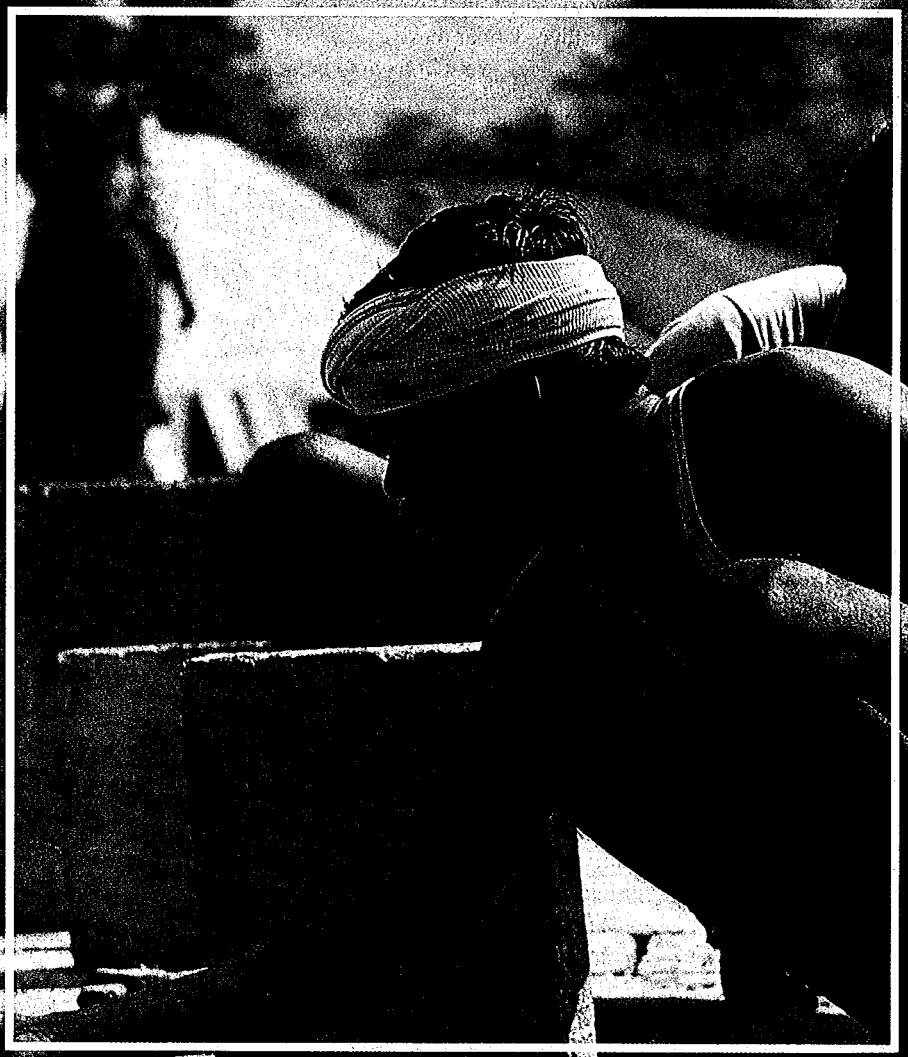
INTERNATIONAL IRRIGATION MANAGEMENT INSTITUTE

REVIEW

Vol. 4 No. 2 December 1990



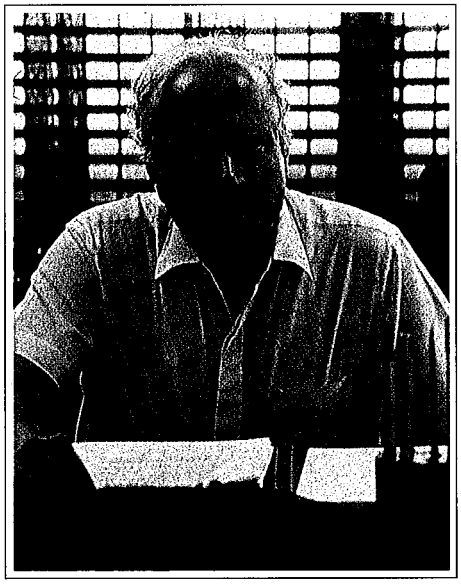
Irrigation Investment:
Where should the money go?
Improving information for irrigation decision makers.
Training needs assessment in Malaysia.

NEW STRATEGY NEEDED FOR WATER MANAGEMENT

Dr. M.S. Swaminathan is a distinguished scientist of international repute whose work in the field of plant genetics over 30 years has earned him numerous honors and awards. Swaminathan was Director General of the International Rice Research Institute from 1983 to 1988, and is currently President of the International Union for Conservation of Nature and Natural Resources (IUCN) and Honorary Director of the Centre for Research on Sustainable Agricultural and Rural Development in Madras. Previously he served as Independent Chairman of the FAO Council and as a Member of the UN Advisory Committee for Science and Technology for Development. Prior to his appointment to IRRI, he held a number of leadership positions in agricultural research and development in India: Director of the Indian Agricultural Research Institute; Director General of the Indian Council for Agricultural Research; Secretary to the Ministry of Agriculture. Swaminathan served as science adviser to the government of India under Prime Minister Indira Gandhi. IIMI Review staff talked to Swaminathan at the first Indian National Water Management Fair in Madras earlier this year.

IIMI Review: You've been credited with developing ways and means of increasing food production through technological innovations, but lately, you seem to have shifted your emphasis to a more "people-oriented or management approach" as opposed to a "technological approach." Why?

Swaminathan: While the success of the Green Revolution cannot be challenged, we must spread the revolution to water management and reorient our strategy to take the maximum effects of water management as they pertain to efficiency, economy and equity. I have always been interested in people and resources, but in the future, we will be asked to produce more food from less land and less water. The groundwater we have is being depleted and such things as deforestation in the Himalayas for example, are leading increasingly to alkalinity which in turn degrades the soil further. Under these circumstances, we will have to increase



"...we must spread the [Green] revolution to water management..."

food production, in India alone, by 7 million tons a year compared to the 3.5 million tons per year we increased during the Green Revolution years. We must now reorient our strategy and look at our resources more carefully. In the 1960s, we had to capitalize on well-endowed areas. Now, we have to spread the revolution to areas less well-endowed with natural resources. How to combine economy, efficiency and equity is the question.

IIMI Review: What do you see as the main hurdle to be cleared for that to be accomplished?

Swaminathan: India's main problem is crop diversification, which has to come from the household level. We are in a dynamic situation right now. We have improved the confidence of farmers tremendously and have shown the rest of the world that farmers (in developing countries) are willing to take on new technologies, provided they are economically viable and socially acceptable. I think what the Green Revolution did was three things: first we destroyed the myth that farmers could not change; second, we built up the confidence of the farmers; and third we provided countries with the means to increase food production which helped them in times of drought by building up their reserves.

IIMI Review: Can you give an example?

Swaminathan: Well, specifically the Indian drought of 1987. The country managed to survive by having 30 million tons of grain in storage. That also helped to stabilize prices. What we need now is a total systems approach to look at the five sources of water: rain water, river water, groundwater, seawater and effluent or sewage water that can be treated and used for several purposes.

IIMI Review: How can institutions and other organizations concerned with these problems change this situation?

Swaminathan: These types of Fairs are a great way to reach the farmers who are most affected by any new technologies that are developed. Another way is to reach the lending banks which are slowly realizing that farmer organizations are creditworthy. I think they are making an attempt to reach out to these groups.

IIMI Review: You mentioned that farmers are most affected by new technologies. There are concerns, expressed by various entities, that farmers are not consulted enough when it comes to designing new irrigation

(Continued on page 5)

REVIEW

Letters To the Editor,

An Urgent Need
Recently, while evaluating the information and knowledge base of field engineers in irrigation projects in South Africa, I was saddened to find that in a vast majority of the cases, the only information they have access to are text books they used in their engineering colleges, which in many cases were 30 years-old. Sometimes one feels that knowledge generated over an entire generation has somehow been lost.

What is now urgently needed in the field of irrigation management is to get the knowledge, technology and experience we already have to solve the problems in the real world. During the past two decades, many attempts have been made to identify research needs in irrigation, but a concomitant effort to determine why research experiences are not being translated into practice has simply not been made.

Application of research to practice is not considered a glamorous subject, but we need to rethink our priorities. Urgent actions are needed to define the information needs of the people in the field, and then implement cost-effective measures to deliver such information regularly in a timely fashion to the people who need them. Most irrigation professionals in developing countries are starved of information, though a minority, mainly in the capital cities, is being bombarded with information.
Sincerely,

Asit K. Biswas
President,
International Water Resources Assoc.

FMIS in India
Going through a recent IIMI Review, (Vol.3, No. 1.) I found that IIMI has undertaken responsibility for assisting farmer-managed systems in several countries throughout the world. India is missing. On the other hand, the State Government of Gujarat has agreed to hand over a canal system to the Aga Khan Rural Support Programme (AKRSP) in the hope of organizing farmers to manage the canal. Although, the irrigation tank was completed in 1980, in 1990 the canal is still not finished, even though it was meant to serve a command area of only 1,500 ha. As we plan to take on two more systems over the next two years, we could greatly benefit by your experience and assistance.
Your report on the Philippines NIA's newest efforts to organize farmers was very informative in updating our knowledge on what is happening in that country. Since the Philippines is a leader in this field, it would be good if you could regularly report on their progress.
Yours faithfully,

Anil C. Shah
Chief Executive
AKRSP (India)

From the Editor. As reported in the last issue of the Review, IIMI's research in India on various topics including FMIS is just getting off the ground. Please send your comments to Editor, IIMI Review.

Improving Managing Techniques
We still have far to go in improving irrigation management in India. We do not have a good understanding of the more fundamental reasons for poor performance

(Continued on page 17)

CONTENTS

Researchers are now questioning where new irrigation investment should go.

Director General: Roberto Lenton
Editor in Chief: Francis O'Kelly
Managing Editor: Matthew Driskill
Photo Credits: Cover, pgs 2, 3, 4, 12, 13, J. Colmey; I.C., IRRI; pg 8, IIMI; pgs 9, 15, 18, Daniel Berthery; pgs 10, B.I.C., B.C., Mathew Driskill; pg 14, Shaul Manor; pg 16, Herve Plusquellec.

International Irrigation Management Institute. 1990. IIMI Review Vol.4, No.2 Colombo, Sri Lanka. 20 p.
DDC: 631.7 ISSN: 1012 831X

For more information, contact the Editor, IIMI Review, P.O. Box 2075, Colombo, Sri Lanka.

IRRIGATION INVESTMENT IN ASIA: WHERE SHOULD THE MONEY GO?

Throughout Asia irrigation has been the mainstay of agricultural development for over four decades. In many countries, India for example, irrigation investment accounts for almost 10 percent of total public outlays since independence. As late as 1980 in Sri Lanka, similar investments have climbed above 20 percent of total government capital expenditures. The majority of this spending has gone to bring new land under irrigation and most efforts have paid off. Most of Asia is now self-sufficient in rice production, but having reached that stage, a new question arises — In what direction should future irrigation investments be channelled? Should the money be spent to build more systems or to deepen existing irrigated land base or to a host of other possibilities?

Construction investment has dovetailed with world rice prices.

In the recent past, a quiet revolution has taken place among international donors and policymakers with the pendulum of thought swinging from irrigation construction to system rehabilitation to improvements in irrigation system management. That trend, in and of itself, is not surprising. What is surprising is that despite the continuing importance of irrigation in economic development, few attempts have been made to determine the integrated manner of past investments, or more importantly to examine the profitability among investment alternatives in the future.

To fill the gap, and using Sri Lanka as the test case, International Irrigation Management Institute (IIMI) researchers instituted a study that compiled time series data on different types of irrigation investments — new construction, rehabilitation, and management improvement projects — during the last four decades and analyzed changes in the process of economic development. In doing so, researchers have been able to provide hard evidence supporting the argument that IIMI and others have put forth for the past five years. "Generally speaking, the era of major irrigation construction in Sri Lanka is over," says Masao Kikuchi, IIMI's principal author of the study. And he adds, "to the extent that land is scarce in relation to

Table 1. Annual compound growth rates of rice production, area planted, and yield per hectare in Sri Lanka.

	Annual compound growth rates (%)		
	Rice production	Area planted	Yield per ha
1952 - 1960	7.2 (100)	3.2 (44)	4.0 (56)
1960 - 1970	5.0 (100)	2.2 (44)	2.8 (56)
1970 - 1980	3.9 (100)	1.6 (41)	2.3 (59)
1980 - 1985	4.0 (100)	0.4 (10)	3.6 (90)
1951 - 1985	5.0 (100)	2.0 (40)	3.0 (60)

labor, the forces should be the same in all Asian countries."

Development of Rice Production in Sri Lanka

In carrying out the study, the author first sought to document the process of rice production in Sri Lanka. At the time of independence, Sri Lanka produced 40 percent of its rice requirement; by 1985, the figure had risen to 90 percent. By using new cropping technologies in combination with expanded irrigated area, domestic rice production increased six times. Answering how the increase was accomplished, says Kikuchi, "is almost synonymous to explain the process of irrigation development in the country."

The increase in rice production was due to increases in area planted to rice and to rice yield per hectare (ha). Specifically, the author says, the 5 percent annual growth rate in production between 1952 and 1985 was brought about by 2 percent annual increases in area planted and 3 percent annual increases in rice yield. The first came primarily in the development of new irrigation systems in Sri Lanka's dry zone — the irrigated rice area increased from about 250,000 ha in 1952 to twice that by 1985, almost all of which came from new major irrigation systems in the dry zone, located in the northern and eastern areas of the island. As Table 1 shows the contribution to production increases of new irrigated area and yield per hectare shifted towards the latter over time. By 1985, virtually all farmers were using new crop varieties, developed by the national agriculturual experiment stations and others, and were also using large amounts of fertilizer.

According to Kikuchi, irrigation development in Sri Lanka played a pivotal role in increasing total rice production by increasing the area planted and land productivity. But, its importance declined over time so that the contribution of higher yields exceeded 90 percent in the 1980s. That

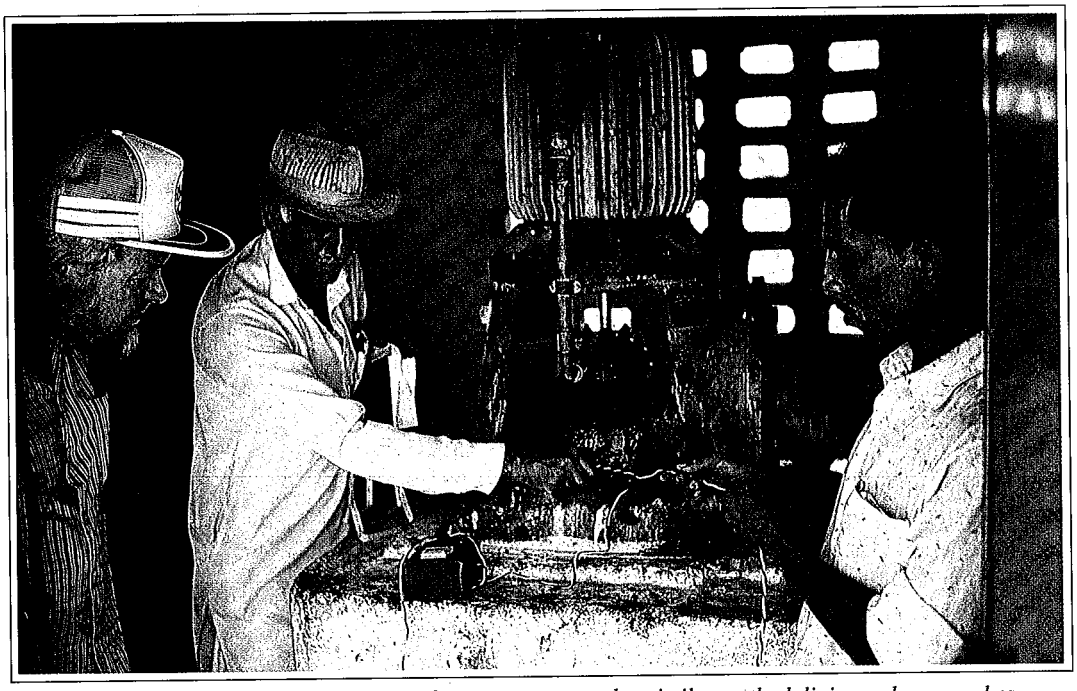
Table 2. Irrigation investments in Sri Lanka, by type of investment, in 1986 constant prices, and their share in the government budget and the total public investments, 1950 to 1988.[a]

	Irrigation investments				Share of the total irrigation investments[e] in	
	New construction[b]	Rehabilitation[c]	Operation and maintenance[d]	Total	Government budget	Total public investments
	Rs million in 1986 prices				%	
1950	907	-	34	941	8	37
	(96)		(4)	(100)		
1955	859	-	38	897	6	29
	(96)		(4)	(100)		
1960	601	-	121	723	3	19
	(83)		(17)	(100)		
1965	619	-	62	681	3	15
	(91)		(9)	(100)		
1970	994	-	78	1071	3	16
	(93)		(7)	(100)		
1975	1116	5	127	1248	2	13
	(89)	(1)	(10)	(100)		
1980	3023	225	137	3385	6	21
	(89)	(7)	(4)	(100)		
1985	2770	451	141	3362	6	18
	(82)	(13)	(4)	(100)		
1988	1676	299	89	2064	3	na
	(81)	(15)	(4)	(100)		

Note: a) Five-year averages centering the years shown.
b) Investments made for constructing new systems or restoring old abandoned systems. Only irrigation infrastructure related investments, such as tank and canal construction, are included.
c) Investment for major rehabilitation and modernizing existing systems.
d) Not including overhead costs such as personnel emoluments and administrative expenditures.
e) Ratios are obtained between the series in current prices.

System rehabilitation is gaining popularity over new construction.

suggests, say the authors, that the development of peasant agriculture in Sri Lanka has come to a turning point.



Research on irrigation technology and management employ similar methodoligies and approaches.

Trends in Irrigation Investment

In the next stage of the study, the authors, using government records, developed an irrigation investment series to devise hypothetical situations that could be used to determine irrigation investment variants. Public investments in the post independence period are summarized in Table 2, grouped into the three categories of new construction, rehabilitation, and operation and maintenance (O&M).

Several important points emerged from the analysis, says Kikuchi. First, irrigation in general, and construction in particular, have been far and away the most important investment opportunities in Sri Lanka. Second, irrigation construction has dominated the three, indicating that the irrigation sector has been directed to attain a national policy goal of rice self-sufficiency by using more irrigated land. Third, investments in new construction have experienced three peaks, in the early 1950s, the late 1960s, and the late 1970s reaching into the early 1980s. The peaks and valleys in investment raise the question of why investment has not been on a sustained level and has fluctuated so dramatically.

Kikuchi says he first saw such fluctuations in a similar study he completed in the Philippines 15 years ago, with Y. Hayami. "The peaks were induced by rises in world rice prices," he says. "The first peak came with the food shortage right after World War II and during the Korean War, the second coincided with the 1965-66 famine in the Indian subcontinent, and the last with the worldwide poor harvest in the mid 1970s."

Another important point in the irrigation investment trend is the emergence of rehabilitation projects in the mid-1970s, which have increased in their share of investments ever since. "The trend represents a change in momentum in irrigation development," says Kikuchi.

The first major rehabilitation project in Sri Lanka, the Tank Irrigation Modernization Project (TIMP) was started in 1976, and was quickly followed by others. In addition, this trend was accompanied by a stream of projects aimed at improving water management of existing irrigation systems, the first being the Minipe Water Management Project implemented in 1978.

Last, the table shows that expenditures for irrigation system O&M as a share of irrigation

Table 3. Rates of return of irrigation investments in the 1980s: Comparison among new construction, major rehabilitation, and water management improvement projects, based on 1986 constant price estimation.

		B/C ratio	Internal rate of return (%)
I.	New construction:		
	The average for the 1980s[a])	0.8	9
II.	Major rehabilitation projects:		
	TIMP[b])	1.1	11
	Gal Oya	2.3	24
III.	Water management projects:		
	Kimbulwana	13.4	83
	Pimburettawa	7.4	77
	Nagadeepa[c])	-	-

Notes: a) For the technology level "new improved varieties; N=120kg" and the estimated construction costs.

b) The rates of return for this project are based on "would-be" benefits assumed in the project appraisal report. For all other rehabilitation and water management projects, the project benefits are based on the data that show changes before and after the projects.

c) For this project, no systematic benefit from the project can be identified.

investment has remained as low as 4 percent as late as 1980, despite the huge investments in new systems.

Determinants of Irrigation Investments

The study next tried to test certain theories. On the surface it would appear that the long-term investment trend, from 1950-1985, in new irrigation construction was induced by high economic returns. At the same time it was proposed that the cost of construction was increasing throughout the period as development moved from "easy" sites to more difficult ones. Thus, scientists theorized that irrigation infrastructure and emerging seed-fertilizer technology reinforced one another and became a mechanism for sustaining the profitability of construction, despite rising construction costs. To test the hypothesis, the authors estimated the rates of return to investments in new construction over the last four decades along with estimated benefit/costs.

"What we found," says Kikuchi, "was that returns on investment in new irrigation were high initially, and sustained thereafter by successive development of seed/fertilizer technology. Without that, the economic potential would have been exhausted 15 years after independence."

Further analysis of the data also suggested that ultimately, the social payoff of investments in new systems, was largely determined by the rice import price and its short-term fluctuations. "A high import price gives a direct impact to the government decision on investments in irrigation construction" by increasing the prospect of returns. But there was one more factor — the availability of foreign funds. The study was able to show a direct relationship between the availability of foreign funds and construction. "The last two peaks of construction investment," says Kikuchi, "and particularly the third, were created by donor countries; they too were influenced by the high profitability of investments."

Taking the analysis to its final conclusion, the authors found that decline in world rice prices, which hit rock bottom in 1986, and rising construction costs combined to make any new attempts at major irrigation construction economically unwise. Even in the event of a tremendous increase in rice prices, construction costs would still outweigh any possible gains. "There may be some spots where new systems can be built at low capital costs, though they will be projects of a much smaller scale," says Kikuchi.

The Bottom Line

In their final hypothesis, the authors theorize that irrigation development in Sri Lanka has come to a stage, given the massive investments in irrigation construction in the past, where greater profitability exists in investments aimed at improving and enhancing existing systems. To test the hypothesis, the study, using similar assumptions and techniques, sought to estimate the rates of return and benefit/costs of two completed rehabilitation projects and three water management projects. The results were then compared to rates of return of new construction investments in the 1980s as shown in Table 3.

"As we expected, the two major rehabilitation projects showed rates of return higher than for new construction," says Kikuchi. In particular, the Gal Oya project showed profitability rates equal to investments in new construction at the time of independence. On the other hand, rehabilitation projects are not ironclad investments. In the case of TIMP, the first such project in the island, a bias toward engineering and capital intensive changes and a failure to consult and include farmers in implementation, led to its poor performance. "It has given many valuable lessons to the rehabilitation projects that followed. Rehabilitation can be very profitable, providing there is a heavy emphasis placed on the management component."

More surprising was the economic performance of the water management improvement projects. Even with conservative assumptions used to evaluate project benefits, the Kimbulwana and Pimburettawa Projects yielded internal rates of return almost 10 times that for new construction projects. "It suggests that such projects have been terribly underinvested." There is one caveat. In the third case of Nagadeepa, there was almost no improvement or discernable return on investment. The difference, according to the author, was that in two success cases, minor rehabilitation investments accompanied the water management components.

The bottom line is that the big profits lie in water management projects, accompanied by small physical improvements. Unfortunately, that is easier said than done, because, says the author, "We know next to nothing, or at best very little, about what makes a water management project succeed or fail. There are no comprehensive principles."

Still, says the author, the Sri Lankan experience revealed in the study illustrates that economic potentials in Asia's irrigation sector lay in pursuing a management orientation.

(Continued from Prelude)

systems or new ways of farming in general. Do you agree?

Swaminathan: I believe that scientists must learn to translate pure research into technologies that farmers can readily adapt to site-specific challenges. Science is good, but you do need to involve the farmers from the beginning. He's tradition-bound and has been farming in the same way that his father has done and his father before that. But as I said, if you can show them that something will work, that it fits in with the culture, then we have shown, from the Green Revolution on, that farmers will change and adapt to new technologies.

IMPROVING THE INFORMATION BASE FOR IRRIGATION SYSTEM MANAGERS

If irrigation system managers are to make the best use of available water they have to have up-to-date information on agricultural and hydraulic conditions. This is especially true for irrigation agencies that operate demand-based systems where there must be an accurate match between available water supplies and short-term changes in crop water requirements in different parts of the system.

For a demand-based system to be effective, irrigation managers must have good information on the functional area of each tertiary block, the area under each crop type and the expected water requirement for each crop. This allows proper calculation of the water requirement for each block. The manager needs to know likely water loss in each part of the main and secondary canal system. There has to be effective discharge measurement capability at key structures throughout the system to ensure actual water deliveries meet, as far as possible, the target discharges for that irrigation period. A final requirement is a monitoring capability to assess whether the pattern of target discharges during each irrigation period provided the correct water conditions for optimal plant growth, and whether the delivery pattern was reasonably equitable.

Studies in Indonesia conducted by IIMI and the Department of Public Works under grants from the Asian Development Bank between 1985 and 1989 demonstrated significant differences between the data used by system managers in calculating irrigation demand at different points in the system, and the actual conditions. In conjunction with the World Bank project on Efficient Operation and Maintenance, IIMI assisted in developing and implementing a cost-effective program to upgrade basic information for system managers.

The objectives were to enable system managers to use their existing staff to undertake a series of periodic measurements of key variables using simple equipment as part of a long-term process to improve overall information on system conditions. The program was designed to be conducted within the existing resources of the department and to be sustainable into the future.

The first part of the program undertook an inventory of conditions in four pilot systems in West Java to determine the extent to which there was effective capacity to control and measure water in the main and secondary canal system. Two major findings emerged:

* only 75 percent of all gates were functioning sufficiently well to provide the required degree of control over water; in one system less than 50 percent of the gates were effective;

* only 50 percent of all measuring devices were functioning and, because one-sixth of all offtakes had no measuring device at all, discharges could be effectively measured at only 40 percent of the locations where measurements were assumed to be taken on a regular basis.

The second phase of the program carried out a series of periodic measurements to upgrade three other key components of the irrigation system: tertiary block areas, calibration of measurement structures and calculation of conveyance losses. Normally, one day a week was devoted to these activities to avoid disruption of other activities. In all cases, measurements involved irrigation inspectors, gate keepers and farmers in an effort to strengthen agency-water user relationships.

Tertiary Block Mapping

The most time-consuming part of this activity was mapping tertiary blocks to determine the overall area irrigated by each tertiary gate, to identify landholding boundaries of each farmer, to identify additional water sources used on a regular basis to supplement canal water deliveries and to determine which areas had been permanently lost to irrigated agriculture because of housing, roads and other nonagricultural uses.

Three primary findings emerged from these measurements:

* the area that can actually be irrigated was on average only 87 percent of the official irrigated area; one system was less than 80 percent;

* current tertiary block boundaries vary greatly from those recorded at the time of system construction, so that individual tertiary block areas ranged from 27 to 164 percent of official data;

* in many cases farmers used water from streams and drains to supplement canal supplies: in one system as much as 15 percent of the total irrigated area relied solely on non-canal water sources.

The maps resulting from this exercise proved of great value to irrigation inspectors. Previously, the irrigation inspector struggled to assess the area under each crop every 15 days

over an area averaging 750 ha, with average landholdings averaging only 0.4 ha, and with no maps at his disposal; as such, the best that could be accomplished was a rough guess at irrigation demand in each tertiary block. The base map, covered with a plastic sheet, provided a much easier way for the irrigation inspector and farmer leaders to walk through the area and sketch cropping patterns directly onto the overlay. This information was then used to make bi-monthly reports to system managers.

At system level, the managers quickly substituted revised tertiary block area into the forms used for calculating total system water requirements. In most cases these data had not been revised since the systems were first constructed or rehabilitated, often as long as 20 years ago.

Calibration of Measuring Devices

Because so many measurement devices were not functioning, the program decided to target structures of the greatest importance in implementation of an effective water distribution plan.

A total of 190 structures were re-calibrated and new staff gauges added where necessary. This selective program meant that after a total of about 10 days of measurements, spread out over five months, nearly 95 percent of all important structures could be used to measure discharge compared to 40 percent before the program started.

Methods used for calibration varied according to the size of canals and the hydraulic conditions: the most common method was to use portable flumes installed in the canal downstream of the gate being calibrated; in other cases the existing structure was checked using current meters. Portable weirs and float devices had to be used in a few cases.

Emphasis was placed on structures at the head of main and secondary canals, along secondary canals and at larger tertiary gates. The selection of the structures calibrated was based on the total area commanded by the gate and the existing administrative boundaries of the irrigation agency. It was deemed critical to develop good measurement capability at the boundaries between irrigation inspectors so as to allow system managers to check whether each irrigation inspector was using only the water allocated to him, and not depriving irrigation inspectors further down the canal system.

To complement the calibration program, forms used for recording discharges were modified to include a column for recording Delivery Performance Ratio. This ratio compares the actual discharge delivered to the target discharge and gives system managers and irrigation inspectors a quick way to check whether plans were properly implemented and where major deviations have occurred.

The training program also encouraged system managers to determine why deviations between actual and target discharges occurred: they were encouraged to ask whether such variations occurred because the plan failed to accurately assess local demand — in which case the irrigation inspector had to make local adjustments to the system-wide plan — or whether they resulted from inappropriate gate operations by agency staff or farmers.

Conveyance Loss Estimation

The final component of the program aimed at measuring conveyance losses in main and secondary canals. In the systems studied, system managers had never measured actual conveyance loss. In practice, system managers were obliged to use standardized estimates in transforming tertiary block water requirements into system level operating plans.

The program involved a set of repeated measurements in sixteen canal sections in the four pilot systems. This involved about two days of work per month so that losses could be estimated at a range of different discharges in the canal system in both the wet and dry seasons.

The program was designed to reflect normal operating conditions: the discharge into the canal system was measured, and then, taking into account travel time of water along the section, measurements were taken at each offtake along the study section. This method, while not necessarily the most accurate, avoided problems of ponding or disruption to normal operation of the system.

Results from this component of the program showed striking differences between what had previously been assumed by the system managers and actual conditions:

* three canal sections showed net increases in discharge downstream because of return flows, resulting in no conveyance loss whatsoever;

* conveyance losses in the remaining 13 sections averaged 23 percent, almost double what was assumed under standard guidelines;

* calculation of average percent loss per kilometer (km) proved to be a more useful and more consistent way of expressing conveyance losses, and could be easily used on existing forms for calculation of water requirements at system level: actual values ranged from 3 to 10 percent per km, with one canal showing losses of over 25 percent per km;

* there was large variability in conveyance losses between different canals in the same system, and there was a large decrease in conveyance losses as canal discharge decreased.

These results demonstrate the importance of actual measurements for system managers. The high variability makes it difficult to use standard estimates with any likelihood of precision, and managers were quick to grasp the utility of the data in development of modified operational plans for water allocation and distribution.

Cost

Assuming the first question asked whenever the program was discussed with senior officials would be "how much does this all cost?" detailed costs for all components of the program were recorded. Researchers assumed there was relatively little utility in developing such a program if it cannot be undertaken within the financial and staff capabilities available to the agency.

Overall costs for the mapping program including equipment and payments for labor inputs amounted to about US$4.70 per ha. In determining this figure, labor inputs by irrigation agency staff were not included whenever they were considered part of their normal duties, but small token payments were made to staff who were asked to undertake additional tasks, and to farmers who felt that they needed some recognition of their inputs.

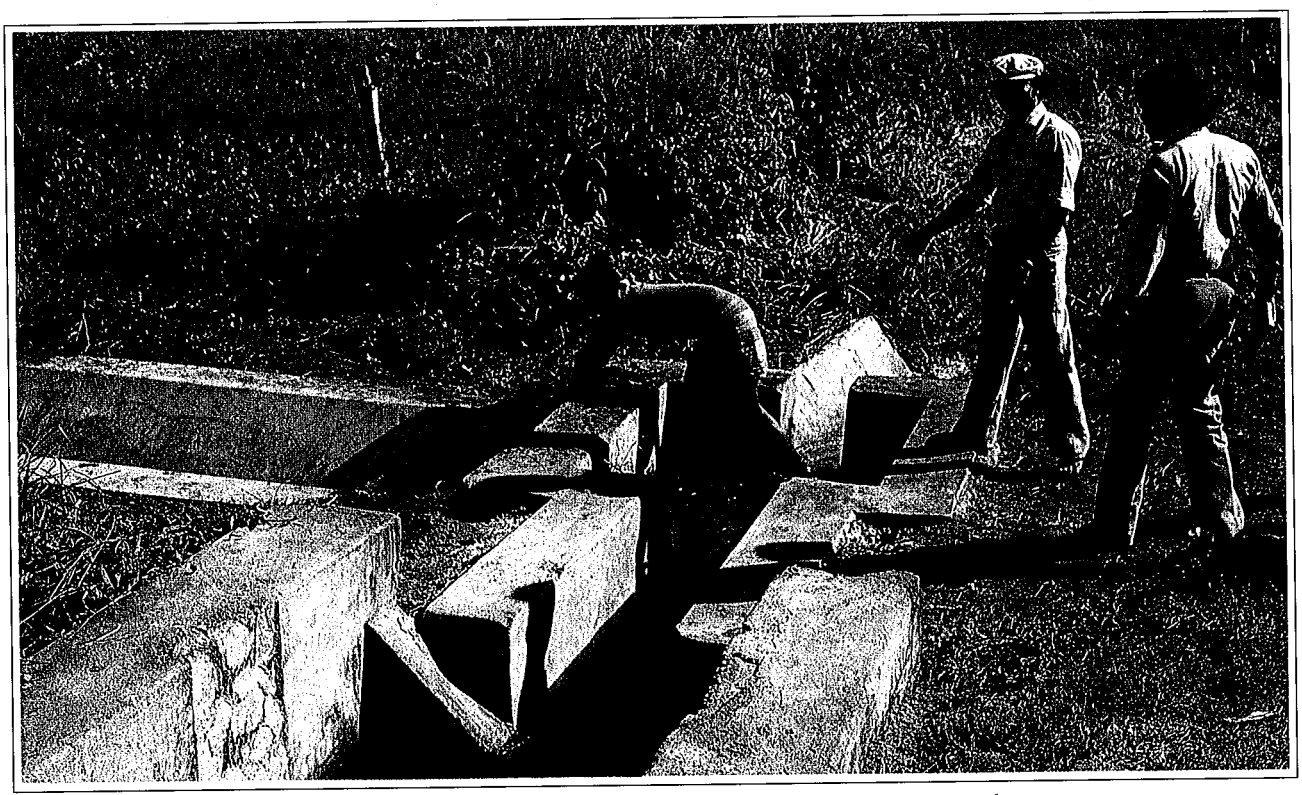
Given that the maps will be valid for some years, it is fair to estimate the annual cost of the mapping program to be on the order of US$1 per ha per year.

The calibration program had a fairly high net cost per structure, largely because of equipment purchases. Main and secondary gates cost about US$15 to calibrate, while tertiary gates cost only about US$8. However, if the calibration is assumed valid for as little as two years, then the annual cost is less than US$0.20 per ha. The main and secondary canal calibration program alone, ignoring tertiary gates, averaged US$0.04 per ha per year.

The conveyance loss program showed similar costs. The average for all 16 sections measured was US$0.25 per ha per year assuming measurements were repeated once every three years. Labor inputs accounted for about two-thirds of the total cost.

The annual recurrent cost for all three activities combined therefore worked out to be approximately US$1.50 per ha. There was also a one-time cost for training in the program of nearly US$9,000. However, this training program included all relevant agency staff in four systems covering nearly 15,000 ha, resulting in a one-time investment of about US$0.60 per ha. This would not need to be repeated in the foreseeable future because by the end of the six-month pilot program there was sufficient capability to continue the program.

To put these figures into perspective, current operation and & maintenance (O&M) allocations in West Java are approximately $7 per ha per year. This level is probably too low to allow proper O&M inputs by the Provincial Irrigation Department which estimates that an annual expenditure of closer to US$15 is actually required. If this level were attained, then the total cost of the program would not place an undue burden on the O&M budget. If the area irrigated rises by as little as 1 ha for each 125 ha served, the value of the increased production at 25 percent of current farm gate prices would well exceed the total annual cost of the program and its associated training.



The era of new irrrigation construction in Sri Lanka may be drawing to a close.

NETWORKS AS A RESEARCH TOOL

For researchers worldwide, forming and nurturing "networks" that link researchers in related fields are a vital and integral part of their work.

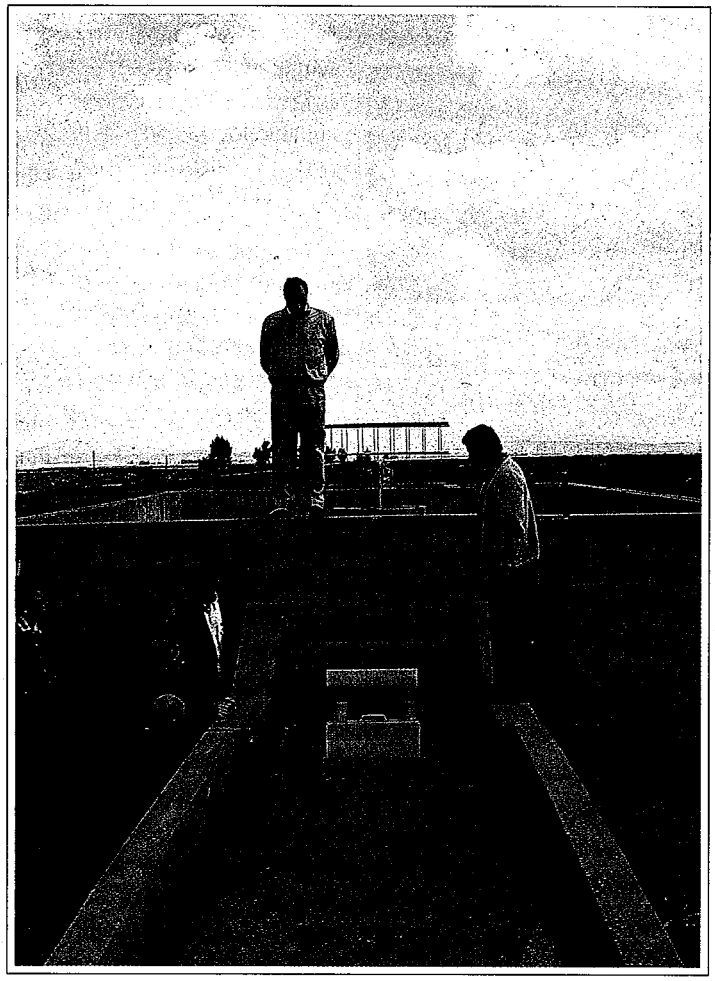
Scientists at the International Irrigation Management Institute (IIMI) are no exception. Since 1984, when the Institute was first chartered, IIMI researchers, in collaboration with donor agencies and other international researchers, have established two different networks and may soon start a third.

IIMI currently acts as the secretariat and coordinator for the Farmer-Managed Irrigation Systems Network (FMIS) and the Research Network for Irrigation Management for Crop Diversification (IMCD). The third network is now being planned for West Africa.

The FMIS Network has grown from just a few dozen scientists meeting in Thailand in 1987 to a group that now counts over 700 members in well over a dozen countries. The Network itself works to promote the participation of farmers in managing their own irrigation systems to improve productivity and increase incomes. The Network maintains contact with its members through the use of a newsletter and has just produced its seventh with another planned for late 1990. Headed by Shaul Manor as coordinator, the Network has held three workshops within the last three years in Africa and Asia on the roles of social organizers in FMIS, design issues in FMIS and most recently, FMIS in North and West Africa.

The Africa workshop, held in May 1990 in Rabat, was the first in Africa and was held to lay the groundwork for an FMIS Network in Africa. About 70 scientists from Asia, Africa, Europe, Latin America and the United States attended it.

Initiated in 1986 but with its real beginnings in 1988, the IMCD Network is IIMI's newest challenge. Under the leadership of Senen Miranda, the Network is holding its first progress review in December in the Philippines. So far researchers from eight countries will attend to discuss the Network's past and chart its future. Several moves by regional and national network scientists are also underway. The IMCD Network is still in its infancy and counts fewer members. The IMCD Network is working to promote crop diversification in irrigation systems originally designed for rice to alleviate the problems farmers face in years of low rainfall or in areas where irrigation for rice is unreliable. This network also maintains contact with its members through the use of a newsletter and has just produced its first with another tentatively scheduled for 1991.



Better irrigation management will increase the demand for more modern irrigation technologies.

According to Charles Abernethy, director of IIMI's Programs Division, networks serve to "internationalize research in one field where a breakthrough in one country may have applications in another."

"In the past, irrigation has tended to have a nationalistic tradition because people are familiar with their own systems in their own countries. There has been remarkably little interaction but networking has played a big role in bringing interaction about." But, Abernethy adds, "you still find that the majority of papers reference only work from their own country. We need to translate that into things that work for other countries."

"The good thing about networks is that as an information dissemination tool they can be used to compare cross-country experiences that may be similar or dissimilar and we can learn lessons from the comparison," says Senen Miranda, IIMI's coordinator for the IMCD

Network. "For an international organization such as IIMI, it provides an opportunity for various countries, through the network, to exchange information and to visit other countries which enable members to look at what's happening, what they can actually see and not just what's reported in a paper."

Without networks, Miranda says, "as an international institute we would be no different than a funding agency which sponsored projects not related to a common subject. Networking is something that should be actively done or you really don't have any comparative advantage."

THE NIA MOVES FORWARD ON DIVERSIFIED CROPS

With the recent inauguration of its new project headquarters building, the Diversified Crops Irrigation Engineering Project (DCIEP) in the Philippines took another step toward realizing its goal of promoting crop diversification in Asian countries.

The project, sponsored jointly by the Japanese International Cooperation Agency (JICA) and the Philippine government's National Irrigation Administration (NIA) began in 1987. The prinicipal objective is to answer why farmers continue to rely solely on rice as their main income-producing crop when other crops — grown in addition to rice and not as a replacement — could bring more money into the farm family.

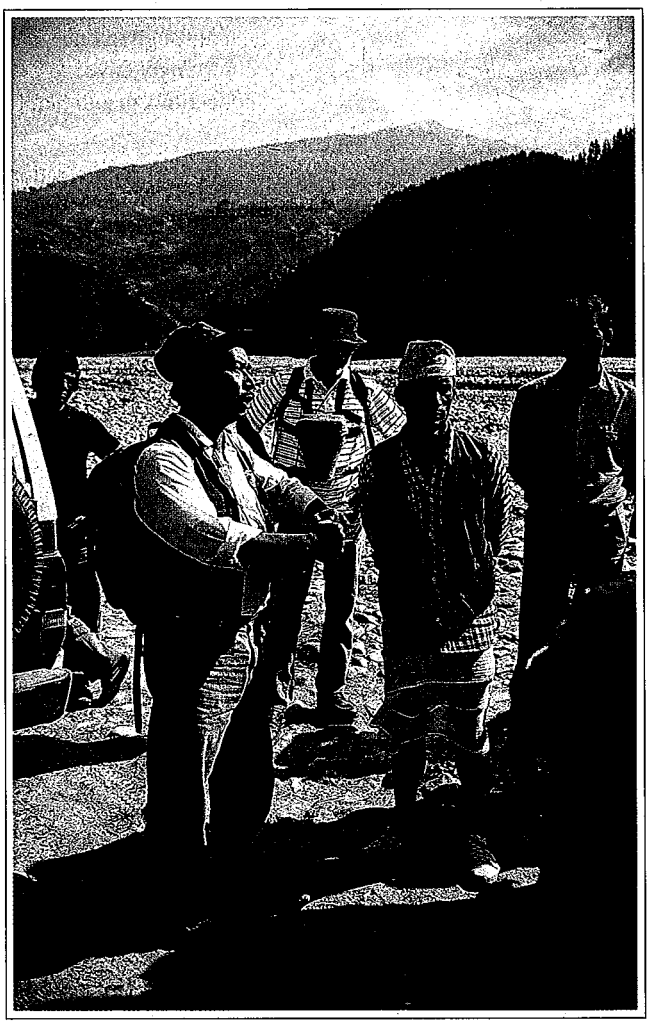
Some of the questions the three year-old project is attempting to answer:

* How much area within existing irrigation systems is suitable for upland and low water-demanding crops?

* Are the existing facilities in the irrigation systems adequate for the requirements of non-rice crops?

* What crops are suitable and, at the same time, profitable enough to attract farmers to shift from rice?

* Are operation and maintenance (O&M) personnel in the existing system capable of responding to the new stricter water delivery requirements?



IIMI's FMIS network brings together researchers from Nepal to Burkina Faso.

This project, the first of its kind at the NIA, is studying the most appropriate methods of providing irrigation to diversified crops, while at the same time attempting to establish design criteria for irrigation and drainage facilities for non-rice crops on irrigated rice fields. The project will also concern itself with the importance and potential of diversified crops to develop ways and means to more efficiently use available water resources. Technical training for NIA personnel also plays a part.

Along with those project goals, the DCIEP will produce a technical manual listing procedures and practices to be followed by engineers and other irrigation agency personnel involved in planning, designing, operating and maintaining irrigation and drainage facilities for crop diversification in existing NIA irrigation systems.

The new project site compound boasts a five-story headquarters building with a three-wing dormitory, library, soil and water laboratories, training rooms, offices and an audio-visual center. The dormitory can house almost 50 people.

"Thus, in essence the DCIEC will provide the hardware and the DCIEP will provide the software for crop diversification in irrigated areas," says Dr. Jose Galvez, the NIA's Assistant Administer for Systems Operations. "The center will cater to the needs of the project during its entire duration (it's set to expire in 1992). Then the NIA will continue to use the center for NIA functions related to DCIEP activities as well as to irrigation engineering, operation and maintenance and water management. Presumably the training facilities provided under

the project could also cater to the needs of other countries in Asia."

Since the project is a joint effort of Japan and the Philippines, Japanese experts will be deployed to transfer their knowledge to their Filipino counterparts. Other Philippine personnel will travel to Japan for their training.

One of the primary objectives of DCIEP is to provide a comprehensive training program and technology transfer to some 870 NIA field personnel. These trained personnel will then move to the field to promote crop diversification in their areas of responsibility. The training program is aimed at top field managers such as regional irrigation managers, project managers, operations managers, and department managers, mid-level managers and construction engineers. Other officials down the line will also receive training at the center.

"The project is a strong manifestation of the desire of NIA to promote adoption of non-rice crops in existing irrigation systems and to attain higher efficiency in water and land utilization," says Galvez. "It is also a way to increase the awareness of top and mid-level field managers on the importance of crop diversification on agricultural production and profitability."

PERFORMANCE ASSESSMENT FOR IRRIGATION

A new 10 year program to judge the success of global irrigation is taking shape at IIMI's headquarters.

IIMI recently received approval from its international Board of Governors to proceed with the planned program which will assess the performance of irrigation systems in both developing and industrialized countries.

The program was recently presented to the Institute's board. The 13-member board, which includes such notable figures as former US Secretary of Defense Robert McNamara and Board Chairman David Bell, said it would give IIMI its full support to help the idea become a reality.

In its resolution of approval, the board said:

"The Board of Governors accepts and strongly supports the Director General's proposal that IIMI should undertake a new, long-term program to improve procedures and practices in the assessment of the performance of irrigation systems at all levels."

The actual program itself will address in an integrated fashion both the supply of and the demand for performance assessment methodologies in developing countries for enhancing the performance of irrigation systems.

The program's features include:

* A global review of existing procedures and practices on performance assessment in both industrialized and developing countries.

* The identification of the main deficiencies in existing practices and of the need for improved procedures.

* The formulation of new and improved techniques for performance assessment.

* The promotion of field experiments to test the practicability and validity of improved procedures and the promotion of the application of improved procedures and practices on a worldwide basis.

The program also calls for the setting up of a "Global Assessment Task Force" which will include the best minds in the world concerned with irrigation. Close collaboration is also called for among IIMI and agencies concerned with the performance of irrigation systems. These agencies include national research organizations, operation and policymaking bodies, international agencies such as the United Nations Food and Agricultural Organization (FAO) and the International Commission on Irrigation and Drainage. Regional and international lending organizations will also be an integral part of the task force.

The program would initially extend over a four-year period. The target will be to have developed and field-tested new procedures in several systems and to have disseminated the results though a wide network by 1994.

Stop Press

Director for Research

IIMI's Governors have appointed Mr Khalid Motadullah to the newly created position of Director for Research. Currently General Manager (Planning) of the Water and Power Development Agency (WAPDA) of the Government of Pakistan, Mr Motadullah has served in various leadership positions in Pakistan, including that of Principal of the WAPDA Academy at Tarbela, and has been recognized internationally through his association with the International Commission on Irrigation and Drainage. Mr Khalid Motadullah has a Masters degree in Civil Engineering from the Massachusetts Institute of Technology and has received advanced management training at the Harvard Business School. Mr Khalid Motadullah will take up his duties early in 1991.

The Director for Research will oversee all of IIMI's research programs, and have specific functional or advisory responsibility for all country-specific projects conducted by IIMI's country operations, in addition to executive responsibility for all thematic/global programs, whichever their division of implementation.

Malaysian Irrigation Expansion Leads To Training Needs Assessment

With the planned improvement and expansion of irrigation in Malaysia, the government's Department of Irrigation and Drainage (DID) realized the need for increasing its training programs to more effectively increase irrigation capacity and management. The DID invited IIMI to join its efforts to review existing Malaysian training programs, a first step in the necessary task of identifying the knowledge, attitudes, and skills necessary to improve the managerial performance of the DID staff working in the irrigation sector. In collaboration with the DID, IIMI performed a Training Needs Assessment (TNA) during late 1989 at two sites in Malaysia.

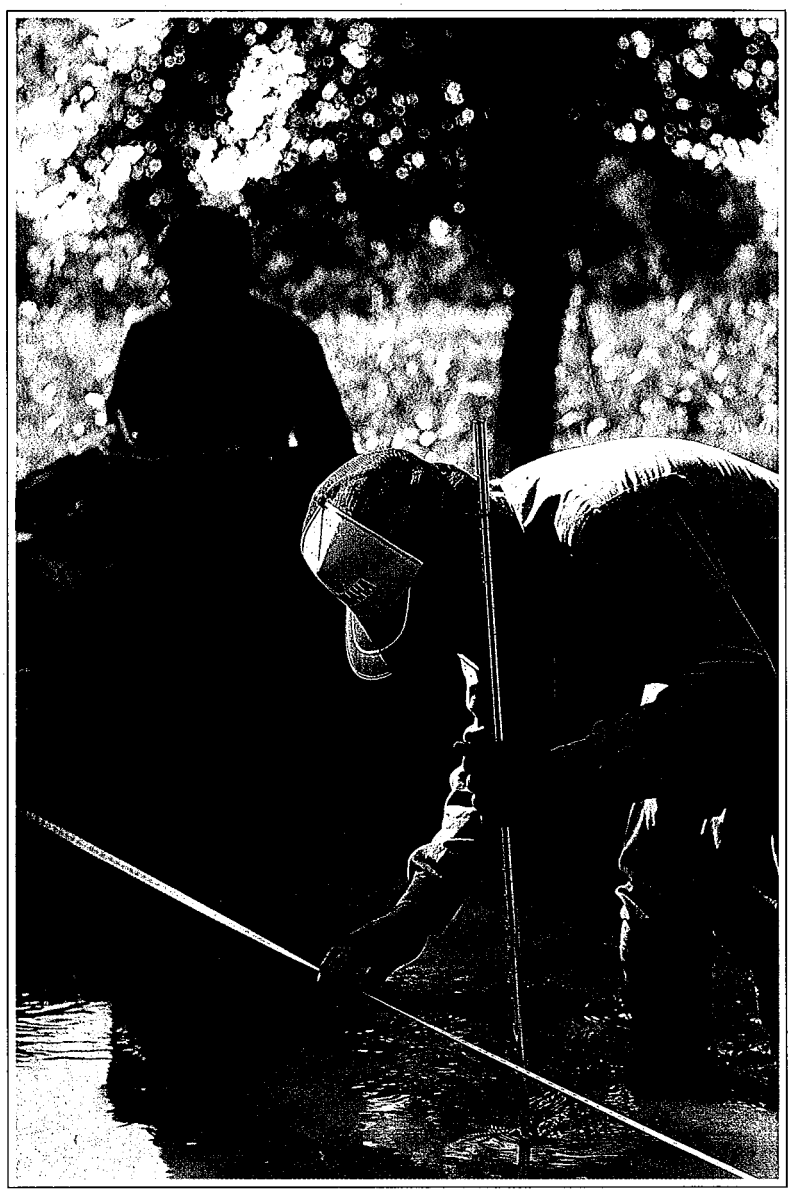
The TNA's main objective was to identify factors affecting the performance of individual DID personnel and to develop solutions to any problems found. To achieve this, the TNA, headed by IIMI's Zenete Franca, identified several secondary objectives which ranged from reviewing the concept of irrigation management and the distinction between management and technical activities, to identifying current and future performance standards for personnel.

The DID is a specialized Malaysian government agency under the direction of the Ministry of Agriculture. Established in 1932, it is responsible for land and water development with particular emphasis on the use of those resources for rice production. Malaysia's main irrigation focus in the past has been in eight large-scale granary areas, but in 1984, a new National Agricultural Policy was established to provide guidelines to policymakers on the long-term development of the irrigation sector.

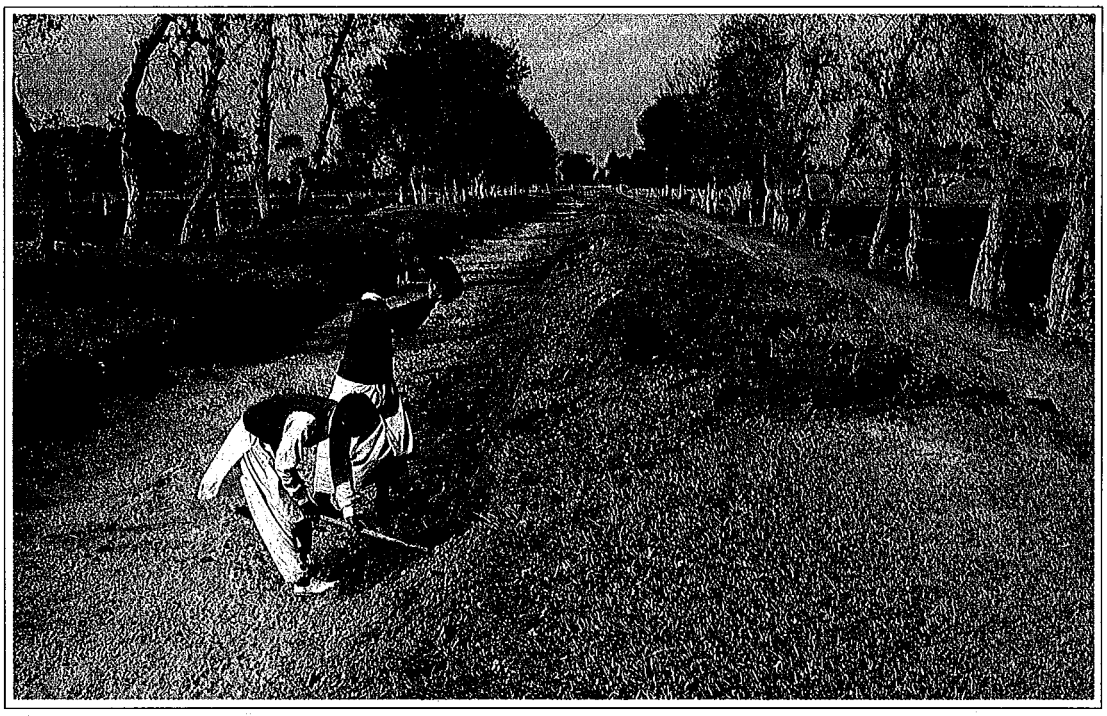
According to Shahrizaila Bin Abdullah, Director General of the Department of Irrigation and Drainage, "further investment in irrigation infrastructures will continue in the granary areas," thus leading to the need for increased management skills.

The TNA exercise also included a job and task analysis, the identification of managerial knowledge, attitudes and skills required to perform tasks as well as any knowledge gaps. The study also attempted to establish priorities in training needs.

With 321 DID staff attending, Franca sought through the training to get staff "to discover the human side of themselves and realize the strength in working as a team." And, she says "people should not be afraid to ask questions."



IIMI plans to undertake a long-term program to develop methodologies to assess irrigation performance.



IIMI expects to further expand its program in Pakistan in 1990-91.

Too often, Franca says, "top managers have to save face and are hesitant about asking questions which will not motivate people. You tend to develop 'apple polishers,' people who only want to please the boss and are afraid to ask questions."

The TNA canvassed the entire range of irrigation personnel in Malaysia. The sessions were attended not only by top managers, but also by technical assistants, technicians, irrigation inspectors, irrigation overseers as well as researchers, and trainers. The sample represented 28.6 percent of all the DID personnel directly involved in irrigation work.

Conducted through the use of group techniques to facilitate interaction and enhanced participation, the participants divided into groups according to their jobs. A senior irrigation management specialist presented the analytical framework for irrigation management and discussed with the participants the distinction between managerial and technical activities.

"One of the best things to come out of this was the participation of all the managers and workers," says Franca. "Many people, for the first time, felt that they could have some input into the work of the organization. The top managers saw that participation from those below them could help their organization and realized that giving their employees a sense of the directives of the organization — what it's trying to accomplish — is one of the keys to motivating people. They learned that they have to talk with their people and communicate more."

According to Franca, and other participants, the results of the TNA were better than expected. Many of their conclusions should enable the DID to increase its training and thus, increase that country's irrigation management capabilities.

"The main thing affecting the performance of individuals at the DID related either to training or to organizational constraints," Franca says, adding that "the concept of irrigation management and the distinction between the technical and managerial aspects of irrigation activities were not clearly understood by the participants before the TNA exercise was held."

Other problems identified included a lack of performance standards and expected competence levels of or for particular jobs and gaps in managerial knowledge.

"Organizational constraints such as political interference, limited budgets and some farmers' inability to follow schedules were also identified," says Franca.

Franca and her team developed recommendations for the DID, including improving job descriptions and personnel evaluations, developing long- and short-term training programs based on knowledge gaps identified during the TNA and developing of a human resources department for the DID.

"We hope," says Franca, "that these types of improvements in training will help them understand better how to approach farmers and help them to recognize that how you approach someone and present your knowledge have a positive or negative effect on what you're trying to do."

PUBLICATIONS

RECENTLY PUBLISHED TITLES

IIMI Review, volume 4 number 1

John L. Colmey (Editor)
March 1990. 24p. A4. Softcover.
ISSN 1012-8318X.
Available on subscription. Price per volume (2 issues) US$15.00.

This issue of the *Review* contains a series of articles on irrigation management issues in India, and coverage of management training, along with an interview with Mostafa Tolba, Executive Director of the United Nations Environment Programme on the world's environment and water management.

Farmer-Managed Irrigation Systems Newsletter, number 7

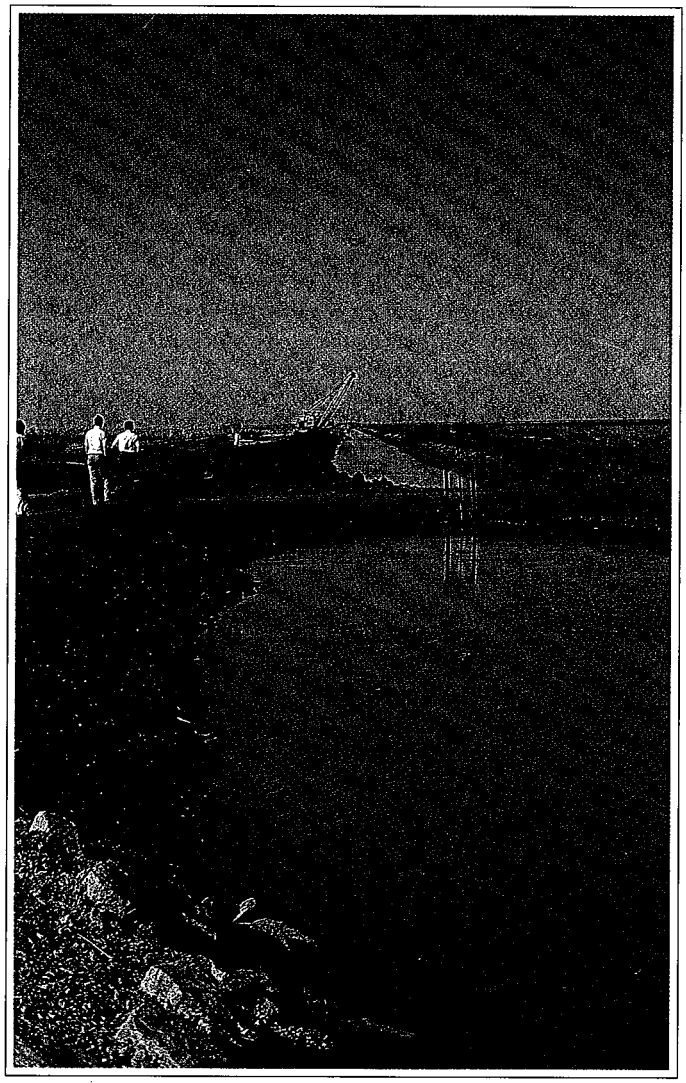
Shaul Manor (Network Coordinator)
August 1990. 24p. A4. Softcover. ISSN 1012-988X.

The FMIS Newsletter contains information and stories dealing with Farmer-Managed Irrigation Systems in Nepal and several other countries as well as recent information on the latest FMIS Network Advisory Committee meeting held in March 1990 in Kathmandu, Nepal. A list of publications and planned workshops is also included in the planned quarterly publication of which this is the seventh since the establishment of the Network. Dr. Shaul Manor acts as coordinator for the FMIS Network. IIMI acts as the secretariat for the Network.

Irrigation Management for Crop Diversification Newsletter, number 1

Senen M. Miranda (Network Coordinator)
August 1990. 20p. A4. Softcover.
ISSN 1016-7927.

This is the inaugural edition of the IMCD Newsletter which contains news of interest to the Research Network of Irrigation Management for Crop Diversification in Rice-Based Systems. The Newsletter contains information on crop diversification efforts in Malaysia and also a brief report on the IRRI-IIMI Collaborative Project working in the Philippines, Thailand and Indonesia. Dr. Senen M. Miranda acts as coordinator for the IMCD Network. IIMI acts as the secretariat for the Network.



A multi-faceted program of research is expected to get underway soon in Sudan.

IMIN Bibliography: A Selected Bibliography on Irrigation Management, volume 3 number 1

Ramya de Silva (Editor)
1990. viii + 126p. Softcover. ISSN 1015-1680.
Free selectively on request.

A bibliography of selected documents entered in the Irrigation Management Information Network (IMIN) database. Publications and information from over 100 countries are indexed: monographs, conference proceedings, government publications, technical and research reports, dissertations, and journal articles. Chapters in books are included. The present issue covers acquisitions in 1989.

International Irrigation Management Institute
Irrigation Management in Latin America

1990. xii + 96p.
Softcover. ISBN 92-9090-124-1.
Price US$13.50. US$8.50 (developing countries).
Also available in French and Spanish.

In Latin America, some 11 million hectares or 8.1 percent of the total arable area is classified as irrigated. Although the total extent of irrigated agriculture in Latin America is small compared to that of Asia and represents less than 5 percent of the total worldwide irrigated land, the potential for increasing the area under irrigation is great. Over the next few years IIMI will initiate collaborative programs with Latin American institutions to complement similar activities in Asia and Africa. The publication presents papers from seven Latin American experts describing the present

situation of irrigation management in their own countries in the wider context of overall irrigation management issues in the region and identifying problem areas and areas where the potential for improvement seems great.

Inge Jungeling
Improving Management of Small-Scale Irrigation Systems: A Possible Field of Assistance for Nongovernment Organizations? Experiences from Hambantota District, Sri Lanka

Sri Lanka Country Paper No.5.
1989. xvi + 64p. Softcover. ISBN 92-9090-122-5.
Price US$12.50. US$7.50 (developing countries).

This paper analyzes the contributions of a community-service oriented nongovernment organization (NGO) in improving management of small-scale irrigation systems in Sri Lanka. It documents the decision-making processes of the nongovernment organization and the context in which this decision making takes place. The study also examines contributions of other NGOs to irrigation development in the Hambantota District of Sri Lanka.

David Groenfeldt
Guidelines for Rapid Assessment of Minor Irrigation Systems in Sri Lanka

Working Paper No.14.
1989. vi + 38p. A4. Mimeo.

This paper presents a set of guidelines for rapid evaluation of an irrigation system developed by IIMI staff in cooperation with the staff of the Regional Development Division and the Badulla District office of the Integrated Rural Development Projects in Sri Lanka. It was compiled following a workshop on rapid-assessment methodologies suitable for minor (small-scale) irrigation systems held in August 1988.

Ijsbrand H. de Jong
Fair and Unfair: a Study into the *Bethma* System in Two Sri Lankan Village Irrigation Systems

Working Paper No.15.
1989. vi + 30p. A4. Mimeo.

Bethma is a traditional custom in small, communal tanks of Sri Lanka, where water supplies which are not adequate for the full command area are allocated to a part of the area, and all farmers are given proportional land shares in the irrigated part.

This paper deals with the rules that govern bethma, how farmers make use of them and the role of the government in bethma. It also addresses the questions: Why do conflicts happen less frequently during bethma? Why do farmers practice bethma? What are the farmers' perceptions?

Rathnasiri Ekanayake, W.M.U. Navaratne and D. Groenfeldt
A Rapid-Assessment Survey of the Irrigation Component of the Anuradhapura Dry-Zone Agriculture Project (ADZAP)

Working Paper No.16.
1990. vi + 46p. A4. Mimeo.

The focus of the Anuradhapura Dry-Zone Agriculture Project (ADZAP) in Sri Lanka has been to provide a viable farming system through careful development of local resources. The pre-project context of semi-shifting *chena* (swidden) agriculture was to give way to permanent, intensive cultivation of both irrigated command areas and upland plots. In addition, the project includes components for livestock development, rural roads, agricultural extension, and training and credit.

The report deals with the irrigation component of ADZAP which constitutes the greatest component cost and the dominant focus of the project. It is suggested that supplementary lift irrigation, that is, tapping groundwater supplied by the tank itself, could become an important feature of the farming system in the project area.

Rathnasiri Ekanayake and David Groenfeldt
Organizational Aspects of Improved Irrigation Management: An Experiment in Dewahuwa Tank, Sri Lanka

Working Paper No.17.
1990. vi + 38p. A4. Mimeo.

One of the incentives in improving irrigation management is to find ways of stretching water further during the dry season in water-deficit systems, when rice is relatively more expensive to grow than during the wet season, and when other crops which can be grown *only* during the dry season offer the farmer and the country a comparative advantage.

This report addresses the issue of irrigation management to promote diversified crops during the dry season. As Sri Lanka approaches self-sufficiency in rice production there is little logic in growing rice using land and water resources which could support higher-value non-rice crops, using less water.

M.H.S. Dayaratne and Gamini Wickramesinghe (Editors)
Role of Nongovernment Organizations in the Improvement of Minor Irrigation Systems in Sri Lanka: Proceedings of a Workshop held at Digana Village, Kandy. Sri Lanka. 17-18 March 1989

Working Paper No.18.
1990. viii + 56p. A4. Mimeo.

An inherent feature of nongovernment intervention in minor irrigation schemes is the continuous involvement of beneficiary farmers to create a sense of ownership of the system by farmers which ultimately reduces their dependency on outside assistance. The Government of Sri Lanka has encouraged these assistance programs as operation and maintenance of minor irrigation systems have become a heavy burden on the government. These proceedings present experiences of importance to government organizations that are directly involved in minor irrigation work.

Ranjanie Moragoda and David Groenfeldt

Organizational Aspects of Improved Irrigation Management: Kalankuttiya Block, Mahaweli System H, Sri Lanka

Working Paper No.19.
1990. viii + 28p. A4. Mimeo.

IIMI's research interest in Sri Lanka's Mahaweli System H, in general, and the Kalankuttiya Block in particular, was prompted by the existing widespread adoption of non-rice crops during the dry season. By studying a case of diversified cropping "success" IIMI hoped to better understand the irrigation management factors underlying that success, and if possible, to improve on them.

This report addresses the issue of irrigation management to promote diversified cropping during the dry season.

Shyamala Abeyratne
Rehabilitation of Small-Scale Irrigation Systems in Sri Lanka: State Policy and Practice in Two Systems

Sri Lanka Country Paper No. 6.

1990. xiv + 58p. A5. Softcover. ISBN 92-9090-123-3.

Price US$12, US$6.50 (developing countries).

This case study is a valuable contribution to the literature on assistance for farmer-managed and particularly small-scale, irrigation systems, and the lessons drawn are relevant not only to Sri Lanka, but to other countries as well.

This paper analyzes the impact of a government program for irrigation system rehabilitation and improvement of water management, based on a study of two small irrigation systems in Sri Lanka. It examines critically the implementation of the rehabilitation of two small systems, one a reservoir system, the other a diversion or "anicut" system; and it raises questions about the likely long-term impact on the productivity and sustainability of the system.

International Irrigation Management Institute
Annual Report 1989

1990. 48p. A4. Softcover. ISBN: 92-9090-127-6.

Price US$9.50. US$5.00 (developing countries).

Kapila P. Vimaladharma (Compiler)
A Selected Bibliography on Small-Scale Irrigation Systems in Sri Lanka

1990. 36p. A4. Softcover. ISBN 92-9090-132-2.

Price US$7.75. US$3.95 (developing countries).

A bibliography of available writings, whether published or unpublished, on minor irrigation in Sri Lanka covering such areas as assistance programs, water management, farmer participation, and system performance and management.

Masao Kikuchi (Editor)
Resource Mobilization for Sustainable Management: Proceedings of a Workshop on Major Irrigation Schemes in Sri Lanka held at Kandy, Sri Lanka. 22-24 February 1990

1990. Approximately 252p. B5. Softcover. ISBN 92-9090-133-0.

Price US$18.75. US$ 11.50 (developing countries).

The papers focus on institutional reforms that are seen as a prerequisite to effective mobilization of sufficient resources for sustainable management of irrigation schemes. They analyze the impediments to high-performance system management within the irrigation management agencies and the direction in which reforms must move to bring improvements and identify broader policy issues and recommendations that are very important to the whole change process underway.

FORTHCOMING PUBLICATIONS

Shaul Manor, Sanguan Patamatamkul and Manuel Olin (Editors)
Role of Social Organizers in Assisting Farmer-Managed Irrigation Systems: Proceedings of a Regional Workshop of the Farmer-Managed Irrigation Systems Network held at Khon Kaen, Thailand. 15-20 May 1989

1990. Approximately 152p. B5. Softcover. ISBN 92-9090-128-4

Price US$13.50. US$7.50 (developing countries).

The successful and often impressive experiences in Farmer-Managed Irrigation Systems in many countries in Asia have prompted the development of a number of programs in various countries with the purpose of accelerating this process. Implementing these types of systems is generally accomplished through the fielding of "social organizers." Social organizers serve as intermediaries between the farmers and the agencies. The community-centered, farmer-motivated social organizers have made a significant impact on sustainable irrigation system management.

This regional workshop proceedings documents the experiences of practitioners and researchers from nine countries in South and Southeast Asia, emphasizing the problems they encountered and their suggested solutions.

Robert Yoder and Juanita Thurston (Editors)
Design Issues in Farmer-Managed Irrigation Systems: Proceedings of an International Workshop of the Farmer-Managed Irrigation Systems Network held in Chiang Mai, Thailand. 12-15 December 1989

1990. Approximately 316p. B5. Softcover. ISBN 92-9090-101-1.

Price US$25.50. US$13.00 (developing countries).

In many countries irrigation systems have been built and managed by government agencies, but due to poor performance and high recurring costs, governments are seeking ways to turn over the operation and maintenance of the systems to the water users. However, the procedures and designs used for improving existing systems and building new farmer-managed systems are often not

appropriate when the end product is to be managed by the farmers.

This publication represents an effort to focus on design and the design process for farmer management, to give attention to the technical expertise of the farmers, and to highlight the necessity of incorporating farmer input into all phases of the design process.

Assistance to Farmer-Managed Irrigation Systems: Results, Lessons, and Recommendations from an Action-Research Project

Nepal Country Paper No. 3.
1990. Approximately 64p. A5. ISBN 92-9090-144-6

Price US$11.50. US$6.95 (developing countries).

This report highlights the results and lessons learned in an action-research project that developed and tested strategies for assisting 19 farmer-managed irrigation systems in a remote area of Nepal. Nominal assistance that enabled the farmers to improve both their physical irrigation infrastructure and their management practices was provided. User participation in identification of problems, setting priorities for physical improvements, and implementation of the assistance was compulsory. User participation brought many positive results, including the enhanced ability to operate and maintain the systems on their own.

The results and lessons drawn are based on continuous observation and documentation of field activities, project accounts, and reports from project staff, consultants, and farmers. Using the experience and lessons of the action-research project, recommendations have been prepared in the form of procedures to be followed for providing assistance to existing irrigation systems in a similar environment.

Publications may be obtained by writing to one of the following:
Distribution Section
Information Office
International Irrigation Management Institute (IIMI)
P.O. Box 2075, Colombo, Sri Lanka.

Telephones: (94-1) 565601 (12 lines)
Telexes: 22318 or 22907 IIMIHQ CE
Telefax: (94-1) 562919

In North America

Agribookstore,
1611 North Kent Street,
Arlington, Virginia 22209, USA.
Telephone (1-703) 5259430

and in Europe

S. Teoche Mittler Gmbh,
Triops Department,
Hindenburgstrasse 3,
D-6110 Darmstadt
Federal Republic of Germany.
Telephone: (49-6151) 311551

Publications are distributed free of charge to selected audience groups. Certain publications are offered free on demand; others will normally be distributed, subject to availability, free of charge, to institutions and individuals working in irrigation and related areas in the Third World. Publications are also available to readers on a sales basis; cheaper prices apply for selected third world Readers. The cost of despatch will be added to the prices indicated; sea mail will be used unless orders specify airmail (for which there will be an additional charge).

Please note that free copies (apart from review copies) may only be obtained from the Institute and not from sales agents.

IIMI enters CGIAR network

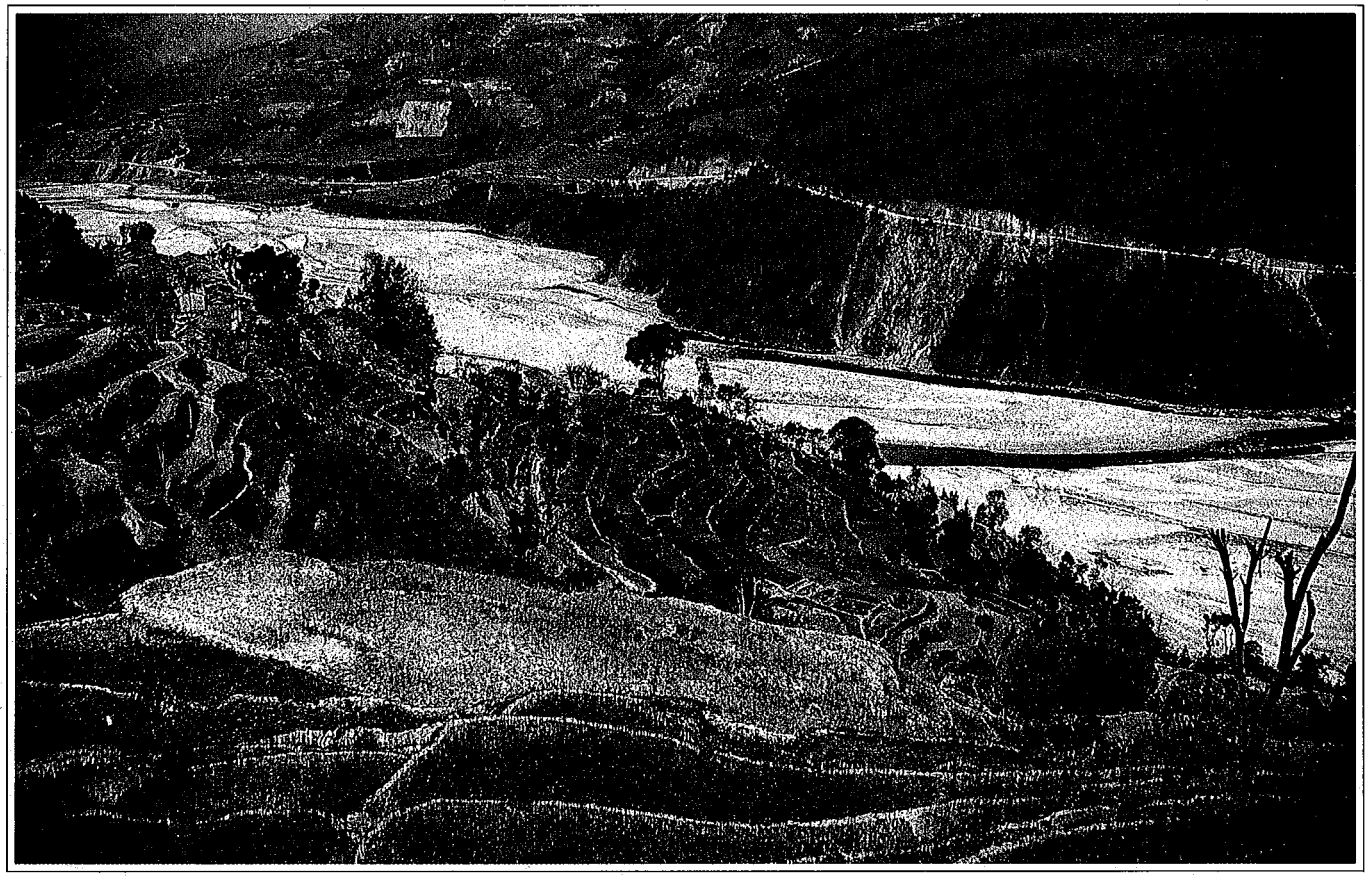
The Institute has been admitted to the prestigious CGIAR (Consultative Group of International Agricultural Research).

The "CGIAR" group is an association of over 40 governments, international organisation and private foundations such as the Rockfeller and Ford Foundations, established in 1971 to promote agricultural research and development around the world. Co-sponsored by the World Bank, FAO and the UNDP, the CGIAR now funds 15 research centres and so provides about US$250 million annually for food crop, livestock research and resource management in developing countries. The centres include IRRI (International Rice Research Institute) based in the Philippines and ICRISAT (International Crops Research Institute in Semi Arid Tropics) in Hyderabad, India.

"This development is of great significance, said IIMI's Director General Roberto Lenton. "IIMI's entry into the CGIAR system will create a much closer bonding with its peer agricultural organisations, as well as guaranteeing IIMI's development in the years to come due to the greater financial security inherent in being part of the CGIAR."

Currently, IIMI has a donor grant of US$8 million which is spent on development projects. In addition to a strong program in Sri Lanka, IIMI has 7 other offices in Asia and Africa.

The decision to admit IIMI to the Washington based CGIAR network was made after rigorous scrutiny of the institute's achievements since 1984 by an external review panel. The panel found IIMI's work had contributed greatly towards improving food sufficiency throughout the developing world.



IIMI

INTERNATIONAL IRRIGATION MANAGEMENT INSTITUTE
Postal address: P.O.Box 2075, Colombo, Sri Lanka.

Printed at Stamford Press, Singapore