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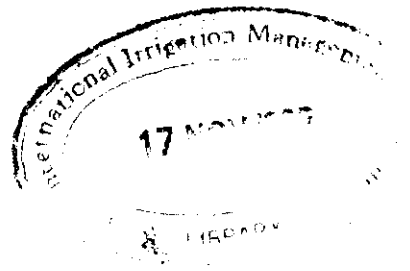
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REVIEW OF IIMI'S EXPERIENCE IN STRENGTHENING NATIONAL CAPACITY FOR IRRIGATION MANAGEMENT AND RESEARCH

PAPER PRESENTED
BY
P. S. RAO AND NANDA ABEYWICKREMA

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Part I

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REVIEW OF IIMI'S EXPERIENCE IN STRENGTHENING NATIONAL CAPACITY FOR IRRIGATION MANAGEMENT AND IRRIGATION RESEARCH

I. INTRODUCTION

A. Strengthening National Capacity

1.01 **IIMI's Mission and Goals:** IIMI defines its mission as being:

to foster the development, dissemination and adoption of lasting improvements in the performance of irrigated agriculture in developing countries.

By lasting improvements IIMI means those which are environmentally sound, economically viable and socially equitable. Performance improvements will be measured primarily in terms of productivity, equity, and sustainability.

1.02 This mission statement is very broad, and the goals included in it could, in principle, be achieved in different ways. IIMI has therefore narrowed its role by applying three limiting factors. As a result, IIMI will:

- * address issues that are unique to irrigated agriculture,
- * focus mainly on policy and management issues,
- * concentrate on research and its application.

1.03 These emphases are articulated in three institute goals:

1. Generating knowledge to improve management and policy making.
2. Strengthening national research capacity.
3. Supporting the introduction of improved management and policy making.

These goals are not discrete and separate but are part of a continuum ranging from generation of knowledge to its application in the real world. As a result, most IIMI activities will address more than one goal.

1.04 While IIMI seeks to generate and enhance the knowledge base required to improve irrigation policy-making and management by its own research for achieving the first goal, the emphasis in the second and third goals is on strengthening national capacity for irrigation research and irrigation management respectively.

1.05 Strengthening National Research Capacity: IIMI will seek to help developing countries to improve their own knowledge bases for managing irrigation systems by helping to improve their scientific capacity to conduct research on irrigation management. As an institution with a strong research focus, IIMI has a comparative advantage in strengthening national research institutions, in training individual researchers, and in otherwise helping in the development of human resources needed to achieve excellence in research.

1.06 Strengthening National Capacity for Irrigation Management: IIMI seeks to achieve this goal by supporting the introduction of improved management and policy-making in a country. It will help countries to apply the existing knowledge bases and use research results to improve performance of irrigated agriculture. IIMI will help managing and policy-making organizations to develop human resources and undertake the organizational and operational changes needed to improve policy-making and management. As a decentralized institute with a practical bent and strong linkages with implementing agencies, IIMI is well-positioned to support the introduction of improved policies and management systems.

1.07 Terminology: The C. G. term, National Agricultural Research Systems (NARS), is probably adequate to cover irrigation management research also, though there are no NARS conducting such research in many countries. Even those countries that have well established national commodity research systems do not have an equivalent national irrigation research management capacity. In most developing countries, national scientific capacity to do research on irrigation management is weak and fragmented. Much of the research done by the national agencies in irrigation management is of a single discipline, studying one or a few aspects of an irrigation system in relative isolation. Since irrigation systems are highly complex, this single-discipline approach is unable to provide useful solutions to real problems. IIMI has a real challenge in that it has to first assist building up of National Irrigation Management Institutes (NIMIs) before trying to strengthen them. Till such time, IIMI has to work with institutions, universities, and private consulting firms, which together might constitute a first approximation to NIMI to discharge the functions of NIMI. The term National Research Institutes (NRIs) will be used here to indicate all types of such institutions involved in irrigation management research.

1.08 IIMI also seeks to strengthen the capacity of National Irrigation Management Organizations (NIMOs), which term covers a wide variety of entities ranging from small groups of farmers, to departments of irrigation and agriculture, and planning agencies.

1.09 Collaboration and live irrigation systems: The key concept in IIMI's efforts in strengthening national capacity is collaboration with NRIs and NIMOs. Unlike the NARS which primarily work in the confines of laboratories and research stations where controlled experimentation is possible, IIMI works with live irrigation systems and real functioning organizations; and often uses 'an action research methodology' defined in a broad sense.

1.10 For IIMI, the NIMOs with which it collaborates are both research partners and also the subjects of its research activities. This is also possibly the case with ISNAR and IFPRI. Because IIMI collaborates with both NIMOs and NRIs, it has a natural comparative advantage to strengthen

both of them. IIMI's interactions with NIMOs should help them to use the results of research produced by NRIs to create an increased demand for research outputs from NRIs.

B. The Review

1.11 Purpose: This paper reviews achievements and experience of IIMI in strengthening national capacity. After eight years of operation, IIMI seeks to record and critically analyze its experience of strengthening national irrigation research capacity of NRIs and national capacity to formulate and implement research-based policies and management systems by NIMOs. The intended outcomes of this internal review include: (a) an understanding of the scope and effectiveness of our activities, including lessons learned, (b) a vision of how national capacity could ideally be strengthened, comparing and contrasting the work of others, and citing available literature, and (c) recommendations on how IIMI could improve its capacity strengthening activities.

1.12 Audiences: The first and primary audience is IIMI itself. The Institute needs to reflect on its achievements and learn from its failures. It needs to revise its strategy, if necessary, and make plans over the medium term on how to sustain and improve past successes. A second priority will be to recast the material in this Internal Review document for external readers including clients, donors collaborators and TAC. A third audience will be the External Review team, who will need this information for their work. The material may also be recast to form a journal article or IIMI publication.

1.13 Organization of the Review: IIMI's International staff have been developing programs and activities in about ten countries for different lengths of time over the last eight years. There is a storehouse of rich experience. They know to what extent IIMI's activities have contributed to strengthening national capacities of the NRIs and NIMOs and its contributory factors. A conceptual framework was developed to help IIMI staff to describe, analyze and reflect on their activities in a structured manner regarding perceived impact in strengthening national capacities for irrigation management and irrigation management research. Two illustrations on the use of the conceptual framework were also provided by examining experiences in two countries. After receiving the conceptual framework and the illustrations, IIMI staff in charge of either country-specific activities or thematic and other trans-national activities, prepared their contributions to this review, which are put together in Part II. In addition to these contributions, we have also had access to other relevant IIMI reports and correspondence, and the views of senior IIMI staff with whom we held discussions.

1.14 IIMI's experience in strengthening national capacity as evidenced by perceived outputs and impacts is described in a condensed form in the second section. The analysis of the experience is presented in the third section. Lessons and recommendations are in the fourth section. The final section reviews the past and looks to the future. The conceptual framework which also includes the program of IIMI's activities, and describes the issues and methodologies in analyzing the impacts of IIMI's activities in strengthening national capacity is attached as annex 1. A brief note on impact evaluation in ISNAR is in annex 2.

1.15 This is a complex subject and a challenging exercise. An effort of this type is evolutionary in nature going through iterations of discussion, comment, and revision. This is a step in that direction.

II. EXPERIENCE IN STRENGTHENING NATIONAL CAPACITY

2.01 IIMI's experience in strengthening national capacity for irrigation management and irrigation research in various countries is briefly described in this section. It is derived mostly from the country reports and other activity reports received from IIMI staff in response to a request to them to contribute to this review effort. In some countries, it has been possible for IIMI staff to describe the results and impacts of IIMI's activities. In other cases, especially where the first phase of IIMI's activities has commenced in the last year or two, as the time has not yet come to look at results and impacts, the reports have described some expectations and the nature of emerging results.

2.02 IIMI's experience is described first, country-wise with countries arranged in alphabetical order, and second, in terms of activities and special projects which are not country-specific.

A. Countries

BANGLADESH

Strengthening National Capacity For Irrigation Management

2.03 In an IIMI/IRRI research project, staff from the Bangladesh Water Development Board (BWDB) and the Bangladesh Agriculture Development Corporation (BADC) participated. Some of its research findings were selectively adopted such as rotation on secondary canals, demonstrating how areas under irrigation could be increased, through the application of simple management techniques. These organizations on their own initiative, have subsequently extended application of this experiment to other irrigated areas as well. Though assistance from other sources may have also helped this process, their work with IIMI in the initial project had made this agency appreciate the potential effectiveness of non-hardware management approaches.

2.04 IIMI's workshop with the Bangladesh University of Engineering and Technology (BUET) and BWDB enhanced interaction between the staff of these agencies in diagnosing opportunities and constraints faced by irrigation projects in the pilot areas, which in turn led to defining management objectives and innovations that are feasible for adoption.

2.05 In regard to professional development, it is too early to assess the effect of IIMI's efforts with BADC in training its staff, as this training program has not been completed. Participation of staff from other irrigation management agencies, N.G.OO etc at IIMI workshops, have usually generated active dialogue and openness of thinking, which is likely to lead to improved collaboration in the future.

2.06 Dialogue and consultation has helped such as in the effect on BADC in its changing role in an environment of privatization, where aspects of the strategic planning methodology elaborated

by the IIMI team in a Workshop, are being applied by this agency. Its ultimate benefits could be expected though external approval of plans and availability of funds is required.

Strengthening National Capacity For Irrigation Research

2.07 The joint research collaboration between BRRI and IIMI may have helped staff to widen their perspectives on socio-economic aspects of management improvements in irrigation. Staff turnover within this agency of some who collaborated, will however reduce expected benefits. Other staff, some of whom had worked with IIMI on collaborative research projects have been sponsored for post-graduate studies. On the other hand, several graduate students from the Bangladesh Agriculture University have sought the assistance of IIMI staff to evaluate their research methods and analyses. Informal exchanges and workshop interactions between staff of universities and research institutes with IIMI, have also been pronounced.

2.08 Strengthening national capacity faces several constraints. Change is difficult to implement in bureaucracies, and irrigation management may not be accorded high priority due to a technical and hardware bias. The role of Government in a sector predominantly dominated by groundwater irrigation modes, is also rather uncertain. However, IIMI has been able to make some favourable impact in agencies and projects where its credibility and acceptance had been built up. The absence of strong teams for research work has also been a constraint.

BURKINA FASO

Strengthening National Capacity For Irrigation Management

2.09 The objective of the program is in Improving Small Scale Reservoir based irrigation schemes through management innovations by a AfDB grant for four years. The project commenced in April 1991 and mid-term results are now emerging. However the following are evident: (a) improved counterpart staff capability in irrigation management; (b) broadening the insight of staff in operational agencies to irrigation management issues through training; (c) identification of weaknesses in legislation and operational arrangements in irrigation work - remedial measures are being adopted in some locations; (d) information dissemination through newsletters and (e) a high level of collaboration.

Strengthening National Capacity For Irrigation Research

2.10 As there are no irrigation management research agencies, the option adopted is to strengthen skills of staff in relevant agencies through training and related modes. However a multidisciplinary collaborative field program has been launched to diagnose performance of selected irrigation schemes and formulate strategies for improvement. Research has highlighted the unreliability of the data base; magnitude of unauthorized irrigation; reservoir storage capacities - these have led to improved farmer practices within the project locations in irrigation management. Research has also helped formulate a suitable methodological framework of analysis-diagnosis to be applied to other field sites within the project; and has assisted in developing a socio-economic and organizational profile of the system of irrigation.

INDIA

Strengthening National Capacity For Irrigation Management

2.11 The research undertaken by Indian institutions in collaboration with IIMI is still going on and is expected to be completed by the end of 1992. It is too early to identify the impacts of the research on the capacity for irrigation management. The thrust of IIMI-India program is more on strengthening research capabilities of selected Indian institutions than on directly working to increase the irrigation management capabilities.

Strengthening National Capacity For Irrigation Research

2.12 Collaborative research is the main activity in the India program of IIMI. Four research projects were undertaken in the States of Tamil Nadu, Gujarat, Uttar Pradesh and Bihar in a collaborative mode by clustering in each case one academic institution to work with one irrigation management training institute together with the irrigation agencies in the State. In these activities, all the work is done by national researchers with guidance and help from IIMI and in close interaction with the agencies managing the irrigation systems. This practice of starting the program at the field level has helped to establish close relationships with irrigation practitioners which will then help to move on to the agency and policy level to resolve issues arising from field research.

2.13 IIMI provided training to research officers working in Bihar, Uttar Pradesh and Tamilnadu for field data collection, and social science and management research methodology. The training program lasted for a week in each state. One of the members of the collaborative research team from Anna University visited IIMI Headquarters to be an observer in the survey on organizational dynamics conducted by the IIMI management specialist. The researcher used part of the methodology in his research study back home. Students working for Ph.D. and Masters degrees have used research projects to do their field work for their dissertation research.

INDONESIA

Strengthening National Capacity For Irrigation Management

2.14 IIMI has carried out research in Indonesia for four years mainly with ADB Technical Assistance. It has many findings of great value in terms of improving the management and performance of the irrigation systems. IIMI has been successful in having some of the recommendations adopted on a pilot basis in a number of systems in which intensive studies have been carried out to demonstrate impacts. The primary highlights are described below.

Improving the data base

2.15 Between March and September 1989, a major program was undertaken that covered four irrigation systems in West Java, with a total command area of 16000 ha. The program was field-based, involved subsection chiefs, irrigation inspectors and gate keepers. The activities focused on: mapping of tertiary blocks covering 1520 ha; identification of the location and importance of additional water sources in eight tertiary blocks; a complete inventory of the condition and functionality of 353 control structures and their associated measuring devices; calibration of 190 measuring devices and gates; monthly measurement of conveyance losses in 16 sections of main and secondary canals; and interviews and observations by agency field staff to understand irrigation management problems and constraints of Water Users' Associations (WUAs).

2.16 The rationale for selection of the irrigation systems was that three of them were Advanced Operation Units (AOU) of the West Java Irrigation Project funded by the World Bank. In the AOUs there has been a re-evaluation of all forms and reporting requirements to support improved system operations.

2.17 A reduced version of this program has also been implemented successfully in Way Jepara System in Lampung Province, and a manual in Bahasa Indonesia prepared so that it can readily be disseminated to other provinces.

2.18 Following the pilot testing, it was found that the program was highly cost-effective; that field operations improved immediately; and improvements were within the constraints of staff levels and skills because training was incorporated into the regular duties of field and sub-section staff.

2.19 There was a heavy demand for additional programs in both West Java and Lampung from other systems, both within and outside the AOU program.

Improving rotational irrigation

2.20 A major revision of rotational irrigation practices was pilot tested during the 1989 Dry Season in the 4200 ha East Maneungteung Irrigation System in Cirebon, West Java that resulted in major improvements in equity and irrigation management performance.

2.21 The pilot testing resulted in a simpler and more manageable rotation schedule that reduced average weekly working of irrigation inspectors and gate keepers; active and successful participation by farmers in planning and implementation of the revised schedule that resulted in fewer irregularities during each rotation period; willingness of tail-end farmers to plant areas in 1990 that were left fallow in 1989.

2.22 The entire pilot testing cost only US\$ 70 for the Planning meeting and no other regular costs were incurred. It demonstrated that it was possible, with little or no expenditure, to significantly improve irrigation management practices using existing staff and resources and that tightening up of existing procedures could lead to major improvements in equity, production and performance while at the same time making management easier and less time consuming.

Strengthening National Capacity For Irrigation Research

2.23 In its activities in Indonesia, IIMI maintained close links with several Universities in Bandung, West Java and Padang, West Sumatra; and the Centre for Agro Economic Research in Bogor. Under the Rockefeller Project on crop diversification, IIMI developed linkages with Agricultural Research Division, particularly Sukhmandi Research Institute and the University of Gadjara Mada in Yogyakarta. In Indonesia, however, there is no national irrigation research capacity. There are some individuals who had undertaken research in technical matters (hydrology, design etc.) and a small number who were exposed to irrigation management research. Strategic dialogue and the informal set of linkages between IIMI and policy makers within the Directorate General of Water Resources Development (DGWRD) led to a proposal by DGWRD to establish an Irrigation Management Centre that would focus on research, training and management dissemination within Indonesia. IIMI had, however, left Indonesia before the initiative fructified.

MOROCCO

Interactions with National Agencies on Irrigation Management and Research

2.24 **Collaborative Research:** National researchers are assisted through IIMI supervision to develop their skills when serving in their own organizations. This modality has resulted in evidence of saving irrigation water through innovative relations among farmers. Collaborative research is in the review, evaluation and synthesis of findings of recent research done by other organizations. A research project is also underway to provide irrigation advice to farmers to increase income, save water, and remedy problems of waterlogging and salinization.

2.25 Assistance to National Partners: IIMI also provides small consultancy assignments on request. Though limited, it has considerable potential. Some of the assignments have covered problem areas such as interaction of design and management of irrigation systems; crop-based irrigation operations; use of geographic information systems and remote sensing for irrigation; and to assess hydraulic performance of canals.

2.26 The country has technologically developed irrigation organizations but also with constraints for institutional collaboration and information gathering activities. There has been a reciprocal ignorance between IIMI and Moroccan irrigation agencies with the latter having little experience in relations with independent research bodies. IIMI has also to recognize differences in its irrigation when compared with Asia and East Africa, and also overcome language barriers. There has been a lack of trust by Moroccan officials with IIMI as its image has been somewhat misleading. IIMI has not been able to provide core funds as indicated; provide copies of its publications in French; or staff its office with a wide range of high level expertise as claimed. As such the experience so far has been a mixture of success and failure and the ratio of failures may be higher. To strengthen national capacity, work has to be in the language used in the country. Funding and working capacity also requires reinforcement. Due to these constraints, IIMI has been unable to improve national capacity so far, and is engaged in limited forms of assistance.

NEPAL

Strengthening National Capacity For Irrigation Management

2.27 Policy Contribution to System Turnover & Participatory Management: IIMI staff contributed to policy formulation on farmer-managed irrigation systems in the deliberations of the National Planning Commission when finalizing the irrigation master plan for Nepal. This was made possible as IIMI staff had worked on farmer irrigation organizations in the Indarawati River Basin in collaboration with the Water and Energy Commission Secretariat. The results of these studies were widely disseminated among policy makers and had helped to reinforce the image of IIMI. The National Eighth Plan required that more farmer participation modes be adopted in irrigation, as there is now a greater awareness of the beneficial role of effective water users organizations in their contribution to agricultural development in the country and especially in the agency-managed systems which do not have a tradition of farmer participation.

2.28 Efforts at Institution Building and Management Development: As institution building study of the Agriculture Development Bank of Nepal was made by IIMI. It focused on its organization and programs. Recommendations made in regard to the organization, policies, procedures and programs of its lending activities in the irrigation sector were generally accepted for implementation. Also, innovative skill enhancement programs were initiated in the Water and Energy Commission Secretariat to facilitate undertaking resource surveys, farmer to farmer training and the development of farmer consultants. These initiatives have broadened participatory approaches to human resource development. IIMI also disseminated the findings of the Farmer Managed Irrigation Systems (FMIS) Program which helped to widen options available and share

experiences of other countries enabling FMIS strategies to reduce costs and enhance performance. These efforts at institution building, skill development and organizing information networks have contributed positively to strengthening national capacity for irrigation management.

Strengthening National Capacity For Irrigation Research

2.29 Action Research and Research Capability Development: IIMI collaborated with the Water and Energy Commission Secretariat in a research project to enable physical and management improvements in farmer managed irrigation systems. The results of this contribution, reinforced IIMI in turn to have an impact on the formulation of national policy measures in this field. A research study of irrigation schemes supported by the Agriculture Development Bank of Nepal validated the significance of strong water users organizations in making irrigation systems viable through improved loan repayments and the sustainability of agricultural production. IIMI has strengthened skills of counterpart staff deployed on action research and other collaborative projects. Enhanced staff capability generated by IIMI with the Institute of Agriculture and Animal Science has subsequently enabled the establishment of an Irrigation Management Study Group which is providing useful research functions. By conducting training courses on irrigation structures for hilly and mountain environments, the research skills of the Institute staff have also been upgraded. The staff of the Research and Training Branch of the Department of Irrigation have also benefitted from workshops, seminars and other skill improvement programs organized by IIMI.

NIGER

Strengthening National Capacity For Irrigation Management

2.30 The objective of the Program is in identifying strategies to reduce operation costs, diversify crops and improve irrigation management along the Niger river by a AfDB grant for four years. The Project commenced in July 1991 and it is too early to assess results. However the following are evident as potential areas of future results: (a) collaboration is good with national partners; (b) IIMI has built up credibility with farmers, cooperatives and partner agencies through irrigation management interventions and improvements in project locations; (c) activities have been launched for training and professional development of project staff, cooperative leaders and farmers; (d) coordination with Burkina to contribute and help finance publications for the West African Irrigation Network.

Strengthening National Capacity For Irrigation Research

2.31 There is no irrigation management research institute. But IIMI has launched work in selected areas of collaborative field research and diagnostic analyses to identify major management and system constraints and design interventions to improve performance and reduce operating costs. A workable field research methodology has been developed and rapid diagnostic studies have been made of project locations, which has oriented research work on a problem solving basis to ensure continuing relevance.

NIGERIA

2.32 Initiating Relations with National Agencies: Programs are at the initiation stage as the country program is only a year old. IIMI has been assigned to work with the HJ River Basin Development Authority (HJRBDA) which is one of eleven parastatals of the federal government with responsibilities for irrigation development. Due to the country's Structural Adjustment Program, these parastatal agencies are now expected to function with financial autonomy, which means that IIMI will need to collaborate with HJRBDA to promote agency-farmer cost sharing and joint management of work in this irrigation project. The activities for collaborative research will include institutional development; change in management style; O&M procedures; and resource mobilization. Though the country has many agriculture research institutes, it does not have one for irrigation management. However, many Universities are conducting irrigation related research. IIMI has participated in seminars organized by national institutes where papers were presented by its staff. These activities have enabled IIMI staff, to develop new contacts.

2.33 A MOU has not yet been finalized with the Government, but to start its program IIMI has entered into an agreement with ICRISAT to function under its umbrella until formal recognition is obtained. Similarly, a Consultative Committee has not yet been set up, but IIMI programs are discussed with officials of the related Ministry, Department and HJRBDA. Linkages are now being established with agencies which will be important for future activities of IIMI. As the program in Nigeria is still at its initiation stage, it is too premature to evaluate elements regarding the strengthening of national capacity.

PAKISTAN

Strengthening National Capacity For Irrigation Management

2.34 Awareness building on equity and salinization issues in Pakistan: IIMI's activities in Pakistan have contributed to a growing awareness of the importance of equity in distributing canal water and its relationship to the prevention of secondary salinization. For example, during the annual closure period in early 1992, a public campaign was carried out to desilt distributories and water courses. During this activity, much more desilting was carried out than in the past, even attracting the support of the Chief Minister of the Punjab. As a result, tail-end farmers now enjoy a more equitable and reliable supply of canal water and, hence, more sustainable agricultural production. IIMI has monitored the whole exercise.

2.35 Appreciation of the reality of irrigation systems: The results of the field research conducted over the last six years have brought a much better appreciation of the reality of the irrigation systems among the collaborating agencies rather than the images of the system to which they are used. The agencies will take time to internalize the approaches to adopt improvements and innovations suggested by IIMI or to institutionalize them. In one instance, targeted maintenance took place in a distributory canal at the suggestion of IIMI.

2.36 Implementation of management interventions: As an outcome of a "retreat" organized for dialogue and consultation with senior officers of the establishment in Pakistan in October 1991, a working group was established which, one year later, has led to collaboration of Punjab Irrigation Department (PID) and IIMI in the implementation of three of the four management interventions that were discussed at the retreat. IIMI mounted training sessions on water measurements in secondary canals that would make it possible for PID to collect flow data as the first step in the process of "enhanced accountability" for water distribution. Collaboration with PID's Directorate of Land Reclamation led to monitoring of leaching flows, and two irrigation engineers were seconded to work with IIMI staff on a Decision Support Package.

Strengthening National Capacity For Irrigation Research

2.37 International Waterlogging and Salinity Research Institute (IWASRI) is in name the author of the document required by Government of Pakistan (GOP). The document was drafted by IIMI Pakistan and it formalizes IIMI's execution of the Technical Assistance research project in North-West Frontier Province. Ministry of Water and Power of GOP, has recently decided to strengthen IWASRI's research capability by extending its number of senior staff positions. This was done in part to equip IWASRI to qualify for continued UNDP support, to play an adequate role as counterpart to a Netherlands Research Assistance Project, and strengthen the institute to act as the Pakistan focal point for the Egypt-Pakistan comparative studies undertaken with support from IPTRID. Having competent research staff at IWASRI, helps to make it a suitable collaborator for implementation of some of IIMI Pakistan's projects and further strengthen its research capability.

PHILIPPINES

Strengthening National Capacity For Irrigation Management

2.38 Irrigation Management for Diversified Cropping: IIMI research on irrigation management for diversified cropping (1985-1990) contributed significantly to improve understanding of management constraints and recommended policy measures to enhance farmers' efforts to diversify their cropping practices in irrigated areas during dry season. IIMI worked collaboratively with National Irrigation Administration (NIA) to develop and field- test guidelines for crop diversification in NIA-managed gravity irrigation systems. The field staff of NIA and the research staff of State Colleges and Universities (SCUs) were trained in conducting field research. Two national workshops were conducted and three documents were published for dissemination of information on crop diversification in rice based cropping systems.

2.39 The three year collaborative research project between IIMI and IRRI on "research on irrigated crop diversification" which began in 1987 had a Philippines component. This project provided opportunities for professional development of local researchers and identified strategies to enhance irrigation system performance during the dry season. The strategies identified were: better water control at system level, water augmentation through the use of shallow ground water, system characterization and mapping, crop scheduling and simulation.

Strengthening National Capacity For Irrigation Research

2.40 Research Collaboration: During 1989-91, IIMI, jointly with NIA and collaborating regional universities, successfully completed 14 research projects designed to identify, field-test, and evaluate management innovations to strengthen Irrigators' Association (IAs) and NIA's ability to improve and sustain the performance of irrigation systems in a cost effective manner.

2.41 Based on this, a short-term intervention plan was designed and implemented in 1991. Initial results clearly indicated program success in both institutional and O&M performance aspects, such as farmer involvement in operation and maintenance, NIA involvement in institutional functions, Irrigation Service Fee collection, and adequacy, reliability and equity in water distribution.

2.42 Support to research scholars: The Philippines research program had helped to develop the research capacity of many individuals. Five doctoral and four masters research scholars were supported by the program.

SRI LANKA

Strengthening National Capacity For Irrigation Management

IMPSA Project in Sri Lanka

2.43 IIMI's activities in Sri Lanka had an impact over the years in the promotion of "participatory irrigation management" as a government policy. One of the most visible activities carried out by IIMI in recent years has been its involvement with the USAID-supported "Irrigation Management Policy Support Activity (IMPSA)".

2.44 Following from the recommendations of a national workshop co-sponsored by IIMI on "Participatory Management in Sri Lanka's Irrigation Schemes" held in 1986, the IIMI-Sri Lanka Consultative Committee arranged special meetings of the Secretaries of the Ministries in charge of Irrigation and Agriculture and other senior officers. These efforts resulted in the preparation of a Cabinet paper containing the broad, policy framework for the introduction of "participatory irrigation management". This document was jointly submitted to the Cabinet by the two Ministers in charge of Irrigation and Agriculture, and was approved by the Cabinet in December 1988. The Cabinet paper outlined the policy and set the broad direction clearly but many issues related to implementation needed to be worked out. This need has led to the IMPSA project.

2.45 IMPSA used a unique participatory process for elaborating and refining the Sri Lankan government's participatory management policy and for developing a wide consensus on institutional reforms and strategies. The IMPSA exercise has clearly demonstrated the effectiveness of a consensus building approach to policy formulation. The methodology pioneered in this exercise was adopted for designing a project on the Shared Control of Resources (SCOR)

which is currently being undertaken by Sri Lanka Field Office under a USAID grant. IIMI expects to play a key role in the implementation of this project, building on the participatory process and close working relations fostered under IMPSA.

Improved Management of Systems

2.46 IIMI Sri Lanka Field Office had developed, through action research, recommendations for improved system management in Kirindi Oya and Walawe Projects. IIMI's work in Walawe has led to some increase in participatory implementation of the rehabilitation of the system. Some of the results achieved in the Kirindi Oya Project are that for the first time, all the area developed under this project was brought under cultivation and the water utilization has been reduced and the tertiary system management research component introduced to develop and field test management procedures resulted in a considerable saving of water and also a better co-ordination among the implementing agencies and the farmer organizations.

2.47 Middle level officers of Government agencies were seconded to work with IIMI on field research projects. They had individually acquired considerable expertise in research as well as improved understanding of the irrigation systems. In two cases, they had returned to positions in their departments with increased responsibility for management of irrigation systems.

Simulation modelling of canal operations

2.48 In collaboration with CEMAGREF (Centre National du Machinisme, du Genie Rural, des Eaux et des Forets), IIMI has been jointly implementing a project in Southern Sri Lanka to develop a computer model that simulates main canal operations. The management information and communication system developed in the Kirindi Oya project area has, for the first time since the inception of the project, enabled the project managers to provide irrigation to all five tracts in the Kirindi Oya Right Bank Command area, thereby increasing the irrigated area by 500 ha despite experiencing less rainfall than in the previous season. This was achieved by a saving of about 10 percent of irrigation water from the previous season's cultivation.

Strengthening National Capacity For Irrigation Research

Research component of ISM Project

2.49 The research component of the Irrigation Systems Management (ISM) project funded by the USAID and overseen by IIMI-SLFO was specifically designed to develop the research capacity of national institutions. Research projects were contracted to private consulting firms who worked in close collaboration with IIMI-SLFO. The work was guided by a Research Advisory Committee. This has provided opportunities for the firms to gain experience and develop strength in irrigation management research.

2.50 Seven major and two smaller research studies were carried out. The results of these studies were distributed widely within Sri Lanka, discussed at national level workshops and formed the basis of several IIMI publications.

2.51 Some results of the research program were incorporated directly into ISMP activities. The data and techniques developed under the study of water delivery systems were incorporated into ISMP training programs on water measurement. Findings on the costs of operations and maintenance formed the basis for modifications and development of the ISMP maintenance program. Also as the findings generally applied to more than the seven ISMP systems, many results of these studies were incorporated into the Irrigation Management Policy Support Activity (IMPSA) papers and into other policy decisions beyond the immediate scope of the ISMP. The findings of the institution building study and the turnover study have served to strengthen the government's commitment to participatory management of irrigation schemes as laid out in the IMPSA papers.

2.52 The research program has had some small success in solving problems for ISMP. However, the major effects of the research program have not been within the project but rather in affecting the policy environment. The most important success of the research program, may have been the wide dissemination it gave to lessons from ISMP. The management of the component by IIMI has been important to the activity not so much because of the value of the results but more importantly because a) IIMI, as a research institution, has been in the position to provide guidance in the research process, and b) IIMI, as a Sri Lankan based institution, has the confidence of a variety of government personnel and private persons and has the means to disseminate the results locally. This suggests that such research activities will have a higher likelihood of useful results if overseen by similar institutions.

IMPSA Project

2.53 In the IMPSA project described earlier, senior professionals in Sri Lanka worked closely with IIMI-SLFO staff and operated as a cohesive team. The consensus building approach to policy formulation involved a series of activities: preparing draft staff working papers in consultation with panels of experts; organizing a series of consultative workshops with a broad spectrum of people, including farmers, field level officials, middle managers, and representatives of the private sector; interactions with a high level Irrigation Management Policy Advisory Committee (IMPAC) in order to review draft policy papers and reach consensus on the contents. This type of policy research and analysis strengthens the capacity of both irrigation management practitioners and researchers. This is a good model with high potential for development and dissemination of improved management practices as well.

2.54 The IMPSA project has also made important recommendations which, if implemented, have a high potential for strengthening research capacity. For example, a Research Management Unit (RMU) has already been instituted in the Irrigation Department under the National Irrigation Rehabilitation Project (NIRP) funded by the European Economic Community.

SUDAN

Strengthening National Capacity For Irrigation Management

2.55 Two National Workshops were held on privatization of irrigation schemes and irrigation water charges. The Workshop on Irrigation Water Charges was a response to country pressure to recover costs of irrigation service from water users and was held at the request of the Ministry of Agriculture. The workshop was attended by the two Ministers (Agriculture and Water Resources) and other key officials. An entire range of policy options and their implications were discussed; factors that determine irrigation water charges in Sudan; and the experience of other countries. The suggestion made by the IIMI representative to sell water at selected control points and minor heads along major canals in the irrigation scheme has been accepted by the Government which is now seeking to implement this policy.

2.56 The Workshop on Privatization of Irrigation Schemes in Sudan was organized by IIMI at the request of the Minister of Irrigation and Water Resources and the Minister of Agriculture and Natural Resources, both of whom were closely associated with it. The workshop helped to identify and discuss policy options to implement policies of privatization/turnover, share experiences of other countries, and document relevant national/international experience in this field. The recommendations of the workshop related to establishment and institutionalization of water users associations; identification of different processes and levels of turnover for different types of irrigation schemes; highlighted the aim of turnover to increase productivity and the well being of tenants; and emphasized the need to adjust macro-economic policies to make the process successful and sustainable and to monitor and evaluate the turnover process. Changes in Government policies have been made on the basis of these recommendations. As a follow up IIMI has been requested to evaluate the on-going management turnover in the White Nile Pump Schemes and the workshop activities to integrate this program in the country.

2.57 In both these workshops the beneficial role of IIMI as a catalyst for policy reforms was acknowledged. The international experiences shared by the IIMI representatives contributed considerably to the examination of policy options and its evaluation.

2.58 Institution Building of the Sudan Gezira Board involved the provision of an IIMI consultant to assist the Board to advise on water management aspects based on field experimental results; and help establish an organization Unit within the Board to identify factors influencing performance, constraints to low water efficiency, evaluate performance parameters and to develop human resources. These activities have assisted in improving the work activities of the Board which cover around half the irrigated area in Sudan. The work of IIMI has made client groups to be more open-minded and receptive to new ideas which is a good sign for future changes. In certain cases initiatives have been taken towards implementing ideas for improving management practices such as constructing flumes to monitor tail-water runoff, monitoring canal supplies etc.

Strengthening National Capacity For Irrigation Research

2.59 IIMI is assuming the role of coordinator and facilitator by providing technical inputs on irrigation management research done on a joint basis by the Hydraulic Research Station/MOA and the Rahad Agricultural Corporation. Field research is leading to changed perception of irrigation systems and are exploring areas for performance improvement.

B. Networks

Irrigation Management for Crop Diversification

2.60 The idea of forming a research network on irrigation management for crop diversification (IMCD) was approved in principle during a regional workshop organized by IIMI in Sri Lanka in November 1986. The actual formal organization followed later during an ADB-funded workshop held in Bangkok in December 1988. A steering Committee, consisting of representatives from nine countries and from IIMI, oversees the operation of the Network. The activities of the Network include: conduct of a specific research both in a comparative and situation-specific mode; holding of progress and review and planning workshops; exchange of information and dissemination of research results on irrigated crop diversification in rice-based farming systems; and exchange of visits to research sites among members through holding workshops.

2.61 IIMI and IRRI carried out a substantial portion of the research in IMCD. The rest was subcontracted to universities and research institutions. Since professional development was one of the key features of the project, three masteral and seven doctoral candidates, plus one postdoctoral, were engaged in doing research. A number of research planning and review workshops were held in different countries and the workshop proceedings are published. The network also publishes an annual newsletter (IMCD Newsletter).

Strengthening National Capacity for Irrigation Management

2.62 A number of relatively senior irrigation managers and policy makers from NIMOs from the nine member countries had participated in the workshops. They are on the mailing list of the IMCD publications. A direct impact of the network are the national committees that have been established or are being initiated to coordinate the planning and implementation of irrigated crop diversification in a number of member countries. In December 1990, five Philippine national agencies entered into an agreement to create a National Committee on Crop Diversification (NCCD). Similar initiatives to form national committees were undertaken in Nepal, Bangladesh and Sri Lanka. The interest and awareness on the important role of innovative irrigation management in promoting crop diversification is certainly heightened among the members of the network. However, even in countries where IIMI is placed, because of the short-term project nature of the funding support, the researches have not been conducted long enough to determine and refine the processes needed for a methodical internalization of the irrigation management innovations on the part of both the irrigation organizations and farmers.

Strengthening National Capacity for Irrigation Research

2.63 Selected senior staff from NRIs had participated in the Network's annual workshops and related visits to research sites. They also receive and contribute to the Network publications. In member countries especially where IIMI has a presence and where there are active national research programs, the number and expertise of the staff of NRIs collaborating with IIMI has definitely been enhanced. Most of the NRIs are universities showing serious interest and inclination to do irrigation management research. Three masteral and seven doctoral candidates, plus one postdoctoral, were engaged in doing research. It is a clear indicator of research capacity enhancement by human resource development.

Farmer Managed Irrigation Systems (FMIS)

2.64 The FMIS Research Program evolved from the Kathmandu workshop on public intervention in FMIS. Its aim is to help both government agencies and nongovernment organizations to develop appropriate and effective FMIS assistance strategies, and develop assessment methods to enable managers and planners to understand when and how intervention can be successful. Through conducting FMIS research, IIMI attempts to strengthen national research planning and implementation capacity leading to appropriate and effective policies regarding the farmer-managed sector.

2.65 The FMIS project employed two research modes, an indirect network mode and direct research. The indirect mode involves the FMIS Network which generates and disseminates information, and provides backstopping support to policy makers, manager and researchers who are concerned with and/or are actively engaged in assisting the FMIS sector. At the same time, IIMI has carried out direct research in collaboration with national research institutes and/or implementing agencies.

Strengthening National Capacity

2.66 The FMIS Network, which has drawn the attention of many irrigation professionals to the potential of FMIS in various parts of the world, is a growing network. The expansion of the Network outside the Asian region was a result of key professional participating in the Network activities. About 25 percent of the total membership is taking an active part in the Network through the exchange of information and experiences. More professionals from Africa and Latin America have joined the Network. The Network spread to Africa and Latin America as a direct result of people from these two continents taking part in its activities and more attention was given to initiating FMIS programs in African countries like Egypt, Sudan, Morocco and Nigeria. In Latin America, the FMIS Network has already made significant progress in Argentina in creating awareness of the importance of FMIS among the various institutions in the country. The activities in Argentina have stimulated interest among the neighbouring countries such as Chile, Brazil and in particular Peru, presenting new opportunities for the exchange of information and experiences with Latin American countries. Recently, professionals from China have indicated a strong interest in FMIS Network activities, which is an encouraging development.

2.67 In Thailand, the Royal Irrigation Department (RID) has realized the importance of farmers' experience and knowledge in the rehabilitation of FMIS and, as a result has changed its approach which had been mostly technically oriented. An associated national network, TRIMNET, has played an important role in facilitating this change. In Sri Lanka the experience gained in FMIS is having an impact on the preparation of new irrigation management policies. As a result of lessons learned the next major FMIS rehabilitation project will be focussed on institution-building, and recently the government has been discussing a policy objective of turning more schemes over to farmers for self-managed. In Bhutan, the results of activities carried out on FMIS are an important input for framing a new irrigation policy. In Nepal, an action-research program was conducted to examine strategies for assisting existing FMIS. The lessons learned from this program have wide applicability for increasing farmer participation and responsibility in irrigation management. In the Philippines the emphasis has been on translating major findings into intervention strategies and detailed implementation schedules.

2.68 The involvement of government and agency officials in FMIS workshops and in other activities of the FMIS program has, in some cases, a direct effect on government strategies. If they are directly involved in the FMIS network and are in a position to influence changes in their own country, then there is an opportunity for direct implementation of new ideas or approaches. For example, in Sri Lanka a government official who has actively participated in the Workshop on the Role of Social Organizers in assisting FMIS has succeeded in getting some of the recommendations made at the Workshop implemented. As a result, in a new program in Sri Lanka, about 250 social organizers will be recruited to help farmers to get organized and improve the irrigation-management performance in FMIS. Similarly, other participants of this particular Workshop from Indonesia and the Philippines have contributed to improving FMIS in their own countries; a Farmer Irrigation Organizing Project has been formulated in the Philippines, and a program to use trained agency staff as social organizers in the turnover program has been developed in Indonesia.

2.69 The need for training in FMIS has been highlighted at FMIS Workshops and at Advisory Committee meetings and also by several Network members. Those requests have encouraged several institutions to initiate activities in training independently or in collaboration with IIMI. Dissemination of knowledge to network members and other interested audiences through publications has helped sharing knowledge and research findings. On way of evaluating the impact of such publications is through the responses received from network members. They show a high interest in these publications.

C. Management Training for Institutional Development

2.70 Management training, conferences and related institutional development activities were designed both to strengthening national irrigation research capacity and support the introduction of improved management and policy making.

2.71 **Training and capacity strengthening in research on irrigation management** include comprehensive programs at strengthening institutions, and training individual researchers. The latter includes: (a) on-the-job training, (b) fellowships for staff of national research institutions in developing countries, and (c) career internships for post doctoral and other highly qualified staff of national research and training institutions. In addition, IIMI's conferences and seminars provide opportunities for researchers in developing countries to meet and exchange ideas both among themselves and with irrigation managers and policy makers.

2.72 **Training and institutional development in irrigation policy making and management** also has two components: institutional strengthening and training of individuals. Under the former activity, IIMI works in partnership with national training centers and universities to implement a management training and development approach that includes training needs assessments, curriculum development, development of training materials, training of trainers, and monitoring and evaluation which promote opportunities for developing awareness of the needs for introducing strategic planning and its human resource development program.

2.73 **In Malaysia**, IIMI completed successfully three distinct stages of strengthening the Department of Irrigation and Drainage (DID) which is the primary NIMO of the country. The first stage was completion of all the elements of the training cycle. The outputs, the impacts on building training capacity within DID, and the clients' perception of the impacts have all been systematically recorded. Trainers from DID who were trained by IIMI in 1991 had conducted a number of training programs in 1992 using the training modules developed by IIMI. That is the multiplier effect. They had also translated the training modules into Bahasa Malaysia for use in training "irrigation technicians" who do not know English. The second stage was strategic planning and preparing a human resources development plan for DID which was conducted in 1991 and 1992. The third stage was" training on research on the performance of irrigation schemes' which was conducted in 1992. The impacts of these activities have also been documented. One of the immediate impacts is the creation of a temporary research division in the Training Centre at Kora Bharu. The client's (DID) perception of the impacts of these three stages of activities is very favourable.

2.74 **In Bangladesh**, the training cycle was partly completed in the Bangladesh Agricultural Development Corporation (BADC). Because of the move to privatize some of the major functions of BADC, it found itself in a situation of managing change. The strategic planning and human resources development activities conducted by IIMI at BADC seemed to have made a useful impact on BADC's thinking as evidenced by BADC's perception of the impacts.

2.75 **Special Awards**; The special awards program, which enabled successful managers of irrigation systems to work with IIMI staff and prepare case studies of their innovative experiences in improving performance of systems, was very good in terms of producing impacts. Two of the case studies were translated into training materials for training DID staff in Malaysia and both were highly evaluated by the participants in the training programs. The award recipients became role models for managers of systems in other countries.

D. Information Program

PURPOSE

2.76 IIMI seeks to disseminate its information on activities and research results to its partners, collaborators, and a wide range of people holding key positions in national irrigation management agencies and irrigation research systems. This is achieved principally through the publication of IIMI's research work, although other activities include the services offered by the Library and Documentation section, and by direct mailings to selected persons and organizations by direct mailing.

PUBLICATIONS

2.77 A variety of publications, which may be internally generated, externally commissioned, or simply supported, are produced by IIMI. In order to cater to the wide range of audiences, the Institute has produce its publications in several categories or series. **Country Papers** are intended mainly for national, rather than international, audiences. There are a series of Country Papers for each country in which IIMI maintains a collaborating field operations activity. Heads of Country Programs are principally responsible for developing and controlling these series, in consultation with their national Consultative Committees. **Governance documents** enunciate aspects of the Institute's policies and plans, or give overviews of its performance and accomplishments. **Institute periodicals** currently includes only the "*IIMI Review*", but more may be added later. The aim has been to produce one issue of the "*IIMI Review*" annually, but this has recently been changed to two issues annually. The audiences for these are wide, including donors, professional colleagues, staff of irrigation management agencies, and other media. The "*IIMI Review*" presents the principal findings of IIMI's work, and users' reactions to them, as well as keeping its readers informed of new IIMI undertakings and their rationale. It is intended to create and sustain external awareness of IIMI's programs.

2.78 **Management Briefs** are a vehicle for conveying concise summaries of significant findings rapidly to a wide audience of irrigation professionals and decision-makers. These are short, of the order of 2-4 pages, and aim to draw attention to results which IIMI believes are likely to be usable by managers more widely than in the specific location where they were developed or tested. They also draw attention to the more extensive and detailed publications. **Monographs** are substantial texts reviewing some area of research or program interests that are significant to the Institute. Such texts do not confine themselves to IIMI's own research findings, but aim to provide the reader with an integrated view, including non-IIMI work. **Newsletters**, with or without

accompanying papers, are the main way of sustaining communication among members of a subject-oriented network of researchers or other professionals. In 1987 IIMI initiated a network on Farmer-managed Irrigation Systems (FMIS), and in 1988 a further network on Irrigation Management for Crop Diversification (IMCD). The FMIS newsletter published twice a year has a circulation of 1,500 and the IMCD newsletter which is published annually has a circulation of 500. **Proceedings** are published in connection with workshops, seminars and conferences. **Project Reports** are required in satisfaction of the conditions of many externally-funded projects, and their style may therefore vary widely in accordance with donors', and collaborators' views. In collaborative field research studies, it is the normal practice to produce a report in this series each year, and a final report at the end in the case of studies continuing over several years. These Reports are normally generated by the project research staff, and are aimed at national audiences in the country where the research takes place. Final reports often have some further input, or review, from other IIMI staff.

2.79 **Reprints** of materials initially published elsewhere are produced, subject to agreement with the initial publishers. **Research Papers** have some characteristics similar to monographs, but are generally narrower in scope and scale. **Working/Discussion Papers** are intended to make available quickly, the results, or sometimes just the progress of research, at stages before it is ready to be formalized for one of the higher-level series, such as a Research Paper.

DISTRIBUTION

2.80 Distribution of publications occurs through a variety of processes. Some are distributed without charge, for example to national collaborators and other categories of professional colleagues.

2.81 The Information Office prepares, and updates periodically, a catalog of publications in print. The Information Office has also developed methods for rapid announcement of new publications, for example through dissemination of "flyers" to an extensive mailing list.

2.82 IIMI uses English as the principal working language. IIMI recognizes the importance of disseminating its publications in languages which are widely used in its collaborating country programs.

Outputs

2.83 Since 1985 IIMI has produced 4 general, 3 co- and two occasional publications on its research work, 12 technical publications and monographs, 16 country papers, 21 working papers, 15 newsletters relating to the Networks, 8 issues of the institute periodical - the IIMI Review, and 7 Annual Reports. The Library and Documentation section accrues formal and informal literature from national and international sources and provides regular and customized dissemination of information to a total of 70 staff, partners and collaborators worldwide.

III. ANALYSIS OF THE EXPERIENCE

3.01 In order to analyze the relative success or failure of IIMI's activities in making significant impacts and enhancing the national capacity of NRIs and NIMOs, it is necessary to examine several factors that are relevant and weigh their respective influence in causing impacts. Some factors are external to IIMI; these are specific to the situation and are sometimes rapidly changing. IIMI has perhaps less control over these and may need sometimes to adapt to them in a suitable manner. There are other factors which are internal to IIMI over which it has more control. The objective of the analysis is to enable IIMI to learn lessons that will help to manipulate these internal and external factors more effectively to achieve stronger impacts in future. As varying combinations of factors in different country situations result in differing impacts, the inter-relationships among external and internal factors being equally crucial, also requires careful consideration.

A. External Factors and NIMOs

3.02 External factors including some that seem to reciprocally affect the degree of impact of IIMI's activities in strengthening the capacity of NIMOs are described in the following.

Demand and perceived need to improve management and performance of irrigation organizations and systems

3.03 Is there an effective demand from the government, farmers, donors or other stakeholders in the irrigation sector to improve management and performance? Is it subject to internal push, external pull or both? The response seems to vary widely from one country to another.

3.04 The perception of the need for improvement is influenced, in many countries, by the irrigation agency's degree of concern for the agricultural output from the system, and its realistic understanding of current irrigation performance. But such perception of need in some countries is not governed by macro-level concerns of population or food production requirements. Nor is there adequate incentive for the irrigation agency to consider agricultural performance of the system in evaluating performance of the agency, or the system under its control. Pakistan, India and Sri Lanka can be cited as examples.

3.05 On the other hand, there are countries which are increasingly recognizing the need for performance improvement and irrigation agencies are required to adapt to new situations such as those resulting from conditionalities in Structural Adjustment Loans. Investment funds are becoming scarce; governments are forced to "disengage" from many of their past support roles; donors are less inclined to provide funds for construction or subsidies; privatizing efforts are gaining momentum. Bangladesh, Niger, Nigeria, Sudan and some other countries are facing such challenges. In these countries, demand is increasing for assistance and expertise for strategic planning of organizations, and improving management and performance. The workshops in Sudan on "Land and Water Charges", and "Privatization of Irrigation Schemes", and the "Strategic

Planning Workshops" of the Bangladesh Agricultural Development Corporation (BADC) in Bangladesh, are examples of such demand.

3.06 In a somewhat different context is the case of Malaysia. Its rapidly industrializing developmental scenario is making it difficult to hold farmers on to their lands at existing levels of profitability in agriculture. There is also a vision and commitment at the highest political level emphasizing the need to provide high quality services effectively and cost-efficiently in all sectors of the economy. This has resulted in commitment at the highest level of leadership of the Department of Irrigation and Drainage (DID) to seek IIMI's assistance in management training, strategic planning and human resource development.

Accountability for Performance in Irrigation Organizations

3.07 Irrigation organizations seem to suffer from lack of accountability to water users and other stakeholders. Accountability for performance requires clearly planned and defined objectives, targets and results at all levels in the agency and system with adequate arrangements for performance control and monitoring. The assignment of responsibilities, the structure of the organization and its relation to the technical consumer related aspects of its work, and the controls required to ensure accountability are important. Ensuring accountability thus requires inter-supportive changes in these related aspects of organization and management which are difficult to initiate and sustain. Hence, difficulties can be anticipated in the implementation of changes required to enhance accountability. This is reported in the Pakistan case but is more generally and widely applicable to many countries.

Transaction Costs of Implementing Management Changes

3.08 Most of the interventions identified for improving management may have relatively little financial expenditure costs. However, some of them may have significant transaction costs, both internal to the irrigation organization and external in its relations with influential landowners (such as implications for substantial losses in informal rents). These transaction costs are endemic to many public activities, and cannot be ignored in any realistic program for intervention.

Reality and Image of Performance

3.09 In many countries, the perception and image of the performance of the irrigation systems is different from the reality, and its managers are unaware of divergence between image and reality. Also, as irrigation agency staff generally believe that they know the system better than "outsiders; any intervention suggested by an outsider is subject to a severe test of credibility. IIMI requires an extended and intensive presence in the field in order not to be considered as an "outsider". It equally takes time to build up credibility and for acceptance of results of research to close gaps between image and reality. As Gil Levine points out in a companion paper on "Review of IIMI's Research Program", "perhaps the most important of IIMI's innovations has been the introduction of "realism" into the "Imagery" of the perceptions about the operation of the major irrigation systems in the countries in which it is working". This observation is validated by IIMI's experience in most countries.

Continuity and Commitment Leadership

3.10 As most of IIMI's work is concerned with institutional development, capacity building and implementing managerial changes, commitment at the highest level of the organization is essential. This is facilitated if there is long term continuity in the leaders or leadership groups at the organizational and political levels. It takes time to develop the requisite understandings and trustful relationships. Sri Lanka is a good example, where continuity of strong leadership at higher levels in the government had helped IIMI's efforts considerably. Similarly in Malaysia, the continuity of leadership of the Director General of DID facilitated completion of the "training cycle" and "strategic planning, and human resource development" over a three year period.

Climate of Experimentation and Prior Experience

3.11 In Sri Lanka, the important impacts of the new participatory irrigation management policy approved by the Cabinet in 1988 and the subsequent IMPSA project and its impact became possible, largely because of the context of these IIMI-SLFO activities. A climate of experimentation in irrigation management existed for a decade or more before the advent of IIMI on the scene. A big push was given by the Gal Oya Project which adopted farmer organizations as important elements of the rehabilitation process. The INMAS program was launched in 1984 for improved irrigation system operation and maintenance, better coordination of inputs and farmer organizations. The Irrigation Management Division was already established. The previous decade of pilot projects in Minipe and Kimbulwana, other experiments and the Gal Oya experience, and IIMI's own field research in Sri Lanka, had provided a firm basis for the formulation and implementation of the IMPSA project.

3.12 In the Philippines, considerable experience was already available from field research conducted in the 1970s collaboratively by National Irrigation Administration (NIA) and the International Rice Research Institute (IRRI). It was therefore possible for IIMI to conduct field research on irrigation management for diversified cropping (1985-90) and contribute significantly to improve understanding of management constraints to diversified cropping. IIMI worked

collaboratively with NIA to develop and field-test guidelines for crop diversification in NIA-managed gravity irrigation systems.

3.13 In Nepal, prior knowledge and experience especially of IIMI staff, on Farmer Managed Irrigation Systems (FMIS) helped them to move in quickly to develop innovations and make significant impacts on the thinking at the levels of the Ministry and Planning Commission. The National Eighth Plan required that more farmer participation modes be adopted in irrigation. Greater recognition was provided to the beneficial role of effective water users' organizations in their contribution to agricultural development and especially in their importance within the agency-managed systems of the country.

Interest Congruence and Donor Support

3.14 It was the congruence of interests of donor, the client country, and IIMI that helped IIMI's collaborative field research in most cases. In instances of inadequate congruence, performance and impacts tended to be adversely affected as an unintended consequence. For example research conducted in many countries was in a "project" mode with donor funding in two phases for a total period of about five years. Given the type of field research, initial state of conditions and context in many countries, five years would have carried the research past the stages of "observation, data-collection and diagnostics" and "pilot-testing of the revised procedures and promising innovations". But the time the outputs of IIMI's research in terms of knowledge generated were available, suggested interventions pilot-tested, and the implementation phase about to commence, the research had to be discontinued due to lack of further funding for the project. IIMI could not follow up on these "outputs" up to the "impact" stage. Philippines and Indonesia, where the field research was financed by the Asian Development Bank are examples of such experience.

3.15 Collaborative research was generally conducted by one or two IIMI staff members working in the country and not by a critical mass of multi-disciplinary staff. This was due to the limited scale of funding. As only one or two staff members were available, it made their task very difficult in finding time for interactions at the higher levels of the agencies where impacts really need to be targeted especially on policy-related matters. Also, the project mode of IIMI's work (which displaced programmatic considerations), led to an emphasis on outputs and not on impacts.

3.16 On the other hand, the four year term of the African Development Bank funded projects in countries of West Africa appear to be better placed in this regard. Two such projects in sequence would provide an eight year period which should enable measurable impacts in the countries to be made.

3.17 Donors who provide aid and funds for the irrigation sector have considerable influence on sector related policies of the country. If funds are provided for construction projects, rehabilitation, or for "special maintenance" with less attention for improved management and higher levels of performance on a sustained basis, then the irrigation agencies are understandably more interested in such projects than in IIMI's activities for improved management and performance of irrigation systems. Conversely, where the donors' objectives and interests in the irrigation sector of a

country coincided with those of IIMI, major opportunities for impacts were found and exploited to the extent possible. (see para 3.05)

Staff Secondment from NIMOs

3.18 Staff seconded from irrigation organizations to work with IIMI staff in collaborative research projects, develop understanding, insights and expertise useful to their organizations. Many staff from NIMOs had worked in earlier IIMI research projects in Sri Lanka, Philippines and Indonesia and then returned to assume positions of responsibility in their organizations. Staff from NIMOs are similarly working now in IIMI research projects in Sri Lanka and Burkina Faso.

B. External Factors and NRIs

3.19 Some of the factors and constraints in the countries that would influence the impact of IIMI's work on strengthening irrigation research capacities are described below. A few external factors relating to NIMOs are also equally relevant for NRIs (such as interest congruence, donor support etc.).

Institutional Availability and Supports

3.20 In many countries, institutions with research capacity in irrigation management (NRIs) are either non-existent or are weak and fragmented. The main reasons appear to be: there is no effective demand for irrigation management research in the country. It is difficult, in such a situation, to obtain and sustain a critical mass or viable concentration of researchers in irrigation management in any institution; there are no incentives for conducting applied field research, which takes more time and effort compared to doing soft computer-oriented research. Inadequate leadership has adversely affected academic and research institutions, and, often, there is no continuity at top management for a reasonable period of time; and absence of policies and funds to support good field research.

3.21 While the work of other IARCs (like IRRI and others) are greatly facilitated by the existence of NARs in such countries, IIMI is required to establish its own field research outfits and manage its research work in collaboration more with irrigation agencies (NIMOs) and less with NRIs in many countries. India is perhaps the only country where IIMI is not doing field research on its own but working collaboratively with NRIs in a non-resident mode of operation.

Research Staff

3.22 In many countries, it is often officers from NIMOs who are seconded to work with IIMI in field research, and who have thus acquired research expertise unlike research staff from NRIs. This has been the case in Indonesia, Philippines and Sri Lanka. Exceptions to this pattern are found in India and Bangladesh. The case of India has been noted in para 3.21 above. In Bangladesh, the joint research between IIMI and Bangladesh Rice Research Institute (BRRI) on the IIMI/IRRI project brought researchers from BRRI's Irrigation and Water Management (IWM) division into close contact with IIMI's research team. Also, the research leader for the IIMI part of the IIMI/IRRI project has been on secondment to IIMI from Rural Development Academy, Bogra. He has completed his Ph.D. dissertation in economics with Rajshahi University during his time with IIMI. Many of the national research staff that IIMI recruited for its field research are generally fresh candidates rather than researchers attached to NRIs.

3.23 The case of Philippines is rather unique. Every regional office of NIA has a research coordinator who could act as a nodal point to develop collaboration with researchers in the Universities and colleges. Under the Accelerated Agricultural Production Project (AAPP), IIMI worked jointly with NIA and the collaborating regional universities and successfully completed 14 research projects. Based on the results of the research, NIA planned to apply the tested strategies country-wide for improving performance of irrigation systems.

C. Internal Factors

3.24 IIMI's internal factors which influence strengthening of national capacity in NIMOs and NRIs are analyzed in the following.

Statement of objectives

3.25 In projects prepared in the early years of IIMI for field research in Philippines and Indonesia, strengthening national capacity especially of NRIs was neither explicit nor implicitly stated. Only later mission statements of IIMI declared this as an objective. The present goals of IIMI emphasize strengthening national capacity of NIMOs and NRIs explicitly. Caution is therefore needed when interpreting the impacts arising from the projects of the earlier period.

Length and level of involvement

3.26 In a country operation, a long term presence, higher level of involvement reflected in staffing adequate funding for an appropriate range of activities, a program rather than a project approach are more conducive to establish IIMI's acceptance and inspire confidence in institutions and persons IIMI deals with. The likelihood of success in strengthening national capacity is governed by IIMI's interest to become involved in irrigation management issues, as it sees its importance in the context of the country's development efforts. Length of involvement provides the country a long-term perspective in dealings with IIMI unlike with consultants. In Sri Lanka and in Pakistan, IIMI has enjoyed this advantage to a greater extent than in other countries. Staff have emphasized that IIMI has to be patient in the process of institutional development; these things do not happen overnight, which in fact places IIMI with its long-term presence in a favourable position. Conversely, if IIMI does not function long enough in a country, then IIMI's projects may produce some outputs but are unable to institutionalize sustained impacts or improvements. This also has crucial ramifications for decision-making at IIMI on matters of expansion versus consolidation of its presence and efforts in various countries and regions, and to obtain required finances for country-specific activities.

Resident staff strength

3.27 It is found necessary for good quality research in a country if IIMI ensures a critical mass of staff of a multi-disciplinary character, having effective managerial and interpersonal skills. Stationing a single staff member in a country has been found to be rather inefficient in achieving IIMI's goals and use of resources. In such cases, regular support and inputs from headquarters and other parts of the institute is an effective way of compensating for this deficiency to some extent. Recruiting national staff with necessary disciplinary skills to complement internationally recruited staff could also address this issue and strengthen national capacity for research. This is also suggested by Gil Levine in one of his recommendations in his paper on Review of IIMI's Research Program.

Staff Competence

3.28 Competence of IIMI staff is pointed out as an important factor. In the institution - building function and managing administrative and representational roles, more than just good research competencies seems to be required. Good interpersonal skills, right attitudes, and a good personal chemistry are essential for influencing people and making impacts.

Collaborative activities

3.29 The strength of the relationship developed with agencies in a country is dependent on the type, magnitude, and intensity of collaborative activities. The highest levels seem to have been achieved in Nepal, Pakistan, Philippines, Sri Lanka and Sudan.

3.30 An important aspect is the ability and flexibility of IIMI to respond in a given situation or felt need. Examples are: IIMI's association in the IMPSA project in Sri Lanka, and responding to requests of the Consultative Committee in Sudan to organize the workshops on "Land and Water Charges" and "Privatization of Irrigation Schemes"

IIMI-initiated institutions

3.31 The Study/Research Advisory Committees, Project Coordinating Committees and Consultative Committees are in this category and help to forge and strengthen relationships at different levels and modes. While Study/Research Advisory Committees strengthen capacity to manage research programs (more in a technical sense), Project Coordinating Committees help to manage IIMI's projects. Consultative Committees usually determine the research program, set priorities, review, evaluate programs and relate it to overall policy.

3.32 Where Consultative Committees were formed in the early stages as in Sri Lanka and Pakistan, IIMI was able to interact at higher levels of administration in these countries. It has been found helpful to interact at higher levels to make contributions to and impacts on policy and management and to receive the country's support for IIMI's work. Where the Consultative Committees were not formed in the initial stages, as in the Philippines and Nepal, for example, it was difficult later on to induce their formation thus limiting IIMI's interaction to fewer persons and agencies and probably not at the higher levels. On the other hand, if IIMI were to wait to constitute a Consultative Committee before starting work in a country, undue delays may result. It may have to use the existence of another Center in the country to quickly start its activities; as for example, IIMI-ICRISAT relationship in Nigeria. Previous experience indicate that Consultative Committees will be necessary only if IIMI is developing a program in the country; and also IIMI needs time, initial knowledge and experience in a country before the Committee can be suitably formed.

3.33 IIMI experience also suggests and indicate that the Consultative Committees, and Research Advisory Committees would benefit by including some nationals of the country who may have retired but are widely respected in the country for their experience and knowledge as esteemed professionals. Impacts are made through people and such persons with experience and influence carry credibility, can help to change existing systems, and obtain higher management performance. IIMI can also help them to communicate their experiences in such a way as to help the management of change in appropriate institutions. Something akin to the special awards program that IIMI had for irrigation professionals might pay good dividends. Research publications are useful for other researchers to read. In the institutional building role, IIMI will have to seek innovative ways of interpreting the results to the national agencies in an extension mode.

3.34 Besides committee mechanisms, IIMI has entered into formal Memoranda of Understanding (MOU) with other international or regional organizations for general interaction and collaboration, implementing specific joint research and training, or information exchange activities. There are many examples of MOU such as in Burkina Faso, where IIMI has entered into MOUU with five organizations.

Information Programs

3.35 Publications based primarily on in-country field research, proceedings of in-country workshops, training programs and country papers reach a wide clientele and help to strengthen national capacity.

3.36 In the West Africa Regional Program, information exchange in irrigation management is promoted by the edition and publication of a regional bilingual (French-English) newsletter. This has subsequently been strengthened by production of a national language newsletter focusing on environmental issues where points of view of farmers in IIMI's research sites are prominently featured.

3.37 There are also Special Newsletters brought out by the networks on irrigation management for crop diversification (IMCD Newsletter) and Farmer Managed Irrigation Systems (FMIS Newsletter) that focus on special subjects of these networks and specific audiences constituting these networks.

Networks

3.38 Networks focusing on learning from each other with reference to a research topic of interest to more than one country have been found to be particularly effective in strengthening national capacities in NIMOs and NRIs. The Networks on Irrigation Management for Crop Diversification (IMCD) and on Farmer Managed Irrigation Systems (FMIS) are two examples of important contributions made over the last few years.

3.39 A direct impact of the IMCD Network are the national committees that have been established or are being initiated to coordinate the planning and implementation of irrigated crop diversification in a number of countries. A similar impact has been realized in developing farmer managed irrigation systems through the FMIS Network.

Management Training and Institutional Development

3.40 Management training and institutional development activities seem to have been successful in strengthening national capacity and demonstrating recognizable impacts fairly quickly. The experiences in Malaysia and Bangladesh are both illustrative. In Malaysia, the training capacity-building in the Department of Irrigation and Drainage (DID) had an immediate multiplier effect when the trainers trained by IIMI used the training modules prepared by IIMI and conducted many courses on their own. They had also translated the training modules into Bahasa Malaysia for training irrigation technicians (who do not know English). The successful completion of the training cycle has led the DID and IIMI to the other two stages of 'strategic planning and human resources development plan,' and 'training on research on the performance of irrigation schemes.' The client's (DID) perception of the impacts of these activities is very favourable. In Bangladesh, the training cycle was partially completed. In the context of management change of the Bangladesh Agricultural Development Cooperation (BARC), the strategic planning and human resources development activities have made a useful impact on its thinking.

Collaboration with many types of organizations

3.41 IIMI has been working not only with government agencies but also with parastatals, non-government organizations and private firms. Work with ADB/N in Nepal, proposed work with Grameen Bank in Bangladesh, collaboration with FFHC and Nation Builders Association, and private firms (under ISM Project) in Sri Lanka, are examples. IIMI has also been working closely with other international centres like IRRI, ICRISAT, and IFPRI; developmental organizations like FAO; and in West Africa, with IUCN in a regional environment project. These contacts help IIMI to develop better relations with a wide range of people and institutions in these countries which also helps in its work.

Expectations raised by IIMI in NIMOs

3.42 One factor that negatively influences IIMI's relations with NIMOs is the level of expectations raised by IIMI in NIMOs in initial interactions and its later inability to match it. In Morocco, initial expectations were that IIMI would finance research from its own funds, and make available a French version of all its major publications. Many responses from leaders of country programs also indicate that countries and NIMOs expect IIMI as an international institution to contribute from its own funds for country projects at least partly. In the alternative, the country perception is that IIMI competes for scarce bilateral funds along with local and foreign consultants.

IV LESSONS AND RECOMMENDATIONS

4.01 What are the lessons we can derive from analyzing experiences in strengthening national capacity? How can we use them for IIMI's benefit in the future and what recommendations can be made? These questions are addressed in this section.

A. Lessons

Primacy of field research

4.02 Well designed and successful field research in a country in collaboration with national irrigation agencies indicates to be an essential prerequisite to achieve the following: develop deeper understanding and insights into the management, operation and performance of systems and agencies; introduce "realism" into the "image" of perceptions on the performance and operations of irrigation systems; acquire credibility and develop trustful relations; and stimulate demand to improve management and performance of irrigation organizations and systems. After achieving success in this phase of field research, IIMI can influence policy makers and managers of systems to implement management innovations that are proposed, provided financial and social costs of implementing changes are affordable.

Long term presence

4.03 The first phase of successful field research and pilot-testing of innovations seems to last about five years on the minimum. Short-term, donor-supported, and project-oriented field research (of about five years) has generally been able to generate outputs but not much impacts. Sustained work over a longer time frame and a programmatic approach are indicated for recognizable impacts to emerge that can lead to lasting improvements in system performance.

Potential for impact

4.04 Favourable factors in a context help quicken the pace of realizing the potential for making impacts. These relate to the following: a climate of experimentation and prior experience; continuity of leadership in the agencies; special donor interest and support including appropriate pressures in conditionalities of structural adjustment loans; presence of eminent nationals on the IIMI's international staff and Consultative Committees; and secondment of adequate and suitable staff from the national agencies.

4.05 Certain types of activities can perhaps achieve quicker outputs and impacts than field research. Examples are: networking (like IMCD and FMIS networks); institution building activities like management training, strategic planning and human resources development, dialogue and consultation on policies and management; and information dissemination.

Strengthening National Research Institutions (NRIs)

4.06 In many countries, institutions with irrigation management research capacity are either non-existent or are weak and fragmented. Strengthening research capacity a difficult and challenging task. It may be a more viable to encourage establishing research management units in irrigation agencies (like in Sri Lanka or NIA in Philippines) or in existing research institutions (like Hydraulics Research in Sudan) to work as nodal points for organizing research and mobilizing other available expertise in the country.

Successes to repeat

4.07 Some of the more successful activities from the point of view of impacts seem to be: the IMPSA project in Sri Lanka; the work in the Philippines with NIA and the collaborating regional universities under AAPP; the management development and training approach to institution building in Malaysia and Bangladesh; the work in Sudan; the work in Nepal on farmer organizations (FMIS); the "retreat" in Pakistan for interaction with senior officers and policy makers; and the participatory action-research and project development in Sri Lanka.

Failures to learn from

4.08 IIMI should be more cautious not to raise expectations unrealistically in countries where it may like to start activities anew. A minimum period of stay with assured funding are essential if IIMI has to deliver what it promises. The minimum period will depend on the context of the country and an informed judgement has to be made.

B. Recommendations

Design for specific impacts

4.09 When programs or projects are designed, it will be very useful to be clear about the specific impacts intended, how these will be achieved by intended outputs of the project or program, and the estimated period for realizing impacts.

Quick visible impacts

4.10 A few success stories should be generated as quickly as possible. Nothing succeeds like success and success in turn feeds on itself. IIMI should concentrate its strategic efforts and choose the right mix of activities in a few very favourable contexts to achieve some highly visible and quickly realizable impacts in improved management and sustainable performance of agencies and systems.

Increasing the chances of success

4.11 Approaches that will increase chances of success should be pursued: working closely with major donors in a country and seeking convergence of interests to improve management and performance of irrigation systems; negotiating at a high level in the government and reaching agreements on necessary arrangements with a country before taking up residence in a country and commencing operations; planning for a program rather than projects; and securing pledges of assured funding for a reasonable period of time.

Monitoring outputs and impacts

4.12 Monitoring outputs and impacts of all activities and ensuring their quality is essential and the responsibility for this function must be fixed appropriately at the director's level. The Management Committee must review systematically the results of monitoring on a periodic basis. Formats should be developed for project leaders to report outputs and impacts at appropriate intervals. Since some of the important impacts occur after a project is completed with a lag of time, some mechanisms should be put in place to track those impacts and evaluate them.

Multidisciplinary staff

4.13 It is desirable that each team should contain staff representing various disciplines and experience. Even if it is not always financially feasible to recruit international staff to form a team in each location, alternative ways of achieving the objective should be explored: for example, two staff members in Nepal and two in Bangladesh could form a multidisciplinary team of four and support each other on a sustainable basis; or complement international staff with national staff of different disciplines.

Strengthening Consultative and other Committees

4.14 Impacts are often made more through people than through published reports. If more eminent and influential persons with high credibility in the country are associated with modalities such as Consultative Committees, Study Advisory Committees etc than at present, they may serve as change agents to introduce management innovations. Their experience will also be very valuable for IIMI in the conduct of its activities in the country.

Promote establishment of research units

4.15 In order to enhance irrigation management research capacity in a country, IIMI should promote establishment of "research management units" in irrigation agencies or in existing research organizations to act as nodal points for research.

Long-term effort

4.16 IIMI should recognize that strengthening national capacity requires a long-term effort though the exact time frame could vary among different countries depending on the context. But IIMI should plan for a 5-10 years program in a country in order to obtain tangible impacts.

V. RETROSPECT AND PROSPECTS

A. Retrospect

4.01 To assess realistically the role of IIMI in national capacity building, a retrospective historical perspective from 1984 is needed. Changes of emphasis in mission, goals and programs of IIMI and its resultant impact on national capacity building during this period, though not readily evident today, were nevertheless important factors at different periods in IIMI history. Time tends to blur the drama of change and summate such changes to the lowest common factors.

Mission and Goals

4.02 The IIMI mandate when it was established in 1984 was to strengthen national efforts to ensure more productive use of irrigation systems. This in subsequent years was elaborated in a mission statement: to strengthen national efforts to improve and sustain the performance of irrigation systems through the development and dissemination of management innovations. This stress on management innovations to improve performance and thereby strengthen national efforts has since been modified. The current IIMI mission is to foster the development, dissemination and adoption of lasting improvements in the performance of irrigated agriculture, with three goals - generating knowledge (i.e. develop improved systems and policies); assisting countries to generate knowledge (i.e. strengthen national research capacity); and apply knowledge (i.e. support the introduction of improved irrigation management systems and policies).

4.03 The change from strengthening national efforts to strengthening national capacity now provides IIMI with a more pervasive role with greater responsibility. In this regard, a distinction is also evident of IIMI's role in research compared with management and policy. Strengthening national research capacity implies a more direct systemic role to improve the structure and functioning of research, whereas in policy and management improvement, it is a "supportive" or servicing role. Perhaps the magnitude of resources and program efforts required to strengthen national capacity in management and policy being considerably more than in the research field, may account for this difference in roles and responsibilities. In view of these changes of emphasis over time, any evaluation of past program on the basis of present goals of national capacity strengthening (and that too mainly in the research field) needs to be done with judicious caution.

Programs

4.04 During the early period, IIMI work emphasized research on selected issues; professional development of personnel; and facilitated the exchange of information among professionals. The importance of institution building, crucial to national capacity strengthening did not receive commensurate emphasis as now. The main program themes were on system management; rehabilitation and management improvement of irrigation systems; and farmer management. This was subsequently changed into seven themes: for managing; institutions; water resources; financial resources; irrigation facilities; irrigation organizations; support services; and institutional change. Present programs focus on performance; sector level management; public irrigation organizations;

local management; water delivery and disposal, with trans-program components on environment; technology; gender issues and databases. A more elaborate program structure is now available in the area of Institution building.

4.05 These shifts in program, mainly reflect changes in the needs of clients, donor interests and IIMI's perceptions based on its experience. The country projects which received funding usually required remedies to urgent and immediately felt problems in selected areas, which many not have been those best suited for long-term national capacity building. Due to more limited and specific aims and outputs expected from these projects, the resultant strengthening of project capacity in the country in such fields may also not have added upto strengthening national capacity on a country-wide basis. Some projects also did not explicitly specify an objective of either strengthening national capacity or strengthening national efforts. Changes in program emphasis and also discontinuity in donor funding for projects under implementation, did not facilitate cumulation of effects necessary for long term impacts and national capacity building, in many instances.

IIMI Capability

4.06 A pre-requisite for national capacity building is the development of capability within IIMI and its recognition by clients and key stakeholders. IIMI staff needed to initially obtain first hand experience on collaborative field research projects for data collection, problem diagnosis and pilot testing before expanded applications or inputs into national policy could be made. The experience gathered by IIMI staff during this early period is now available in programs of other countries and in new country offices being set up in West Africa etc. A cross-fertilization of experience is now taking place (for instance the policy changes in Sri Lanka; farmer management in Nepal etc. have provided fresh insights to West African countries). The experiences of IIMI programs in other countries in similar fields, are also providing quick insights in diagnosis and strategy options. Tapping on a common pool of institutional experience is thus yielding fruit now. IIMI is also able to avoid and circumvent many of the teething problems of setting up country offices which it experienced in the early years.

4.07 The capacity of IIMI staff on which IIMI capability substantially rests, has increased over the years resulting in greater confidence and credibility of its client and donor groups. This evolution towards polyvalent capability and skills has comparatively not been easy. Collaborative action research in the field is more demanding and exacting than individual research in laboratories. Management skills are also required in planning and operating programs and projects. To induce management and policy acceptance of changes, IIMI staff have to develop high levels of inter-personal skills, capability of being effective change agents and skills in diplomacy and negotiation. The combination of substantive and process skills in IIMI country based staff now, provide an important lever to achieve the IIMI mission and program results with greater facility when compared with earlier years.

Strategic Planning and Management

4.08 The lessons of experience indicate that the process of strategic planning in country offices needs strengthening specially in regard to the following: (a) designing programs first and projects thereafter with specification of outputs and impacts to support or build national capacity; (b) selection of a project mix to enable quick, visible impacts in the country, (c) securing agreement with the Government on all important program matters before a resident country office is set up; and (d) planning for programs to obtain long term impacts, and securing donor funding and support for it.

4.09 Similarly, strategic management could be strengthened to (a) closer collaborate and secure alignment of interests with clients and donors; (b) monitor outputs and impacts of programs and projects; (c) ensure that the country office has an inter-supportive team on a resident or visiting basis with required number of staff with disciplinary skills; (d) strengthen the composition and functioning of Consultative and other Committees; and (e) promote the establishment of research units in countries lacking such institutions.

B. Prospects

4.10 The exclusive consideration of the past by retrospective analysis alone is inadequate. A prospective vision of the future is equally important. IIMI should be mindful of the vision of its founders as much as the needs of its clients. The framework for such a vision is now provided in the IIMI Strategy document. Assessing and diagnosing the gap between vision and current reality within each country and making strategic interventions will indeed be most crucial to the ability of IIMI for developing national capability. Five dimensions are highlighted - effective policies; effective organizations; effective human resources; effective technologies; and national capabilities.

Effective Policies

4.11 The Strategy document stresses several aspects which contribute to effective policies - the need for practical long-term objectives; a strategy to achieve these objectives; mobilizing the necessary resources, supports and environment; and monitoring policy implementation. It is well known that in several countries gaps are evident in many or all of these dimensions. The attention and interest of the country to remedy this situation needs to be generated. This could be by internal push of policy makers, national planners, relevant ministries and agencies, the Consultative Committee etc. or by the external pull of international donors, IIMI office staff etc. IIMI could contribute to improving the policy matrix by collaborating in sector planning; policy analysis; assessing resources and supports; and devising methods of monitoring and replanning. The degree of IIMI involvement would vary according to the degree of past experience and development of planning in the country; availability and adequacy of reliable data, local skills in planning etc. It is however important to recognize that policy formulation at the national level alone may not yield optimum results, unless effective policies and plans are available drawing on such national policies both at the agency or organization level, and also operational policies at the field level. The

impact of national policy needs such vertical linkages, and monitoring of policy implementation should track down conflicts and discontinuities, which could be rectified by replanning policies by such feedback. Recent experience in policy planning tends to emphasize it as a "learning process" and less as a "blueprint".

Effective Organizations

4.12 The Strategy document highlights several elements required for the dynamic management of organizations - responsiveness; accountability; performance orientation; and sustainability. What is envisaged is the upgrading of mere organizations, to function as institutions, which is necessary if policies are to be formulated and implemented effectively. During the last ten years a reform movement commencing with the business sector but now enveloping the public sector too (eg. education departments, extension systems etc) is devoted to "the search for excellence in management". Irrigation agencies should be penetrated by this movement, its ideas and findings. As entry into these agencies to effect reforms may be difficult, the leadership of these agencies, the assistance of local training and consultancy organizations and the catalytic or facilitative support by IIMI staff in appropriate combinations should be designed and mobilized. Irrigation organizations and IIMI staff could also draw on successful lessons in institution building in the country in other sectors, in order to draw on demonstrable exemplars. Experience of the country in strategies for organization change and administrative reforms may also provide useful lessons and pointers. An appropriate mix of organization training, resource consultancy and process consultancy designed for specific organizations which are strategic for system and sector change may perhaps yield the best results.

Effective Human Resources

4.13 It is recognized that the quality and effectiveness of organizations mainly depend on the quality and motivation of its staff. The Strategy document therefore stresses the following elements: improving the number and quality of skill improvement programs for staff at all levels; attractive career prospects for good quality personnel to work in the sector; and providing incentives and rewards for high performance. Three aspects may be kept in mind by country staff, when planning for effective human resources. Firstly, it is equally vital that staff who have already been trained or developed specially to higher professional levels are utilized effectively after training by their organizations. Unless this aspect is monitored, such training may benefit the individual but not the agency or contribute to improved sector performance. Secondly, as IIMI resources are limited, but as country human resource needs are high and demand driven, strategies have to be applied to obtain multiplier effects from IIMI resources. The implementation of distance learning programs combined with practical hands-on experience sessions, has been an effective and cost-saving modality in other sectoral areas of development which should be utilized in the irrigation sector as well. On the job training has also been found to be more effective than off-the-job institutional forms of training. These and other cost-effective methods of human resource development, should be increasingly utilized and sponsored by IIMI for adoption by countries. Finally, the reform of personnel management systems within the irrigation sector would require facilitation with the top management of irrigation agencies, relevant ministries, and other

agencies empowered with personnel policy-making for the public sector if the irrigation sector is to attract and retain good staff.

Effective Technologies

4.14 The Strategy document emphasizes the need to generate and adopt technological innovations. Several elements are identified - enhancing productivity, employment and incomes; demand driven technology; and the need for sustainability environmentally, socially and economically. In the field IIMI works, technological break-throughs as dramatic and visible as high yielding crop strains may not be easy. IIMI in its field operations should quantify benefits received from managerial and other O&M innovations. Such benefits by increased yields/cropping; reduced water use per ha.; cost reduction; labour saved etc needs to be expressed in financial terms to permit comparability, visibility and acceptance by relevant client groups. The nature and sustainability of innovations by IIMI requires client acceptance. This would be facilitated by involving the concerned client groups at key stages of formulating and finalizing innovations. The responsibility cast on IIMI for innovations is also high, as most countries do not have institutions exclusively engaged in irrigation management research and development. This means that IIMI has to combine strategic and applied research with adaptations, which thereby makes it to cover a broader spectrum of emphasis in research.

National Capabilities

4.15 The Strategy document highlights the counter-productiveness of either national or international agencies working in isolation. It is therefore proposed to increase the synergy among local, national, regional and international agencies through more effective partnerships, collaborative projects, linkages, information exchange, training and other programs. This indeed is a crucial strategic lever for application by each country. What may be more difficult to achieve by high visibility dramatic innovations may be possible by alternative modes of intensive application using strategic multipliers. Strategic planning and management is required in each country for intensifying collaboration, partnership and multiplier effects through a multi-modal package designed to suit the needs and challenge of each country. Such planning and management efforts are also best done in collaboration and partnership to secure the commitment of all stakeholders. If capability is to be strengthened at national or country-wide levels, then such efforts are crucial.

Abbreviations and Acronyms

AAPP	Accelerated Agricultural Production Project
ADB	Asian Development Bank
AfDB	African Development Bank
AOU	Advanced Operation Unit
BADC	Bangladesh Agriculture Development Corporation
BUET	Bangladesh University of Engineering & Technology
BRRI	Bangladesh Rice Research Institute
BWDB	Bangladesh Water Development Board
CC	Consultative Committee
CEMAGREF	Centre National du Machinisme du Genie Rural des Eaux et Des Forets
CG	Consultancy Group
CGIAR	Consultative Group for International Agricultural Research
DGWRD	Directorate General of Water Resources Development
DID	Department of Irrigation and Drainage
FMIS	Farmer Managed Irrigation Systems
GOP	Government of Pakistan
HJRBDA	HJ River Basin Development Authority
IA	Irrigators Association
IARC	International Agricultural Research Centre
ICRISAT	International Crop Research Institute for the Semi-Arid Tropics
IFPRI	International Food Policy Research Institute
IIMI	International Irrigation Management Institute
IMCD	Irrigation Management for Crop Diversification
IMPAC	Irrigation Management Policy Advisory Committee
IMPASA	Irrigation Management Policy Support Activity
IRRI	International Rice Research Institute
ISM	Irrigation System Management
ISNAR	International Service for National Agricultural Research
IUCN	International Union for the Conservation of Nature
IWASRI	International Waterlogging and Salinity Research Institute
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NARS	National Agricultural Research System
NGO	Non-Government Organization
NIA	National Irrigation Administration
NIMI	National Irrigation Management Institute
NIMO	National Irrigation Management Organization
NIRP	National Irrigation Rehabilitation Project
NRI	National Research Institute
O&M	Operations and Maintenance

PID	Punjab Irrigation Department
RMU	Research Management Unit
SCOR	Shared Control of Resources
SCUs	State Colleges and Universities
SLFO	Sri Lanka Field Operations
TAC	Technical Advisory Committee
USAID	United States Agency for International Development
WUA	Water Users Association

CONCEPTUAL FRAMEWORK

A. Process Model

A.01 Capacity Strengthening Process: Strengthening capacities of NRIs or NIMOs is a process that takes place over a period of time and gradually builds up their strengths. The process takes place in a certain context; it is caused by a set of activities; and there are results obtaining from the activities. A process also involves a flow which takes place because of some difference in potentials. In the case of enhancing the capacity of research institutions, it is the flow (or transfer) of knowledge and expertise for doing research. In the case of management organizations, it is the flow of improved management or policy-making skills. Examples of generally familiar processes are given in Figure 1.

B. Context

B.02 The context is what provides the setting for the activities. Other terms which convey the same broad sense are environment, conditions, situation. These are specific to a region or a country or a project.

B.03 What constitutes the context? Every element in the situation that provides the background for the activities and that determines the effectiveness and efficiency of the activities, and the results of the activities. But, in reality, it is adequate to consider the important elements that have particular relevance to the activities while keeping a general view of the situation.

A description of the context for the capacity strengthening process in a country would contain the following indicative list of elements: irrigation situation in the country and its importance, irrigation agencies (NIMOs), irrigation research institutions (NRIs), seriousness of the irrigation problems and the general awareness about them, indigenous efforts for improving NIMOs and NRIs, donor interest in the country's irrigation sector and recent expression of such interest in financing projects in the country. It is important also to know the general socio-cultural, political and economic environment in the country which supports the institutions and which determines the nature and degree of accountability of the institutions.

C. Activities

C.04 IIMI's program of activities consists of the following:

- i) establishing institutional linkages and modalities for financing,
- ii) research activities, and
- iii) institution building activities.

The first activity enables and facilitates the conduct of the other two activities which contribute to the achievement of the results and fulfillment of the goals, among others, of capacity strengthening of NRIs and NIMOs.

D. Institutional Linkages and Financing

D.05 Establishing Institutional Linkages: What are the various institutions and organizations in a country with which IIMI collaborates and works? IIMI works with a multiplicity of national entities and agencies. Function-wise: it works with research, policy, planning, irrigation system management, and training agencies; subject-wise: it works with irrigation, agriculture, rural development and planning organizations; types of organizations: it works with government ministries and departments, parastatals, farmer groups, universities and colleges, private consulting firms, professional associations, and NGOs; and other international centers and development agencies.

Committees: Consultative Committees, Project Coordinating Committees, and Study/Research Advisory and Coordinating Committees, provide the mechanisms for IIMI's institutional linkages to operate in order to enable and facilitate the conduct of the IIMI activities.

D.06 Modalities for financing: There are a variety of arrangements for financing of IIMI activities in countries. Memoranda of Understanding (MOU) between IIMI and national agencies, and Memoranda of Agreement (MOA) among IIMI, national agency, and a donor agency, are the general modes of arrangements. Finances for activities are provided under such arrangements as Technical Assistance grants, and Cooperative Agreement funds.

E. Research

Collaborative Field Research

E.07 Field research in collaboration with national agencies is the most common activity for strengthening research capacity of both IIMI and the national agencies. It involves working together and learning by doing. It generally starts with a 'fact finding and diagnostic phase', then moves on to an 'action research phase', and should logically move on to a phase of 'monitoring adoption of improved management on a wider system basis.'

There are many examples of IIMI's collaborative research such as the work in the Philippines, Indonesia, Sri Lanka and Pakistan.

E.08 **Nature of Collaboration:** There is a wide range of the types and degrees of collaboration. At one end of the spectrum, IIMI takes almost total responsibility and an executing role, sets up its own research staff and data collection facilities in the field, analyzes data, and writes the reports. The collaborating agencies are consulted either formally or informally in the choice of the field sites; some of the agency staff are recruited to work in the research project on secondment; there are periodic interactions with agency staff in the formal Coordinating and Advisory Committee meetings, and in workshops where the results of the research are presented and discussed. Where there are no NRIs in a country or where they are very weak, as has generally been the case, this has been found to be the only feasible way of getting field research started in many countries.

At the other end of the spectrum, the research is done by the NRIs in a 'contract research' mode with IIMI staff providing support and sometimes complementary inputs in expertise. IIMI-SLFO's work in the ISM-Project in Sri Lanka is an example of this. IIMI's work in India also comes closer to this mode. In between the two extremes, there is a continuum which provides for various degrees of collaboration.

E.09 The Swedish Institute, SAREC (1992), which has been involved in promoting research in and for developing countries, distinguishes between two types of institutional co-operation between Swedish research institutions and the national scientific research institutions. One is called the 'Capacity-emphasizing' co-operation. It is appropriate where the national research capacity is weak, and the primary aim is to build research capacity. SAREC's approach to creating research capacity is to make it an integral part of problem-solving research project work. The second type is called "Result-emphasizing" co-operation. In countries with relatively strong indigenous research capacities, the emphasis is on projects whose primary aim is to produce research results using short to medium term projects. These two types, in a sense, are similar to the IIMI's collaboration at the two ends of the spectrum described above.

E.10 **Research networks:** The emphasis here is on learning from each other with reference to a particular research topic of interest to more than one country. Here, the collaboration involves

IIMI scientists working in a liaison and coordinating role with a number of IIMI research projects in various countries which in themselves involve collaboration with respective NRIs and NIMOs. It may also involve collaboration between IIMI and other IARCs in such research networks. In such networks, typically, IIMI acts as a catalyst to collaborative research by convening symposia, paying travel expenses, assisting in the publication of conference proceedings, and, generally, encouraging or strengthening the relationships among the participants. TAC (CGIAR, 1991) defines this type of assistance as "Catalytic assistance" aimed at increasing output through stimulating the reaction, rather than by augmenting one of the reagents. It can make important contributions to strengthening national research capacity. IIMI's networks on 'Irrigation Management for Crop Diversification (IMCD)' and 'Farmer-managed Irrigation Systems (FMIS)' are examples of such collaboration.

E.11 Generic Research: This type of research uses the results of the collaborative country research in a synergistic fashion to improve understandings by comparing and contrasting different country experiences. It leads to the development of generic ways to improve irrigated agriculture that may be applicable to a variety of environments. In addition, through the development of improved conceptual frameworks and research methodologies, it helps to facilitate the work of the NRIs engaged in developing and adopting methods to improve irrigated agriculture.

F. Institution Building

F.12 Institution building activities principally aim at strengthening the research capacity of NRIs and supporting the introduction of improved policies and management by NIMOs, and include:

1. Training and Related Institutional Development
2. Information Exchange and Networking
3. Dialogue and Consultation on Policies and Management.

Training and Institutional Development

F.13 Training and capacity strengthening of NRIs in research on irrigation management: There are two forms of activities: (i) strengthening NRIs, and (ii) training of individual researchers.

F.14 Strengthening NRIs: Since, in most developing countries, national irrigation management research programs are either non-existent, or fragmented among other organizations or inappropriately located, IIMI's approaches include institutional development programs specifically aimed at developing research capability in a given country, and the incorporation of institutional development components in its research activities. These latter actions include, for example:

- a) designing collaborative research activities to link researchers from different organizations;
- b) assisting national Consultative Committees to play a role in strengthening national research by overseeing research priorities, linking relevant organizations, and identifying needs for future research;
- c) designing collaborative research projects so that NRIs take primary responsibility for the conduct of research.

Some examples of this activity are (i) IIMI's work in Sri Lanka under the ISM project, (ii) IIMI's work in the Philippines jointly with the National Irrigation Administration (NIA) and collaborating regional universities, and (iii) IIMI's work in the India program.

F.15 Training of individual researchers: If NRIs are to be strengthened and sustained, greater numbers of well-trained research staff are required. IIMI contributes to the development of such human resources through:

- a) on-the-job training of staff of partner/client institutions deputed to IIMI for participation in collaborative research projects;
- b) fellowships for staff of national research institutions in developing countries;
- c) career internships for postdoctoral and other highly qualified staff of NRIs;
- d) providing opportunities for researchers in developing countries to attend IIMI's workshops, conferences and seminars, to exchange ideas both among themselves and with irrigation managers and policy-makers.

There are examples of one or more of these activities in many country programs of IIMI.

Training and Institutional Development in Irrigation Policy-making and Management

F.16 In order to develop awareness and skills related to the management of systems and to help develop the human resources needed to staff the NIMOs, IIMI's activities have two components: institutional strengthening of NIMOs and training of individuals.

F.17 Strengthening NIMOs: IIMI works in partnership with NIMOs, national training centers and universities to implement a management training and development approach that includes all the components of the training cycle, namely,

- a) training needs assessment;
- b) curriculum development;
- c) development of training materials;
- d) training of trainers;
- e) monitoring and evaluation.

Examples of such activities are IIMI's work with the Drainage and Irrigation Department (DID) in Malaysia and partly, the work with Bangladesh Agricultural Development Corporation (BADC) in Bangladesh.

F.18 Training of individual managers and policy-makers: Efforts to strengthen NIMOs are complemented by training and development programs aimed at individuals and policy-makers. These include coursework at national and regional training programs, travelling seminars and workshops, study tours, study opportunities (to allow successful irrigation professionals to write up their management approaches and disseminate their experience through the publication and distribution of case studies), and attendance at workshops, conferences, and informal 'dialogue and training' programs. There are many examples of these activities at IIMI; the Special Awards program which produced three case studies is one example.

Information Exchange and Networking

F.19 IIMI's information exchange and networking activities are designed to exchange research findings and experience among IIMI researchers, IIMI's partners, others operating in the field, and the wide range of people holding key positions in NIMOs and NRIs whose capacities are strengthened by the use of information.

F.20 IIMI's activities in the area of information exchange and networking include:

Publications: Research and country papers, monographs, discussion papers, workshop and conference proceedings. IIMI Review, published twice or thrice a year, is a popular journal for a wide audience.

Networking and Newsletters: Some networks focus on a specific topic, such as farmer managed irrigation, while others focus on a particular region, such as West Africa. Formal networks are

strengthened by Specialty Newsletters (FMIS Newsletter) and country, regional and international workshops and conferences.

Library and Documentation: IIMI continues to accrue formal and informal literature from national and international sources and provide an active dissemination program based on user profiles. Hard-copy and modern electronic storage and retrieval systems will ensure that the information is accessible for use by IIMI staff, clients, collaborators and researchers.

Dialogue and Consultation in Policies and Management

F.21 In order to work closely with the managers and policy-makers in the NIMOs, IIMI employs an interactive process, which is called 'dialogue and consultation on policies and management'. This is a two-way interaction, which not only helps IIMI to achieve its research goals, but, more importantly, also provides the ideal tool for supporting the introduction of improved systems and policies. IIMI staff may contribute to the dialogue, or merely learn from it. Such activities are "strategic" in the sense that they are oriented towards basic and systematic approaches to change. Examples of such IIMI activities are: (i) the strategy planning workshops with DID in Malaysia; (ii) the IMPSA project of IIMI-SLFO in Sri Lanka; and (iii) the IIMI/DSE workshops in ASEAN countries.

G. Results

Outputs and impacts

G.22 The results of the activities taking place in a certain context are described in terms of the outputs and impacts. Every well designed activity has a clear statement of objectives and the outputs expected to be delivered at the end of the activity. If they are delivered, the activity is deemed to have been successful. Impacts are the further consequences or effects of these outputs on the larger environment which may or may not occur depending on the context and the other intervening factors.

To cite a well known example in irrigation, a water-delivery system has delivered its output successfully, if it has delivered water at every point in time and space according to a schedule which has been agreed upon earlier. The activities of closing and opening and otherwise regulating the gates has been done well and the output delivered. But water delivery is not an end in itself and people are concerned about increases in the agricultural production, and increases in incomes and welfare of rural people. Impact measures are designed to evaluate the relatively direct spatial and temporal outcomes of irrigation such as changes in agricultural production and those designed to assess the farther removed, longer-term, and more geographically dispersed effects such as changes in incomes and welfare of rural people. Impact evaluations tend to be difficult to make, in part because of the large number of intervening

variables whose influences must be sorted out, and in part because of the difficulty in placing an appropriate boundary on the assessment. (Small and Svendsen, 1990)

G.23 Strengthening National Capacity: This review of IIMI's experience is concerned with the results of the IIMI's activities in various countries in both research and institution building, not so much in terms of the outputs of the activities per se, but in terms of the impacts on strengthening national research capacity of NRIs and the national irrigation management and policy-making capacity of NIMOs. It is recognized that there are some activities where one of the specified objectives of an activity is directly strengthening national capacity and the expected output is specified in clear terms. Here, going through the activity (process) itself causes strengthening of capacity and the output is a direct measure of the strengthened capacity. Some examples are: (i) one of the research projects has, among its objectives, provision of opportunities for, say, six researchers from the collaborating NRIs to train up to Masters or Doctoral degree. The output is a measure of strengthened research capacity of NRIs; (ii) a project like IMPSA in Sri Lanka, has, in the process of conducting the activities and developing the policy papers, also raised the awareness and changed the attitudes of many key people. The output is not just the policy papers but enhanced national capacity for policy making which is a mix of competence, attitudes and skills.

Statement of the results in terms of outputs and impacts and with reference to the objectives set out for an activity would require some effort.

H. Issues

H.24 A number of issues need to be framed and questions raised in order to analyze the past experience and the impacts of IIMI's activities in strengthening national capacity of NRIs and NIMOs. It does not, however, imply that these questions or some of them can be answered in the case of all the activities for any number of reasons. One of the more prominent reasons might be that the goal of strengthening national capacity might not have been built explicitly in the design of an activity but just mentioned as a vague expression of an expectation or an intent. An analysis of the experience based on a clear formulation of the issues should lead to a more explicit articulation of objectives of strengthening national capacity in future activities.

Assessment of national capacity

H.25 An assessment of the national capacities of NRIs and NIMOs before and after the activity is necessary for suggesting that there has been an increase in the national capacity. This raises a number of questions.

- a) How is the national capacity of a NRI or a NIMO to be assessed? What are the criteria?
- b) What are the indicators of interest and relevance for describing national capacity before and after an IIMI activity?
- c) What are the methodologies for the measurement and evaluation of the indicators? Clearly, it is necessary to establish a baseline or a bench mark with respect to which the enhanced capacity can be measured.
- d) What confidence can be reposed in the measurement of these indicators? How valid are they? How much of subjectivity is involved in the measurement and evaluation? What are the biases in the estimation of the indicators?
- e) What is the experience of other institutions in a similar predicament? How does ISNAR, for example, evaluate the impact of its service to NARS? There must be many other agencies with a development orientation who are seized with similar situations.

Causality and factors

H.26 After having successfully assessed that there has been a significant increase in the national capacity, it has to be established beyond reasonable doubt, that the increase has indeed been caused by the IIMI activity. It is possible that many other actors and activities are simultaneously making an impact on increasing national capacity of the same institutions. How are the credits to be apportioned? and by whom?

H.27 What are the factors (or determinants) in the context (or situation), both external to IIMI and internal to IIMI, that have played a major part and exerted considerable influence in achieving the increased national capacity of NRIs and NIMOs?

Lessons and recommendations

H.28 What are the lessons of the experience? What are the successes to repeat or replicate? What are the failures to learn from and avoid?

H.29 What is a reasonable time frame, in a given context, to make a significant impact and strengthen national capacity? Are the expectations, in this regard, reasonable? Is it possible to accelerate the process by injection of more resources, or, are there constraints of 'absorption capacity' in a particular context?

H.30 What recommendations emerge from the analysis of the past experience to guide the future activities? Some of them may be country-specific or context-specific; and others may have wider applicability.

I. Methodologies

Measurement, evaluation and feedback

I.31 The broad goal of strengthening national capacity of NRIs and NIMOs needs to be translated into more specific objectives and criteria when it is sought to be achieved by an IIMI activity. Once that is done, some appropriate indicators can be used and evaluated. The simplicity or complexity of the methodology of evaluation varies widely depending on the case. Though impact evaluations are generally difficult, an attempt can be initiated and refined in due course. The important thing is to develop a culture of evaluation and responsiveness to feedback.

I.32 There are some simple cases where the numbers are the measures of indicators and the methodology is simply counting.

Example:

Objective: enhancing research capacity of a collaborating NRI in a research project.

Criteria: research capabilities of staff of NRI in the particular area of research and publications in a set of reputed journals in the relevant field.

Indicators: number of staff holding Ph.D. and Masters degrees in the particular area; and number of publications in journals.

Methodology: Count the numbers of staff with Ph.D. and Masters degrees; and the number of publications in journals, before and after the activity.

I.33 If the researchers collaborating in this project are not exposed to any other research inputs from elsewhere, the collaborative research activity of IIMI can claim the credit for enhancing the research capacity of the NRI, at least for the time being. But the increased capacity may not be sustained, if the NRI cannot retain the staff and provide a good research environment to continue their work.

In this case, there is no subjectivity in the measurements or in the methodology and the confidence in the validity of the results could be very high. If someone should suggest the quality of publications as another indicator, evaluation by a panel of experts would need to become part of the methodology and subjectivity and bias cannot be avoided.

I.34 Rarely are methodologies so simple. But methodologies of evaluation are generally well known in the research community. It should, however, be mentioned that construction of evaluation instruments requires special skills and training and such expertise needs to be commissioned as appropriate. It is not proposed to discuss here the methodologies and instruments except to enumerate them in the hope of soliciting additions to them. Some of them are :

- a) Pre-tests and post-tests
- b) Specially designed evaluation forms specific to the activity
- c) Self-assessment forms
- d) Baseline and periodic surveys using questionnaires
- e) Structured interviews with key persons or a sample of persons
- f) Observation in meetings, committees, workshops
- g) Informal interactions outside meetings and workshops.

Depending on the complexity of the case, mixing of methods and methodological innovations would be appropriate and should be encouraged.

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Extract from

Service Through Partnership - ISNAR's Strategy for the 1990s

Monitoring ISNAR's Impact

Evaluating ISNAR's performance and assessing its impact is difficult. While the mandates of the other centers in the CGIAR system focus at least in part on the development of improved production technology, that of ISNAR focuses wholly on institutional development. This is a complex and little understood process that cannot be satisfactorily assessed through the use of quantitative indicators alone.

Acceptable methods for assessing institutional development in national agricultural research systems have yet to be developed. Many external forces influence national systems and their performance, and this makes it difficult to isolate ISNAR's contribution.

Assessing the institutional performance of national systems has been designated as a major theme underlying ISNAR's work during the 1990s. In developing management technologies for this task, ISNAR will first test these on itself.

The criteria used to evaluate ISNAR's performance will include the number of requests it receives and meets for information, training and advice; improvements in individual managerial capacities in national systems; adoption of ISNAR's products; changes in the structure, internal processes, and external relationships of national systems; and differences in the research results achieved by national systems (as indicated by the adoption of new technologies, the number of publications, etc.)

A number of mechanisms will be used:

- . The annual Internal Program Review
- . The Biennial Meeting of Leaders of National Research
- . The bi-annual meetings of the Program Committee and the Board of Trustees
- . Periodic program and project reviews
- . Feedback from stakeholders
- . The External Reviews organized by the Technical Advisory Committee of the CGIAR