing countries, as well as experience in evaluating this type of project and program.

These four team members and their desired qualifications are as follows:

- Irrigation Engineer (Expatriate): Experience in the social and technical aspects of irrigation management, especially activities and issues involving management interventions in agency-built systems, strategies for sustainable operations and maintenance, and monitoring/evaluation systems and their relation to system management.
- Irrigation/Resource Economist (Expatriate): Experience in analyzing O&M activities and their relation to cost recovery and water charge policies, specifically the cost of O&M in agency-managed systems; strategies for resource mobilization on jointly-managed systems and agency systems targeted for farmer turnover; and economic and other incentives for water users to assume responsibility in system management.
- Institutional Development Specialist (Expatriate): Experience in analyzing irrigation organizational structures and their relationship to management processes, the statuses and roles of farmer/water user organizations and local participation in irrigation financing and management, and the role of training and applied studies in manpower development.
- Irrigation Specialist (Nepali): Broad experience in both agency- and farmer-managed systems in Nepal, with proven field skills and knowledge of irrigation engineering as well as public finance and public administration. Expertise in local-level resource mobilization, and the GON irrigation policy environment and program budgeting process, are also highly desirable.

To support this evaluation team ISPAN will also provide a Team Planning Coordinator, who will organize a one-day Team Planning and Orientation Meeting in AID/W prior to the team's coming to Nepal; and a Home Office Coordinator to provide backstop support and assist in the overall coordination of the evaluation.

These four "core" team members will be complemented by three other professionals representing AID/W, the GON/DOI, and the International Irrigation Management Institute (IIMI) in Sri Lanka. The GON participant will be with the team full-time, and will act in a liaison-advisory capacity. The AID/W and IIMI representatives will participate approximately half-time, each with specific technical tasks, as outlined below:

- GON/Department of Irrigation Official: A senior official within the DOI with a broad grasp of national irrigation development initiatives and GON policies, an understanding of irrigation management and institutional development issues, and

experience in training and research activities and their relevance to the irrigation sector.

- AID/W Senior Water Management Specialist: As the Agency and Bureau representative, he will focus on inter-institutional and sectoral issues, particularly the role of IMP within the context of structural adjustment and the IBRD/ADB sectoral program. He will also assess IMP policy initiatives within the context of AID and GON policies in the irrigation sector.
- IIMI Training Specialist: This specialist, who is supported through an ANE/ISPAN Cooperative Agreement with IIMI, will assess IMC's training program with regard to institutional strengthening, appropriateness for SMD field activities, and manpower development within the sector. Also of interest is IMC's strategy for human resource development, and how it articulates with the DOI's future development plans.

Regarding funding for these three specialists, travel and per diem costs for the GON participant will be paid through project funds. Salary, travel and per diem costs for the AID/W and IIMI participants will be paid through OE and Cooperative Agreement funds, respectively.

D. Evaluation Timing and Activities: The evaluation will take place over an approximate six-week period, beginning o/a 13 March and ending o/a 24 April. Evaluation activities, and the timing of each member's input, is illustrated schematically on the next page. An overview of these activities is as follows:

- Preparatory/Orientation Period (13-25 March)
 - A. Kathmandu (13-25 March): The two Nepali team members will collect and begin reviewing background materials. They will contact appropriate GON officials and arrange appointments for the team during the week of 27 March.
 - B. Washington, D.C./Manila (20-25 March): The three U.S.-based team members and the ANE Bureau's Water Management Specialist will meet in Washington for 2-3 days for an overview of project and evaluation activities. This will include discussions with ANE technical and program specialists, especially ANE/PD, ANE/DP/E, and ANE/TR/ARD; a Team Planning Meeting; briefings with Cornell University/CUIAP consultants involved in IMP; and meetings with World Bank officials responsible for the Line of Credit/Sector Program in Nepal. The team will have the following background materials available for review during this orientation (N.B. This list is a selection of key documents and represents only a sampling of those that will be available to the team in Nepal):
 - IMP Project Paper (June 1985)
 - IMP Start-Up Workshop Report (October 1986)
 - IMC Special Study on "O&M and The Mobilization of Local Resources on AMIS in Nepal" (November 1987)
 - Irrigation Rules/Legislation: 2044 (March 1988)
 - WUA Series Report on Irrigation User Organizations at Sirsia-Dudhaura (April 1988)
 - World Bank Staff Appraisal Report on the Mahakali II Irrigation Project (May 1988)

EVALUATION ACTIVITIES AND TIMING

MARCH			APRIL			
Week of			Week of			
13	20	27	3	10	17	24
-----			Preparatory Period: Kathmandu			
-----			Preparatory Period: AID/W			
-----			Kathmandu: Project/Program Overview			
-----			Field Activities, IMC			
-----			----- Draft Report Preparation			
-----			----- Joint GON and USAID Review			
-----			Local Irrigation Specialist			
-----			DOI Senior Engineer			
-----			Irrigation Engineer			
-----			Resource Economist			
-----			Institutional Development Specialist			
-----			AID/W Water Management Specialist			
-----			IIMI Training Specialist			
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- DOI Working Policy Paper on Irrigation Development for the Fulfillment of Basic Needs (August 1988)
- Proceedings of a Workshop on the Institutional Improvement of the DOI (August 1988)
- Asian Development Bank Appraisal of the Irrigation Sector Project in Nepal (November 1988)
- LBII/IMP Trimester Report No. 7 (November 1988)
- IMP Project Review Workshop and Revised Workplan (December 1988)
- UNDP Irrigation Sector Program Support Project Document - Draft Version (January 1989)

Following this orientation a one-day stopover will be planned in Manila to meet with ADB officials involved in Nepal's sector program, should this meeting not be able to be arranged in Nepal.

- Project/Sector Overview: Kathmandu (26 March - 1 April):

The evaluation team, with the exception of the AID/W and IIMI participants, will meet and begin the formal evaluation process. Early on they will meet with the IMP Management Team (IMP Project Director, USAID Project Officer, TA Team Leader) and other interested DOI and USAID staff to discuss and finalize the scope of work. During this week the team will continue reviewing background materials and meet with appropriate Project and TA personnel, GON officials, USAID staff, and Donors involved in Nepal's irrigation activities.

They will also make preparations for the upcoming field trip.

- Field trip: Parwanipur, Hande Tar, Pokhara (2-11 April):

The team will visit the SMD field sites at Sirsia-Dudhaura (Parwanipur) and Hande Tar, and the IMC in Pokhara. With a view toward comparing IMP activities with those of other irrigation systems, the team should visit other agency- and farmer-managed systems in the Kathmandu-Parwanipur-Hande Tar-Pokhara vicinity. During field visits the team will meet with DOI and TA staff, local officials and leaders, members of user organizations, other line agency staff involved in irrigation, and other appropriate persons.

- Draft Report Writing: Kathmandu (12-19 April):

The team will prepare a draft evaluation report, with inputs from each of the team members. The Evaluation Team leader will furnish ten copies of the draft to the USAID Project Officer, who will distribute it for review.

- Reviewing and Finalizing the Draft Report (20-24 April):

The DOI and USAID will hold a joint review meeting at which the Team Leader will present the findings, recommendations and conclusions of the evaluation. He will then incorporate the comments from this meeting into the final draft report, which he will present to the USAID Mission Director prior to his departure from Nepal.

E. **Relationship and Responsibilities:** The Consultants will work under the policy guidance of the USAID/Nepal Mission Director, and the operational guidance of the Chief of the Office of Agriculture and Rural Development (ARD) and the IMP Project Officer. The GON liaison official shall be the Acting Project Director of the IMP. The USAID/ARD Natural Resource and Institutional Development Division (NRID) will coordinate inputs required for the evaluation, including administrative support and logistical arrangements as specified in PIO/T Item No. 20 "Provisions for Logistic Support". The Evaluation Team Leader is responsible for coordinating the work of all team members and for ensuring that ISPAN administrative and logistical inputs are provided as required and that drafts of the evaluation report are completed on schedule.

F. **Level of Effort:** To carry out this six week evaluation the Contractor will provide approximately 22 person weeks of assistance: five weeks each for the expatriate consultants; six weeks for the local consultant; and one week for the home office and team planning coordinators. Regarding the three other team members, the GON/DOI representative will devote full-time, while the AID/W and IIMI representatives will participate about three weeks each (3-24 April, and 28 March-16 April, respectively). All team members will work a six-day work week, with Saturdays off.

G. **Key Personnel:** The four full-time professionals which the ISPAN Contractor is providing for this evaluation are "Key Personnel" under this contract. Candidates for these positions must be approved by USAID/Nepal and the GON.

H. **Reporting:** The evaluation team is responsible for completing an evaluation report. This report will record the team's findings, recommendations, and conclusions; it will also cover, as substantively as possible, the team's views regarding the performance of the project to date, its prospects for a successful completion, and any changes the team believes will have a positive influence on the future implementation and impact of the project.

The Contractor will prepare a final report in conformance with ANE Bureau evaluation guidance, which will be provided by DP/E. The report will include the following sections:

- Table of Contents
- Executive Summary (not to exceed three pages)
- Map(s)
- List of Tables
- Abbreviations and Acronyms
- Currency Equivalents, Weights and Measures, Glossary
- Body of the Report (not to exceed 50 pages), including a brief description of the country and program context in which the project was developed and implemented, sections for each project component evaluated, and the findings upon which the recommendations and conclusions are based.
- Appendices, which at a minimum should include
 - (a) Evaluation Scope of Work
 - (b) Description of Methodology Used in the Evaluation
 - (c) Annotated Logical Framework
 - (d) Persons Consulted by the Evaluation team
 - (e) Bibliography of Documents Consulted

Within three weeks of the departure of the Evaluation Team Leader from Nepal, the ISPAN Contractor will submit 75 copies of the Final Evaluation Report to the ANE Senior Water Management Specialist, fifty of which will be sent to USAID/Nepal and the remaining distributed in AID/W.

APPENDIX B

METHODOLOGY

APPENDIX B

METHODOLOGY

Members of the Evaluation Team first met in Washington D.C. at the ISPAN headquarters for a two-day Team Planning Meeting concerning evaluation assignment. The Training Specialist (IIMI) assigned to the team and the Nepali evaluation team members were not able to attend. Resource people from USAID, Louis Berger International, Inc., Cornell University, and the World Bank joined the meetings to provide background information about the IMP activities in Nepal.

The team then regrouped in Kathmandu where the first week was spent meeting with IMP Project staff, AID/Nepal staff, staff of the Department of Irrigation and others involved in the irrigation sector. Following the briefings in Kathmandu, the team proceeded to the IMP Sirsia-Dudhaura field site in the Terai. The team was joined by members of the IMP staff, the Technical Assistance group and the AID/N Project Officer. The team split into small groups to make field visits, some going to the head of the irrigation system, some to the middle and some to the tail. The team had the opportunity to talk with the water user organization representatives and members. Informal meetings were held with field staff at the IMP office in Parwanipur.

Following the one and a half day field visit, the team proceeded to Pokhara to visit the IMC staff and the Western Regional Directorate. The team once again split up to meet more informally with specific staff members. Part of the team visited the Western Regional Director to discuss the Irrigation Line of Credit activities and Hande Tar.

The team's training specialist and AID/W member remained in Pokhara to continue discussions while the rest of the team proceeded to the second IMP fieldsite at Hande Tar. One half-day was spent talking with IMP field staff, inspecting the canal system and headworks and talking with farmers.

The team regrouped in Kathmandu to begin writing the evaluation report. Informal meetings were held with AID/N staff to brief them on our tentative findings and recommendations. A draft was then submitted to the AID/N Project Officer for review. Subsequently, a meeting was held with AID/N, IMP and DOI staff to discuss the evaluation results.

The full itinerary of the Evaluation Team is as follows:

- 3/29 Team Planning Meeting, ISPAN (Ait Kadi, Easter, Peabody, Stanbury)
- 3/30 Continued; depart for KTH
- 4/2 AM Franca joins team; team meeting with AID/N Project Officer and IMP staff
PM Team meeting to review TMP in Washington
- 4/3 AM Meet AID/N staff; Director, DOI; Central Region Director
PM Team meeting
- 4/4 AM Meeting with ILO, WECS, and IIMI staff
PM Meeting with Ministry of Finance, Joint Secretary and Undersecretary
- 4/5 AM Meeting with IMP Staff and TA
PM Peabody joins team; meeting with IMP Staff
- 4/6 AM Meeting with PDSP, CIWEC, DOI and UNDP staff
PM Meeting with Ministry of Water Resources, Acting Secretary; Team meeting
- 4/7 AM Team meeting; Individual meetings with WUA, TA and ADBN

- PM Individual meetings with National Planning Commission; World Bank
- 4/8 AM Team work on report outline
- 4/9 AM Depart for Sirsia-Dudhaura
PM Meetings with IMP field staff at field Office, Parwanipur
- 4/10 AM Field visits
PM Field visits; visit to Naryani Project
- 4/11 AM Depart for Pokhara
PM Meeting with IMC Director
- 4/12 AM Individual meetings with IMC Staff
PM Part of Team leaves for Hande Tar; remaining team members meet with IMC staff
- 4/13 AM Field visit at Hande Tar; meeting with Western Regional Director in Pokhara
PM Return to Kathmandu
- 4/14 AM Team meeting and review of outline
PM Continued team meetings
- 4/15 AM continued team work on outline
PM continued team work on outline
- 4/16 AM report writing
PM continued report writing
- 4/17 AM team meeting; meeting with AID/N Project Officer and Deputy Director, DOI
PM report writing
- 4/18 AM team meeting
PM report writing
- 4/19 AM report writing and review
PM team meeting; meeting with AID/N staff
- 4/20 AM Franca departs; report writing and revision
PM report writing
- 4/21 AM work on recommendations
PM meeting with AID/N and IMP to discuss draft report and submit draft to AID/N Project Officer
- 4/23 AM develop appendix for report
PM meeting with AID/N and DOI to discuss draft report
- 4/24 AM revision of draft report
PM continued revision of draft report; Peabody departs
- 4/25 AM submit final report to AID/N Project Officer
PM Ait Kadi, Easter and Stanbury depart

APPENDIX C

PERSONS AND PLACES VISITED

APPENDIX C

PERSONS AND PLACES VISITED

<u>Agricultural Development Bank</u>	<u>Designation</u>
Ganesh Ram Shrestha	Section Officer
Anil Sharma	Engineer
Rudra Upadhyay	Engineer
<u>Department of Irrigation</u>	
Mohan D. Karki	Director General
Nasirudeen Ansari	Deputy Director General/ Sector Coordinator
Shiva R. Pant	Deputy Director General
Lava R. Bhattarai	Western Regional Director
Ratneswor L. Kayastha	Central Regional Director
<u>District Agriculture Office, Parsa</u>	
N. Syangboa	Acting Agriculture Dev. Officer
Jaya Mangal K. Thakur	Asst. Agriculture Dev. Officer
<u>District Irrigation Office, Bara</u>	
Ram Dev Shah	District Irrigation Officer
<u>International Labour Organization (ILO)</u>	
Chris Baker	Project Coordinator
Wipko H. W. Drenth	Senior Engineer
Robert Makkinga	Economist/Training Specialist
S.C. Lakhey	
<u>International Irrigation Management Institute (IIMI)</u>	
Dr. Robert Yoder	Resident Scientist
Dr. Prachanda Pradhan	Resident Scientist
<u>Irrigation Line of Credit TA Staff</u>	
Louis Rijk	Team Leader
John Stout	Engineer Consultant
<u>Irrigation Management Project Office</u>	
Binod K. Aryal	Acting Project Director
Giri R. Gautam	WUA Section Chief
Ajaya L. Shrestha	ME&F Section Chief
Isvar C. Adhikari	O&M Section Chief

Irrigation Management CenterDesignation

Rishi Ram S. Neupane	Director
Trilokya M.S. Pradhan	Training Chief
Shiva K. Shrestha	Rural Sociologist
Purna K. Shrestha	Engineer
Rajendra L. Shrestha	Engineer

Irrigation Management Project TA Staff

William C. Bell	Team Leader
Fred Schantz	Training & Research Specialist
Laxman Ghimire	Assoc. Training Eng. Specialist
Dr. Upendra Gautam	Assoc. WUO Specialist
Krishna M. Gautam	Assoc. Trng. & Rech. Specialist
Ram M. Joshi	Assoc. Ag. Dev. Specialist
Krishna H. Maharjan	Training & Research Officer
Munni Sharma	Training & Research Officer

Cornell University

Dr. Norman Uphoff	Applied Studies Advisor
Dr. Prachanda Pradhan	(until 2/89)

IMP Field Site Sirsia-Dudhaura

Krishna Chandra Shah	System In-Charge
Kishore Pant	Engineer (ME&F)
Madav Banskota	Engineer (O&M)
Suman Sijapati	Engineer (O&M)
Bhanu P. Jaiswal	Junior Technician (JT)
Krishna P. Gawali	Junior Technician (JT)
Jaganath P. Shahakanu	Overseer
Ran Narayan Chaudhari	Overseer
Radha Krishna Manandhar	AO Supervisor
Nirmal Mainali	Association Organizer
Amod K. Jha	Association Organizer
Gyanendra K. Singh	Association Organizer
Hari Narayan Pande	Association Organizer
Bhagawati P. Yadav	Association Organizer
Suresh K. Shah	Association Organizer
Water User Association Members	
Water User Group Chairmen, Members, and User Farmers	

IMP Field Site, Hande Tar

Jivan Nanda Yadav	Overseer
Subhakar Neupane	AO Supervisor
Hem Raj Subedi	Association Organizer
Lal P. Dumre	Association Organizer
Biswa N. Dhakal	Association Organizer
Water User Association Members	
Water User Group Chairmen and Members	

<u>Ministry of Water Resources</u>	<u>Designation</u>
Bhubaneshwor K. Pradhan	Acting Secretary
<u>Ministry of Finance</u>	
Punya P. Dahal	Joint Secretary
Krishna R. Pandey	Under Secretary
<u>National Planning Commission</u>	
Govinda Kafle	Joint Secretary
<u>Narayani Irrigation Project</u>	
Chandreswor Rauniyar	General Manager
Makehor Barnawal	Farmer Organization Officer
Basudev Banskota	Economist
Sarad P. Sharma	Engineer
<u>UNDP</u>	
Purusottam Subba	Program Officer
<u>USAID/Nepal</u>	
David M. Wilson	Director
William Stacy Rhodes	Deputy Director
Travis Rattan	Controller
Timm Harris	Chief, PPD/PD
Robert V. Thurston	Chief, ARD
George F. Taylor	Deputy Chief, ARD
Dr. Jon H. Breslar	Project Officer, ARD
Prayog M.S. Pradhan	Program Specialist, ARD
<u>Water and Energy Commission Secretariat</u>	
Surya Nath Upadhyay	Executive Director (Legal)
Rajendra Kshatri	Legal Officer
<u>World Bank</u>	
Eric Cruikshank	Deputy Res. Rep./Nepal
Ram Chandra Mishra	Agriculture Specialist/Nepal
Dr. Richard Reidinger	Irrigation Program Specialist
Dr. Robert Siy, Jr.	Irrigation Program Specialist

AID/S&T

Dr. Sheridan Plunkett

ISPAN

Dr. Peter Reiss
Graeme Frelick

Louis Berger International, Inc.

Laura MacPherson

Designation

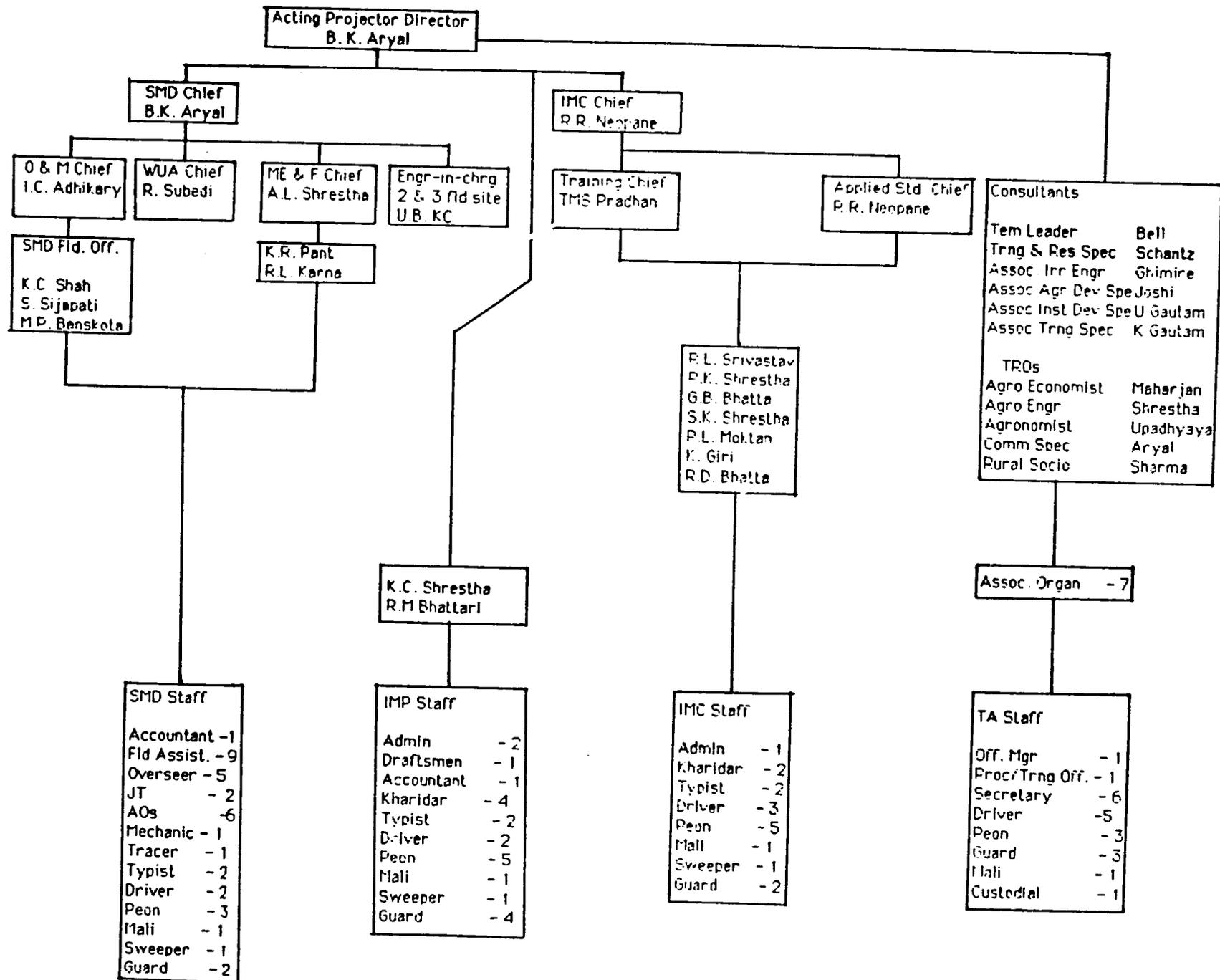
Rural Development Specialist

Program Manager

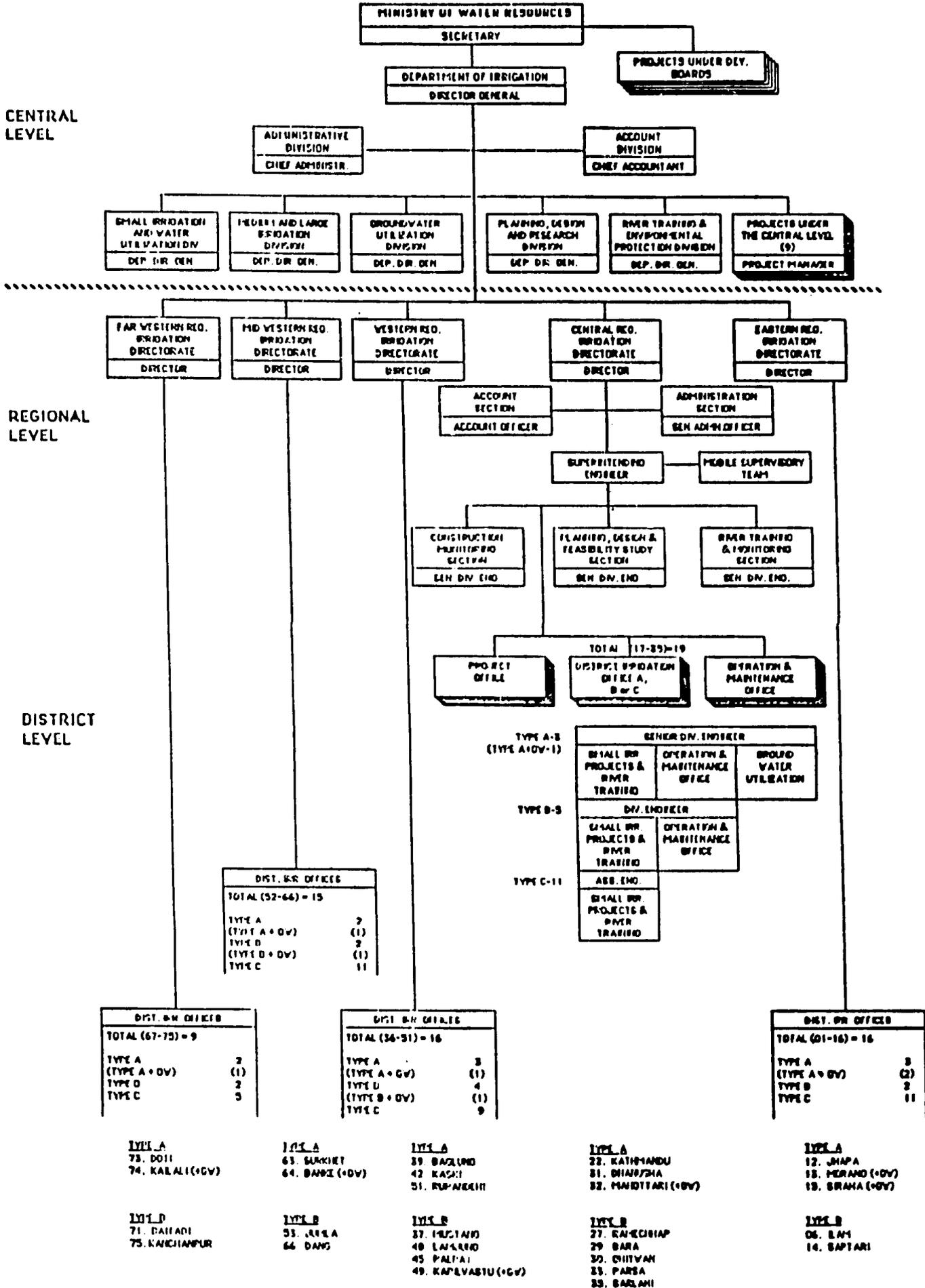
APPENDIX D

ORGANIZATION CHARTS OF DOI AND IMP

**IRRIGATION MANAGEMENT PROJECT
ORGANIZATION CHART
(MARCH 1989)**



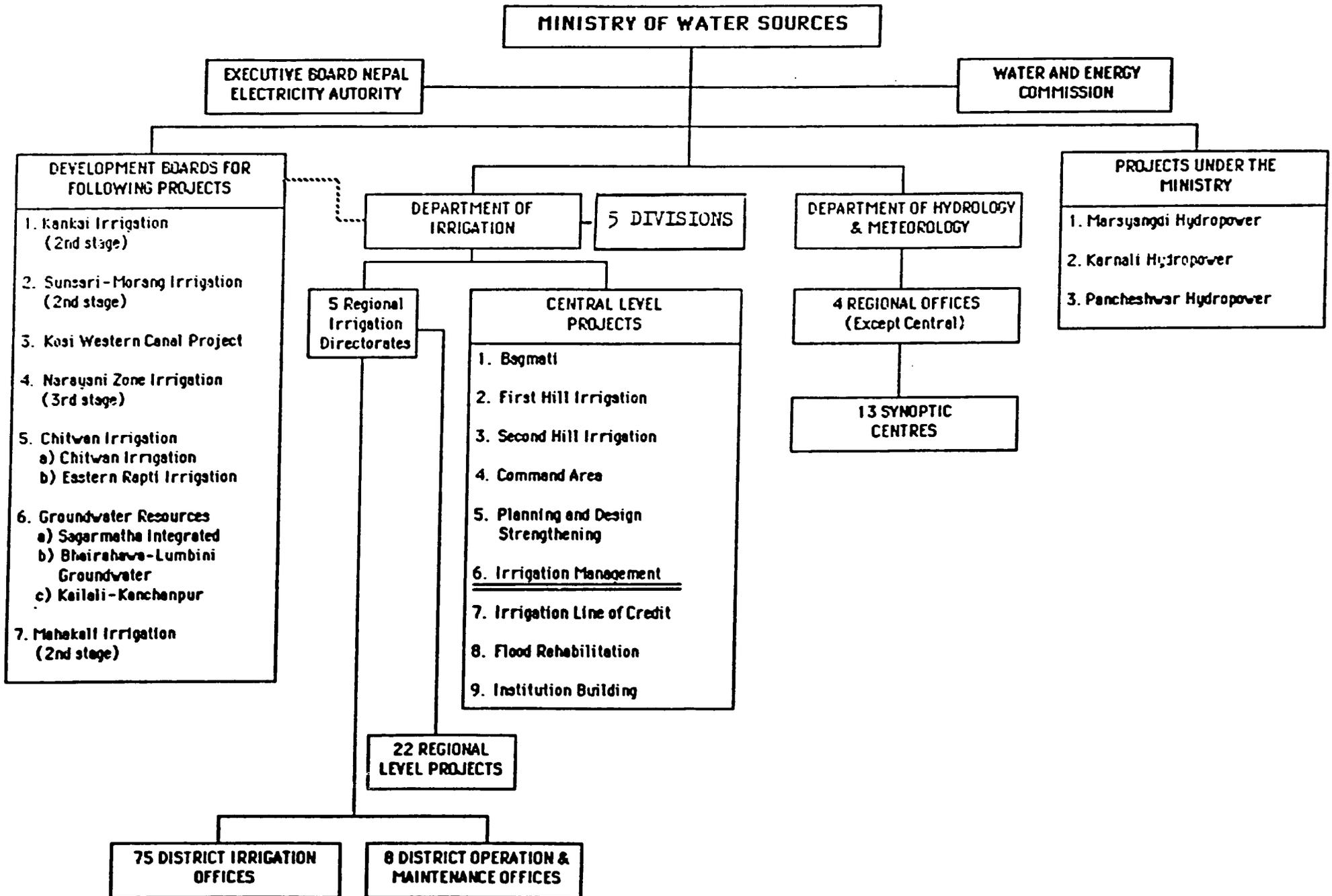
SCHEMATIC PRESENTATION OF INSTITUTIONS AT CENTRAL, REGIONAL AND DISTRICT LEVEL



DISTRICT LEVEL

DIST. SR OFFICES TOTAL (52-66) = 15 TYPE A (TYPE A + OV) 2 (1) TYPE D 2 (TYPE D + OV) (1) TYPE C 11		DIST. SR OFFICES TOTAL (67-73) = 9 TYPE A (TYPE A + OV) (1) TYPE D 2 TYPE C 5		DIST. SR OFFICES TOTAL (34-31) = 16 TYPE A (TYPE A + OV) 3 (1) TYPE D 4 (TYPE D + OV) (1) TYPE C 9		DIST. SR OFFICES TOTAL (01-16) = 16 TYPE A (TYPE A + OV) 3 (2) TYPE D 2 TYPE C 11			
TYPE A 73. DOLI 74. KALALI (+OV)	TYPE A 63. SARKHET 64. BANZI (+OV)	TYPE A 39. BAZUND 42. KASHI 51. RUPAKSHI	TYPE A 22. KATHMANDU 31. BHARPUJA 32. MANDITARI (+OV)	TYPE A 12. JHAPA 13. MERAND (+OV) 13. BRAHA (+OV)	TYPE D 71. PAHADI 75. KANCHANPUR	TYPE B 53. JUREA 64. DANG	TYPE B 37. HELTAND 48. LAKSAND 45. PALPAI 49. KAPDEVASTU (+OV)	TYPE B 27. KANCHANPUR 29. BARA 30. CHITWAN 33. PARSA 33. SARLAMI	TYPE B 06. LAMPA 14. SARTARI

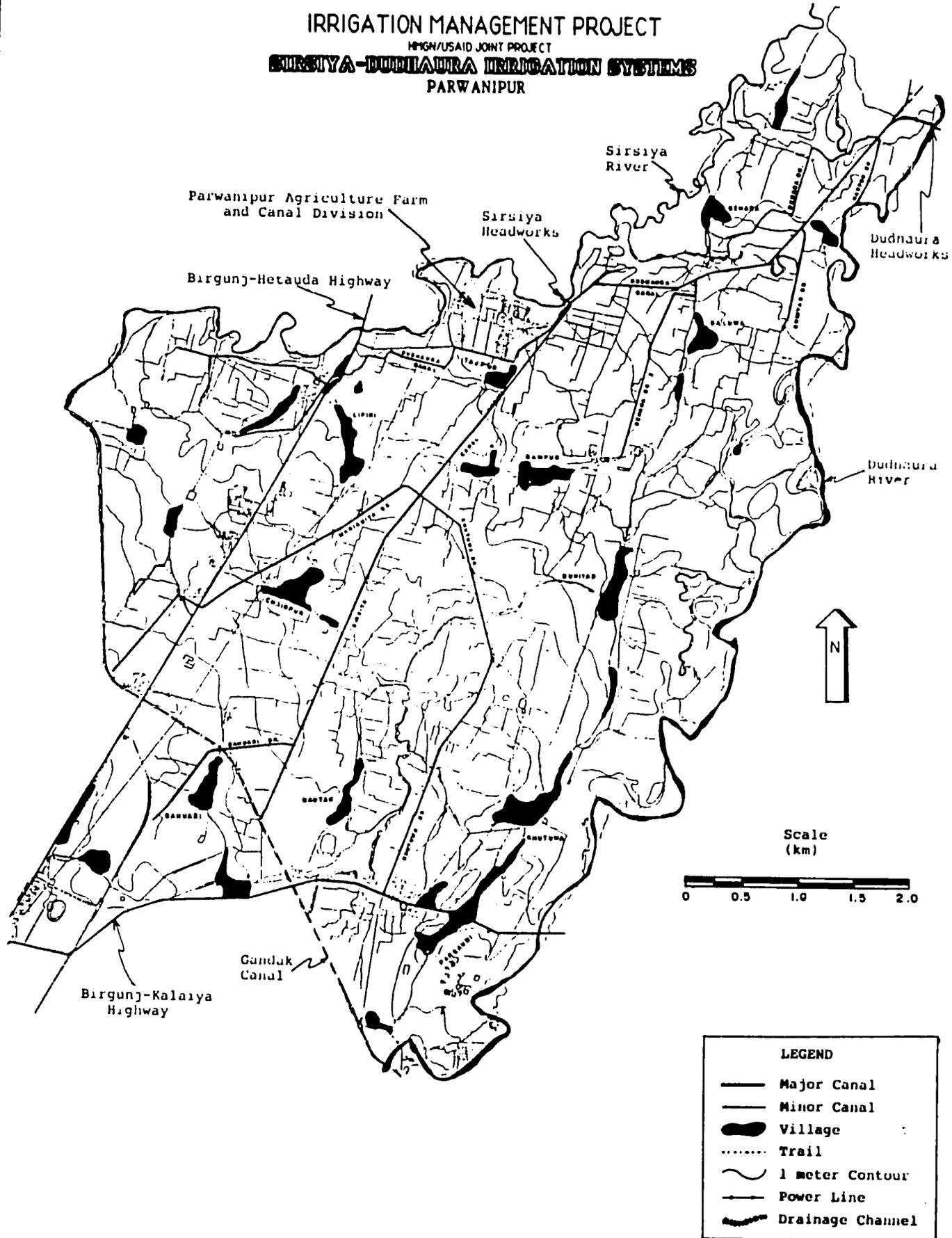
ORGANIZATION CHART OF THE MINISTRY OF WATER RESOURCES



APPENDIX E
MAPS

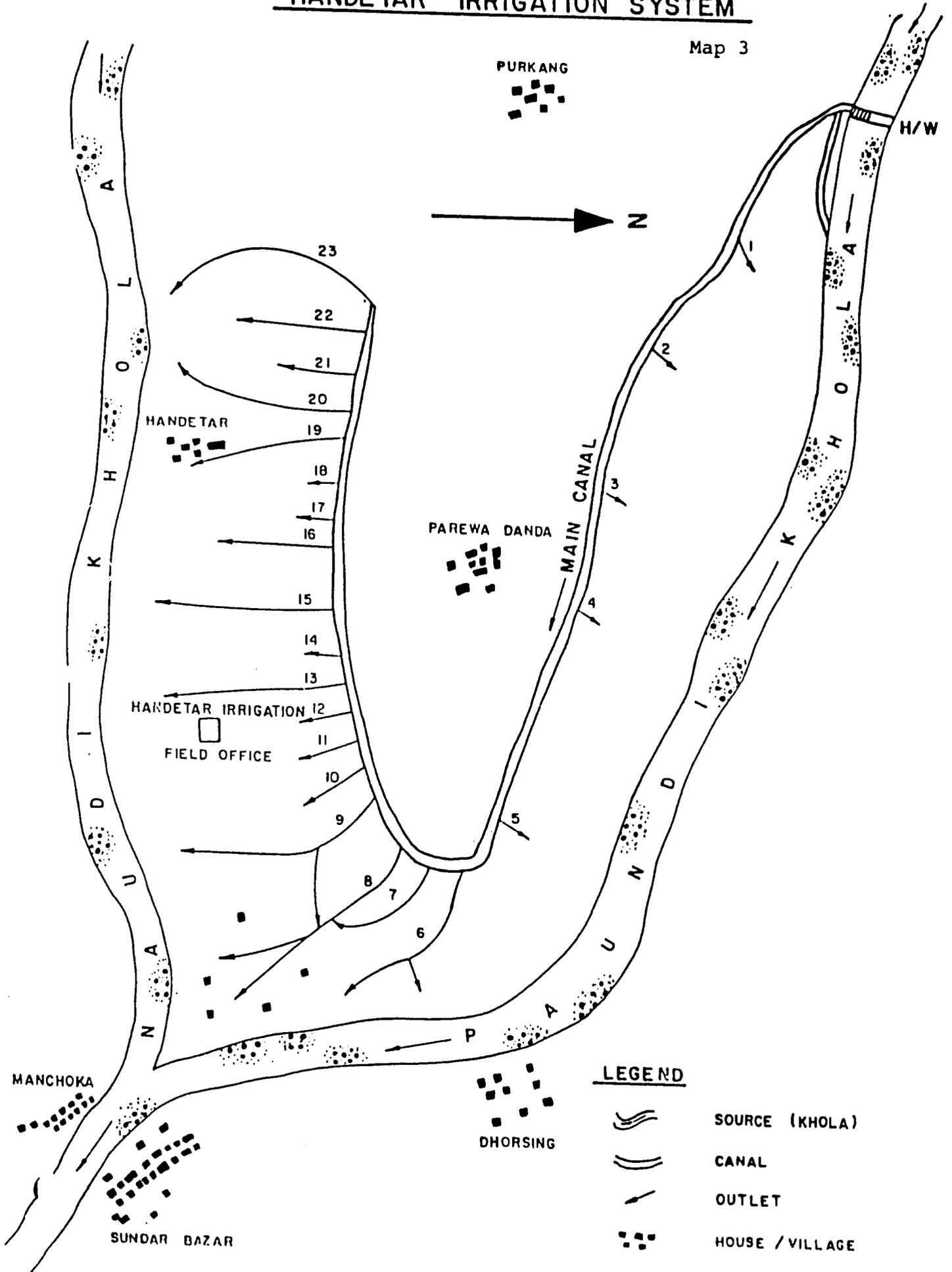
HIS MAJESTY'S GOVERNMENT OF NEPAL
MINISTRY OF WATER RESOURCES
DEPARTMENT OF IRRIGATION

IRRIGATION MANAGEMENT PROJECT
HIGH/USAID JOINT PROJECT
SIRSIYA-DUDHAURA IRRIGATION SYSTEMS
PARWANIPUR



HANDE TAR IRRIGATION SYSTEM

Map 3



LEGEND



SOURCE (KHOLA)



CANAL



OUTLET



HOUSE / VILLAGE

APPENDIX F

ANNOTATED LOGICAL FRAMEWORK

APPENDIX F

ANNOTATED LOGICAL FRAMEWORK

LOG FRAME STATEMENT IN PROJECT PAPER

CURRENT STATUS

1. Objectives to Which This Project Contributes

- To increase the total agricultural production from irrigation systems.

- Objective is over-ambitious and no data are available in Nepal to determine impact on total agricultural production. (Statement of objectives was revised in 1989: "capability of the DOI and farmers to improve irrigation management practices strengthened.")

Measures of Goal Achievement

- National foodgrain production increased.
- Small-farmer incomes increased.
- Agriculturally related employment increased.

- Same as above
- No data
- No data

Assumptions for Achieving Targets

- GON will increase and maintain budget for irrigation management.
- GON policy will encourage domestic food production.
- Availability of irrigation water supplies approaches historical average.
- Other production inputs such as seed, fertilizer, and credit available.

- Viable assumption in long term
- Viable assumption
- Viable assumption
- Viable assumption

2. Project Purpose

- To increase the institutional capabilities of the Department of Irrigation, Hydrology and Meteorology (DIHM), other GON agencies, and farmer groups to develop and sustain efficient, equitable irrigation management practices in irrigation systems.

- Some progress but still at an early stage.

Objectively Verifiable Indicators

- DIHM-operated IMP sites have been successfully delivering water equitably, reliably, and on a timely basis to water users who have developed into strong organizational units (WUAs). - Viable improvements made
- A hill irrigation improvement process has been developed that identifies appropriate interventions for improving farmer-operated hill irrigation systems. - Work only recently started
- The process for organizing WUAs has been sufficiently adapted to conditions in Nepal; IMC trainers can support DOA and MPLD programs in organizing farmers. - Good progress made
- The Systems Management Division (SMD) can support new programs for improving operation and maintenance (O&M), organizing WUAs, and providing monitoring, evaluation, and feedback (ME&F) services at other DIHM-operated irrigation projects. - At an early stage of development
- The Irrigation Management Center (IMC) will steadily increase the cadre of qualified staff who can support new irrigation management programs, by providing a wide range of training courses and being able to undertake applied studies that document the lessons learned. - Good progress, particularly in AO training
- Awareness has rapidly increased among government entities that improved irrigation management practices are significantly important in making government-operated irrigation projects productive. - Good progress

Means of Verification

- Annual joint GON-USAID/N Assessment. - Being implemented
- Midproject evaluation. - Now undertaken
- Final project evaluation. - To be undertaken at completion

Important Assumptions for Achieving Purpose

- GON will increase and maintain budget for irrigation management. - Viable in the long term
- Availability of irrigation water supplies approaches historical average. - Viable assumption
- Other production inputs such as seed, fertilizer, and credit available. - Viable assumption in the long term

3. Project Outputs: Magnitude of Outputs

- Field-oriented training programs provided at least once each year for WUA leaders, association organizers, dhalpas, overseers, irrigation technicians, field technicians, asst. engineers, and irrigation engineers. - Partly achieved
- Training capacity is sufficient to support other GON programs in irrigation management. - Progress being made
- Descriptive rapid appraisal studies conducted and reported on 15 DIHM and farmer-managed irrigation systems. - Rapid appraisals completed on 7 DOI-managed systems and 10 farmer-managed systems.
- Seasonal documentation on implementation process at all IMP field sites (9-14). - Only achieved for WUA activities
- Physical and management interventions tested and assessed in 5 or more farmer managed systems. - Not yet started
- Hill irrigation improvement process documented. - Not yet started

Means of Verification

- Review of completed reports on special studies by the Applied Irrigation System Studies (AISS) Unit of IMC.
- Consultant reports.
- Field trips and inspections.
- Not undertaken
- Numerous, but many recommendations not followed
- Some completed

4. Project Inputs

a. Training

- In-country: 147 programs and 2,374 participants—\$316,000
- Asia Study tours: 14 tours and 70 participants—\$94,000
- Short courses in USA, Israel and Asia: 35 courses and 44 participants—\$237,000
- Masters degree in Asia: 15 participants—\$300,000
- Conferences/Seminars/Workshop (not in Project Paper)
- 21 programs with 300 participants completed \$25,000
- 6 tours with 28 participants completed—\$125,000
- 8 short courses with 24 participants (USA, Asia, Australia)—\$105,000
- None; 1 Ph.D. to USA \$69,000
- 6 conferences/seminars for 12 participants—\$37,000

b. Applied studies

- \$660,000 stage;
- 5 studies completed; 4 in draft
- 10 in early stage of completion

c. Technical assistance

- * - Long-term TA: 16 person-years
- Short-term TA: 2 person-years
- 15 person-years completed
- A number of longer-term local consultants have been hired under short-term TA. 0.5 person-years completed
- \$2,856,000
- \$1,649,438 spent to date

* The Project Paper had 16 person-years of long-term assistance. The LBII Contract has 24 person-months of long-term assistance.

d. Commodities

- \$965,000 - \$425,628 spent to date

e. Construction

- Building: \$580,000 - \$47,000 total spent to date;
SMD wing at DIHM Headquarters; SMD Construction of IMC not begun
office at DIHM Regional Directorate;
SMD small building at 3 irrigation
systems; IMC headquarters building.

- Maintenance: \$630,000 - ESI works at 1 site - \$157,945
Essential structural improvements at 3 systems. Maintenance at 3
at 3 DIHM irrigation systems. Selected improvements at IMP farmer-managed irrigation
systems. IMC Field site being
identified.

f. Personnel

- \$1,275,000 - \$135,000

g. Operating costs, SMD

\$160,000 - \$84,000

h. Project evaluations

- \$150,000 - \$84,000 committed for midterm
evaluation

Means of Verification

a. Training

- Project report - Partly fulfilled

b. Applied studies

- Annual and completion reports - Not fulfilled

c. Technical assistance

- Project reports - Fulfilled

d. Commodities

- Project reports and site inspections - Partly fulfilled

e. Construction

- site inspection

- Partly fulfilled

f. Personnel

- Project reports and GON budgets

- Now being implemented

g. Operating costs, SMD

- Project reports and GON budgets

- Now being implemented

h. Project evaluations

- Midproject evaluation and end-of-project evaluation

- Midproject evaluation now in progress

Important Assumptions for Achieving Input

- USAID funds will be provided in a timely manner.

- Valid assumption

- GON funds will be provided in a timely manner.

- Valid assumption

- GON will approve and fill project positions.

- Some difficulties with this assumption

- TA contractor qualified in the implementation of social-technical initiatives in institutional irrigation management will be provided.

- Viability has not been demonstrated.

APPENDIX G

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APPENDIX G
BIBLIOGRAPHY
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Trimester Report No. 6 (16 March to 15 July 1988)
Trimester Report No. 7 (16 July to 15 November 1988)
Trimester Report No. 8 (16 November 1988 to 15 March 1989)

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- | | |
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| Irrigation Management Project—Consultancy visit period (3-21 January 1987) | Norman Uphoff |
| Nepal Irrigation Management Project—Consultancy visit period (6-9 and 14-17 January 1987) | Randolph Barker |
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| Irrigation Management Project—Consultancy visit period (3-22 August 1987) | Norman Uphoff |

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