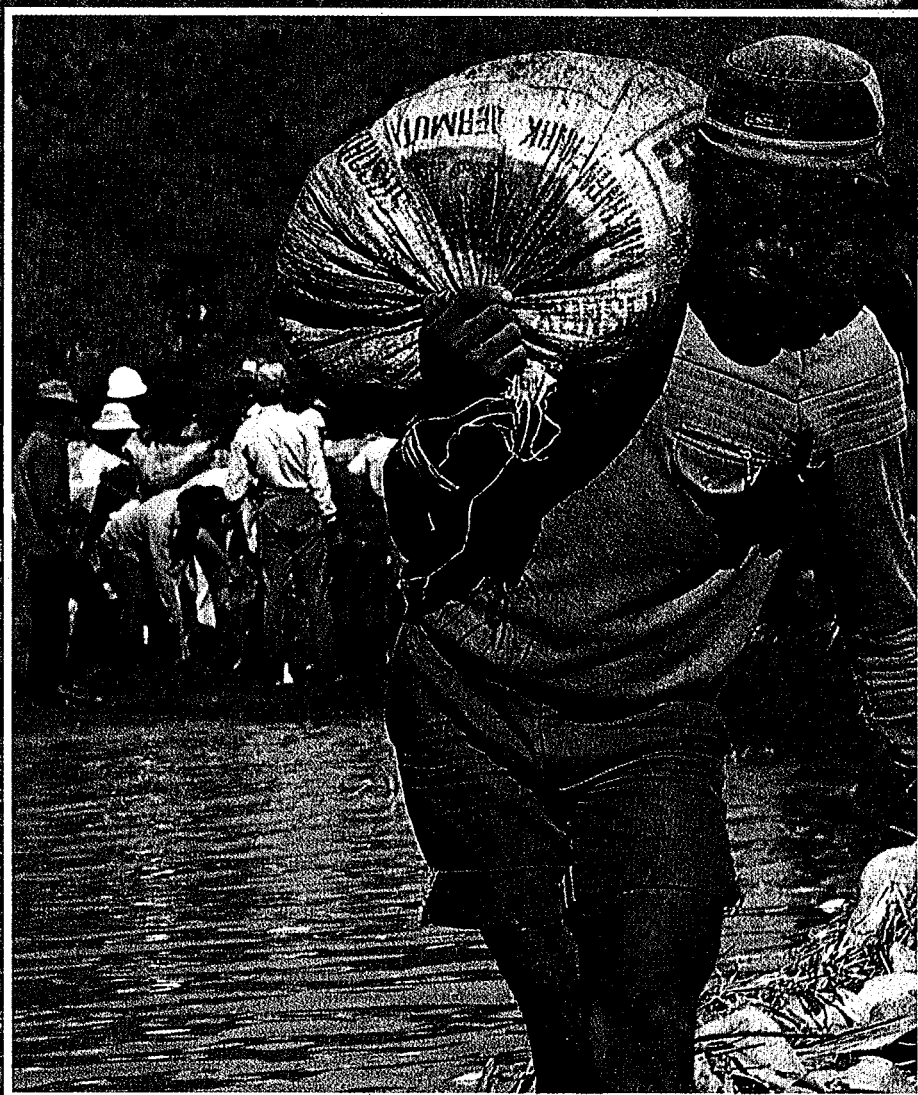


IIMI REVIEW

Volume 5 Number 4

November 1992



**Irrigation Management Turnover:
Structural Adjustment or Strategic Evolution?**

IIMI's Program on Local Management of Irrigation Systems

INTERNATIONAL IRRIGATION MANAGEMENT

CALENDAR OF IIMI EVENTS

November

- 30 November to 2 December —
Internal Program Review, Colombo,
Sri Lanka.

December

- 3 — Discussion on the Impact of
IIMI's Research Activities and Efforts
at National Capacity Building,
Colombo, Sri Lanka.
- 4 — Program Committee Meeting of
the Board of Governors, Colombo, Sri
Lanka.
- 5 — Full Board Meeting, Colombo,
Sri Lanka.
- 6 — Inauguration of IIMI's New HQ
Building, Colombo, Sri Lanka.

January 1993

- 4 to 6 — The Management of Irriga-
tion (Co-organized by the Inter State
School for Advanced Level Techni-
cians in Hydraulics and Rural Engi-
neering [ETSHER]), Ouagadougou,
Burkina Faso.

February

- 8 to 9 — Executive and Finance
Committee Meeting of the IIMI Board,
Manila, Philippines.
- 8 to 11 — Third Progress Review and
Coordination Workshop of the
Irrigation Management for Crop
Diversification in Rice-Based Irriga-
tion Systems (IMCD) Research
Network (Co-organized by the
Bangladesh Agricultural Research
Council [BARC] and the Bangladesh
Agricultural University [BAU]),
Dhaka, Bangladesh.

April

- 5 to 8 — Program Committee and
Board of Governors Meeting, Co-
lombo, Sri Lanka.
- 11 to 13 — Irrigation System Manage-
ment Research (ISM/R) Symposium
(Co-organized by the Government of
Pakistan and USAID, Islamabad),
Lahore, Pakistan.

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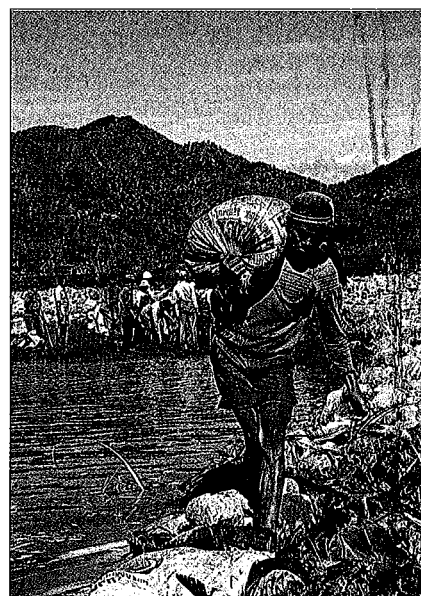
Director General: Roberto Lenton
Editor: Nargis Umagiliya
Layout: Kithsiri Jayakody
Graphics: D.C. Karunaratne

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For further information, please contact:

INFORMATION OFFICE
International Irrigation Management Institute
P.O. Box 2075, Colombo,
Sri Lanka.



*Farmers filling sandbags for
river diversion, Indonesia.
Photo: John Colmey.*



Africa — Farmers facing sudden need to take over management of components of large irrigation schemes.

Irrigation Management Turnover: Structural Adjustment or Strategic Evolution?

Douglas L. Vermillion, Irrigation Specialist, IIMI

Stakeholders

Early in the morning, Mr. Anwar picked up his hand hoe and satchel and was headed out the door when his wife called from the back of the house, "Why aren't you taking the children with you?"

"Because I'm going to the canal, not the field," he answered. "Transplanting will have to wait three more days. At the meeting last night all the farmers sharing water from the canal were told that the government will no longer clean the canal or distribute the water to the field turnouts. So we decided not to start the season until the entire canal is cleaned out. Maybe this

will mean we will get our water when we need it."

As he walked along the path he wondered if he would get a better crop as a result of the extra work. He also wondered if the more prosperous farmers at the top end of the canal would show up for the canal cleaning.

Mr. Helmi handed his boss, the Irrigation Supervisor, a cup of tea and said, "I've been taking silt, garbage and weeds out of the canal for you for ten years now. To supplement my pay, my family runs a small shop next to the canal. How can I send my daughter to school if I am discharged from the service?"

"Perhaps we can arrange to transfer you to work on the main canal," said the Supervisor, "where management is not being turned over to the farmers. Of course you would have to leave the shop behind," he said. "This could be difficult to arrange though, since we are supposed to cut back on staff and you are not a civil servant. Maybe the new farmers' association would hire you."

"I don't even know what's happening with my own job, you know. They want me to pass on the maintenance work and gate operations to the farmers. How am I going to do that?"

In a somewhat unsettling meeting with the Directors of the Irrigation and Agriculture Departments, Mr. Savas from the Finance Department explained the implications of the structural adjustment policy on their budgets. They would be cut. Some staff would have to be released or redeployed. Substantial agricultural subsidies and price supports would be history. Some sub-sectors, such as agricultural credit and irrigation management, must become completely self-financing. "Let's face it gentlemen," said Mr. Savas, "the

must be turned over to farmers, others will continue. The main canals of large systems need more intensive management. Future farmer-managed irrigation will need technical guidance and periodic support services.

"In fact, new needs are emerging. These include organizing and sustaining water users' associations, inter-sector river basin management and environmental monitoring and regulation. We must not see management turnover as "reduction" so much as "reorientation." Some staff

may be released, perhaps some can be transferred to the water users' associations, and some may be trained and redeployed for new roles. Irrigation will always be a vital part of the economy."

At the dinner table of a house in the city, the mother spoke of an article in the day's newspaper about something called "privatization" in agriculture. She wondered if it would mean higher or lower food prices. Perhaps there would soon be a greater variety of vegetables in the market to choose from.

What do these people have in common? They are all stakeholders with a personal interest in irrigation management turnover. They will all be affected by it but they are not sure how. They

do know it is coming. They see it as part of a broader pattern occurring all around them. The roles of the state in the economy are diminishing and the roles of the private sector — individuals, community groups, private voluntary associations, businesses — are multiplying.

What is "turnover?"

The word "turnover" is used in many countries, from Indonesia to the Dominican Republic. We define it to

mean, "the transfer of responsibility and authority for irrigation management from the government to non-governmental entities." It may or may not include transfer of ownership of irrigation system assets (which is the more precise meaning of "privatization").

There are many other terms used locally as well. In the U.S.A., where irrigation management turnover has been a policy for decades, it is often referred to as management "transfer" (as it is also in Mexico). In Peru, it is called "transition." In Senegal, it is "disengagement." In Sri Lanka, it is "participatory management." In Bangladesh, it is "privatization." In Nigeria, it is "commercialization." In Nepal, it is "joint management." In Australia and Niger, it is "self-management." In Indonesia, it is also called "handing over." In Colombia, it is also called "takeover" (emphasizing the farmers' perspective). In China, the gradual shift towards farmer-based canal committees and O & M contracts for "specialized teams" is related to the more general agricultural reforms involving "responsibility contract systems."

Some turnover programs focus on transferring management to farmers for small-scale irrigation systems, such as in Indonesia, Nepal, Senegal (for river water lift systems) and Bangladesh (for groundwater tubewells). Just as common are turnover programs to transfer management for distributary levels of large-scale systems, such as in India, Nepal, the Philippines, China, and Sri Lanka. Countries like Mexico, Colombia and Madagascar have launched national programs to turn over management to water users' associations and gradually federate farmer associations from field to distributary, and eventually, to main system levels.

It is easier for some countries to transfer responsibility for system maintenance than transfer authority over crop plans and water distribution. Transfer of authority may involve



Asia — Farmers invest in canal maintenance.

irrigation systems are too high a burden for the government to pay, and are under-performing even so. Maybe the farmers are ready to take over some or all of the management. Certainly the government is ready to privatize."

In a meeting with his deputy directors later that day, the Director of Irrigation explained his views.

"We must think positively about this and examine all the options. While some management functions

some loss of control by the agencies. It may require new openness about accounts, joint decision making, and mutual accountability for targets and expenditures.

In the late 1980s, Colombia declared a national policy of irrigation management turnover. The provinces set up national standard accounting procedures which determined unit costs for all aspects of O & M. This enabled irrigation managers, for the first time, to develop system-level budgets based on actual costs of management. This information was made available to the farmers' associations, that were paying irrigation fees. This "needs-based" budgeting served to reveal to farmers the actual cost of agency management. In a number of systems, farmers calculated what it would cost for them to take over the management and they decided they could do it more cost-effectively than the government. So they requested "takeover," which matched the government's policy to "turnover." In addition to these incentives, the government placed considerable emphasis on training farmers' association leaders.

Some countries, such as Senegal, Sudan and Nigeria, are not only shifting authority for O & M to farmers' associations but are also transferring the functions of providing agricultural inputs and marketing services. In countries as different as Australia and India, responsibility for developing capital replacement funds has been, or is being, devolved to farmers' associations. In Chile, ownership of irrigation system assets has been privatized into the hands of farmers' associations. Indonesia is currently reviewing this option.

Why do it?

Reasons given for embarking on irrigation management turnover are many. From economists we hear about "cost recovery," "cost-efficiency," and "cost-effectiveness." From planners we hear about "reallocation of

resources" and "financial and environmental sustainability." From practitioners or specialists we hear about "management performance," "water use efficiency," and "productivity." From farmers we may hear about the need for "local control," "lower water charges" and "greater profit potential."

There is a common string of logic which underlies most of the rhetoric surrounding turnover. The common argument is as follows:

Government bureaucracies tend to lack the incentives and responsiveness to optimize management performance. Farmers have a direct interest in sustaining the cost-efficiency, profitability, and physical condition of irrigation systems. Where farmers are not already paying for the full cost of irrigation O & M (which is the typical situation in many developing countries), turnover may increase the total cost which farmers have to pay for irrigated agricultural production.

However, improved cost-efficiency and management responsiveness will generate more than enough increased income to make up for the difference. Turnover will also save money for the government. The funds can then be reallocated to other functions which

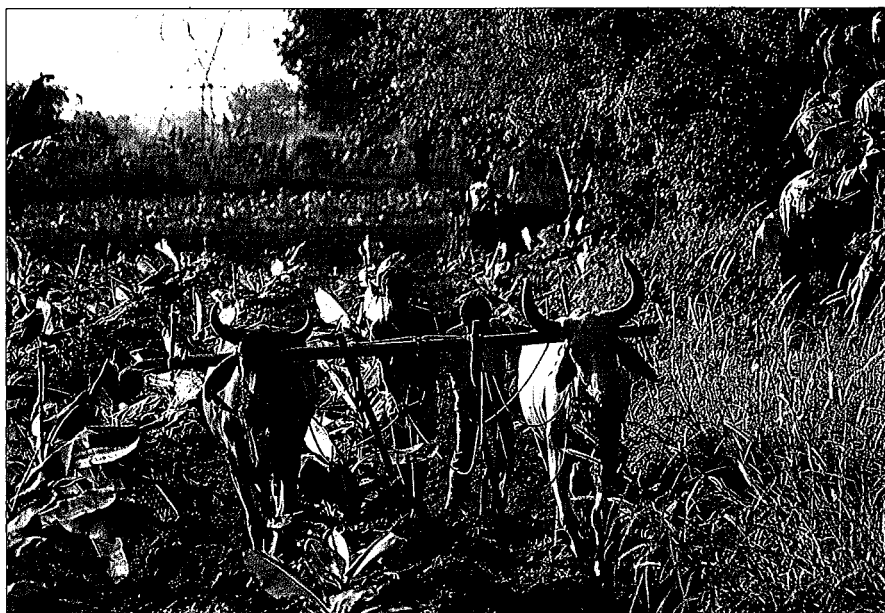
can not be handled or financed by the private sector.

Of course there are potential weaknesses in this logic. Common individual interests do not always aggregate to collective action, especially where considerable socioeconomic inequality exists. In some places, poorer farmers may not be able to afford additional costs for irrigation, especially where the price of cereal crops is already low. (A retort to this, however, is that greater management responsiveness will facilitate crop diversification.) In some economies, (even ones as different as Malaysia and Bihar, India) irrigated agriculture may be relatively unprofitable. Also, effective turnover demands strong local institutions, including clearly established water rights and conflict resolution arrangements. Where these do not exist, turnover may not induce the performance improvements anticipated.

And finally, the "string of logic" has little to say about equity. The emphasis is on sustainable productivity. How will management turnover affect the access to water and income of the poor, the less influential, or tail-end farmers? In some locations, local elites may capture even more control as a result



Sri Lanka — Men and women improve canals.



India — Will successful turnover depend on higher profitability of irrigated agriculture?

of turnover. (A retort to this, however, is that elites manipulate management as much or more before turnover and that turnover may actually make them more dependent on the less powerful. This is because they will need to share the costs of privatized irrigation with the less powerful. They will no longer be able to benefit from government-subsidized management.)

Management Challenges

Three things are clear from the debate. First, it is a debate (the issues are still largely unresolved). Secondly, turnover is happening in many places, with or without much debate — largely because of severe financial pressures. Thirdly, it is rather surprising how widespread turnover is despite the fact that the actual results of turnover, and the various approaches being used, are as yet largely unexamined internationally. This is a potentially serious problem in that management turnover could shape the nature of irrigation management and its performance over the next few decades more than any other management innovation. Perhaps more for financial than for ideological reasons, policymakers sometimes rush

ahead of prerequisite legal or institutional evolution. Policies are declared and sweeping programs are implemented, often without the benefit of strategic planning, experiments, and knowledge about approaches and results obtained elsewhere. Information is urgently needed about turnover methods and results in different countries.

Turnover may involve a host of complex issues, such as dramatic changes in the roles of the irrigation agency; changes in human resources tasks, skills and deployment; new autonomous institutions in complex social settings (often requiring hydrologic, rather than administrative, boundaries); a shift from direct, hierarchical implementation to indirect, service-providing; and a shift from a construction focus to technical guidance, regulation and institutional development.

Such changes would be a daunting challenge even for the most sophisticated experts in strategic management. Management of comparably complex changes in large corporations often involves such modern strategic planning methods as environmental scanning, corporate reappraisal of organizational objectives, scenario analysis,

responsibility matrices, resources needs assessments, and new information systems (Hanna, 1985). And yet most irrigation bureaucracies charged with formulating management turnover programs are administered by construction engineers, who often have little training in strategic management or institutional development.

There are pressures to treat turnover more as rapid adjustment than progressive institutional evolution. If it is to lead to sustainable and positive results, turnover will require more than policy enactments or "adjustments." It is a change which in most settings requires an evolution towards liberalizing the fundamental institutional environment of irrigated agriculture. Where this has not yet transpired, perhaps turnover policies should be more gradual and more focused on developing viable local institutions.

We hypothesize that if such far-reaching changes are not planned "strategically" (i.e., in a participatory, experimental, and analytical way) nor implemented progressively (as a gradual learning process), they are not likely to lead to a positive and sustainable result.

The following short case descriptions of management turnover illustrate the nature of the challenge in three very different settings.

BIHAR, INDIA: Turnover in Paliganj Distributary, Sone Command

On July 17, 1988 an old man approached visitors getting out of a jeep which stopped beside a structure along the Paliganj Distributary Canal. "Who are you?" he called out. "Why do you come here when you can't even deliver water to our fields?" Others came forward and joined in verbal assaults and threats. It was obvious that the level of discontent

among farmers about irrigation was near boiling point. A man from the jeep explained that he wasn't from the Water Resources Department. They were part of an Action Research Team from the Water and Land Management Institute in Patna. (Srivastava and Sinha 1991) They wanted to study the problem of irrigation in Paliganj and try to help improve the situation. He said he could not guarantee any improvement would happen, but said, "perhaps if we are sincere and cooperate with each other we can make an improvement."

The Paliganj Distributary has a command area of about 12,000 hectares (ha) in 76 villages, which affects a population of about 100,000 people. It is part of the Sone Canal System which was built in 1874 and has a command area of 700,000 ha. In 1989, fifty percent of the farm families in the Paliganj area earned less than Rs. 10,000 per year (approximately US \$ 526). About 30 percent of the population is landless, most of whom work as farm laborers, leaseholders or sharecroppers. Social tensions related to caste and land tenure are pronounced. This is considered a "socially disturbed area."

Partly because of the threatening situation, field operations staff of the Water Resources Department had, for some time, ceased to venture into the command area or go down the canal. Even jeeps of armed forces accompanying irrigation officers had been attacked by angry farmers. So they restricted their movements to only operating the head regulator according to a fixed rotational schedule. Upper-end farmers commonly breached the canal and blocked it with stop logs.

Agriculture is considered unproductive by many of the small-holder farmers, in an economy with few better options. It may be one of the most difficult environments imaginable to attempt to turn over irrigation management to the farmers, much less at the level of a distributary canal with a command area of 12,000

ha. It was an unlikely location for a pilot experiment if the selection criterion was to maximize chances for success.

The Action Research Team spent the first six months making measurements along the canal and waited for farmers to approach them. Eventually, farmers began asking what they were doing and the dialogue began. Over the next several months, a series of meetings were held in villages along the command area. Farmers voiced their complaints to the team and discussed possible options for change. Research and farmers' comments indicated that the main management constraint was not below but above the outlets, along the canal.

On March 17, 1989, a landmark meeting was held with farmer representatives and the Team. Farmers said that the canal was the government's responsibility, so why should management be shifted to them? A Team member frankly replied that the irrigation officials did not feel safe to come to the canal and that upper-end farmers were blocking and breaching it. He said to the farmers, "You must bear the harm or the benefit of the system, not the Water Resources Department." The Team suggested that they form a distributary canal committee and first focus on water distribution along the canal.

After this was done, the distributary committee began a process of organizing village-level irrigation committees, focusing first on the 20 villages transversed by the canal and which were most affected by water distribution. The village committees each had five to nine members (in principle representing different tenure and caste groups). One from each village committee was on the Paliganj Distributary Farmers' Committee, which had 35 members. It met every two weeks and was a new communications link between the villages. The Team originally called the meetings. Council officers were not selected for 15 months, in order to

avoid early conflict and develop trust and awareness between members. The meetings focused mostly on water distribution and agricultural activities around the canal command.

During an especially dry Kharif season in 1989 (June through November), lower-end farmers announced that because of drought they would soon have to cut the crop and feed it to the animals. When upper-end farmers realized the severity of conditions in the lower reaches (some making visits to the lower end for the first time), they arranged to close breaches and remove stop logs and set up a rotational arrangement along the canal. This set a precedent which continued, with the village-level committees acting as a conduit of information about crop conditions, crop plans, water shortages, and tampering with the canal. By now, irrigation officials were attending meetings and again interacting with farmers in the field.

In the Kharif season in 1990, an operational plan was discussed and approved by the distributary committee. Twenty farmer representatives monitored operations along the canal which became input to make modifications in the plan. During 1990, the distributary committee met 12 times. A walk-through of approximately 25 miles (40 kilometers) of the canal (which took five days) was done to identify needs for repairs. A maintenance plan was made based on priorities agreed in the committee. Irrigation officers participated in helping develop both plans. As a result, during Kharif, water reached 16 miles along the distributary canal (whereas in the past it had reached 10 miles at most). Figure 1 shows the difference in average monthly discharges reaching a lower-end measuring gauge for 1988 and 1990. In 1988 (before the action research), an average of approximately 16.7 percent of the total water entering the distributary reached gauge ten (approximately two-thirds down the canal) between July and October. During the same season in 1990, a monthly average of 21.2 percent of

the total canal water reached gauge ten.

In a recent meeting with some members of the distributary committee in July 1992, they proposed a plan to collect an irrigation fee from all members. The committee would keep 70 percent of the collection and give 30 percent to the Water Resources Department. They proposed that even collection of only one rupee per month per farmer would be sufficient to cover the costs of O & M for the canal (roughly 43 US cents). The farmers also wanted stronger legal registration and additional support from the government. Farmers have already started advising other farmers from neighboring canals about the advantages of taking over management.

This experiment, admirably attempted in a challenging environment, is in need of a larger strategic framework. Rather than occurring as part of an overall state policy and strategic plan, this action experiment arose as a locally induced initiative. To sustain it and encourage dissemination, a more systematic policy and comprehensive program will be needed at the state level.

INDONESIA: Small-Scale Irrigation Turnover Program

With the collapse of the oil boom in the mid 1980s, revenues of the Government of Indonesia shrunk enough to require a 50 percent reduction in the budgets of both the agriculture and irrigation departments. Numerous structural adjustment policies (SAPs) were adopted. The three main SAPs in the irrigation sector were the introduction of an irrigation service fee, needs-based O & M budgeting and small-scale irrigation management turnover. Pressures from the government and donors forced a rapid response from the Irrigation Department to develop and implement a nation-wide program to transfer management for all small-scale irrigation systems in the public inventory from the provincial irrigation services to water users' associations. The first wave of turnovers would be for systems below 150 ha in command area. The second wave would be for systems between 150 and 500 ha in size.



Indonesia — System repair precedes management turnover.

Since Indonesia has a large number of small-scale irrigation systems, all public systems below 500 ha in size constitute 70 percent of all public systems or 21 percent of the total design area for public irrigation in the country. Early in 1987, a national-level working group was formed, consisting of officers from the Directorate of Irrigation I, the Ford Foundation, a national NGO (LP3ES), and IIMI (IIMI 1989). Given a short time frame of less than a year, the working group was charged with the task of developing a viable process and work plan for implementing turnover throughout the country. Various rapid appraisals, workshops, brainstorming and planning exercises, and other consultative activities were held as the group moved towards identifying a process.

By early 1988, the turnover program had started in two provinces, in West Java and West Sumatra. By 1990, turnover had spread to seven provinces. The overall objective was to save funds for O & M from the small-scale systems to enable the

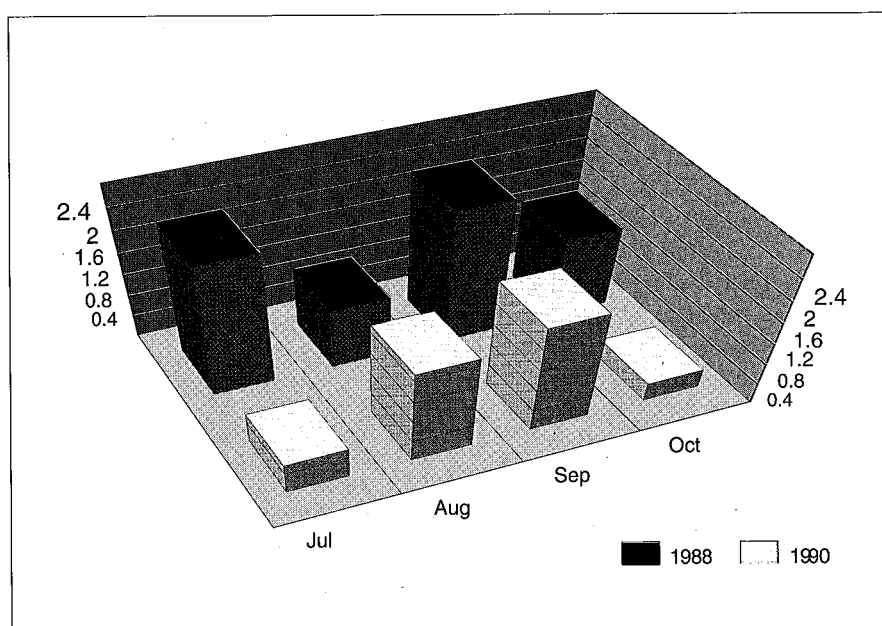


Figure 1. — Water reaching lower section of Paliganj Distributary Canal, Bihar, India, during Kharif season, 1988 and 1990.

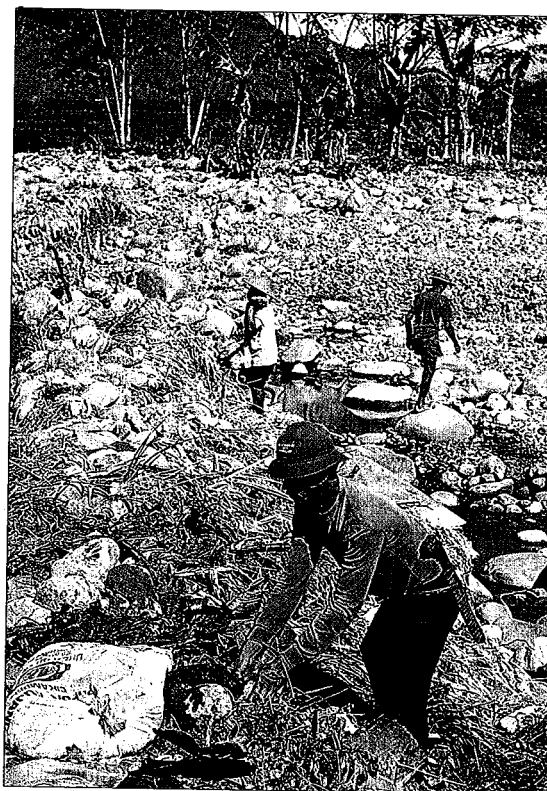
funds to be reallocated to large systems.

The turnover process involves six basic stages of implementation. First is a provincial-level survey of basic information on all eligible systems, based on existing records. This supports planning for implementation, training needs and budgets. Second, field inventories involving system walk-throughs and interviews yield information on existing management roles and on whether or not physical repairs are needed prior to turnover. Third, a detailed profile of each system is done by a trained irrigation officer, together with farmers, to plan institutional and physical system improvements needed before turnover. Fourth, needed system repairs are identified, prioritized and designed by farmers, with assistance from the irrigation service. Construction labor is performed by local farmers where possible. Simpler, low-management-intensity designs are frequently suggested and partly designed by farmers. Fifth, water users' associations are organized, training in O & M is given to farmer representatives, and O & M work plans prepared. The sixth step is official system turnover, which is expected to occur between 12 and 18 months after initial activities begin in the system.

In Indonesia, turnover is occurring in many small systems where the farmers are already doing much, if not all, of the management. Turnover often constitutes an official acknowledgement of what is already the reality. In other cases, new roles for gate operations and canal management are newly transferred to the users. Since the government could not afford to hire enough externally recruited institutional organizers for a national program, it opted to train existing field operations staff and assign them as organizers. The government provides an average of about US \$100 per hectare for system repairs prior to turnover. No local investment was required, except for participation in planning and training.

IIMI assisted the government in participation in national and provincial-level working groups, in process documentation research, and in economic analysis. It has been estimated that over the 15 years projected for implementation, turnover could save the government about Rp. 22.5 billion (in 1987 rupiah's or $\pm$ US\$13.5 million) in O & M costs for small-scale irrigation. A key objective is to reallocate this money to larger systems above 500 ha in size, in order to achieve the planned allocation of Rp. 25,000 ($\pm$ US \$15) per hectare per year for O & M budgets for larger systems. This is an average amount estimated as needed to make them sustainable. Figure 2 shows the potential budgetary effects of turnover in one section of the West Java Provincial Irrigation Service in Sumedang, West Java. In two stages, all of the funds previously spent on systems below 500 ha are transferred to systems 500 ha and above in size. Because of the large number of small systems and the small number of large systems in the Sumedang Section, reallocation of funds due to turnover will enable it to meet the Rp. 25,000 per hectare per year requirement for the large systems and have a residual left over (IIMI 1989).

Preliminary research during the early stages of implementation indicated that turnover was not having a general negative impact on performance of the systems and that considerable voluntary investments and labor activities were stimulated by the turnover process. However, considerable attention to construction overshadowed the need for more attention to institutional development and O & M training for water users' organizations. Further clarification is probably needed about the disposition of agency staff in systems after



Indonesia already has a tradition of farmer investment in irrigation.

turnover and about whether ownership of system facilities will also be transferred to farmers' organizations. As the program spreads rapidly, greater emphasis is needed on developing an effective information system and well-supervised management training.

Pressures for keeping ambitious construction, system turnover, and dissemination targets must be balanced with the overall strategic principles of the program — which are to follow participatory, physical and institutional improvement methods aimed at engendering a sense of ownership and responsibility among farmers.

Management Turnover in the Columbia Basin Project, USA

The US Bureau of Reclamation (USBR) is not without some similarity to water resources ministries in

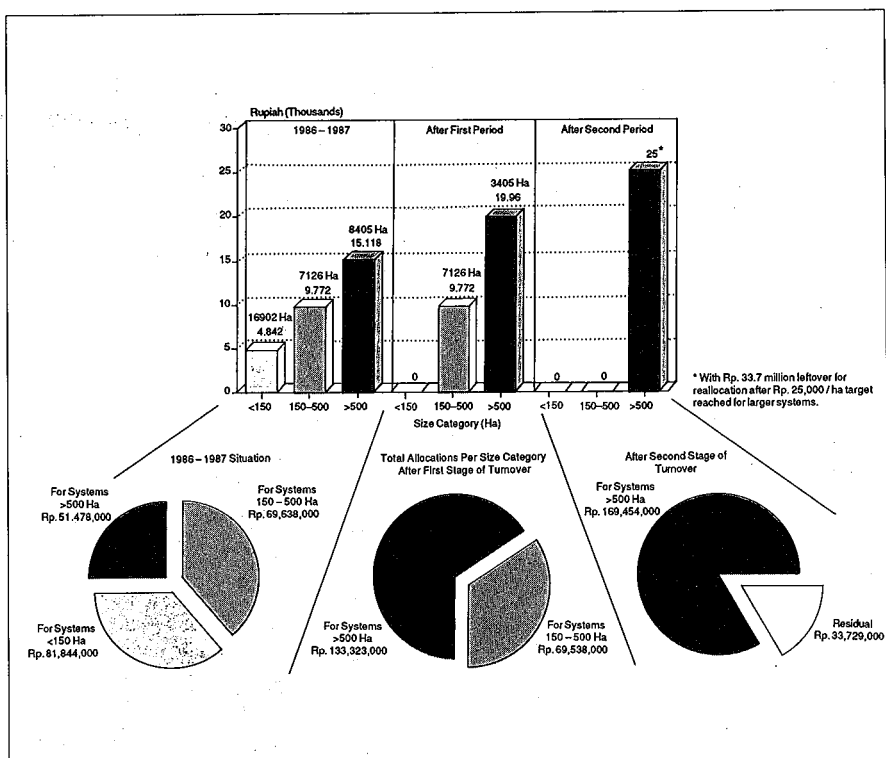


Figure 2. — Potential budgetary effects of management turnover in Sumedang Section, Indonesia (before and after turnover).

developing countries. It emerged out of a policy to expand irrigated area for the social welfare objectives of resettlement. The Bureau has heavily subsidized the true cost of irrigation water to farmers. It has been primarily a construction agency, with less emphasis on handling operations and maintenance. However, the Bureau differs from most counterparts in developing countries by its original mandate to transfer management for even large-scale irrigation systems to users' irrigation districts as soon as possible following construction. It also helps create water users' districts, negotiates construction repayment schedules for the farmers and seasonally charges users for the cost of water prior to delivery.

The Columbia Basin Project is a 557,528-acre irrigation system (225,626 ha) located in Washington State, USA. It extracts about 2.6 million acre-feet of water annually from the 500-foot high Grand Coulee Dam on the Columbia River. By 1986, US 1.687 billion dollars had been spent on construction of the dam, irrigation facilities, and the 6.5

thousand-megawatt hydroelectric power plant complex. The USBR negotiated construction repayment contracts with the irrigators prior to the first flow of water through the canals in the early 1950s. Irrigation fees pay for annual O & M costs, a capital replacement fund (equivalent to 30 percent of annual O & M costs), and 12 percent of the total construction cost (which is US \$1.06 per ha, to be repaid without interest over 50 years).

The Project has 2,026 miles of main, branch, and lateral canals and 7,000 turnouts, plus several thousand miles of surface and subsurface drains. Water application is mostly done by sprinklers. A large variety of crops are grown, including grains, vegetables, fruit, and hay. Agriculture has been relatively profitable over time, with gross value of output rising in real terms from US\$356 in 1960 to \$828 in 1989 (in 1982 prices).

After irrigation began in 1953, the irrigation component of the Project was managed by the USBR. The Bureau was interested in management

turnover because of its long-standing policy (dating back to 1902) and its lack of interest in dealing with thousands of farmers for O & M. The districts were interested in taking over management in order to gain local control over operations and policy and to ensure that management was cost-efficient (so that irrigation fees remained as low as possible).

In 1969, management for the main system and downwards was transferred to three irrigation districts (which are water users' associations). Several years of negotiating management and cost responsibilities between the districts and the Bureau preceded turnover. In contrast to the emphases on construction, farmer training and institutional development — which are typical of turnover programs in developing countries — management turnover in the Columbia Basin Project was characterized by extensive negotiations (involving lawyers on both sides), hydrologic and economic studies, and legal analysis. Key questions needing negotiated agreements included the cost and equity considerations of various transfer options, district realignments of responsibilities and boundaries, setting of maintenance standards and disposition of Bureau staff displaced by management transfer.

Staff displacement was the final obstacle to agreement. Two hundred and ten Bureau staff positions were abolished at the time of turnover, which occurred in 1969. More than 80 percent of these staff were transferred to the districts; others were transferred elsewhere in the Bureau or retired. Total Bureau Project staff declined from 841 in 1968 to 247 in 1970. The Power Division was transferred to an independent office in 1970. Bureau staff in the Project continued to decline after turnover, dropping to 83 in 1985 (Figure 3). In 1991, there were only seven O & M positions for the Project remaining in the Bureau. O & M was in the Irrigation and Land Division.

The districts were able to absorb many of the displaced staff partly due to their revenue-raising capability. The districts obtain revenue from irrigation fees (with a virtual 100 percent collection rate), excess water charges to members, water selling "service contracts" to non-members, and sale of hydro-electric power. Figure 4 shows the revenue composition compared to total expenditures of the Quincy District after turnover.

Each district has between 2,000 and 2,500 water users and elects a board of directors to oversee policy and guide district managers. Water is distributed on a "modified demand system," based on daily farmer requests subject to the constraints of supply, scheduling, and individual entitlements or willingness to pay excess water charges. Water delivery to farmers' fields are cut off for nonpayment of fees. Land titles are appropriated from farmers by the districts if the farmers fail to pay irrigation fees. Since turnover, the Quincy District alone has foreclosed and resold more than 20 landholdings due to nonpayment of water charges.

The Bureau was able to absorb much of the shock of turnover partly

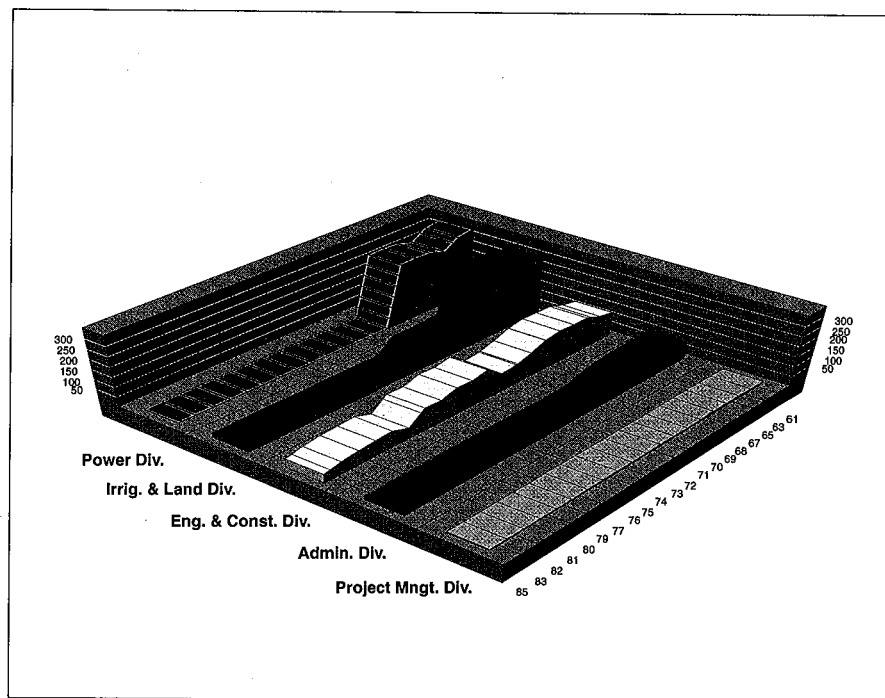


Figure 3. — Number of US Bureau of Reclamation Staff, by division, in the Columbia Basin Project, 1961 – 1985.

through its own reorientation. By 1970, the Bureau was severely cutting back on new construction activities and gradually working its way into new functions, including land management, regulation of wildlife and recreation and wetlands and environmental monitoring and regulation. Some staff displaced by

turnover were trained and shifted to other activities.

Data on the project suggest that management turnover has not brought about any significant drops in water use efficiency, agricultural productivity, profitability of agriculture, economic viability of the districts, or the basic physical sustainability of the system. The Bureau was able to divest itself of an unwanted burden and the farmers gained local control over a primary resource.

Some of the important factors in the success of turnover in the Columbia Basin Project were the strong legal institutions; the clear system of water rights; strategic processes of negotiation, research and legal analysis; rising profitability of agriculture; and multiple sources of revenues for the districts.

The three examples described above show the complexity of issues surrounding irrigation management turnover. It is not a kind of change which can be accomplished through rapid, high-level structural adjustment. It involves an evolution of multi-level

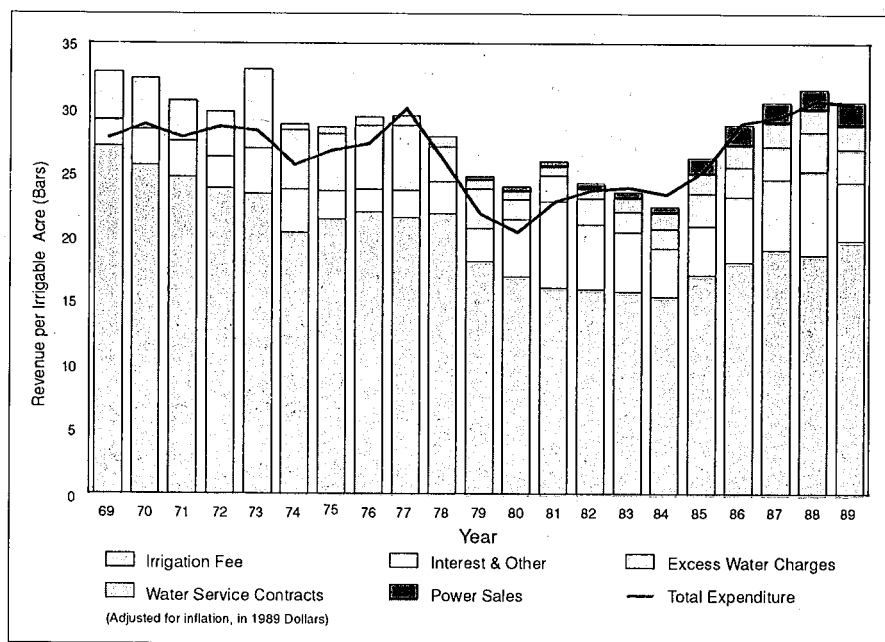


Figure 4. — Revenue per irrigable acre, Quincy Irrigation District, Columbia Basin Project, 1969 – 1989.

changes in financing, management, institutions, attitudes, and often technologies.

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IIMI'S PROGRAM ON LOCAL MANAGEMENT OF IRRIGATION SYSTEMS

There is much to be gained from learning about irrigation management turnover in different environments — particularly by policymakers and agency or farmer irrigation managers. Many are attempting to formulate turnover policies and implement programs in relative isolation from others who are involved in a similar process. Many countries are poised on the brink of reform but are inexperienced in how to move forward with the challenge.

One of IIMI's major programs concerns the transition to viable local management. It is conducting a reconnaissance of turnover policies and planning needs in several countries, a series of case studies, a few in-depth monitoring and evaluation studies, and strategic consultation with selected countries seeking guidance in formulating a turnover process. IIMI sponsors national and international workshops on the subject and facilitates exchange of information through publications and newsletters. This program is partially funded by the German Government (BMZ/GTZ).

One forum for exchanging information on this subject will be a series of Short Reports on Irrigation Turnover and Self-Management. A Short Report will briefly discuss the policy framework for a given case and will provide information on factors leading to the changes, planning and implementing arrangements and processes, perspectives of key stakeholders, and indications of results of the changes.

Important components of IIMI's program on Local Management are the special studies carried out in various locations in Sri Lanka, Nepal, Bangladesh, Nigeria, Sudan, Pakistan and Latin America. In Sri Lanka, a collaborative nation-wide assessment of the government's irrigation management turnover program for distributary canal management of large-scale systems (above 80 ha) is being carried out.

Any persons wishing to share information of interest on the subject of *Local Management of Irrigation Systems* or contribute brief articles to the *Short Report Series* are invited to contact Dr. Doug Vermillion, Program on Local Management of Irrigation Systems, IIMI, PO Box 2075, Colombo, Sri Lanka. These articles will have a maximum length of approximately ten single-spaced pages, plus charts and tables. To the extent possible, this Program will act as a clearinghouse for sharing information on this subject.

The Institute is monitoring field-level implementation of the turnover process, measuring the impact of the process on irrigation system performance and sustainability, and facilitating independent feedback to executing and planning agencies.

IIMI hopes to support a learning process which will address the following questions:

- ☐ How well are the distributaries and field channels, which have been turned over to farmers' organizations, being operated and maintained?;
- ☐ How well are the state agencies and farmers' organizations cooperating?;
- ☐ How effective are linkages between the project management committees and the Irrigation Department?;
- ☐ What factors constrain or support successful farmer-management?; and
- ☐ What is the impact of this process on irrigation performance and sustainability? In addition, IIMI is assisting the agencies to improve their systems for monitoring and evaluating the management of major irrigation systems and of the turnover program.

In Nepal, a research program has been conducted on the process of partial turnover of larger systems. It is about to conduct case studies on full turnover of small systems. IIMI will also assess the need for institutional support and training for water users' organizations and department staff and will be involved in continuing research, advisory and institutional

support services on management turnover.

The Institute has also embarked on an intensive research project regarding minor irrigation privatization in one of the least developed areas of Bangladesh. The program will monitor and assess tubewell irrigation equipment distribution, servicing and operation in the various districts of the northeastern part of the country. This is the site of the ADB-funded Northeast Minor Irrigation Project. IIMI will monitor and assess the performance of the market for irrigation equipment (including credit necessary for pump purchases) and for irrigation support services at the local level. The role of the Bangladesh Agricultural Development Corporation (long associated with the public provision of irrigation equipment) and other government agencies in the new local privatized market will also be examined. The management performance of selected tubewells is expected to answer questions on the efficiency and equity of privately supplied and managed tubewells. The focus of this study is at the pump command area and district levels, but the project will facilitate development of national policy and program guidelines for privatizing minor irrigation in Bangladesh. Another study on management of privatized tubewells by NGOs such as the Grameen Bank is also being done in 1992.

The main emphasis of the program initiated in Nigeria, funded by the Ford Foundation, is on management turnover of components of large-scale schemes of the River Basin Development Authorities in the north. IIMI is assisting the Government of Nigeria in developing and field-testing a viable joint RBDA-farmer management model in the RBDAs. Its initial task is to focus on the key Hadejia-Jamaare RBDA. Turnover methods and procedures developed will be refined and disseminated for

use in other areas of northern Nigeria. The Institute will help the government examine the implications for performance, profitability and sustainability of making the RBDAs financially autonomous and of turning over management of distributary canals to farmers' organizations. IIMI will gradually shift more attention in Nigeria towards private-sector, small-scale pump irrigation.

The Government of Sudan has decided to privatize small-scale lift irrigation along the Nile and to privatize some of the input and marketing functions in large-scale irrigation systems. It has announced plans to develop water users' associations to take over management below the distributary level. IIMI has been invited to participate in a working group on privatization policy formulation.

In Pakistan, IIMI is conducting research to compare management procedures and performance in public and private tubewell irrigation systems. It is also conducting a review with the government, of major policy and organizational change options, which include privatization and self-management.

An exploratory assessment of key irrigation management issues has been initiated by IIMI in Latin America. Irrigation privatization and turnover have already been identified as of utmost importance for research and development in Latin America and case studies are being planned in Mexico, Colombia, and Chile.

The findings derived from these special studies around the world are a critical source of information to better understand these issues at a trans-national level.

MANAGEMENT DEVOLUTION IN CHINA

Chinese economic reforms during the late 1970s and through the 1980s have devolved considerable economic power from the government. The reforms have led to dramatic institutional and management changes in the irrigation sector. Little is known outside China about these changes and their consequences. The application of the "Production Responsibility System" (PRS) to water management emphasizes management efficiency, incentives and profitability. Under the PRS, the common "Net Output Delivery Contract" system (*dabaogan*), permits a collective to lease land or agricultural capital to a third party, which in turn assumes responsibility for part of the collective's tax and commodity sales quota. Under the PRS, contracts for supplying agricultural inputs (including water) are given to third party service delivery organizations.

Different types of management reforms have been introduced under the PRS for large- and medium-scale irrigation systems owned by the **government** versus medium- and small-scale systems owned by the **collectives**. The revolutionary "Economic Contract Responsibility System" (ECRS) (*jingji chengbao zerenzhi*) has been applied to irrigation systems owned by collectives. The ECRS can be applied to an entire irrigation system or sub-sections of it. The rights to take over "means of production" or service delivery functions can be leased or sold outright to contracting water management organizations. Such contracting entities can be companies (*gongsi*), groups, joint households, households or even individuals.

Under the ECRS, the major part of the remuneration of workers in such contracting groups is linked directly to production or service output. The contract managers compensate the collective for their rights to the contract (which is somewhat similar to a franchise arrangement) and agree to perform specified functions. Such contract personnel generally have technical training and water management experience. Schemes are required to set up system-level budgets, fee collection systems and take all responsibility for profit or loss.

For the larger state-owned systems, the "Work Post Responsibility System" (WPRS) (*gangwei zerenzhi*) injects performance incentives into government bureaucratic organizations which are at the interface between administrative and resource management. In addition to fixed salaries, workers receive pay bonuses which are conditional upon attaining some measures of project output. For large government schemes, even the WPRS is generally considered as a temporary arrangement, eventually to be replaced by more devolved ECRS — as soon as economic conditions permit, which means "self-sufficiency with a surplus."

In the case of larger lift and gravity systems, contract companies are becoming increasingly important management entities. Although they are often staffed by former government water conservancy board employees, they represent privatized entrepreneurial units spun off from prior state bureaucracies. Some schemes (especially those which include extensive drainage and flood control components) are not fully self-financing because of the lack of income-generating potential for these components.

These institutional reforms have also brought about two new management innovations, one for irrigation fee charging and one for technology management. In the past, irrigation fees had gone into general government revenue accounts. This provided little incentive for collection and resulted in inadequate allocation of O & M resources back to the systems. Now irrigation fees are placed in system-level accounts. New water laws forbid use of water fees for uses other than operation and maintenance for the respective system from which the fees were collected.

The second type of innovation is so-called "Comprehensive Management," which emphasizes development of market-oriented enterprise activities to supplement revenues obtained through irrigation fees in system-level accounts. The idea of local financial self-sufficiency



Early indications suggest new forms of accountability can improve irrigation services.

is based not just on the production unit output per se, but on a potentially diversified and integrated entrepreneurial management system. This approach received central government sanction in 1985, when the government declared that all irrigation management entities should begin revising their roles from being management "undertaking units" (*shiye danwei*) to "enterprise units" (*qiye danwei*).

A great deal of variation exists in the new "entrepreneurial" institutional arrangements throughout China. Irrigation policy and management are generally province-level matters. Little is known internationally about China's experiences with irrigation management devolution. Mostly positive (albeit qualitative) reports are emerging about the effects of management devolution on the productivity, efficiency, profitability and sustainability of China's irrigation systems. In the near future, IIMI hopes to help stimulate research on irrigation management devolution in China through conducting collaborative case studies and a workshop. (M. Svendsen, IFPRI/D. Vermillion, IIMI)

ACCELERATED PRIVATIZATION OF IRRIGATED AGRICULTURE IN SUDAN

Many know that Sudan is a hot, arid country which is heavily dependent on irrigation. About one half of Sudan's food supply comes from its 1.9 million hectares of irrigated land, which feeds a relatively poor population of 25 million people. All of Sudan's wheat and 90 percent of its foreign-exchange-earning cotton come from irrigated land, as do much of its supply of sorghum, groundnuts, and vegetables. Some might think that because of its relative poverty, little is changing in Sudan.

What many do not know is that Sudan is, in fact, changing rapidly, both in its overall political economy and in the organization of irrigated agriculture. Economic liberalization and privatization of many public-sector enterprises is reversing the consequences of the 1968 nationalization of the economy (which is now blamed for stagnation and inefficiency). Government agencies involved in irrigated agriculture are rapidly shrinking, being divested, or even disappearing.

Parastatal agencies, which for many years have provided farmers with agricultural inputs and marketing facilities in such large schemes as Gezira and Rahad, are shrinking rapidly as their roles are turned over to profit-making companies and cooperatives. Increasingly powerful farmer tenants' unions are demanding more control over cropping decisions. Beginning in November 1992, the parastatal agencies under the Agricultural Ministry will turn over management of minor canals of the large schemes to the Ministry of Irrigation. Management for field canals will be shifted to the farmers.

Similar trends are occurring for pump irrigation schemes along the White and Blue Nile. In April 1992, the White Nile Agricultural Corporation, a parastatal agency, had

2,196 staff. By the end of August 1992, only 500 staff remained. All released civil servants go on pension. Many are searching for new jobs. All smaller schemes are to be under private management by the November 1992 season. There are two options: 1) self-management by farmers or 2) management by private holding companies. It is expected that management for the larger schemes will more "gradually" be taken over by commercial, profit-making companies. The White Nile Agricultural Corporation (WNAC) currently has an outstanding debt of 290 million Sudanese pounds, among 174 schemes along the White Nile. Ninety percent of the debt is with the farmers or tenants; ten percent is "management debts."

Farmers are eager for self-management but unsure as to whether they will be able to avoid contracts with commercial companies, or if so, whether they will be able to manage effectively without some assistance in the short run. Farmers are often not experienced in obtaining financing for

agricultural loans or marketing their crops. There have been virtually no efforts to organize them for management purposes (with the exception of a small pending IFAD-funded project in the northern Nile area). Farmers in pump schemes will be able to decide by majority vote whether they will manage their schemes directly or enter into contracts with private companies.

Farmers recently interviewed in White Nile pump schemes stated their desire to manage their schemes by themselves but were unsure whether they could obtain the credit necessary to do so. If unsuccessful in obtaining financing, they said they would be forced to seek contracts with commercial companies. If successful, they were confident they could boost production and income significantly. One farmer stated that his group was going to recruit their own "agricultural specialist" to assist them with financing, improving agricultural and water management practices, and marketing. When asked whether they would recruit a displaced WNAC

[Continued on page 17]



Rapid privatization of lift irrigation in Sudan.

MEXICO: MANAGEMENT TRANSFER ON A GRAND SCALE*

During the 1989 – 1994 National Plan period, the Mexican Government expects to transfer management of 26 of the 77 large-scale irrigation districts to water users' associations. Irrigation districts manage systems which exceed 1,500 hectares (ha) in area. The total area planned for management transfer during the period includes 2.17 million ha of irrigated land with 292,130 irrigators. This constitutes one-third of the total irrigated land in the country. Eventually all of the 77 districts (3.2 million ha) will be transferred to water user management. These 77 districts currently produce 30 percent of the total crop value produced in Mexico, on roughly 15 percent of the total agricultural land.

The National Plan states that under the transfer program, local associations (including either cooperatives or groups of private owners) "shall take over the operation, conservation and maintenance of water infrastructure." It states that the basic objective is to see that "irrigation districts shall be financially self-sufficient and administratively independent." The National Water Commission (CNA) is overseeing planning and implementation of the transfer program.

A key motivation for the transfer program is financial. In the early 1970s water fee revenues covered roughly 75 percent of the management costs of the districts. In 1989, the fees covered only about 15 percent of management costs. Authorities estimate that, in order to cover full O & M costs, annual water fees will have to increase to the peso equivalent of about US \$25 per irrigated acre, which would constitute about eight percent of farm-level cultivation costs.

The government expects to transfer management for districts to users' associations after system improvements are made, associations are organized and adequate levels of fee collection are reached. Local management will be federated from the lateral to main canal levels.

Considerable diversity in irrigated conditions exists around Mexico. In the Northeast, large-scale farms of about 19 ha each are common. In the Southeast, two-hectare farms are the norm. About 73 percent of irrigated land included in the transfer program are in the Northeast and Northwest parts of the country. Yaqui in the Northwest is one of the first districts where management has already been transferred to users' associations, which are federated up to the sectional

level. The associations are now purchasing water from district authorities, who still retain control at the district level.

The country also has 2.8 million ha of land which is irrigated by about 27,000 small- and medium-scale irrigation systems (below 1,500 ha in size). These are already under local management.

Mexico is rushing ahead with perhaps the single most ambitious irrigation management transfer program in the world. The next few years will be a crucial time to test the idea that such basic change can be achieved on such a grand scale in so little time. The rest of the world will be watching for the results and seeing what can be learned from the experience.

Future Trends of Southeast Asian Irrigated Agriculture: A Regional Synthesis

As part of a joint 5-year program in the region, IIMI conducted a workshop on "Irrigated Agriculture in Southeast Asia beyond 2000" in Langkawi, Malaysia from 5 to 9 October 1992. The event was sponsored by the German Foundation for International Development (DSE) and the International Irrigation Management Institute (IIMI), and co-sponsored by the Universiti Pertanian Malaysia (UPM). The workshop brought together a large number of participants drawn from national and international departments and agencies concerned with the future of irrigated agriculture in Indonesia, Malaysia, the Philippines and Thailand.

The workshop focused on the future of irrigated agriculture in a 20-year perspective, first at the country and then at the regional level. The discussions resulted in the formulation of a Regional Statement which defines two main areas of common concern for the region: first, adjustments of the public/private sector balance and relationships in irrigated agriculture and second, planning and management of water resources use.

The actions called for at the regional level, in regard to these two major concerns, lie in the areas of information exchange and networked research and involve the sharing and use of information and experiences from countries inside, as well as outside of the region.

**Much of the information for the above story was taken from a paper by Roberto Melville of the Universidad Iberoamericana in Mexico City, entitled, "Mexican Hydraulic Policy," presented at the Center for Latin American and Caribbean Studies, Michigan State University, July 29, 1992. — (D. Vermillion)*

Accelerated Privatization . . .

[Continued from page 15]

employee, they responded that they would seek for the most professional person they could find.

Contracts with private companies currently entail a 50:50 share system between farmers and the company. No such sharing of the harvest is done under the WNAC or under self-management, which has followed an individual account system. During the 1991 - 92 season, one scheme still managed by the WNAC obtained wheat yields of seven sacks per feddan (roughly one acre). A nearby scheme newly managed by a contracting

private company achieved yields of 11.5 sacks per feddan. But because of the share system, farmers only obtained a net income of three sacks per feddan in the high-yielding three schemes (managed by the private company), whereas farmers obtained a net income of four sacks per feddan in the lower-yielding scheme which was still managed by the WNAC.

Privatization is coming fast to the farmers of Sudan, without the benefit of phased institutional or infrastructural development and training. The outcome of these rapid changes is unclear, particularly for

social equity and local control over resources. Experience elsewhere suggests that development of viable local institutions is a prerequisite to sustainable irrigated agriculture.

With partial assistance from the Ford Foundation, IIMI is monitoring the effects of privatization of irrigated agriculture both in sample large-scale gravity schemes and in pump schemes along the White Nile. It is also facilitating review and discussion of the policy changes and participating in collaborative research, committees and workshops. (D. Vermillion/M. Shafique, IIMI)

TURNOVER: THE COLOMBIAN EXPERIENCE

Colombia is a country of 30 million people with an area of 1.1 million sq. km. The country is blessed with abundant water resources represented by more than 1,000 perennial rivers. Of the 6.6 million ha identified as having high irrigated agriculture potential (through provision of irrigation, drainage and/or flood control), only 11.4 percent or 750,473 ha have been developed. This consists of 525,869 ha under irrigation and 224,604 ha with drainage and/or flood protection facilities.

155,454 ha of land are irrigated by the public sector (including 22,652 ha developed for farmer management) while 370,415 ha are completely under private sector management.

The institutions of the public sector dealing with land development have been numerous and their achievements have been modest at best. To date, a total of 30 irrigation districts* have been built by the public sector. In the late 1970s, it became evident that the irrigation districts were facing serious difficulties. A lack of resources prevented the various institutions from

bringing these projects to completion. This was aggravated when the water users refused to pay for the inefficient services provided, which led to further deterioration of project facilities.

In 1976, the government decided to establish a new institute, the Colombian Institute for Hydrology, Meteorology and Land Development (HIMAT) which would be responsible for overall land development activities. HIMAT was instructed to supervise the transfer of the management responsibilities of the Coello District (44,100 ha) to its water users' association, ASOCOELLO. This was the first case of irrigation system turnover in Colombia, and one of the earliest in South America.

The turnover of the Coello District is generally viewed today as a success story, a rare early example in developing countries. Collection rates on water charges are at 100 percent and the district gets no help in financing its annual O & M expenses. Turnover has succeeded for several reasons: highly motivated and trained personnel, good management, regular

maintenance, adequate transportation and communication facilities, and the dynamism of the private farming sector and support services in Colombia.

Despite these good results, the turnover program came practically to a standstill in 1980. Colombia, like other countries of the region, was facing a deep recession and went through what was to be called the "lost decade." In many countries, severe financial pressures are driving turnover as a rapid adjustment. Contrastingly in Colombia, severe lack of resources actually prevented the agency from taking any new initiatives — because of the Colombian position that physical and institutional development should precede management transfer. Such development was temporarily unaffordable.

In early 1990, with the economic crisis receding, the RUT District (9,500 ha) was transferred to the water users' association, ASORUT. Since then, three more large districts have joined the turnover process: Saldana

*In Colombia, the terminology "irrigation districts" applies to areas provided with irrigation, drainage and flood protection works, either individually or in combinations thereof.

(14,049 ha), Rio Recio (10,374 ha) and Samaca (1,533 ha). Irrigation fees are generally based on actual system-level costs. The turnover program involves a strong emphasis on training water users' association leaders in technical, financial, and other managerial aspects of irrigation.

Preliminary assessment of the impact of the turnover process in the RUT system points towards similar positive achievements as experienced by Coello. Water distribution, maintenance, and crop production have all shown improvements since turnover took place. The present rate of water charges recovery stands at 100 percent, although this amount covers only 80 percent of the total O & M expenses. The RUT pumps its water from the Cauca River. At present, the pumping cost represents 25 percent of total expenses. This figure has been increasing yearly and projections put the percentage at 33 percent by the year 1997. The cost of pumping is now ASORUT's main

concern, since it could affect system performance in the long run. Other large-scale systems given over to farmers' associations have not been in their hands long enough to make any significant evaluation of their experiences.

Another turnover approach that the government is currently undertaking is the so-called "mini-districts" program. This program develops farmer-managed irrigation systems which have an average area of 70 ha. The projects are designed, built and implemented jointly by newly created associations and government agencies (which expect to recover up to 50% of the investment costs). The subsidies are justified on the basis of the small farm size of the intended beneficiaries. Some 20,000 ha under this new program are now developed. No evaluation of performance has yet taken place. Up to 80,000 ha represented by 850 "mini-districts" have been targeted for development over the next six years.

For the remainder of the century, the government is contemplating an aggressive land development program in which farmer self-management stands as a major component of the strategy. Both, HIMAT and existing Regional Development Authorities will be turning over irrigation districts to water users. A federation of water users' associations, Colombian Federation of Irrigation Districts (FEDERIEGOS), is already in place to act as a coordinator of turnover activities. A new Land Development Law has already been enacted by the government to guarantee funding of the program and provide legal support for enforcement of rules and regulations.

Turnover in Colombia can be considered relatively successful so far, and will be a major government policy for the foreseeable future in the context of irrigation development of the country. (Carlos Garces, IIMI)

ECOLOGICALLY SOUND RESOURCES MANAGEMENT IN IRRIGATION

The 10th International Irrigation Symposium scheduled to be held on 29 and 30 April 1993 in Berlin, Germany will focus on Ecologically Sound Resources Management in Irrigation. It is tied into the framework of the Wasser Berlin '93 Congress.

Conference topics include Ecology versus Economy in Third World Countries, Water and Sustainable Agriculture Development, Reactions of Water Management to Salinity of Soil and Water, and Managing the Interaction of Irrigation Systems with their Environments.

The event is organized by the German Association for Water Resources and Land Improvement (DVWK) and co-organized by the World Bank, Food and Agricultural Organization of the United Nations, International Commission on Irrigation and Drainage and the International Irrigation Management Institute among others.

The DVWK's mission is to promote water resources development and agricultural engineering, taking environmental aspects into consideration. Its tasks

include the evaluation of the latest scientific findings for practical application and the elaboration of recommendations for professional action in the fields of hydrology, hydromechanics, hydraulic engineering, water management, water quality control, soil protection, groundwater protection, agricultural irrigation and drainage. In carrying out its program of activities, the DVWK works in close cooperation with a large number of national and international associations, organizations and institutions involved in water management and related disciplines.

IRRIGATION MANAGEMENT TRANSFER IN NEPAL: OUTLINES OF A NEW POLICY

To date, it is believed in Nepal that many systems that were built by the government some time ago, have in fact been "turned over" to the irrigators by default due to lack of resources channeled to these systems by the government. On the other hand, the government would like initially to turn over management for small government irrigation systems that are 200 ha or less in area in the hills and 2,000 ha in the plains of the Terai region.

In 1989, The government initiated an action plan for the turnover program. In 1992, a revised irrigation policy was formulated to have the Irrigation Department implement turnover. The policy has the following provisions:

- ☐ The government shall not collect irrigation fees from systems after their turnover. The Water Users' Associations (WUAs) can themselves determine the rate of irrigation fees, collect them, and use them for operation, maintenance, and renovation of their own systems.
- ☐ In systems to be turned over, programs are to be developed to draft association constitutions and strengthen WUAs. Rehabilitation work is to be carried out only with the consent of the WUAs and with an agreement that future operation and maintenance will be carried out by them.
- ☐ In cases where the WUA of a given system is not willing to participate in the turnover program, the government shall discontinue all future maintenance and operation activities in that particular system.
- ☐ Full ownership of the irrigation system and related structures will rest with the WUA and be registered with the government.

- ☐ Both the government and the WUA may enter into an agreement related to the proper use and development of the irrigation system and its facilities.
- ☐ The two parties also share the cost of rehabilitation of the turnover system (with at least 5% provided by the users and the rest by the government). In addition to this, rights-of-way and land needed for the rehabilitation must be provided freely by the users themselves.

The budget speech for the 1992 Parliament and the Economic Survey for the fiscal year 1991 – 1992 (produced by the Ministry of Finance, His Majesty's Government of Nepal) states that though there has been heavy investment in the irrigation sector and substantial expansion of irrigable land, these have not contributed to the expected level of increase in agricultural productivity. According to the economic survey, this is due to: a) lack of timely repair and maintenance of canals, b) lack of proper water management at the farmers' fields, and c) untimely and inadequate water supply during the planting season. The survey also notes that there is a need for a more concerted effort to ensure local people's participation in the expansion, preservation, repair, maintenance and operation of irrigation facilities.

Furthermore, the proposed Water Resources Act that has recently been tabled and discussed in the 1992 Parliament session (August 11) stipulates that the WUAs shall have full ownership over the projects handed over to them by the government.

The Western Regional Irrigation Directorate of Nepal has already undertaken activities to turn over two pilot irrigation systems in 1992. The water users of one pilot "turnover" system located in the hills have already issued a letter of commendation to the District Irrigation Office (the office through which the activities were channeled). The WUA indicated that all terms and conditions that were jointly agreed upon by the WUA and District Irrigation Office have been fulfilled and water has been satisfactorily delivered. The farmers are now willing to "take over" the system.

The other system in the plains of the Terai had a very small level of resources invested in the system after its initial construction some thirty years ago under the government's minor irrigation program. Since then,



Heavy investments are required to maintain Nepal's irrigation systems.



Will the benefits of turnover exceed the costs to farmers?

the farmers have been effectually "managing" the system. An agreement was made with the farmers to do certain rehabilitation work at the

intake and share costs for these activities. By August 1992, these activities were completed and the system was ready for turnover. Though this was not an agency-managed system, the turnover program in a way precluded the possibility of it becoming agency-managed. During the rehabilitation process, the district office insisted that a management committee be formed, representing the various sub-commands. Rehabilitation facilitated farmers with different interests to come together and decide on a water allocation system for the various sub-commands. The agreement was not easy to achieve. In the negotiation, one such group which did not have water rights was even given a new minimal water share. A representative from that area was also included in

the water users' committee, to ensure that his group's members did not violate the newly agreed-upon water allocation. Farmers contributed 25

percent of the cost in the form of labour. Farmers complained that not every one contributed his fair share of the workload.

Some irrigation officials are of the opinion that farmers will be unwilling to take over systems that still need structural improvements and rehabilitation. However, some irrigation officials who are highly supportive of turnover tend to think that there is a danger of the turnover program being used as yet another opportunity for construction. Early experience indicates that farmers are willing to organize themselves for the turnover program and for operation and management of their system — if they see the government genuinely assisting them, not only in infrastructural rehabilitation, but also in the institutional aspects of water allocation and conflict resolution.

In Nepal, much about turnover has been discussed and debated, a policy has been adopted, but the actual results for the farmers, the government and the environment are yet to be seen. (Ujjwal Pradhan, IIMI)

WORKSHOP ON MONITORING AND EVALUATION OF PERFORMANCE OF IRRIGATION SYSTEMS

This workshop on Monitoring and Evaluation of Performance of Irrigation Systems took place in Chiang Mai, Thailand during 6–7 May 1992. It was organized jointly by The German Foundation for International Development (DSE) and IIMI. A principal objective of the workshop was to train approximately 20 people from four ASEAN countries on techniques for monitoring and evaluating irrigation systems. Professional middle-level

managers from both irrigation and agriculture departments and researchers from universities interested in irrigation management attended the meeting.

IIMI staff members, Drs. Hammond Murray Rust, Doug Merrey and Mark Svendsen spent two days with the workshop participants discussing issues of strategic management and its value in providing a framework for improvement of irrigation performance.

Their presentations included a summary of the work undertaken in the International Food Policy Research Institute/IIMI study on irrigation performance, issues related to operational management of irrigation, and institutional issues that relate to irrigation performance. These presentations provided the participants with a new perspective on linking objectives of each system to performance methodologies.

South Asian Regional Workshop on Groundwater

Dhaka, capital City of Bangladesh was the venue for a South Asian Regional Workshop on Groundwater Farmer-Managed Irrigation Systems and Sustainable Groundwater Management held during 18 – 21 May this year. The workshop was hosted by the FMIS Network and organized jointly by IIMI headquarters and the IIMI office in Dhaka. The importance of groundwater issues was proved by the large number of professional who showed an interest in attending the workshop.

The main objective of the event was to assess south Asian experiences with different social, institutional and legal structures that promote sustainable, productive and equitable management of groundwater through farmer-managed irrigation systems. The workshop focused on aquifer and drawdown issues, issues of FMIS groundwater support services, sustainability of groups as groundwater irrigation managers under conditions of water surplus, water deficit conditions and the question of whether wells are within the surface irrigation system or outside it. Lively discussions led to a series of far-reaching recommendations: these ranged from the establishment of water users' associations to the turnover of various responsibilities for management of government systems to farmers.

A two-day field trip to various types of groundwater FMIS in Bangladesh provided an opportunity for the participants to get an idea of irrigation practices in the country.

PERFORMANCE MEASUREMENT IN FARMER-MANAGED IRRIGATION SYSTEMS

An international workshop on Performance Measurement in Farmer-Managed Irrigation Systems held from 12 – 15 November 1991 in Mendoza, Argentina provided an opportunity for the exchange of experiences and ideas among a large number of professionals drawn from 25 countries. The workshop sponsored by the FMIS Network was jointly organized by the International Irrigation Management Institute (IIMI) and the Instituto Nacional de Ciencia y Técnica Hídricas (INCYTH).

Four main issues were discussed during the workshop. The first issue focused on the objectives of performance measurement and the relevant indicators for assessing FMIS performance. The second issue was concerned with the methodology of performance measurement, focusing on minimum data needs; sampling requirements; cost-effective, simple and acceptable mechanisms of information gathering; and relevant parameters of agro-ecological environments. The other two issues discussed were the analysis and interpretation of results, and the utilization of results as well as the internationalization of the performance assessment process, such as how to assess water users' perspective on performance and how to identify local practices or needs for performance assessment.

The participants agreed that measurement of management performance of FMIS is a good instrument to monitor and evaluate the management status of FMIS and their sustainability. They stressed the importance of developing the more practical aspects of performance assessment useful for FMIS. It was also suggested that funding for performance assessment in FMIS should come from the irrigation fees from the members, provided the assessment process adopted by the members is simple and effective as a tool for improving the management of the systems.

The event provided an important opportunity for strengthening understanding of the basic concepts and principles of performance evaluation and its role in the management of irrigation systems. It also brought together irrigation management experiences of Asia, Africa, and Latin America, thus promoting the possibility of continuing dialogues and exchanges of experiences between Latin America and the countries of Asia and Africa.

The workshop included a field trip to the Lower Tunuyan River Irrigation areas of Mendoza. These areas are typical of sub-tropic arid regions. Their water source is the snow cap of the Andes Mountains. With the provision of sufficient water and good drainage facilities, these potential areas can be developed as agricultural land for a particular crop.

APPLICATION OF MATHEMATICAL MODELING FOR IMPROVEMENT OF CANAL OPERATION

An international seminar organized by IIMI and CEMAGREF (French Institute of Agricultural and Environmental Engineering Research) focused on the Application of Mathematical Modeling for the Improvement of Irrigation Canal Operation. It was held from 26 to 29 October, 1992 in Montpellier, France.

The reliability of water supply in most of the irrigation schemes greatly depends on an accurate operation of the main distributary canals. Various techniques have been developed to master these systems, from manual operation to remote control.

The need for a global understanding of hydraulic systems' behavior and the efficiency of operation methods is increasing with the growing competition for water use in large irrigation schemes. During the last decade, mathematical computer programs have been developed to model hydraulic systems functioning. Some of these programs have been used to improve the conception, operation or rehabilitation of irrigation canals.

The principal objective of this seminar was to review and compare experiences in the application of the techniques of simulation and

mathematical modeling to support practical management of water in real irrigation canals, with special reference to cases in developing countries.

The seminar included technical discussions, poster and film presentations, model demonstrations and a field visit to different irrigation systems in the south of France. It brought together irrigation system managers and model developers of several countries who have contributed to real life applications of such models.

NILE 2002 CONFERENCE

Nile 2002, an international technical conference devoted to the protection and development of the Nile Basin will be held from 1 to 6 February 1993, in Aswan, Egypt. The theme of the conference is "Comprehensive Water Resources Development of the Nile Basin: Getting Started." The Water Research Center in Egypt is organizing this event in collaboration with the Canadian International Development Agency (CIDA), the World Bank and other international organizations.

The objective of Nile 2002 is to establish a dialogue among technical experts from the Nile Basin countries and international experts, on the best ways to protect and develop the water resources of the Nile Basin in a comprehensive

way to ensure the sustainability of its development.

Major conference topics will include Nile water data base, application of modern techniques for acquisition, transmission and dissemination of information among users, modeling and computer application to simulate the dynamics of the resource base and optimization of its use, environmental considerations, an integrated approach for national and basin-wide

development planning, and strategic planning and elements of policy framework development.

This conference will be useful for engineers, planners, scientists, specialists and development organizations interested in a multidisciplinary approach, and in the promotion of cooperation between persons interested in the Nile Basin.

For more details on Nile 2002, please contact:

Nile 2002 Secretariat
WATER RESEARCH CENTER

22 El-Galaa Street, Bulak 11611

Cairo, Egypt

Phone: 20-2-760 474, 20-2-574278; Fax: 20-2-773 678

ENHANCING THE INFORMATION BASE ON IRRIGATION MANAGEMENT

Networking is a mode of activity appropriate to IIMI's global work. To meet the challenges of today and the future in the area of information exchange, IIMI has developed strong links with the world's premier information services in the field to enhance its information base on irrigation management.

The six-year-old Irrigation Management Information Network (IMIN) database is coordinated by IIMI's Documentation Service. IMIN serves to promote the exchange of information among the members of the network, so providing technical and information support for irrigation management information development.

The bibliographic database contains over 9,102 citations collected since January 1986. The rate of addition is about 1,000 records per year, which will increase as more collaborators join the network.

Citations of published and unpublished monographs, theses, research reports,

Through the Irrigation Management Information Network, researchers and professionals in the field of irrigation management are better able to keep in touch with the ever expanding literature in their fields of interest.

conference proceedings and periodical articles on irrigation management and related subjects are available in the network database.

A bibliography titled "A Selected Bibliography on Irrigation Management" is compiled from the input to the database and published biannually. It is sent to over 500 interested individuals and libraries all over the world. It is expected that the bibliography will assist those interested in irrigation management to locate a wide variety of materials on the subject.

Computer search services are offered to users. The information can be retrieved by author, title, keyword, location, date of publication, series, subject category or by geographical area. IIMI provides photocopies of non-copyright material available at headquarters, or helps obtain documents through interlibrary loans.

The Institute has successfully established a decentralized, microcomputer-based information network. The service provides shared resources amongst scattered locations in a manner that was previously prohibitive because of the costs involved.

Through the Irrigation Management Information Network, researchers and professionals in the field of irrigation management are better able to keep in touch with the ever expanding literature in their fields of interest.

For further information, please contact the Library and Documentation Service at IIMI Headquarters in Colombo, Sri Lanka.

PUBLICATIONS

COUNTRY PAPERS

D.J. Bandaragoda and G.R. Firdousi.

Institutional Factors Affecting Irrigation Performance in Pakistan: Research and Policy Priorities.

Country paper-Pakistan-No.4.
ISBN: 92-9090-154-3.
August 1992. 98p. A5. Softcover.

Irrigation development in Pakistan has, over a long historical period, led to an extensive network of irrigation infrastructure in the country. The experience gained during this long period has also led to the evolution of a strong irrigation tradition which has sustained the broad-based community interest in irrigation. The result is a very complex institutional milieu in which a set of formally established irrigation rules and organizations exists side by side with an intricate set of social institutions. The two sets act like a dual system, more often than desired, in conflict with each other. This paper analyzes the present institutional barriers and highlights the importance of irrigation rules and procedures in the institutional framework.

Alfredo Valera and Mohd. Nor Bin Hj. Mohd.Desa.

Design Management Interactions of Malaysia's Kerian Irrigation Scheme.

Country paper-Malaysia-No.1.
ISBN: 92-9090-141-1.
September 1992. xxv+64p.
A5. Softcover.

The Kerian Irrigation Scheme in Malaysia was the focus of this study, which is one of a series undertaken by the International Irrigation Management Institute and the World Bank with the overall objective of improving our understanding of the

design and management interactions of surface irrigation systems and the way they influence the performance of the systems. This study of the Kerian Irrigation Scheme determines effects of the rehabilitation design and actual management interactions on performance and suggests ways to improve the existing level of system performance. The study also probes, among other things, such shortfalls as overly optimistic management assumptions and the declining interest of farmers in irrigated farming.

WORKING PAPERS

Edward J. Vander Velde and Robert L. Johnson.

Tubewells in Pakistan: Distributary Canal Commands: Lagar Distributary, Lower Chenab Canal System, Punjab.

Working paper No. 21.
May 1992. vii+44p.
A4. Softcover.
ISBN: 92-9090-161-6.

PERIODICALS

IIMI Annual Report 1991.

ISSN: 1017-5954.
October 1992. 64 p. A4. Softcover.

IIMI Review. Volume 6 No.1.

ISSN: 1012-831X.
June 1992. 20 p. A4. Softcover.

IMIN Bibliography: A Selected Bibliography on Irrigation Management.

ISSN: 1015-1680.
Volume 5 No.1.
(documents entered in the Irrigation Management Information Network Database, January - June 1991).

NEWSLETTERS

FMIS. Newsletter of the Farmer-Managed Irrigation Systems Network.

ISSN: 1012-988X.
July 1992. No. 10. 24p. A4. Softcover.

STAFFING

Ms. Nancy Andrews has been appointed as Director of Finance and Administration, effective early January, 1993. Ms. Andrews, a U.S. citizen, comes to IIMI from the Ford Foundation in New York where she is currently the Deputy Director of the Office of Program Related Investments. Prior to joining the Ford Foundation, she served as Project Manager for the Financial Services Corporation in New York, Economic Analyst for Senator Edward Kennedy of the U.S. Senate, and Public Finance

Research Associate for the Morgan Guaranty Trust Company. She has an M.A. degree in Urban Planning with a concentration in finance from Columbia University, and a B.A. degree in English and Journalism from Wake Forest University.

Dr. Azaharul Haq, formerly Irrigation Specialist and Senior Water Management Advisor, Sudan Field Operations was reassigned in August, 1992 to Sri Lanka Field Operations.