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# **PROPOSED PROGRAM AND BUDGET FOR 1989**

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of the  
IIMI Support Group**

**INTERNATIONAL IRRIGATION MANAGEMENT INSTITUTE**

Digana Village via Kandy, Sri Lanka

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PART I

**BACKGROUND:  
IIMI'S PROGRESS TO DATE**

## STATEMENT OF MISSION AND PRINCIPLES

IIMI's mission is:

**to strengthen national efforts to improve and sustain the performance of irrigation systems in developing countries through the development and dissemination of management innovations.**

The following values guide the Institute in carrying out its work, and ensure that selected activities and courses of action are consistent with IIMI's overall mission:

1. The promotion of multidisciplinary, collaborative, field-based research. This involves the use of real irrigation systems as field laboratories rather than the development of experimental facilities; and the employment of a systematic approach to research.
2. An emphasis upon solving real problems. This requires the Institute to ensure that impacts reach clients and ultimate beneficiaries; that it not only develops innovations, but collaborates with client agencies for their adaptation and implementation; and that it maintains only a small nucleus of headquarters staff, so that most of the professional staff are placed in direct contact with practical management problems.
3. Ensuring that IIMI's products and services achieve standards of excellence. This implies international recruitment of the most qualified specialists in the field, drawn from all parts of the world; undertaking long-term programs when such effort is required; and focussing efforts on those activities in which IIMI has a clear comparative advantage.
4. Fostering the increased autonomy of client agencies, thereby fulfilling IIMI's mission to strengthen national efforts. The ultimate criterion of success will be the elimination of the need for IIMI to continue its assistance.

5. Ensuring that IIMI's work ultimately contributes to the reduction of poverty, the promotion of social justice, and the alleviation of negative environmental, economic, and social externalities related to irrigation development.

## CURRENT STATE OF DEVELOPMENT

IIMI began operations in June 1978. It operates as a decentralized international institute with headquarters in Sri Lanka and a number of cooperating units located in various parts of the developing world. To date IIMI has engaged internationally recruited professional staff, together with the necessary support staff, facilities, and equipment in Sri Lanka, Pakistan, the Philippines, Indonesia, Nepal, and Burkina Faso.

In Sri Lanka, IIMI's headquarters are located in Digana Village near Kandy. Within the village, IIMI operates and maintains an office complex, staff residences, a clinic, a school, and a guesthouse with restaurant and sports facilities. In June 1987, IIMI's Board of Governors made a decision to divest IIMI of responsibility for the management of village facilities (which earlier ranged from road repair to building maintenance) in an effort to reduce costs and concentrate effort.

Construction of a new headquarters building for the Institute, provided largely by the Government of Sri Lanka through a World Bank credit, began in June 1988. IIMI also operates a liaison office in Colombo to maintain close contact with government offices and partner institutions in the national capital.

IIMI's headquarters staff total 13 internationally recruited staff and some 60 office support staff. Headquarters staff provide direction and technical support to IIMI's international activities and carry out research projects in Sri Lanka. In Sri Lanka, IIMI conducts collaborative research in two locations, one in the North Central Province and one recently added field site in the Southern Province. Staff conducting this work are advised by a national "Sri Lanka-IIMI Consultative Committee."

In September 1986, IIMI signed a Memorandum of Agreement (MOA) with the Government of Pakistan to establish a unit in that country. In the short term, this unit will have a larger organizational and geographic scope than other country units. The Pakistan unit currently operates out of temporary

office facilities in Lahore and a well-equipped field station (granted to IIMI by the Punjab Provincial Irrigation Department) near Farooqabad, Punjab, about 75 kilometers (km) from Lahore. A prospective location for its central office facilities has been identified near Lahore, to be financed by the Government of Pakistan through a World Bank credit at a cost of US\$2 million.

Smaller country units with one, or at most two, internationally recruited professional staff and necessary local support staff have been in place in the Philippines since February 1985, in Indonesia and Nepal since October 1985, and in Burkina Faso since June 1988. In the Philippines, a collaborative agreement is in effect with the National Irrigation Administration (NIA) which provides for office facilities at the NIA's central office and field offices. Staff carry out research activities at field sites on Luzon and Mindanao islands.

In Indonesia, IIMI staff work together with counterpart research staff seconded by the Government of Indonesia's (GOI) Directorate General of Water Resources Development and the Provincial Irrigation Services of East, West, and Central Java. The GOI also provides office facilities in Jakarta and Bandung and at one of the field sites.

In Nepal, a collaborative agreement is in effect between IIMI and the Water and Energy Commission Secretariat (WECS) which provides for office space in the WECS's headquarters' facilities in Kathmandu. Two internationally recruited professional staff work with several support staff. Field sites have been established at irrigation systems in the Indrawati River Basin, in the Tarai, and in the Western Development Zone.

IIMI has also begun implementing its strategy for work and initial operations in Africa. A meeting of the Institute's Board of Governors in June 1986 approved the placement of resident staff in Sudan and Morocco and the establishment of a small regional office in West Africa to support national programs in several West African countries. Selection of locations was based on several criteria, including anticipated food production deficits; the extent of existing irrigation; communication links with neighboring countries; political and institutional stability; and the existence of competent irrigation institutions with which IIMI could collaborate.

IIMI opened its regional office for West Africa at Ouagadougou in June 1988, after the signature of a Memorandum of Understanding (MOU) with the Government of Burkina Faso in May. IIMI's offices in Sudan and Morocco are expected to be established before the end of 1988, following agreements with their respective governments.

IIMI will commence operations in Bangladesh and India before the end of 1988. In Bangladesh, an MOA with the Bangladesh Agricultural Research Council (BARC) was signed in July, 1988, which will permit IIMI to post a senior internationally recruited irrigation specialist by October. In India, signature of an MOU with the Ministry of Water Resources is expected shortly. The agreement will enable IIMI to undertake collaborative research with a number of Indian Institutions.

## SUMMARY OF ACHIEVEMENTS

In four years, IIMI has grown from a small research center to an internationally respected research institute with a coherent organization and clear mission, a well-defined research product, and a strong interdisciplinary staff. Through these activities IIMI has focused international attention on the importance of improved irrigation management to sustained agricultural productivity and poverty alleviation in developing countries; has identified those problems whose solutions will have the greatest impact; and has identified a research agenda which shows the way to practical solutions. These achievements can be seen in three fundamental areas: institutional development, program, and finance.

### **In the area of Institutional Development, IIMI has:**

- appointed 25 internationally recruited staff with necessary support services and facilities; developed and initiated substantial research programs in 5 countries; and carried out research in 3 other countries. In 1988, staff were drawn from 13 countries and 9 disciplines.
- established MOAs with 14 governments, agencies, or research institutes in 11 countries, with 2 international agricultural research centers (IARCs) (International Rice Research Institute [IRRI] and International Food Policy Research Institute [IFPRI]), and with 5 international research organizations.
- developed a long-term strategy which will guide the Institute's activities over the next decade.

### **In the area of its Programs and their impact, IIMI has:**

- made substantial contributions to understanding the ways in which financial and human resources are mobilized to support the costs of operating and maintaining Asian irrigation systems. A study concluded in

1986 reviewed literature on irrigation financing, developed a conceptual framework for future research and analyzed data from five countries. IIMI delivered results and recommendations in an IIMI cosponsored seminar for senior officials of the Asian Development Bank (ADB). This landmark study laid the foundation for a number of follow-up projects now in progress.

- Completed four years of research in Sri Lanka, the Philippines, and Indonesia to identify and alleviate constraints to effective irrigation management in rice-based irrigation systems during the wet and dry seasons. This research led to recommendations and innovations for improved management which are now being pilot-tested in all three countries. An international research network is being implemented to further develop and disseminate these innovations.
- Concluded an innovative research study of the internal management processes of two Sri Lankan irrigation agencies. This study used concepts from the social and management sciences commonly applied to the private sector. Results include a series of recommendations to the agencies for improving internal decision making, performance control, and communications.
- Contributed to marked improvements in the irrigation rehabilitation process as a management process: decision making, communication and consultation with farmers, and the roles of contractors, consultants, implementing agencies, and donors. IIMI is now showing how institutional strengthening contributes to long-term sustainability of rehabilitated systems.
- Identified and field-tested research methodologies to develop effective and responsive practices for operating main canals. The methodology uses computer simulations of the behavior of canals and structures operating under conditions similar to those observed in actual systems.
- Initiated field research to assess the performance and manageability of irrigation systems in Sri Lanka and the Philippines in relation to their design features.

Developed a simple low-cost methodology for measuring field-level water adequacy, productivity, and equity of water distribution in lowland rice irrigation systems.

- Developed an equivalent distance methodology which provides an equity measure of water delivery along an irrigation canal. The methodology is based on the premise that inequity or inadequacy of water supply depends not on distance alone but on distance modified by hydraulic conditions at each control structure. This will assist irrigation managers in devising operational procedures and maintenance and rehabilitation strategies that reduce inequity.
- Completed three years of research on farmer-managed irrigation systems throughout Asia aimed at developing improved and appropriate strategies of government assistance to these systems, in ways that improve and sustain their performance. In the process, IIMI has developed interdisciplinary rapid assessment methodologies, which are now being adopted by the governments in Sri Lanka and Nepal. Related to this, IIMI has developed its Farmer-Managed Irrigation Systems network to facilitate interaction among researchers, policy makers, and managers involved in this subject. By 1988 this network included some 200 irrigation professionals from 30 countries.
- Initiated and began implementing a three-year collaborative research program with IRRI, focusing on problems of irrigation management for rice-based farming systems. Funded by the Rockefeller Foundation, research is being conducted in Bangladesh, the Philippines, and Indonesia, building on the work by both institutions in those countries.
- Continued a collaborative program with IFPRI which emphasizes the need for irrigation policy issues and their relationship to crop diversification in Asia and irrigation development in Africa, and developed a proposal for a new project to develop a framework and methodology for assessing irrigation performance, and to assess performance of a cross section of existing systems.

- Co-hosted three annual six-week training courses in association with the Economic Development Institute (EDI) of the World Bank and the ADB (in 1986) through which 71 participants from 16 countries have benefited. IIMI also supported 8 master's degree Fellows from 4 countries; 17 pre-doctorate Fellows from 7 countries; 6 post-doctorate Fellows from 4 countries; and 3 Special Awardees from 2 countries, outstanding irrigation managers who came to IIMI to share and document their experiences in introducing innovations for improved management. In addition, the Institute has sponsored or cosponsored 19 workshops with participants from countries throughout Asia and Africa.
- Built up a mass of research on technology and management practices, now being published, and established a library containing approximately 4,000 titles, a database with 2,300 listings, and a mailing list with 3,290 names from 116 countries. IIMI has published 52 titles and disseminated over 50,000 copies of them.

**In the area of Finance and Administration, IIMI has:**

- Established a substantial and diverse funding base through its funding strategy which combines restricted and unrestricted funding.
- Increased its total income from less than US\$1 million in 1984, to nearly US\$7 million in 1988.
- Generated support among the international donor community as evidenced by their long-term commitments to IIMI's program and activities.

PART II  
**PROPOSED 1989 PROGRAM**

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## INTRODUCTION

In this part, IIMI's proposed 1989 program is described. Proposed staff and budgets needed to realize these proposed activities are described in Parts III and IV. IIMI's program is presented as a single program, although it is financed by both restricted and unrestricted funds. This unique program, staffing, and budget pattern is explained below.

IIMI's program approach is based on the recognition that the problems of irrigation management are too location-specific to permit IIMI to conduct all of its research in one single headquarters location. Thus, IIMI has been structured with a small headquarters and a number of strategically located units in various developing countries. IIMI uses existing irrigation systems in those countries as field laboratories, in much the same way as other institutes use experimental farms located near their respective headquarters. This multicountry structure allows IIMI to address through its program a range of issues beyond those that could be examined in one country alone. For example, it allows IIMI to work on the management of irrigation systems to minimize salinity and waterlogging effects in Pakistan, where such issues are prevalent; to work on the planning and management of lift irrigation schemes in Bangladesh, where such schemes constitute the major proportion of the irrigation sector; to develop better irrigation management practices for diversified crops in Sri Lanka, the Philippines, and Indonesia, where such practices are greatly needed; and to work on developing better programs of assistance to farmer-managed irrigation schemes in Nepal, where 80 percent of the irrigated area is farmer-managed.

Because all projects, whether in Sri Lanka or elsewhere, are undertaken only if they clearly address a given aspect of IIMI's program, all activities, regardless of the location in which they are conducted, are considered part of one coherent and unified program and institutional framework. However, despite this, many of IIMI's projects can be financed by bilateral or special project funding, because the research undertaken in any given country responds to the research and development needs of that country. Even in these cases, the research is designed so that the output of the research not

only addresses the needs of the country in which it is conducted, but also leads to the development of practices that may be adapted to other countries or situations with similar conditions. This budgeting system permits IIMI to take advantage of financing opportunities that would not be available if it were to rely exclusively on unrestricted sources of funding.

Because IIMI can finance its program through both restricted and unrestricted funds, it can also support its internationally recruited staff positions through a mix of these two funding sources. This permits IIMI to treat all staff positions equally, and subject to the same terms and conditions. Furthermore, staff mobility among positions is encouraged.

## PRINCIPAL PROGRAM ACTIVITIES

The program activities that are proposed to be undertaken during 1989 have been developed in accordance with IIMI's strategy, which is described in detail in a companion publication (The Strategy of the International Irrigation Management Institute, draft, September 1988). In essence, these program activities fall into two major categories:

1. development of management innovations through research, and
2. assistance to national irrigation agencies in implementing and adapting such innovations to their own particular circumstances.

Each of these two program categories may be further divided into two sectors which are reflected in the Institute's organizational structure. The development of management innovations requires not only *field research* on irrigation management systems in specific environments, but also *thematic research* to develop generic innovations that may be applicable in a variety of environments. Assistance to strengthen the management capacities of national irrigation agencies requires *management training* and *information programs*.

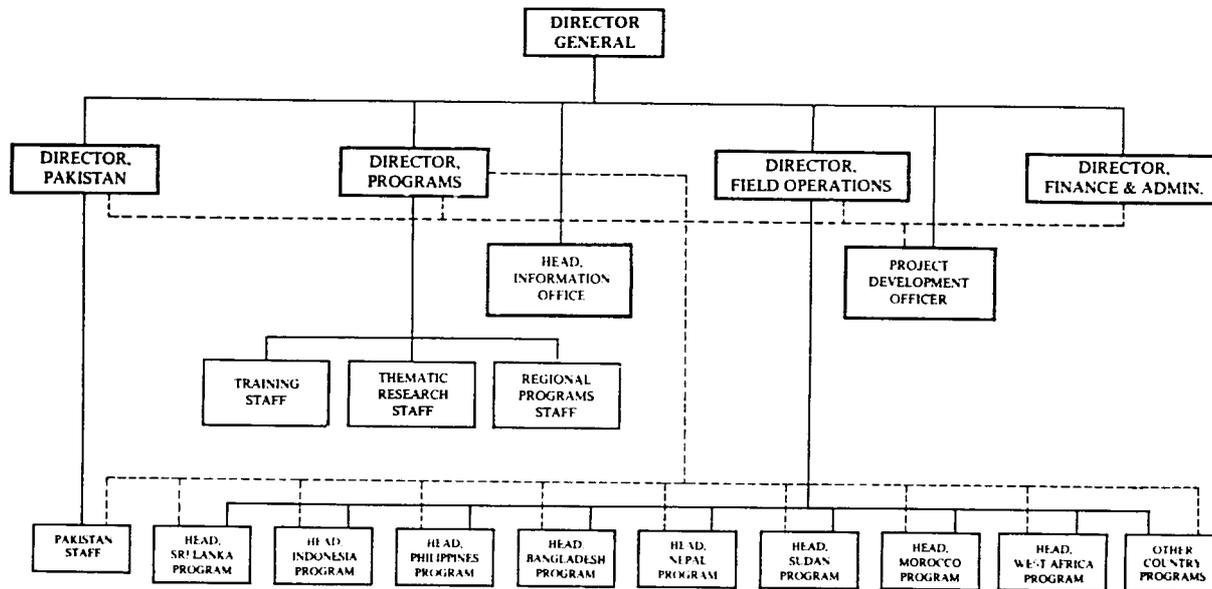
In accordance with IIMI's strategy, IIMI proposes to conduct its 1989 activities within seven themes: Institutions for Irrigation Management, Management of Water Resources for Irrigation, Management of Financial Resources for System Sustainability, Management of Irrigation Facilities, Management of Irrigation Organizations, Management of Irrigation Support Services to Farmers, and Management of Change in the Institutions for Irrigation. These themes sharpen the focus of the three broad programs of Systems Management, Rehabilitation and Improvement for Management, and Farmer-Managed Irrigation Systems, which provided the framework for IIMI's activities between 1984 and 1987.

To conduct its program activities, IIMI is organized into three principal programmatic divisions: Field Operations, Pakistan, and Programs. The Field

Operations Division is responsible for the Institute's country-specific collaborative field projects in all countries except Pakistan; the Pakistan Division is responsible for the Institute's activities in Pakistan; and the Programs Division is responsible for IIMI's global thematic work, which includes thematic research, regional or multicountry projects, and management training. Two additional offices complement the work of these Divisions: the Information Office, which is responsible for the Institute's Information Program; and the Project Development Unit, which is responsible for the development of specially funded new programs.

The proposed 1989 activities of each of the above three Divisions and two Offices are described in the following sections. IIMI's organization chart, which depicts the organizational structure under which its program will be carried out, is shown in Figure 1.

Figure 1 INTERNATIONAL IRRIGATION MANAGEMENT INSTITUTE  
(ORGANIZATION CHART)



## FIELD OPERATIONS DIVISION

IIMI's field operations projects involve IIMI staff in collaborative activities with national institutes or management organizations. The day-to-day control of such projects, and the compiling of reports are primarily the business of the staff of IIMI's country units. Headquarters staff maintain regular contact with field staff and take part in field studies.

IIMI's field projects are frequently financed by external donors through bilateral funding agreements. The process of project formulation, therefore, involves at least three parties: IIMI, a national agency, and a donor. For these reasons, project planning normally begins between one and two years before the inception date.

National collaborators include irrigation management agencies, research institutions, universities, and professional training centers. Other IARCs, along with one or more national agencies, sometimes also join as partners.

Workshops and seminars at the national level play an important role in field studies. Conducted by IIMI and its partners, these serve as a forum for discussing research results, and provide an opportunity for feedback from host-country professionals and a vehicle for disseminating results.

In 1989, IIMI proposes to continue field projects already underway in Sri Lanka, Pakistan, Indonesia, Nepal, and the Philippines, as well as projects initiated during 1988 in Bangladesh, Sudan, West Africa and Morocco. Non-resident activities are proposed in India. Field operations activities in each of these countries except Pakistan are described below. Field activities in Pakistan, which, as noted earlier, are organized under a separate Division of the Institute, are described in a later section.

### **Sri Lanka**

In Sri Lanka, national agencies earlier principally interested in new construction, are now chiefly concerned with raising performance through improved operation and maintenance (O&M), and rehabilitation of older

systems. These agencies are open to experimenting and testing management innovations. This environment, combined with the range of management conditions, is highly conducive to IIMI's research and development activities within the country and has potential for significant contributions to other countries.

*Proposed 1989 program.* IIMI's present program covers the full range of IIMI themes. In 1989, IIMI proposes to work with Sri Lankan irrigation managers to begin focusing on a few key themes that are most relevant to Sri Lanka. The Sri Lanka-IIMI Consultative Committee will continue to provide guidance and assistance in facilitating the research. Collaborating agencies include the Irrigation Department (ID) and Irrigation Management Division (IMD), within the Ministry of Lands and Land Development (MLLD); the Mahaweli Economic Agency (MEA) and others within the Mahaweli Authority; and the Department of Agrarian Services (DAS), the Agrarian Research and Training Institute (ARTI), and others within the Ministry of Agriculture.

Research will be principally undertaken by IIMI on two major systems in the North Central Province, and two major systems in southern Sri Lanka. In addition, under a project funded by the United Nations Agency for International Development (USAID) for the period 1987-1990, IIMI will work closely with national research organizations, the ID and IMD to carry out applied research in several other locations.

Under the USAID-financed research, national research organizations will carry out applied research focused on five major topics: management strategies for system rehabilitation, cost-effectiveness of O&M alternatives, effective and implementable performance monitoring and feedback, effectiveness of alternative approaches to organizing farmers, and framework for farmer-agency joint management of major irrigation systems. IIMI will work closely with national organizations to develop proposals, carry out research, analyze data, and present the results; and will work with IMD to interpret and adapt the results under its Irrigation Systems Management Project. A major objective of this project is to enhance national capacity for applied irrigation management research.

Another closely related field project, funded by the ADB for the period 1988-1990, will continue in the Kirindi Oya and Walawe projects in southern Sri Lanka. The Kirindi Oya Project is a major new irrigated settlement project which is just developing; it also includes improvement of irrigation facilities for areas under existing tanks which get a more reliable water supply from the new reservoir. The Walawe Project is an older project which is being rehabilitated in order to increase water use efficiencies and equity in distribution of water. IIMI will work with the agencies to improve interagency coordination and agency-farmer communications, and to develop appropriate management structures and procedures to achieve objectives of the projects. Also in the South, an IIMI study, funded in part by the Government of the Netherlands, will apply a management science model to the analysis of agency decision making processes.

By 1989, IIMI expects all three of these projects to enter an action research stage, in which various innovations will be tested in collaboration with the host agencies.

In 1989, two projects will be continued under the theme of Management of Water Resources for Irrigation. One study, funded by ADB under a larger Regional Technical Assistance Project, will analyze and relate the performance of main canals to the structure and facilities provided for control and regulation of water levels and discharges. Its importance lies in increasing agency staff awareness of the relationship between the behavior of the conveyance system and its design characteristics.

IIMI will complete a second study, partially funded by the Government of France, which is field-testing research methodologies to discover effective and responsive practices for operating main canals. The methodology under study uses computer simulations of the behavior of canals and structures operating under conditions similar to those observed in actual systems. Although not new in itself, the adaptation of this methodology and associated tools to Third World conditions will open up new avenues of research.

In 1989 IIMI will expand its activities in the area of Management of Support Services to Farmers, currently funded by a joint grant from the International Fund for Agricultural Development (IFAD) and the *Bundesministerium für Wirtschaftliche Zusammenarbeit* (BMZ). As a follow-up to work on project assessment methodologies, conducted during 1988 in collaboration with the Ministry of Plan Implementation, IIMI will work with both this agency and the DAS to improve the database on farmer-managed systems in one or more districts. The objective of this work is to determine the optimal level of "background" information on farmer-managed systems required for effectively managing routine support services outside a project context. A second activity following up on work initiated in 1988 is field research on the IFAD-financed Anuradhapura Dry Zone Agriculture Project (ADZAP). This study, conducted jointly with staff from DAS, will lead to policy recommendations for future planned development of small catchments in the district.

A set of research and information activities conducted through the "Working Group on Minor Irrigation" will be expanded during 1989 to include at least one field research location, and one national workshop. The Working Group is organized jointly with the ARTI, with active participation by representatives of the ID, DAS, and research organizations. An action research project is planned in Kurunegala District to experiment with alternative management approaches which could be incorporated into the second phase of the World Bank-financed Village Irrigation Rehabilitation Project. A national workshop will be held to review the action research plans with the implementing agencies. Other studies are also anticipated to grow out of the Working Group.

Subject to funding considerations, in 1989 IIMI proposes to continue its work in the North Central Province to identify, evaluate, and document constraints to irrigation management for rice-based irrigation systems in the wet and dry seasons. Research will continue in an action research mode where staff will field-test and document recommended management interventions with the collaborating agencies.

Also subject to funding considerations, in 1989 IIMI proposes to develop a major new project in close collaboration with Sri Lankan irrigation management

agencies under the themes Management of Irrigation Organizations and Management of Change in the Institutions for Irrigation. The project will focus on the internal dynamics and capacities of two irrigation agencies and the effectiveness of their relationships with farmers' organizations. As part of the study a number of subprojects will be developed including study of such issues as improving internal decision making and communication processes, exploring the use of performance monitoring and evaluation as management tools and incentives, and clarifying roles and interactions of the two agencies.

**Indonesia** Indonesia, where IIMI began research in 1985, contains some of the most sophisticated irrigation systems in Southeast Asia. Some US\$12 billion have been invested over the past 15 years in irrigation infrastructure. Indonesia dominates the region in irrigated area and in the number of farmers who depend on irrigation. There are more than 4.5 million hectares (ha) in public irrigation systems and more than 1.0 million ha in village irrigation systems. With more than 165 million people, Indonesia is the fifth most populous country in the world. Annual cropping intensities in irrigated areas regularly exceed 200 percent.

IIMI's work in Indonesia has been undertaken in two phases. In Phase I, which was completed in 1987, researchers measured irrigation performance in three provinces in Java. They identified performance deficiencies and their relationship to management, and recommended a series of management interventions to improve water control and delivery. In addition, IIMI played an advisory role in helping the Center for Agro-Economic Research implement field research into irrigation constraints in one system in Lampung Province in southern Sumatra. It collaborated with the University of Gadjah Mada in Yogyakarta in calibrating measurement structures in Lampung. Phase I was funded by the Asian Development Bank (ADB) with additional support provided by the Ford Foundation.

In Phase II, which will be completed in 1989, IIMI is conducting action research to pilot-test recommended interventions developed in Phase I in West Java, and expand Phase I research into new areas in Lampung. IIMI is

also assisting in the pilot phase of a program designed to turn over O&M responsibilities to farmers in small irrigation systems in West Java and West Sumatra. Initially, work focused on systems less than 150 ha but will expand to include systems up to 500 ha. IIMI's role includes research and advisory services regarding: 1) the nature of provincial irrigation services (PRIS) investment in systems and farmer dependency on the PRIS prior to turnover, 2) monitoring and assessment of the turnover process, and 3) institutional implications of turnover for PRIS sections. Collaborative work on turnover has been started with Padjajaran University in Bandung and Andalas University in Padang. Phase II is jointly funded by the ADB and the Ford Foundation.

Indonesia is also one of the three sites chosen for research as part of the Rockefeller-funded IIMI/IRRI collaborative project (see Programs Division). The overall objective of this project is to examine how modifications in system management and farmer tillage and farm-level water management can be implemented that will simultaneously meet national objectives for increased non-rice cropping and local physical conditions. Within that activity, IIMI is testing and developing irrigation system management practices that take into account variations in the physical environment, crop demand, and water availability.

IIMI's activities in Indonesia are undertaken in cooperation with the Directorate General of Water Resources Development and the Irrigation Departments of those provinces in which IIMI's field research is conducted.

*Proposed 1989 program.* Indonesia's irrigation sector is now moving into a postconstruction phase. The government's new policy statement is aimed at improving the efficiency of O&M, which constitutes a fundamental shift in planning at the highest levels. Among the new policies being implemented is the turnover of responsibility for O&M to farmers in all systems less than 500 ha; ensuring that expenditure on O&M activities are in line with actual needs of irrigation systems; the gradual turnover of responsibility for financing O&M costs from the Central Government to the PRIS; the application of irrigation service fees and the eventual financing of O&M for all main irrigation systems by beneficiaries; and the strengthening of O&M institutions at all levels to create adequate capacity for improving the performance of existing irrigation structures and efficient utilization of increased allocations.

By 1989, Indonesia will be in the third year of a World Bank irrigation subsector loan as well as the third ADB irrigation sector loan. Both of these loans emphasize improved, more efficient O&M and resource mobilization in terms of irrigation system turnover and pilot-testing of irrigation service fee mechanisms. The size of the loans (US\$400 million) and the weight of the two development banks behind them mean that efficient O&M and resource mobilization (as a form of O&M cost savings) will be major areas for analysis over the next few years.

The shift in emphasis from construction to O&M in Indonesia offers expanded opportunities for IIMI research and its impact on improved irrigation management. IIMI's strategy for Indonesia is designed to complement and assist the government in making this transition and in defining appropriate management conditions following the transition. The strategy has been devised in close collaboration with government officials and representatives of the ADB and the World Bank, and builds on the substantial research carried out to date and on collaborative relationships and goodwill established during that period.

In 1989, and subject to funding availability, IIMI proposes to expand its current activities to permit research in five fundamental areas.

First, IIMI proposes to strengthen and broaden IIMI's present research on efficient O&M. This work would address in more depth those irrigation management problems which are currently the focus of ADB and World Bank irrigation sector loans; in particular, it would focus on management problems identified during implementation of the loans.

Second, IIMI proposes to build on the present, ongoing work in turnover of smaller public irrigation systems (150 ha and under). IIMI sees a need for continued involvement to assist with the further articulation and modification of procedures for the turnover of public irrigation systems under 150 ha, and to start the process of modifying the procedures to address the unique needs faced in the process of turning over larger public irrigation systems up to 500 ha.

Third, drawing on the activities in turnover and efficient operations, IIMI proposes to initiate a series of pilot-exercises exploring the possibilities for conjunctive management between PRIS and Water Users' Associations (WUAs) within public irrigation systems of different sizes and levels of technical investment.

Fourth, using research results from East and Central Java collected during Phase I and West Java and Lampung during Phase II, IIMI proposes to define the necessary and sufficient hydrologic conditions required to produce non-rice crops successfully (in particular soybeans) after rice, in irrigation systems that have been constructed primarily to facilitate rice production.

And fifth, IIMI proposes to provide technical leadership for an overall reexamination of present methodologies used in planning irrigation, including the activities of the irrigation committees, as they are manifested in the development of recommended seasonal crop plans, and the forecasting of water available within a single system and between systems served by a common water source.

### **The Philippines**

The Philippines is among the most progressive Asian countries in implementing innovations in irrigation management. In both government-managed and farmer-managed systems, the Philippines experience offers important lessons to other countries in the region which plan to implement similar innovations. However, there is still considerable room for improvement in overall performance of irrigation systems.

IIMI's formal involvement in the Philippines started in February 1985, with a two-year research project to identify constraints to non-rice cropping in the dry season, funded by Phase I of an ADB technical assistance grant to the Government of the Philippines (GOP). IIMI implemented the project in collaboration with the National Irrigation Administration (NIA) and with the Philippine Council for Agriculture and Resources Research and Development (PCARRD) with its research consortia of state colleges and universities. The latter collaboration took the form of research grants for these universities to undertake component studies of the project. One result of Phase I was a

recommendation for continuation of the project to focus on the more important issues and constraints identified at that time. Phase II of the project commenced in 1987.

*Proposed 1989 program.* During 1989, IIMI will conclude Phase II of its research to identify and pilot-test irrigation practices to enhance farmers' efforts to diversify their cropping practices during the dry season. As identified in the first phase of this research, a principal constraint to irrigated non-rice crops is a lack of guidelines for irrigation managers, on such functions as demand assessment, rotational water delivery and other operational procedures, and on-farm management practices. This is because, until very recently, Philippines irrigation policy was aimed at growing rice year-round. Thus, IIMI's research is designed to assist the GOP in making the transition to irrigating non-rice crops by alleviating these constraints.

The final report and the resulting guidelines emerging from this project, to be presented in July 1989, will be one component of a proposed synthesis of IIMI's regional work on irrigation management for diversified crops (see Programs Division). Results from similar projects in Indonesia and Sri Lanka will also be part of this synthesis effort in arriving at applicable procedures and guidelines for irrigation management for diversified crops in the humid tropics for rice-based systems. In the Philippines, NIA will incorporate research results into training materials for its continuing program on diversified crops irrigation engineering project.

In 1989, IIMI will also conclude work on a small joint project among IFPRI, IIMI, and NIA, funded by the Ford Foundation. The project involves a longitudinal case study of the Philippines experience in attempting to shift the irrigation sector to a more self-sustained footing and covers the period from the formation of NIA in 1964 to the present. The review includes an examination of the policies and policy changes which have driven the process, NIA's responses to these policies, and the resulting impacts on NIA and on the irrigation service it provides to farmers. Examples of policies being examined are the cessation of O&M subsidies to NIA in 1982, and the requirement that NIA repay capital costs of certain foreign-financed construction projects.

Following the conclusion of the study IIMI and IFPRI will cosponsor a workshop to discuss the findings.

During 1989, IIMI will conclude its research on the Philippines component of the larger, ADB-funded Regional Technical Assistance (TA) Project on Rehabilitation (see Sri Lanka). Two aspects of the TA apply to the Philippines: a crop diversification regional synthesis; and a study of design and management interactions for rehabilitation. The first is an offshoot of earlier research; the second involves field activities in one or two systems of the Phase II project.

During 1989, IIMI proposes to continue to conduct research in the Philippines on the IIMI/IRRI Collaborative Project (see Programs Division). The contribution of this project will add to those of the foregoing project on irrigation management for diversified crops. However, one major additional accomplishment will be the experience of collaborating with an international agricultural center in pursuing mutual interests in the realm of irrigated agriculture.

During 1989, subject to funding considerations, IIMI also proposes to initiate two additional projects in association with NIA. The first would be a collaborative project with NIA to implement the irrigation component of the USAID-funded Accelerated Agricultural Production (AAP) Project. Under a proposed Cooperative Agreement, to be funded by USAID for the period 1989-90, IIMI proposes to work with NIA in managing and conducting the action research and special studies which make up this component of the AAP irrigation project. The project is designed to help increase the adequacy and reliability of water delivery at the farm level through strengthening the capacity of farmer irrigation associations to plan, repair, operate, and maintain irrigation systems. It also will enhance NIA's capacity to support irrigation associations in carrying out O&M activities.

IIMI will collaborate with NIA in: a) identifying the issues to be researched, b) identifying local research institutions to conduct research under subcontracts, c) managing the subcontracts with these research institutions, and d) interpreting research results and applying them to irrigation system management. It will also assist NIA's Research Department in the design and implementation of research.

The second project, which is currently under consideration by ADB, would focus on reviewing NIA's experience in introducing institutional innovations to improve the management of systems while increasing the participation of farmers. As part of the project, IIMI and its collaborators would review NIA's participatory program in irrigation development and management with emphasis on the process of strengthening farmers' organizations through joint system management; conduct specific studies on the impact of farmers' participation on the several criteria used in measuring system performance (such as water utilization, equity, productivity, maintenance standards, and generation of finance for recurring expenditures); and develop a simplified methodology for assessing system performance in connection with the above which can be implemented at the irrigation system superintendent's level.

### **Nepal**

It is now widely recognized that rapid short-term increases in Nepal's per capita food production, almost constant during the last five years, must come through increased cropping intensity and production, available through better management of existing irrigation resources. Emphasis is being placed on improving the performance of already constructed agency-managed systems with the realization that this requires more participation by farmers. At the same time the government is investigating ways to provide assistance to farmer-managed systems which are still responsible for over 80 percent of all irrigation in the country.

The Government of Nepal has taken a number of steps to improve its ability to plan and manage irrigation. It has encouraged the major banks to consider switching to the irrigation sector rather than project lending. A ministerial reorganization in late 1987 consolidated the government's efforts in irrigation under the Department of Irrigation (DOI). The Farm Irrigation and Water Utilization Division (FIWUD) of the Department of Agriculture has been shifted to DOI. The irrigation program of the Ministry of Panchayat and Local Development will also be under DOI, and DOI plans to establish a number of district offices. And, most important, farmer-managed irrigation systems will be given an increasingly larger role in irrigation development.

Thus, as in Indonesia, there are emerging opportunities in the irrigation sector, which have a high potential for impact on improved irrigation management. This potential suggests the need for expanded IIMI activities in Nepal.

In the past three years, IIMI has conducted research in farmer-managed irrigation systems, both in the smaller hill systems and in the larger (up to 5,000 ha) Tarai systems. IIMI's Nepal unit has high visibility in the country, and staff are called on regularly for assistance in development strategies by donor and government agencies. More recently, the government has requested IIMI to assist in developing the research capacity of the newly formed DOI.

IIMI's Nepal office is currently staffed by two internationally recruited staff members, one full-time and one three-quarter time, and a number of support staff. In 1987 collaborative research was carried out with the Institute of Agriculture and Animal Sciences (IAAS), the Institute of Engineering, the Department of Irrigation, Hydrology and Meteorology (DIHM -predecessor of the new DOI). An MOU exists with the Water and Energy Commission Secretariat (WECS). Funding is provided by the Ford Foundation and IFAD.

*Proposed 1989 program.* In 1989, IIMI will continue the ongoing action research on assistance to farmer-managed systems initiated earlier with WECS. However, subject to funding availability, it also proposes to expand its research in 1989, into four new areas, all of which are concerned principally with agency-managed systems, which come under DOI's purview.

First, IIMI proposes to begin research leading to upgrading and improving O&M in agency systems. Turning systems over completely to the farmers for management is a solution for better O&M of certain types of systems. In larger systems, effective farmer organizations need to be formed, including the federation of field channel groups at subsystem and system levels to enable communication with system managers. This requires increased participation by farmers in decision making about the operation as well as responsibility for maintenance costs by either contributing labor or paying for the service.

Second, IIMI proposes to investigate methods to improve resource mobilization. As more area is brought under irrigation, diminishing O&M resources on a per hectare basis is a problem faced by many countries, including Nepal, especially when irrigation fees cannot be collected. Increased farmer responsibility in O&M along with more control over the budget need to be examined as ways to encourage improved resource mobilization. Requiring all regular costs to be borne by the beneficiaries and allowing all resources -- labor, cash, or kind -- to be retained for use in the system rather than paid to the national treasury are concepts to be investigated.

Third, IIMI proposes to research and develop procedures to facilitate farmer participation in joint management. Both farmers and agency staff must reorient their thinking if they are to work effectively together in managing a system. Visits to large farmer-managed systems, for example, may be useful to convince farmers that they must play an important role in O&M. Such visits would also allow agency staff to see what farmers are capable of accomplishing. Responsibilities must be clearly spelled out between the agency and farmers.

Fourth, IIMI proposes to investigate the feasibility of turnover of management to farmers. This in effect entails transfer of ownership, and legal provisions need to be in place before this could occur. Investigation is needed into the changes required to provide incentives for farmers to take over or for the agency to hand over a system. Support for establishing a viable organization with adequate management tools will need to be developed.

### **Bangladesh**

Among Asian countries, Bangladesh is unique in terms of the nature of its irrigation systems. Much of the country's irrigation follows an energy-intensive irrigation pattern with low-lift pumps from major rivers, deep and shallow tube wells tapping groundwater, and lifting from very shallow wells and residual streamflows using human power and simple machines. Increasing pressure for food production, small fragmented holdings, and energy-intensive technology put a premium on social, economic, and technical efficiency.

The next 5-year plan anticipates an increase in irrigated area from 2 million ha to more than 3 ½ million ha, representing over 70 percent of the potentially irrigable area of the country. This is to be accomplished through expansion of the area served by deep and shallow tube wells -- both through new installations and through expansion of existing ones, and through new surface water systems.

More than three years of exploration with government and donor officials in Bangladesh resulted in mid-1988 in an MOA with the Bangladesh Agricultural Research Council (BARC) and a Ford Foundation grant to IIMI to support the placement of a resident staff member in Bangladesh for three years. With the support made available through this grant, IIMI will post an irrigation specialist in Dhaka in late 1988.

*Proposed 1989 program.* During 1989, the IIMI irrigation specialist will work to strengthen the research capacity of those agencies and institutions conducting research in irrigation management issues, to link irrigation management research and operations communities through joint-action research projects, to disseminate Bangladesh experience to similar situations in other Asian countries, and to facilitate training opportunities within the Bangladesh irrigation community.

IIMI's resident staff member will operate under the MOA with BARC, which oversees agricultural related research in that country. IIMI's initial research will concentrate on tube well systems and surface systems. IIMI's irrigation specialist will also be involved with research related to the IIMI/IRRI collaborative project on rice-based irrigation systems (see Programs Division).

In 1989, IIMI proposes to explore research collaboration in four potential areas. First, IIMI will develop procedures to facilitate effective participation of the farmers in surface irrigation systems, and the mobilization of resources for recurrent costs of O&M. Second, IIMI proposes to explore ways to improve the management of flood control, drainage, and irrigation projects in which increased farmer participation is an essential component. Third, IIMI proposes to explore research on groundwater systems,

proposes to explore research on groundwater systems, both farmer-managed and jointly managed, and associated problems relating to operational strategies and mobilizing resources. Fourth, IIMI proposes to explore cooperative research on a number of social, organizational, and economic problems related to the management of small pump systems.

## **India**

India is a very significant Asian country in terms of irrigated potential, with 68 million ha, and a predicted expansion of 2-3 million ha/year. Southern and eastern parts of India have predominantly rice-based systems similar to those of the humid tropics of South and South-East Asia; while the western and northern regions are arid and semiarid. Rice and wheat are grown in rotation in the north and north-western parts of the country.

Irrigation development and irrigation management have received much attention in the last decade in India. Water and Land Management Institutes (WALMIs) have been set up in 10 States to provide in-service training for professionals involved in irrigated agricultural development. Research in irrigation management has been carried out at the University of Roorkee, Anna University, Madras, and the Institutes of Management at Ahmedabad and Bangalore. The Ford Foundation and USAID have played and continue to play an active role in promoting research and training in irrigation management.

Despite these and other efforts, however, the capacity of Indian research and training institutions to contribute to irrigation performance in India has significant potential for further development. Many Indian institutions currently work in isolation; mechanisms to facilitate network activity and research collaboration are frequently inadequate, and the results of research are often poorly disseminated. There is a clear opportunity for greater communication and collaboration between Indian institutions and those in other parts of the world (particularly South and South-East Asia), where researchers are beset with similar problems.

In 1987, IIMI approached the Ford Foundation, and later USAID, to seek funding for a nonresident program to develop collaborative research and

training activities with Indian institutions. A Ford Foundation grant of US\$200,000 was received in 1987 for 2 years; a USAID grant of US\$500,000 for a 3-year period is expected shortly. The principal objective is to strengthen the capacity of selected Indian research institutions to contribute to improved irrigation performance through collaboration with IIMI. An MOA is expected to be signed with the Ministry of Water Resources in late 1988.

**West Africa** The establishment of regional field operations in West Africa follows two years of planning which included three exploratory missions and extensive discussions with donor agencies, potential research partners, and high-level government representatives. On the basis of those discussions, IIMI identified important research opportunities, to be undertaken in close collaboration with national and regional irrigation institutions, in Burkina Faso, the Niger and Senegal river valleys, and the inner delta of the Niger in Mali (*Office du Niger*).

In mid-1988, IIMI posted a West Africa representative in Ouagadougou, with one year's funding from USAID, to establish wider contacts with appropriate national or regional institutions.

For its West African research projects, IIMI will employ the systematic multi-disciplinary approach that it has successfully implemented elsewhere. This is particularly important in the West African subregion because of the small size of the irrigation systems and the complexity of associated problems. The main objective under these circumstances is to develop replicable solutions to the larger and more complex problem of irrigation development, rather than to provide answers to specific technical or managerial problems in isolation. IIMI's field projects in West Africa will therefore be based on a combination of physical and socio-economic characteristics of typical irrigation development models or strategies as encountered in the West African subregion.

IIMI's field operations in West Africa will be designed to be implemented as a research and development network. The network will provide a mechanism to associate interested organizations from various countries in particular parts of IIMI's program.

*Proposed 1989 program.* In 1989, IIMI will seek to develop its initial posting of a Regional Representative into a permanent office within the framework of a long-term workplan. The regional office will have the following principal tasks during the first year of program initiation, which ends in June 1989:

1. Set up IIMI's temporary subregional office in Ouagadougou, Burkina Faso.
2. Establish contacts on a regular basis with appropriate regional organizations represented in Ouagadougou.
3. Explore prospects for cooperation with national institutions (research institutions, development agencies, and universities) to implement specific field projects in particular countries.
4. Elaborate the various elements of the identified research areas and formulate detailed research plans.
5. Prepare detailed proposals for prospective donors in accordance with their particular fields of interest and IIMI's mission and strategy.
6. Explore the possibility of including Nigeria and other Anglophone West African countries in a regional network. Activities in Nigeria will begin with visiting participation by IIMI in an action research project by Ahmadu Bello University on the development of farmers' participation in irrigation management.
7. Prepare a review of ongoing management training activities in the field of irrigation in the region, and explore the possibility of developing a regional course in irrigation management in close cooperation with the *Ecole Inter-Etat d'Ingenieurs de l'Equipment Rural (EIER)* and the *Comite Interfricain d' Etudes Hydrauliques (CIEH)*.

**Sudan** Sudan has more irrigated area than any other African country except Egypt, and possesses a wide variety of types of irrigation systems. Like

many arid and semiarid countries with extensive irrigation, Sudan has a diversified cropping system, and an element of competition (for water and for labor, particularly) among crops which add complexity to management analyses. Most of Sudan's irrigation systems depend on large canal networks that are fed either by gravity or by large riverbank pumping stations; there are also complex "wild flooding" systems in the East. Although its climate is arid, Sudan's irrigation is not yet constrained by water shortage; the amount of water available (regulated by international treaty) is roughly adequate for the present level of irrigation development.

Irrigation in Sudan is dominated by the Gezira System, which has existed for over 60 years, and is crucial to the entire Sudanese economy, because the cotton it produces is the major export of the country. Other more recent large systems (New Halfa, Rahad) are similar to Gezira. However, Gezira accounts for less than half of the total irrigated area in Sudan; smaller systems make up a significant portion.

The government and parastatal bodies which organize irrigation in Sudan wield an unusual degree of authority, especially in the Gezira model. This goes far beyond what is normally found in South Asia, and enables these authorities to dictate many aspects of on-farm activities, leaving relatively little freedom of choice to the farmer.

In 1987, the Ford Foundation provided a grant to IIMI to cover the costs of posting an IIMI staff member in Sudan for two years. Also in 1987 IIMI signed an MOA with the Director General of the Hydraulics Research Station at Wad Medani, which provides IIMI with office facilities at that institute and the opportunity to collaborate with their staff, as well as with other research bodies. In late 1988, it is expected that an MOU will be signed with the Government of Sudan to grant IIMI status appropriate to a nonprofit international institution. IIMI's first resident internationally recruited staff member will be placed in Sudan, at Wad Medani, as soon as possible after this MOU is signed, and it is hoped that the office will become operational by end 1988 or early 1989.

*Proposed 1989 program.* In 1989, IIMI proposes to begin implementing its research program for Sudan. Initially, IIMI will compile a description of existing management methods and procedures in Sudanese irrigation systems. It is envisaged that this review will serve as a baseline document to assist in the orientation of research studies on specific components or aspects of management arrangements. One of the first tasks of the IIMI representative will be to organize a workshop with representatives of concerned agencies (irrigation managing organizations, research institutes, universities, and training institutes) to discuss their perceptions of program priorities. A preliminary list of possible topics for collaborative research, identified by IIMI with Ford Foundation during 1987, includes the following.

Within the theme of Management of Water Resources for Irrigation, IIMI and its partners would propose to define the extent to which present management arrangements and canal operating procedures succeed in making water available at the right times and places in the system. Related to this, IIMI would propose to analyze, primarily from the recipients' point of view, the optimum characteristics desired of the canal water-delivery system, and the interrelation of this with such factors as on-farm land-grading (furrows, level basins, etc).

Within the theme of Management of Irrigation Organizations, IIMI will seek to discern any correlation between the labor supply and irrigation performance, as various researchers have proposed that in Sudan (and in various other African countries) the deployment of relatively scarce labor resources is a much more significant factor than in South Asia.

Within the theme of Management of Change in the Institutions for Irrigation, IIMI would propose to monitor the impact of changes of management that are imminent in some of the government corporations that manage medium and small systems.

Discussions have continued during 1987 and 1988 with the Gezira Rehabilitation Project Management Unit (RPMU) and the Sudan Gezira Board (SGB), about the possibility that IIMI may place a second internationally

recruited staff member at SGB headquarters, Baraket, with the title of Senior Water Management Advisor. The position would be financed from the World Bank credit for rehabilitating the Gezira System.

**Morocco** IIMI's interest in Moroccan irrigated agriculture lies in the potential for cross-country comparisons, particularly with Asian countries. There are three areas of special interest in this respect: crop diversification, decentralization of management and financing responsibilities for large irrigation systems, and the use of modern irrigation and canal regulations.

An MOU between IIMI and the Government of Morocco will be signed in October 1988. Thereafter IIMI expects to complete arrangements for placing a resident staff member at Rabat.

In 1989, and subject to funding considerations, IIMI proposes to begin implementation of its research program in Morocco. The first year will involve the identification of prospective research partners and issues, the elaboration of the various elements of the identified program, and the formulation of detailed action plans in respect of related ongoing research activities. In all these activities, the resident staff will liaise with the regional representative in West Africa, particularly in information and training activities.

## PAKISTAN DIVISION

### Introduction

In many respects, Pakistan's irrigation environment is different from other countries where IIMI currently employs resources. In contrast to humid tropical Asia, Pakistan is arid or semiarid. It is located entirely in the subtropical zone and has a long history of irrigated non-rice crops, particularly wheat. The irrigated lands are particularly vulnerable to waterlogging and salinity.

Its scale is also different. Pakistan has the largest contiguous irrigation system in the world, extending over some 14 million ha. Approximately 71 percent of Pakistan's agricultural area is irrigated. The country's primary and secondary canals stretch to 61,000 km in length with tertiary-level canals estimated to reach another 1.6 million km, while 42 canal commands and 89,000 watercourses serve an estimated 3.6 million irrigated farms. Annual water supply, primarily from snow-melt runoff from the Himalayan Range, totals about 15.6 million hectare-meters. Some 250,000 tube wells supplementally provide an estimated 4.4 million hectare-meters.

Pakistan has a long history of irrigation. The administrative and physical structures controlling its irrigation systems developed in a physical and socio-economic environment in which land was relatively abundant, water supply was relatively uncontrolled, professional and technical resources were scarce, and the need for equity of water allocation and delivery was high. The result, appropriate to the time, was a combined system geared to administration rather than management, and to stability rather than adaptability.

IIMI has been active in Pakistan since September 1986. Its current program focuses on the following four areas within the general themes of Management of Water Resources for Irrigation and Management of Irrigation Facilities.

*Reliability and equity in main canals of large systems.* IIMI is cooperating with the Punjab Provincial Irrigation Department to examine causes of unreliability and inequity in water distribution in major canal systems. Large-scale irrigation systems in the arid environment of Pakistan are characterized by a

low density of control structures where water can be effectively managed. If management decisions at these structures contribute to unreliability of discharge or inequity in distribution the effects are felt over large areas, and there is little opportunity for downstream compensation of adverse upstream effects. This is exacerbated by design criteria that severely limit water allocations, so that failure to operate canals close to design discharge has wide-ranging impact on system performance.

A particular aspect of this research is to understand better how large canals can be managed when there are limited facilities for intercommunication of water supplies and demands, by identifying operational procedures and practices that can be undertaken by individual engineers without compromising overall goals of equity and without unwittingly exacerbating potential negative impacts on agricultural production or the environment. It focuses not merely on tightening up existing procedures that stress on maintaining equity when water supplies are adequate, but also on what managerial options are available when water supplies do not meet design expectations. It enables alternative management procedures and their supporting technologies to be tested and modified to meet local circumstances.

*Variability and equity of water distribution at secondary level.* Variability of flow in the main or branch canals affect water distribution in the off-taking distributaries (secondary canals) and the watercourses (tertiaries) they serve. IIMI's work, undertaken in cooperation with the Punjab Provincial Irrigation Department, addresses two main issues: the equity of water deliveries among different distributaries and the equity of water distribution along a distributary.

Although the only moveable control structures are at the heads of distributaries and branch and main canals (all other structures being fixed orifices or flumes), a number of different management opportunities exist. The development of the concept of equivalent distance, which combines hydraulic factors with distance along a canal, has assisted in identifying management strategies that could be adopted to reduce inequity. These include relating maintenance activities to equity of water distribution, keeping water levels more in line with design criteria, and having more scope for rotations between distributaries when water supplies are inadequate.

*Irrigation constraints to wheat production in northern Punjab.* This work is carried out in close collaboration with the Punjab Provincial Agriculture Department. In Pakistan wheat is grown on more than seven million hectares, the largest area devoted to any crop in the country. Yields of irrigated wheat average only two tons per hectare and have been practically stagnant for the past five years. Several irrigation-related factors are believed to contribute to keeping yields low.

The activity focuses on interlinkages between canal operations and farm-level irrigation practices to bring about conditions for improved agricultural production.

*Impact of lining on reliability of water deliveries.* Lining of canals has long been seen in Pakistan as one of the major ways to improve water distribution and simultaneously reduce the contribution of seepage losses to waterlogging. Until recently, however, lining has only been undertaken on a large scale at tertiary (watercourse) level in Pakistan under the auspices of the "On-Farm Water Management Project" of the Provincial Agriculture Departments. Very few canals operated by the Irrigation Department have been lined. This is now being seen as a major opportunity.

Studies already undertaken in this activity have been of limited value for two main reasons: reliance on secondary data for assessing prelining conditions, and a lack of opportunity to assess lining in the wider context of alternative strategies for addressing reliability of water deliveries.

**Proposed 1989  
Program**

In 1989 IIMI Pakistan will continue to expand its work on the theme of "Management of Water Resources for Irrigation," with particular attention to the variability, reliability, and equity of the main and secondary systems. It will also continue its research on canal lining and integrate its research on constraints to wheat production in the wider context of farm-level irrigation management issues (see below). IIMI also proposes to begin research on four additional topics, the first two of which fall within the overall theme of "Management of Water Resources for Irrigation," while the other two fall within the theme of "Management of Irrigation Organizations."

The first topic concerns the management of irrigation systems to minimize waterlogging and salinity problems. There is well-documented evidence of the overall increase in groundwater tables since the introduction of large-scale irrigation in Pakistan during the nineteenth century. This has been largely due to seepage from canals and percolation from irrigated lands. In many areas the problem has become so severe that large areas either went out of production due to waterlogging or salinity, or else became considerably less productive. To combat this trend Pakistan has adopted a remedial approach that focuses on the development of drainage systems. Although there is a very low density surface drainage system, the majority of water table control has been through tube wells and, in recent years, through subsurface drainage. There is little doubt that the drainage systems, notably tube wells, have assisted considerably in reducing waterlogging problems.

Throughout the history of efforts to control water table problems in Pakistan there has been almost no attention paid to investigating the opportunities for modification of irrigation practices that could complement the drainage system. With an irrigation system designed to provide deficit irrigation throughout the year, there has been relatively little recognition of management opportunities to prevent or mitigate waterlogging and salinity problems.

Pakistan is not unique in adopting a largely technological, drainage-oriented solution to waterlogging and salinity problems. In arid environments, where net movement of soil moisture is upwards, drainage is essential. Where IIMI can make a positive contribution is in helping to address the extent to which the management of canals that provide water to irrigated areas can help complement the drainage system in a combined management program. Given a commitment to address issues of sustainability, it is clear that IIMI must address waterlogging and salinity problems, but with an emphasis on management contributions rather than the development of new technologies.

The second topic, the development of which is subject to funding considerations, concerns issues of farm-level irrigation water management. The overall objective of this activity, which would be conducted under a specially funded project, is to develop, in collaboration with government agencies dealing with

irrigated agriculture, a better understanding of the behavior of farmers in relation to irrigation water; to identify constraints that govern farmers' actions, and the effect of these constraints upon crop production; and to propose new practices and means of implementing them. Initially the project would include three different fields of activities: measurement of irrigation performances, irrigation constraints to wheat production, and matching of water supplies to farm needs.

In order to assess irrigation performance at the farm level or at higher levels of the distribution network, it is necessary to choose certain criteria or performance indicators that are to be measured in the field. In Pakistan, as elsewhere, the most common measurement of performance at the field level is crop yield per unit of area. But in an environment where the available water quantities are usually deficient in relation to land -- that is, where water, rather than land or labor, is the scarce resource and the major constraint on production -- it is important to know the performance of the irrigation system in terms of production per unit of water. Better knowledge of this parameter, and its geographical variations, should enable us to understand in what circumstances there is scope for better and more productive use of water.

In the field of irrigation of wheat considerable work has been done at existing research institutes on the water relationships of wheat in Pakistan, and recommended irrigation practices have been derived from this work. Such recommendations can initially be taken to define an optimal water-delivery pattern. The aim of the project will therefore be to determine in what respects, and why, actual practices may differ from this optimal pattern.

In matching water supplies to farm needs it must be realized that (in terms of their original design), most canals in Pakistan are seen as being largely supply-based. There is little immediate scope for accommodating demand as the rigidity of the design makes it hard to respond to different conditions.

In general, the canal systems of Pakistan were designed for cropping intensities significantly less than 100 percent. Although supplies have been

enhanced by large storage dams and by tube wells, it is still difficult to bring crop intensities in either season up to desired levels. Constraints include canal sizes, deterioration of conveyance parameters, and the very limited number of control facilities. Tube well operating hours are often also constrained by the capacity of the watercourse into which they deliver. The combined result of all these constraining factors is that, over large parts of the irrigation systems, water deliveries to the farm level are not in practice well matched to the needs of the crops, and are not sufficient to encourage farmers to raise their cropping intensity.

The aim of the project will be to explore the extent of such problems and to identify the relative significance of the various constraints. In particular, IIMI will study the impact on crop production of any mismatching of supply and demand; and to estimate the increases in production that might be expected as a consequence of any improvements in this.

A third topic IIMI proposes to initiate in 1989 is the management of information. A major component of the work of organizations responsible for managing irrigation systems is the proper management of information; without information, management is impossible. As the overall objectives of the Pakistan irrigation systems change from providing limited amounts of water to as many people as possible, to also attempting to meet demand-based criteria such as improved agricultural performance, limiting the development of waterlogging and salinity, and accommodating alternative uses of water, it becomes increasingly important to manage information effectively.

Information requirements differ for different tasks. For example, canal operations require relatively quick feedback of supply and demand conditions so that short-term adjustments can be made to control structures. Monitoring parameters that exhibit longer-term responses, notably environmental impacts such as water table rises or increases in salinity, require feedback mechanisms to higher-level system managers. Finally, the impact of new management techniques on system performance can only be evaluated through performance monitoring and information management.

A fourth topic IIMI proposes to undertake in 1989 concerns the application of recent advances in understanding of the nature of organizations and the ways they make decisions to improve the functioning of bodies such as irrigation departments and water users' groups. One way to look at organizations is to consider actual decision-making processes that take place within the organizations, and the processes by which institutions and individuals involved in irrigation perform their managerial responsibilities. IIMI proposes to address the inter-relationships between decision-making processes and management conditions (human resources, organization, information, tools); the interaction between management and system design (or more generally, the physical conditions and constraints under which systems operate); and various aspects of interagency coordination.

In addition to the above four topics, IIMI proposes to initiate activities at a modest scale within the general theme of "Management of Irrigation Support Services to Farmers." During 1989, and subject to funding considerations, IIMI proposes to collaborate with the Aga Khan Rural Support Program for a study on irrigation efficiencies in a number of farmer-managed irrigation systems in northern Pakistan.

## PROGRAMS DIVISION

The Programs Division forms a new part of IIMI's organizational structure, with effect from 1 September 1988. It has been devised in order to ensure that IIMI's activities are not simply a disconnected set of country operations, but lead to generic descriptions and solutions of irrigation management questions.

The Programs Division will undertake work of three kinds:

- \* thematic research,
- \* regional and multicountry projects, and
- \* management training.

The rationale for incorporating multicountry projects into this Division is that the linking factor that unifies any project conducted in several countries is almost always a thematic one.

### **Thematic Research**

IIMI's Strategy Paper presents a "menu" of 13 sectors or elements of irrigation management, from which the Institute has chosen 7 on which it intends, at this stage of its evolution, to concentrate. These seven are:

- Institutions for Irrigation Management
- Management of Water Resources for Irrigation
- Management of Financial Resources for System Sustainability
- Management of Irrigation Facilities
- Management of Irrigation Organizations
- Management of Irrigation Support Services to Farmers
- Management of Change in the Institutions for Irrigation

IIMI has already acquired experience and data in all these fields, mainly through its project work, but in general this experience is fragmented and special effort needs to be put in to analyzing it, comparing different country experiences, comparing IIMI's findings with those published by other researchers, and developing conceptual frameworks that will connect and explain the findings and ultimately give a predictive capacity.

It is proposed that the Programs Division begin its work in this thematic area during 1989 by arranging for a number of "state-of-the-art" reviews of the present state of international knowledge on each of seven themes. These reviews will then serve as a secure foundation for the development of future work plans on each theme, since they will be designed to identify the principal knowledge gaps and researchable areas in each theme.

The full implementation of the proposed work is dependent upon securing the necessary funding (Alternative B), as discussed in the budget part of this paper. If a lower level of funding is available (Alternative A), only two such projects can be implemented.

The following paragraphs contain short outlines of the scope of each of the seven themes.

*Institutions for irrigation management.* Under this theme, IIMI would seek to determine the appropriate management conditions necessary to operate an irrigation system. This means assessing necessary management resources of all kinds: numbers, quality, knowledge and skills, and deployment of agency personnel; other essential resources such as information gathering arrangements, communication systems, logistic facilities; and the degree to which field decisions are conditioned by systems of operational rules. It includes analysis of the ways by which (for a new irrigation development) the set of managing agencies is initially determined, as well as the interfaces between components of that set. It also includes study of the ways by which objectives (both overall and at subordinate levels) are set; and of the mechanisms for monitoring actual performance, and for responding to non-achievement of objectives.

Governance, also included under this theme, is a significant part of the total set of management conditions, yet its relationship to system performance criteria such as productivity or cost-effectiveness have received little research attention in the past. IIMI would seek to identify appropriate organization models, which currently range from centralized ministries, to single system parastatal corporations, to farmer-managed irrigation systems.

*Management of water resources for irrigation.* Many of the present problems of canal operations result from the changing objectives of individual canal systems over time (or changing external demands, not always explicitly recognized in restated objectives). Such changes are happening through evolution of irrigated agriculture, unintended environmental impacts, or rapid changes in cropping patterns as farmers adjust to changes in the economic environment. In its work thus far IIMI has found that main canal operations, with their preponderance of hardware, are perceived by agencies as already operating efficiently, even when the opposite is often true.

Although canal operations are still the predominant area of water management in developing countries, other features of water management are steadily gaining importance. Groundwater development, and conjunctive use of ground and surface water resources, have helped many countries (notably in the Indian subcontinent and in north China) to modify the seasonality of their irrigation supplies, and to combat waterlogging due to rising water tables. There are often special problems of heterogeneous management, because surface water is usually a public resource, whereas wells are often private.

*Management of financial resources for system sustainability.* The difficulty many irrigation agencies face in mobilizing adequate resources to operate and maintain irrigation systems is at least partly responsible for the rapid deterioration of irrigation systems and the environmental consequences that result. Budgets for recurrent costs have not kept up with investments in new irrigation systems or the increase in irrigated areas. In many countries, budget reductions by central government are reducing available resources even further. As a consequence, many agencies are now exploring alternative methods of mobilizing needed financial resources, with varying success.

IIMI's past research has shown that there is a direct relationship between the ways in which resources are mobilized and managed and the performance and sustainability of irrigation systems. The degree of financial autonomy of an irrigation agency -- whether it receives funding from the central ministry or through the recovery of fees from beneficiaries -- for example, is closely linked with the accountability of irrigation managers.

IIMI's comparative advantage in this area lies not in the narrow financing questions of how much should be collected and from whom; but rather in the interactions between finance, agency performance, and overall system performance. IIMI's research would seek to develop two types of innovations. The first of these constitutes organizational mechanisms for collection, allocation, and utilization of resources. These include the role of beneficiaries in the decision-making process regarding the collection and use of resources, and organizational arrangements that increase the accountability and financial responsibility of agencies. The second type constitutes more specific innovations such as the "wholesaling" of water to groups of beneficiaries.

*Management of irrigation facilities.* Management of irrigation systems includes not only the management of water but also the management of agency staff, the irrigated farming environment, and the interaction with farming -- the management of people, information, and environment. In many developing countries, irrigation bureaucracies administer irrigation systems with a dual emphasis on the supply of water as an input to agricultural production and on following rules and procedures. But the essence of management is to monitor not only the inputs but also the outputs, the process, and the feedback, and to make necessary changes in real time operations in response to such feedback.

Shifting from an administrative mode to a management mode in operating systems is the key to sustaining high levels of performance. In addition, if irrigation agencies are to adopt better canal operation practices and use them on a large-scale and sustained basis, profound changes in their internal structures and processes and in the policy environment influencing them will be required.

Thus, under this theme IIMI will devote considerable attention to the policy decisions, institutional arrangements, and organizational and management changes that can lead to these types of innovations:

- Change strategies (involving policy, organizational, and management innovations) to assist irrigation management agencies to shift from an administrative mode to a more dynamic, innovative management mode;

- Methodologies for monitoring and evaluating the performance of the management process (i.e., of the agency itself) for operational use by irrigation agencies;
- Strategies to increase accountability of agencies, particularly to farmers, and to improve coordination among agencies; and
- Organizational and management techniques to enhance the communication, and information management and decision making processes within irrigation agencies.

*Management of irrigation organizations.* Irrigation systems built and managed by farmers exist in many countries, and in some they constitute the majority. They vary greatly in history, size, and technologies. They include privately owned and operated tube wells, and large tank or diversion schemes serving hundreds or even thousands of farmers. An increasing number of irrigation agencies and donors are currently developing and implementing assistance programs designed to support these systems. Returns on investments in such programs can be high because a minimum of assistance can stimulate considerable increases in food production and rural income.

However, the record of government support is uneven. Government engineers often underestimate the efficiency of farmer-managed systems and knowledge accumulated by farmers. Support programs often undermine the traditional institutions and this leads to conflicts between the agency and beneficiaries.

IIMI's research in this area would be designed to develop cost effective strategies for governments to assist and support irrigation systems managed by farmers. This includes, for example, the development of research methodologies that enable rapid and holistic assessment of the existing resources and institutions.

*Management of support services to farmers.* Many developing countries with mature irrigation systems are currently making large investments in the rehabilitation of irrigation systems. Because systems include physical facilities,

organizational structures and management processes, appropriate mixes of hardware and software are required to upgrade the performance potential, and then to sustain it at the new levels. Many alternative rehabilitation strategies are currently being implemented which offer opportunities to compare costs, benefits, impact, and the sustainability of systems rehabilitated.

At the same time inadequate maintenance often leads to costly rehabilitation before original investments are recovered and often before a full-scale rehabilitation is necessary. Part of the reason for this is that irrigation managers, who have predominantly technical and engineering training, often view rehabilitation as the easier solution. Another reason is the difficulty agencies have in funding, organizing, and identifying maintenance activities that can sustain and even improve the performance of irrigation systems. Thus, this aspect of the theme is closely related to the previous theme of "Management of Financial Resources for System Sustainability."

IIMI's research under this theme would be concerned largely with three types of innovations: a) organization and management processes to implement and sustain a cost-effective maintenance program, taking into account the tradeoffs between regular and deferred maintenance; b) criteria for use in deciding at what point in a system's evolution rehabilitation is necessary, and for determining the type of information which is required for designing the rehabilitation; and c) strategies to plan, design, and implement cost effective rehabilitation programs that take into account the extent to which beneficiaries should be involved in the rehabilitation process.

*Management of change in the institutions for irrigation.* Irrigation management institutions must be able to change, adapt, and respond to the new demands, new objectives, and new technological opportunities. In some cases, it may become necessary to make fundamental changes to an existing set of institutions: to introduce new ones, to abolish old ones, or to relocate the interfaces and redefine areas of responsibility among them.

The process is akin to modernization of the physical system. It involves (partially) returning to the system design stage, and establishing new

management conditions. However, it is often much more difficult to achieve, because existing groups and institutions tend to resist the change. The trend to promote development of farmers' organizations, and to turn over to them certain functions, such as channel maintenance and perhaps fee collection, is a current example.

Physically, this "turnover process" amounts to shifting the interface of management between agency and farmer groups, say from the field channel to the distributary channel. Organizationally it is much more complex. It involves questions about the appropriate constitution, fiscal and financial status, and extent of authority of these stronger farmer organizations; land tenure; relationships with agencies; transfer of employment of some O&M staff to a new employer; and much more. The ways in which these matters are decided have many implications for the subsequent performance of the system, especially its output and equity.

### **Regional and Multi-country Projects**

The Programs Division will have responsibility for projects that are conducted in several countries, because such projects are usually of a thematic nature. Three such projects, which were initiated before the Division's creation, will be under this section of the Programs Division. These address management of support services; management of water in rice-based systems; and irrigation policies. Two additional projects are also proposed to be initiated during 1989. Brief project plans follow.

*Farmer-managed irrigation systems (FMIS).* In 1988, IIMI commenced a multicountry program for FMIS, with funding from IFAD and the Bundesministerium für Wirtschaftliche Zusammenarbeit (BMZ). The IFAD/BMZ project employs two overlapping approaches: a) collaborative research undertaken with national research institutes or implementing agencies or both; and b) network activities to generate and disseminate information and provide backstopping support to policy makers, managers, and researchers who are concerned with and/or actively engaged in assisting the FMIS sector. (The FMIS Network was established following the 1986 IIMI-sponsored Kathmandu workshop on "Public Intervention in FMIS." Its purpose is to enhance

the utilization of existing knowledge through facilitating interaction among researchers, policy makers, and managers around the world; and to facilitate research on, and implementation of, innovative approaches to assisting FMIS).

The project's research emphasis is on intervention by outside agencies to assist farmer-managed systems. Each research activity within the project contributes to management innovations for assistance programs that are more cost-effective to national agencies, more productive for farmers, and more equitable to all residents of rural communities, both landed and landless. By working directly with implementing agencies, IIMI can have an immediate impact on improving the effectiveness of assistance programs. By working collaboratively, both with implementing agencies and with national research institutes, IIMI can enhance the capacity of those organizations to anticipate and respond to the needs of the FMIS sector over the long term.

In practice, IIMI staff can carry out collaborative research only in those countries in which there are IIMI staff in residence (e.g., Sri Lanka, Pakistan), but even here the range of IIMI involvement in studying FMIS assistance is not limited to its own research. Through the network, IIMI seeks to promote research by other institutions, and to disseminate the results of that research.

Under the IFAD/BMZ project, six countries have been identified for specific activities in 1989, based on the mutual interests of IFAD/BMZ and IIMI. The countries are Sri Lanka, Thailand, Bhutan, Pakistan, Bangladesh, and Morocco.

In each of the six countries, the IFAD/BMZ project will support a mix of research and network activities. In Sri Lanka and Pakistan, where IIMI staff are resident, some collaborative research will be carried out by IIMI staff collaborating with various implementing agencies. In other countries (e.g., Thailand), research will be conducted by associated institutions. The response here is to establish links between the researchers and the implementing agencies to ensure that the research results can be put to practical use.

The FMIS Network will provide a link among these six countries, and will extend to more than two dozen other countries in which irrigation professionals

are working on FMIS assistance projects.

*IIMI/IRRI collaboration on rice-based irrigation systems.* In mid-1987, IIMI initiated a three-year collaborative research project with IRRI focusing on the problems of irrigation management for rice-based irrigation systems. The project is funded by the Rockefeller Foundation through a US\$1.2 million grant to IIMI, and a separate US\$300,000 grant to IRRI.

The project addresses three options within the context of reduced economic returns from irrigated rice lands. These include increasing the economic yields of rice, increasing the area served by scarce water resources through more effective and efficient irrigation system management, and introducing crops of higher value than rice into irrigated rice-based farming systems. A major emphasis has been placed on the agronomic, water, and irrigation system management issues related to non-rice crops in irrigated farming systems.

During 1989, research in the Philippines will build on the work of both institutes in the context of irrigation management for rice and non-rice crops. In Bangladesh, the 1989 program will build on IRRI's research carried out in collaboration with the Bangladesh Water Development Board and the Bangladesh Rice Research Institute. In Indonesia, the program will build on ongoing projects of both institutes. The Indonesia program complements that in Bangladesh by addressing the productivity of non-rice crops in rice-based farming systems -- and by exploring in the Indonesian context, the factors affecting the increase in equity and efficiency of water use. In particular, IIMI will address the implications for necessary institutional changes, both within the irrigation agency and the farming community.

The point of integration among IRRI, IIMI and national agencies involved will be the research sites (operating irrigation systems) where monthly meetings or reporting of activities will be held. This will facilitate the regular interactions necessary for the success of the collaboration. Reporting and review meetings, to be held twice a year, will be attended by the most concerned headquarters staff.

An annual review and planning meeting is also planned. During this meeting, the progress of all the component studies will be reported and discussed, including substantive accomplishments and problems. Plans for 1989 may be altered to reflect agreements reached during the discussion. The materials presented during the meeting as well as the results of the discussions will be used in preparing an annual progress report.

In December 1989 a workshop to present the results of the project will be held. This will be attended by concerned staff of the two institutions and by key officers from national agencies involved in the collaboration.

*IIMI/IFPRI collaboration on irrigation policy issues.* During 1988, IIMI will complete the first phase of a collaborative program with IFPRI focusing on irrigation policy issues relating to crop diversification in Asia and irrigation development in Africa. The general objective of the first phase of the program has been to help the two centers establish a collaborative relationship on irrigation related matters. Under the collaborative program, IFPRI and IIMI have jointly appointed a Research Fellow, an agricultural engineer formerly associated with USAID's Water Management Synthesis Project. The Fellow is based at the IFPRI offices in Washington; 75 percent of his time is allocated to IFPRI with the remainder to IIMI.

During 1989, IIMI and IFPRI propose to initiate a major four-year project to develop performance criteria and assess the performance of a cross-section of irrigation systems in Asia and Africa. The project will be implemented in two parts: first, to develop a framework and methodology for assessing irrigation performance, and second, to use that information to carry out the assessment. The project is closely related to the one described below.

**IIMI/World Bank  
Studies of Design/  
Management  
Interactions**

IIMI's Strategy Paper enunciates a set of five principles which (over and above the seven theme areas) must be permanent characteristics of all the Institute's work. Two of these are performance measurement, and the study of interactions between design and management.

IIMI has agreed with the World Bank to a set of standard Terms of Reference, intended to be used for a series of studies on existing irrigation systems in many countries and in many environments. Their common objective will be to investigate how the major physical and organizational design factors influence the management, or manageability, of systems, and their performance.

These studies will be done fairly rapidly, using as far as possible data already available with the managing agencies. Their results will be presented in standardized formats so as to facilitate intersystem and intercountry comparisons.

If the full level of requested funding is made available to IIMI (Alternative B: see Part IV), four or five such studies are envisaged. If less than that amount is forthcoming (Alternative A), only two studies will be possible.

*Environment and health.* IIMI has recently accepted designation by the World Health Organization as a Collaborating Center of the Panel of Experts on Environmental Management for Vector Control (PEEM). This will bring the Institute into collaboration with various others concerned with such fields as entomology and tropical health. A small initial amount is budgeted to initiate this relationship.

### **Management Training**

In its early years IIMI's management training efforts have focused principally on short courses and workshops, and on its system of awards and fellowships. The latter has been intended to provide a flexible range of options for training opportunities for individuals.

During 1989, and under its new Strategy, IIMI will aim at a training program of wider scope. This will emphasize indirect approaches, in which IIMI will seek to strengthen national training organizations and help them to develop courses relevant to irrigation management. The focus will be on training needs assessments, curriculum development, and preparation of course materials based largely on IIMI's own project experiences.

The management training specialist, who will initiate these activities, has been appointed and is expected to be in post by mid-October.

Funding has initially been made available through the USAID Irrigation Support Project for Asia and Near East (ISPAN), which will support these activities through 1990. During 1989, it is intended that the training specialist will draft a plan for subsequent years of relatively swift growth in this area, targeting particularly three audiences:

- \* managers
- \* trainers
- \* researchers

## INFORMATION OFFICE

The information needs of an Institute such as IIMI are complex. Its decentralized structure requires information support which is tailored to the needs of all different support units and audiences; yet which nevertheless remains coherent as a singular overall information thrust. It will be catalytic, focusing on policy and management development and with a strong multiplier effect as information flows down to the end users at the operational level. At this point in its development, the Institute now benefits from a substantial, acquired, research base and from experience which can therefore be turned into an expanded and valuable information support service on the one hand, and as a generator of information outreach essential to the development of irrigation information systems, on the other.

The principal objectives of the 1989 Information Office will be to;

- initiate and implement an "information gathering" system which services the needs of all IIMI units, at headquarters (HQ) and at the different decentralized locations, as well as those of its partners;
- redefine and locate its audiences at the different levels described in its strategy, so that dissemination is truly effective;
- ensure that its information products and activities correspond to the varied challenge of an increased resource base but equally that the "product" in each case is clearly identified as a coherent series of outputs;
- expand, in volume and in geographical coverage, existing and potential information exchange networks;
- increase collaboration with information partners;
- reorganize the program's resource and operational structure to render it more cost-effective and achieving; and

- to catalyze information exchange systems so that exchange of management practices be disseminated with increased interactivity, and consequent sharing of technological innovations, management practices, and developments.

Consequently, in 1989, the Information Office will carry out the following information activities.

- The Publications Output of the research program has recently been reinforced. Research Reports, Management Briefs, Case Studies, and Working Papers series will continue and a substantive publications series will be initiated. Research results, and irrigation policy and management works will be published. Publications from the different IIMI offices will be brought into common formats and appearance, and the dissemination patterns will be brought together.

Certain publications of significant merit may be copublished to ensure a wider dissemination, and higher visibility for IIMI, and it is intended to commission and disseminate one or two works such as Financing Irrigation, and Irrigation Management and the Sustainability Process.

The FMIS and other newsletters will continue, although IIMI will place increasing emphasis on cost effective exchange networks, with sound bases in Africa, Asia, and Latin America, to communicate effectively to a wide community of practitioners at national and agency level in all those countries where irrigation is an important component in sustainable development. Significant papers emanating from the research programs will be placed in leading scientific journals, and off-printed at HQ for Third World audiences and irrigation management practitioners.

Institutional information will continue in the form of the Annual Report and the IIMI Review. In 1989, it is expected that the Annual Report 1988 will be published and distributed by April 1989. From 1989, it is intended to publish the IIMI Review on a quarterly basis. Press Releases and News Bulletins will be issued on a regular basis.

- A Public Affairs Component will be built into the Information Office. This will involve creative research and writing on irrigation management issues, topics, and achievements, and the production and dissemination of Press Releases and Information Bulletins. It will also involve synergistic relationships with national and international media (press, radio, television), to ensure that appropriate coverage is given to the work of the Institute. Press briefings will be held at HQ and other unit offices when suitable events arise, or on the occasion of important visitors.
- A stronger effort will be made in the area of audiovisual communication. Participation in two half-hour television productions, to be relayed on public television networks in US and UK and in the Third World, is envisaged. Videos to support the research programs, and for training and professional development purposes, will be prepared.
- The Library and Documentation Service will expand their provision of services to users at headquarters, field offices, and interested national NGO partners. Special attention will be given to ensuring that the services are fully available to decentralized units, and that the information resources both of HQ and the other units are pooled to maximize the utility and the use of resources.
- Cooperation with Consultative Group on International Agricultural Research (CGIAR) and nonassociated IARCs. The Information Office will work closely with the groups to assist and participate in a system-wide approach to information gathering, production, and dissemination within the overall sphere of agricultural development. This will involve consultation and action on such matters as translations, copublications, shared dissemination networking and referral-system activities, and the use of centers by each other as information focal points in common areas of interest and geographical locations.
- The Information Office will identify specific-funded information projects in areas of concern and as appropriate, by researching areas seen as of crucial and of timely need, locating potential donors, and thus initiating both coordinatory and operational projects to fulfil specific objectives.

## PROJECT DEVELOPMENT UNIT

The Project Development Unit is an essential feature of IIMI's new organizational structure. It is proposed that the Project Development Officer should be in post by the beginning of 1989. The purpose of this office, which will be staffed by one internationally recruited staff member and a few national staff, is primarily to assist the Divisional Directors in developing new programs and in ensuring smooth continuity of project work in all country units. The Unit will therefore be involved in preparation of fresh projects, ensuring that their inputs and timing fit into IIMI's operational and staffing constraints, and that their technical content contributes to IIMI's thematic program development.

In addition, the budget of this Unit, which will be supervised by the Director General, will be the channel for "seed funding" from unrestricted funds. These would be used, for example, during the preparatory phase that leads up to the establishment of a new country program, in order to foster some contacts, collaboration and familiarization with national institutions, at a fairly modest level, during the year or two of negotiations prior to the placing of resident IIMI staff. A small allocation for these purposes will be made if the full amount of requested funds is made available (Alternative B: see Part IV). If less funding is secured (Alternative A), no such "seed" funds will be available.

PART III  
**PROPOSED 1989 STAFFING**

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## INTRODUCTION

This part presents the projected international staff required to carry out the proposed 1989 program described in Part II. The work of the international staff is supported, on all IIMI projects and programs, by nationally recruited staff who play an essential role in the success of such activities.

IIMI finances its staff positions through a mix of restricted and unrestricted funds. All internationally recruited positions have the same terms and conditions of employment, regardless of the way in which they are financed. Furthermore, staff mobility among IIMI units is encouraged.

## CURRENT INTERNATIONAL STAFF

Under the new organizational structure implemented in September 1988 (see Figure 1, page 18 ), research positions have been divided according to new organizational units that reflect the nature of IIMI's programs as described in Part II. The new structure was designed to be flexible enough to accommodate the gradual future growth of the Institute without the need for fundamental organizational revisions. The structure emphasizes the effective deployment of management and research staff resources to ensure the development of thematic understanding and broader learning from field experience, and the effective implementation of field projects to the satisfaction of both donors and collaborators.

IIMI's internationally recruited professional staff positions, as of 31 December 1988 and proposed for 1989, and organized according to the new divisions within the Institute, are shown in Table 1.

Management staff at the senior professional level in this organizational structure include the Director General; the Director, Programs; the Director, Field Operations; the Director, Pakistan; and the Director, Finance and Administration.

The two positions of Director, Field Operations, and Director, Programs, replace the earlier positions of Deputy Director General (vacant since June 1987) and Director, International Programs (vacant as of August 1988). Both are based at headquarters, and are due to come into effect in late 1988. The Director, Field Operations, will be responsible for supervision of the implementation of all country and regional programs with the exception of IIMI Pakistan. This includes allocation of resources, provision of professional support to country program heads, monitoring of project budgets and performance, development of new country programs, and donor relations. The Director, Programs, will be responsible for IIMI's thematic program, including development of conceptual analyses of irrigation management processes; integration of the results from IIMI research activities and the findings of other institutions involved in similar work into general descriptions and

analyses of irrigation management processes; development and implementation of the technical publications program; and management of training and professional development programs.

Table 1. Current and proposed internationally recruited staff.

	Actual at end 1988	Proposed additions during 1989	Total at end 1989
<b>Director General</b>	1		1
<b>Finance and Administration</b>			
Director	1	-	1
<b>Field Operations</b>			
Director	1	-	1
Bangladesh	1	-	1
India	-	+0.5	0.5*
Indonesia	2	+1	3
Morocco	1	-	1
Nepal	1.75	+1.25	3
Philippines	1	+1	2
Sri Lanka	3	0.5	3.5
Sudan	1	+1	2
West Africa	1	+1	2
<b>Pakistan</b>			
Director	1	-	1
Research Staff	4	+1	5
<b>Programs</b>			
Director	1	-	1
Research Staff	6	-	6
Training Staff	1	-	1
<b>Head, Information Office</b>	1	-	1
<b>Program Development Officer</b>	-	1	1
<b>Total</b>	<b>28.75</b>	<b>8.25</b>	<b>37</b>

\*Based in Sri Lanka.

Research staff have been allocated to the Field Operations, Pakistan, and Programs Divisions. IIMI's irrigation, management, and training specialists concentrate on the planning, design, and implementation of research projects; in addition, they assist in the development of management training activities, and participate in activities to promote research interaction and collaboration among IIMI's professional staff.

IIMI's training staff, which during 1989 will consist only of one senior Training Specialist, will be attached to the Programs Division. Such staff will be responsible for developing all IIMI's management training activities, and for providing assistance to all country units which contain a management training component. IIMI does not propose to increase the full-time training staff in 1989, but may augment the training specialist's activities through the use of consultants.

The Information Program is directed by a senior internationally recruited information and publications expert. The Head, Information, is responsible for the Institute's overall information dissemination, publications and public relations program, as well as the library and information databases and networks.

Four new positions outside of headquarters were added to the IIMI international staff in 1988 in order to permit initiation of programs in Bangladesh, Morocco, Sudan, and West Africa. All of these positions have either been filled, or are in the process of being filled, by senior irrigation specialists who serve as the heads of IIMI's Field Operations units.

## **PROPOSED STAFF ADDITIONS FOR 1989**

During 1989, IIMI proposes to increase the internationally recruited staffing level by 8.25 person-years over the level at the end of 1988.

One of these new positions will be the Project Development Officer, who will assist in the identification and formulation of new projects, and participate in negotiations with donors and collaborators in the definition of new projects and fresh phases of existing projects. IIMI also proposes to recruit up to six new resident staff members in support of the proposed new activities which have been described in Part II, and which are currently under consideration by donor organizations for Indonesia, Nepal, the Philippines, Sudan, and West Africa.

## OTHER STAFFING ISSUES

During 1989, IIMI proposes to appoint several research fellows and scholars, who will make specific contributions to the Institute's activities in the different countries in which it is active. IIMI will continue its practice of providing special awards to outstanding irrigation managers to enable them to spend more time with IIMI staff to analyze and write about their experiences in irrigation management.

During 1989, the Institute proposes to engage approximately three person-years of consultant services. Many of these services will be performed by highly experienced consultants who will be designated Senior Associates of IIMI. These special consultants will be retained on a recurring basis to enhance their ability to work with IIMI's staff, donors and clients, and to guarantee continuity. In 1989 IIMI proposes to increase the pool of Senior Associates and consultants by establishing relationships with internationally recognized experts in the irrigation management field.

In identifying suitable candidates for all positions, IIMI employs an open recruitment process designed to attract senior staff of the highest caliber. IIMI's international recruitment policies dictate that its staff should be drawn in a balanced way from professionals from both the developed and developing world, without regard to gender, race, religion, or national origin.

PART IV  
**PROPOSED 1989  
BUDGET**

## INTRODUCTION

Tables 2 to 7 present IIMI's proposed budgets for 1989. The presentation this year differs in certain important respects from the form that has been used by IIMI in earlier years. The major changes of format are:

- The term "core funding" is not used, and separate budgets for "core" and "special projects" are not now presented. Instead, sources of income are differentiated into two categories, unrestricted and restricted, whose meaning is explained below.
- On the expenditure side, an integrated plan is presented in Table 5, and in Table 3 the sources of income to meet each major item of this plan are indicated.
- The expenditure plan is broken down according to the major organizational units into which IIMI has been restructured with effect from 1 September 1988.
- Two alternative levels of unrestricted funding are considered (Tables 2-4). These are designated Alternatives A and B. Alternative A represents the level of funding required to fully implement the program and staffing plans as described in Parts II and III. Alternative B represents a lower amount of unrestricted funding. The purpose of presenting the second alternative is to clarify to IIMI's Support Group and other interested parties how IIMI's management would cut back its programs if faced with a reduction in the levels of unrestricted funds.
- Separate operational and capital budgets are presented. The capital budget is shown in Table 7. All other tables, including the revenue tables, refer to the operational budget only. Sources of revenue to meet the capital budget have yet to be identified.

Much of the content of the tables is self-explanatory, but the following paragraphs are intended to clarify those parts which are new, or in other ways deserve explanations.

## REVENUES

As noted above, IIMI is funded in two major ways, which are classified as restricted and unrestricted.

Unrestricted grants are those which are provided by donors to be expended at the discretion of IIMI and its Board of Governors. Such funds come principally (but not entirely) through the IIMI Support Group. Interest and other miscellaneous sources of income are classified as unrestricted.

Table 2. Anticipated revenues, 1989.

<b>ALTERNATIVE A</b>	
	<b>(US\$ '000)</b>
Restricted funds	7115
Unrestricted grants	2265
Interest and sundry income	50
Total	9430
<b>ALTERNATIVE B</b>	
Restricted funds	7115
Unrestricted grants	1665
Interest and sundry income	50
Total	8830

Restricted funds are those provided for some specific purpose. Indirect cost recoveries are considered as restricted funds as they are earmarked for covering indirect costs. Most restricted funds are in the form of grants for the implementation of some agreed field project, but there are a range of other purposes, such as the holding of a workshop, the secondment of staff, the production of a publication, and so on. The degree of constraint or restric-

tion upon the application of these funds varies widely, being largely determined by the nature and policy of the donor organization.

The evolution of the levels of IIMI's unrestricted and restricted income since its establishment in 1984 is depicted in Figure 2, as is IIMI's projected total income during 1988 compared with past years. The figure shows that unrestricted income has now leveled off at US\$1.82 million. Restricted income, on the other hand, has increased dramatically, from US\$0.32 million in 1985 to US\$5.05 million in 1988.

In 1988 the total of unrestricted grants was US\$1,770,000. This is likely to be supplemented by about US\$50,000 of interest income, making a total unrestricted income of US\$1,820,000. The expected restricted funding for 1988 is US\$5,050,000, making a total income of US\$6,870,000.

Figure 3 shows the progression of income since 1984, grouped by type of donor agency. Figure 3 does not include interest income.

For 1989, the estimated total of restricted funds is US\$7,115,000. About 11 percent of this represents indirect cost recoveries, 60 percent represents projects and grants that have already been approved by July 1988, and the remainder represents projects which are at a stage of discussion where the probability of their being approved by donors seems reasonably secure.

In regard to unrestricted grants, the two contrasted alternatives A and B are shown in Table 2. Under Alternative A, unrestricted grants would need to rise slightly above the levels of 1988, to a total of US\$2,265,000. Total unrestricted income, inclusive of interest and sundries, amounts under this alternative to US\$2,315,000. Under Alternative B, unrestricted grants fall slightly, to US\$1,665,000. With interest and sundry income estimated at US\$50,000, this would produce a total unrestricted income of US\$1,715,000, a fall of 6 percent from 1988.

There is no difference in restricted income between Alternatives A and B.

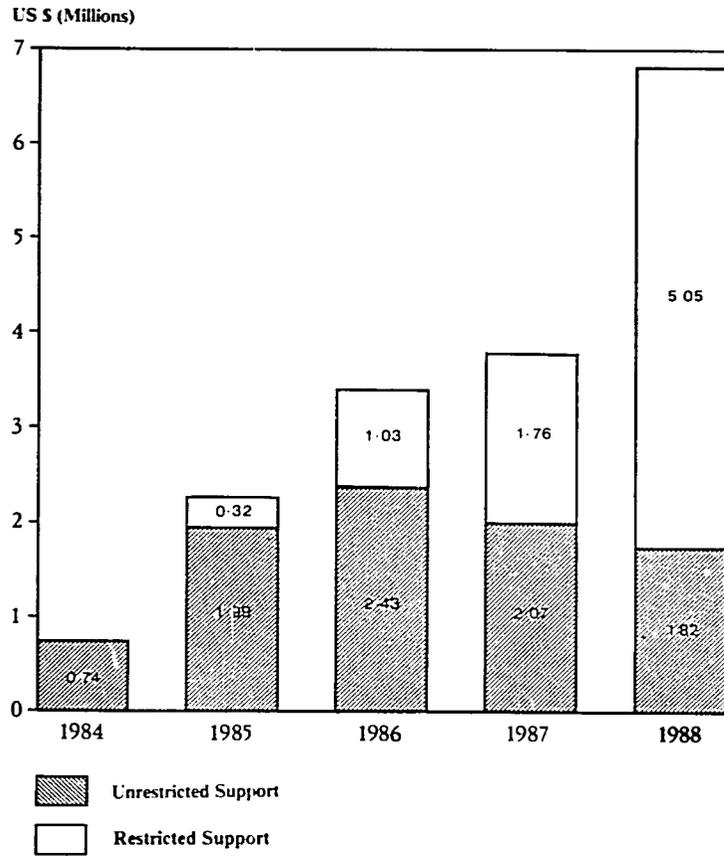


Figure 2. The growth of IIMI's finances; the relative proportion of Unrestricted and Restricted Support for 1984-1988, where 1988 has been projected.

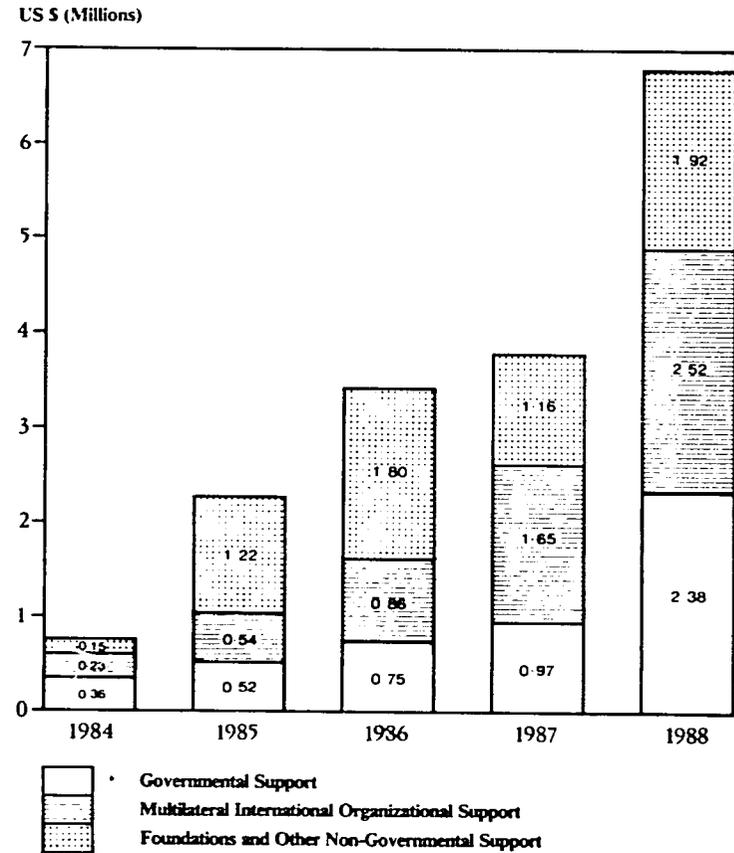


Figure 3. Growth and relative proportion of IIMI's finances by type of donor for 1984-1988, where 1988 has been projected.

## **ALLOCATION OF FUNDS AMONG MAIN ORGANIZATIONAL UNITS**

As described earlier, the Institute has four Divisions (Field Operations; Programs: Pakistan; and Finance and Administration), and two further units responsible directly to the Director General: the Information Office and the Project Development Unit.

IIMI's Strategy describes some principles governing the allocation of restricted and unrestricted funds for each of its component units. In broad outline, it is intended that ultimately the Field Operations and Pakistan Divisions should use principally (but not exclusively) restricted funds; and that the Institute's governance (Board and Director General's Office, other components of the Finance and Administration Division, and the Project Development Unit) should be supported by an indirect cost recovery charge levied on all grants. It is envisaged that the Programs Division will use both restricted and unrestricted funds.

These policies cannot be implemented immediately. Projects agreed some time ago may not carry the indirect cost charge; and recent levels of unrestricted grants would not suffice for the arrangements just described. The 1989 budget is therefore, to some degree, a transition towards these funding objectives.

Tables 3 and 4 illustrate the proposed apportionment of restricted and unrestricted funds, and indirect cost recoveries, among the organizational units, under Alternatives A and B.

Table 3. Summary of sources and application of funds, 1989: Alternative A (US\$ '000).

	Expenditure	Financed by		Indirect cost recovery
		Unrestricted	Restricted	
Field Operations	3591	329	3262	-
Pakistan	1566	150	1416	-
Programs	2018	628	1390	-
Information	415	415	-	-
Program development	174	174	-	-
Finance & Administration	1044	107	150	787
Governance	512	402	110	-
Increase in working capital	110	110	-	-
<b>Total</b>	<b>9430</b>	<b>2315</b>	<b>6328</b>	<b>787</b>

Table 4. Summary of sources and application of funds, 1989: Alternative B (US\$ '000).

	Expenditure	Financed by		Indirect cost recovery
		Unrestricted	Restricted	
Field Operations	3591	329	3262	-
Pakistan	1566	150	1416	-
Programs	1618	228	1390	-
Information	365	365	-	-
Program development	124	124	-	-
Finance & Administration	1044	107	150	787
Governance	512	402	110	-
Increase in working capital	10	10	-	-
<b>Total</b>	<b>8830</b>	<b>1715</b>	<b>6328</b>	<b>787</b>

The difference between Alternatives A and B is (as noted earlier) entirely in the level of unrestricted grants. Alternative A assumes a total of US\$2,315,000 of unrestricted funds, and Alternative B a total of US\$1,715,000. The reduction of US\$600,000 assumed under Alternative B would require corresponding decreases in expenditure on each of the following line items:

	(US\$)
Programs	400,000
Information	50,000
Project development	50,000
Working capital	100,000

Thus any reduction in the level of unrestricted funding will have a strong negative effect on the development of the new Programs Division, with smaller (though significant) effects on other operations that are at present principally reliant on this type of funding (Information and Project Development). Such a reduction would also reduce the contribution towards working capital to a very low level.

The program enhancements that are envisaged under Alternative A have been described in Part II. It should be emphasized that under Alternative B, IIMI would not be able to launch a balanced effort across all seven themes in the Programs Division. With this Alternative, most of the expenditure will be on already agreed projects in the regional and multicountry category, predominantly on management of support services to farmer-managed irrigation, and management of water for rice systems.

Other Points Concerning Tables 3 and 4 Include:

- Indirect cost recoveries from projects funded under restricted terms are projected at US\$787,000. This is 12.4 percent of the restricted project expenditure. New projects agreed up to June 1988 have generally contained an indirect cost recovery rate of 24 percent. The lower rate of overall recovery reflects two factors: several longer-term projects were agreed before the introduction of IIMI's present indirect cost policy; and in

the Tables the indirect cost recoveries from projects still under discussion have been discounted by 25 percent because of their uncertainty, in order not to present an excessive expectation of the funding available to meet administrative costs.

- The Institute's Governance levels (Board and Director General's Office) are distinguished from the Finance and Administration Division.
- The costs of the four Directors of Divisions (and those of Heads of Information and Project Development) are included in their units and are assumed to be supported from unrestricted income.

## OPERATIONAL EXPENDITURE

The Divisional expenditures shown in Table 3 are broken down in greater detail in Table 5. A parallel breakdown in similar detail to match Table 4 (Alternative B) is not shown here but would result in decreases already discussed in the four lines for Information, Project Development, Thematic Research, Training, and Working Capital.

Table 5. Proposed expenditure, 1989 (US\$ '000).

	Int'l staff salaries and benefits	Consul- tants	Nat'l staff salaries and benefits	Int'l tra- vel	Nat'l tra- vel	Office and resrch supp- lies	W/shop and study tours	Vehi- cle/ equip- ment	Con- tract res.	Con- tin- gen- cies	TOTAL
<b>FIELD OPERATIONS</b>											
<b>DIVISION</b>											
Direction	110	.	6	30	4	10		15			175
Sri Lanka	205	13	60	5	55	71	80	15	80	27	611
Indonesia	264	20	79	14	41	51		13	10	20	512
Philippines	136	15	37	20	16	71		43	29	14	381
Nepal	210	33	60	14	16	55	4	27		8	427
Bangladesh	75		3	3	10	7		8			106
India	60	14	8	36	30	40		7		18	213
Sudan	191	14	27	22	23	35		12		8	332
West Africa	246	28	85	32	25	102	10	205			733
Morocco		11	22	5	18	28		10		7	101
Sub Total											
Field Operations	1497	148	387	181	238	470	94	355	119	102	3591
<b>PAKISTAN DIVISION</b>											
Direction	110		10	10	20						150
Projects	388	88	218	49	73	174		78	191	157	1416
Sub Total Pakistan	498	88	228	59	93	174	0	78	191	157	1566
INFORMATION OFFICE	85	40	65	35	5	175		10			415
PROJECT DEVELOPMENT	93	30	3	30	3	5		10			174

(Continued to next page)

Table 5. (Continued)

	Int'l staff salaries and benefits	Consul- tants	Nat'l staff salaries and benefits	Int'l tra- vel	Nat'l tra- vel	Office and resrch supp- lies	W/shop and study tours	Veni- cle/ equip ment	Con- tract res.	Con- tin- gen- cies	TOTAL
<b>PROGRAMS DIVISION</b>											
Direction	110	50	14	20	4	10		15			223
Regional	283	5	93	91	30	126	13	42	35	24	742
Thematic	217	124	49	63	29	74	80	13	50	37	736
Training	100	10	7	45	5	20	100	30			317
<b>Sub Total Programs</b>	<b>710</b>	<b>189</b>	<b>163</b>	<b>219</b>	<b>68</b>	<b>230</b>	<b>193</b>	<b>100</b>	<b>85</b>	<b>61</b>	<b>2018</b>
<b>FINANCE &amp; ADMINIS- TRATION DIVISION</b>											
Direction	110		40	12	4	50		10			226
Administration			191	5	13	346		115			670
General Support		30	20	10	1	77		10			148
<b>Sub Total</b>											
Fin. & Admin.	110	30	251	27	18	473	0	135	0	0	1044
<b>GOVERNANCE</b>											
Board				75	7	44					126
Dir. Gen.'s Office	130	150	33	28	7	28		10			386
<b>Sub Total</b>											
Governance	130	150	33	103	14	72	0	10	0	0	512
Increase in working capital											110
<b>TOTAL EXPENDITURES</b>	<b>3123</b>	<b>675</b>	<b>1130</b>	<b>654</b>	<b>439</b>	<b>1599</b>	<b>287</b>	<b>698</b>	<b>395</b>	<b>320</b>	<b>9430</b>

Some salient points about Table 5 are:

- The major single resource column, International Staff Salaries and Benefits, is estimated at US\$3,123,000, or 33.1 percent of the budget. This is estimated to provide 33 person-years of staff (see also Table 1 which describes the staffing plan). The average cost per person-year is therefore US\$94,600.
- A column for Consultants has been introduced. This is important for providing greater flexibility to deliver support to the relatively small country teams that IIMI deploys in its country operations, and also for engaging people of high experience to make inputs to the thematic research. Consultancy is estimated at nearly 22 percent of international staff costs.
- In occasional cases where a staff member is seconded from a donor government to IIMI, and that person's costs are met directly by the donor, no national equivalent cost figure for that input appears in these Tables, either on the income or expenditure side. This explains, in particular, why the Morocco line of Table 5 appears to show no international staff element: the designated person for that post will be seconded by the Government of France.

## PROGRAMS DIVISION

Table 6 proposes a breakdown of Programs Division expenditures for both Alternatives A and B. In subsequent years it is intended that a full breakdown of this would be presented in Table 5, but for the present year, in view of the newness of the Division, and the uncertainties about eventual levels of unrestricted funding, such detail does not yet seem appropriate.

Table 6. Proposed distribution of expenditure on Programs Division, 1989 (US\$ '000).

Thematic research	Alternative A	Alternative B
Direction	223	173
Regional	742	742
Institutions for irrigation management	70	50
Management of water resources for irrigation	70	50
Management of financial resources for system sustainability	20	-
Management of irrigation facilities	20	-
Management of irrigation organizations	127	102
Management of irrigation support services to farmers*	279	254
Management of change in the institutions for irrigation	20	-
Design/management interaction	100	70
Environment and health	30	10
Training	317	167
<b>Total</b>	<b>2018</b>	<b>1618</b>

\*Includes major funding available through IFAD/BMZ project (see part II).

As noted earlier, Alternative A provides a well-balanced program in the training and thematic areas. Performance in these areas would be substantially less effective if grants are reduced to the level of Alternative B.

## CAPITAL BUDGET

Table 7 presents a capital expenditure budget. There are three items of expenditure, all related to the headquarters site at Digana, Sri Lanka.

Table 7. Proposed capital expenditure, 1989

	(US\$)
Contribution to headquarters building	300000
Ancillary headquarters capital requirements	200000
Digana Village leasehold improvements	300000
Total	800000

As a growing institute, IIMI must continue to devote a portion of its budget to capital expenditure and associated facilities at its headquarters and country units offices. The increasing numbers of staff, projects, and country programs place stress on existing facilities and require the addition of new facilities.

Construction of IIMI's new headquarters building, to replace the temporary accommodation used since 1984, began at Digana in June 1988 and should be completed in the latter half of 1989. The bulk of the cost will be provided by the Government of Sri Lanka from a World Bank credit, but the allocation from that source is not now sufficient to cover the full cost of construction, and IIMI will therefore contribute US\$300,000 towards construction.

In addition, the building has to be furnished and equipped, and ancillary costs like landscaping of the sloping site will arise. The total of these costs associated with the headquarters building is estimated at US\$200,000.

The staff houses which IIMI uses at Digana were built in connection with the construction of Victoria Dam about 1980, and were not designed for a long life-span. IIMI has to make considerable investments in improving and repairing them to make them more durable. IIMI will eventually have the right to use 80 houses. The estimate of US\$300,000 in Table 7 should provide for repairs and improvements to about 30 more.

At Lahore, a site has been found for a central office facility for the Pakistan Division. Design and construction of that building are expected to be financed by the Government of Pakistan. The timing of construction cannot yet be stated, and no expenditures on equipping the building are presented for 1989.

It is hoped that donors can be found to assist IIMI with specific grants towards the capital budget of Table 7. Preliminary discussions have been conducted with the Government of Sri Lanka and with possible donors.

IIMI's capital investment needs are low in relation to other similar institutes and centers. These costs are kept to a minimum as office facilities are often included as part of IIMI's operating agreements with host countries, as in Indonesia, the Philippines, Nepal, Sudan, and Bangladesh.

## IN-KIND SUPPORT

In 1989, IIMI will receive substantial in-kind support and services from its host governments and collaborating institutions; in particular, IIMI will receive support from the Government of Sri Lanka through continued use of IIMI's Headquarters' facilities and field research sites. In addition, the Sri Lankan Government will complete construction of the headquarters building for IIMI at Digana Village at a cost of US\$1 million under a World Bank credit.

During 1989, Provincial governments in Pakistan will provide office and resthouse facilities for site requirements and the Government of Pakistan will begin construction of the headquarters for IIMI Pakistan in Lahore at an estimated cost of US\$2 million, also under a World Bank credit. In other countries, as just noted, IIMI receives generous facilities (such as office space and other in-kind benefits) at no cost.

Several IIMI projects will benefit from the assignment of host country professional staff at little or no cost to IIMI.

IIMI also receives in-kind support from some donors. France and Japan have arranged for secondment of staff to IIMI, and several country programs benefit thereby. IIMI also hopes that, during 1989, its newly structured divisional arrangements will help it to establish new collaborative links with established development research teams and other organizations in the donor countries, and to strengthen certain country operations in this way.