Lessons from the International Workshop on Participatory Irrigation Management: Benefits and Second Generation Problems

Mark Svendsen, Jose Trava, and Sam H. Johnson III

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Preface

This paper presents the major outcomes of the ***International Workshop on Participatory Irrigation Management: Benefits and Second Generation Problems*** sponsored by the Economic Development Institute of the World Bank (EDI) and the International Irrigation Management Institute (IIMI). The workshop was held in Cali, Colombia in February 1997 and attended by more than 35 irrigation professionals experienced in various aspects of participatory irrigation management. A field trip was made to discuss benefits and second generation problems in the R.U.T. Irrigation District in the Cauca Valley.

The workshop was based on a set of eight case studies, five of which (Mexico, Turkey, Colombia, Argentina, and the Philippines) were of countries which are currently engaged in programs aimed at shifting management responsibility from national or state governments to local organizations. The other three cases (Taiwan, Japan, and Italy), were of more developed countries which have had long experience with this form of irrigation system management and could thus serve as practical examples and provide early warning of changes and problems which might occur in the future in countries now implementing IMT programs. Workshop agendas, statement of purpose, list of workshop case studies, list of participants, small group tasks, and the workshop final evaluation are contained in the annex section.

The purpose of the paper is to extract lessons from the case studies prepared for the workshop, capture ideas expressed during workshop discussions, and to document the conclusions reached during small group and plenary discussions. In it, the authors have based their discussion on these sources, but have also drawn on their own thinking and experience in fleshing out concepts and ideas. The result is thus an interpretative summary of workshop proceedings. The intended applications of the paper include it's use as a resource during EDI training programs in Participatory Irrigation Management, and its wider dissemination to practitioners and researchers in the field as a sources of ideas and to alert them to possible emerging problems with transferred schemes and potential solutions to those problems.

Acronyms and Definitions

agency	A public-sector organization which develops and/or manages irrigation systems
association	An IA
CIAT	Centro Interacional de Agricultura Tropical
CIS	Communal Irrigation System (Philippines)
CNA	Commission Nacional del Agua (National Water Commission) (Mexico)
CO	Community Organizers (Philippines)
DSI	Devlet Su Isleri (National Hydrologic Department) (Turkey)
EDI	Economic Development Institute (World Bank)
federation	An apex level body established by a group of irrigation association to support them and to represent their interests
FIO	Farmer Irrigation Organizer (Philippines)
DGI	Departmento General de Irrigacion
IA	Irrigation Association or "association"
ID	Irrigation District
IDB	Inter-American Development Bank
IDO	Irrigation District Organizer (Philippines)
IIMI	International Irrigation Management Institute
IMT	Irrigation Management Transfer
IMTA	Instituto Mexicano de Technologia del Agua
INAT	Instituto Nacional de Adecuacion de Tierras (National Institute for Land Reclamation) (Colombia)
IO	Institutional Organizer (Philippines)
ISF	Irrigation Service Fee
M&I	Municipal and Industrial
NIA	National Irrigation Agency (Philippines)
NIS	National Irrigation System (Philippines)
O&M	Operation and Maintenance
PIM	Participatory Irrigation Management
WB	World Bank

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Introduction

Participation in irrigation management by water users[2] can take a wide variety of forms. Farmers can be involved in various system management functions, including, operations, maintenance, rehabilitation, resource mobilization, financial planning and management, and conflict resolution. Moreover they can be involved in these functions at various system levels; from the field channel to the entire system.

Almost all irrigation systems have some involvement by water users in system management. Involvement may be restricted to water distribution and channel maintenance at the lowest system levels, but it is extremely rare for farmers to be completely uninvolved in such activities. When people speak of introducing "Participatory Irrigation Management" (PIM), they are thus usually referring to a change in the level, mode, or intensity of such participation that would increase farmer responsibility and authority in management processes. This is generally regarded as a good thing, though there are some important qualifications to this judgement, as discussed in the subsequent section on "impacts."

Irrigation Management Transfer (IMT) is another common term which implies increased water user involvement in system management processes. It has a more specialized meaning than PIM, however, and is generally used to refer to a process of shifting a number of basic irrigation management functions from a public agency to a private sector entity, a non-government organization (NGO), a local government, or to a local-level organization with farmers at its base. The most common form of IMT involves the shifting of management responsibility from a centralized government irrigation agency to a financially-autonomous local-level non-profit organization which is either controlled by the water users of the irrigation system or in which water users have a substantial voice in the control process.

The changes in management reported in the five primary case studies on which this paper is based can all be considered forms of IMT. However, there is an important difference between the organizational form of the recipient organization employed in the Philippines, on the one hand, and the form employed in the other four cases (Mexico, Turkey, Colombia, and Argentina). In the Philippines, the primary management unit employed is "community-based" and results from an intensive grass-roots organizational

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[1]Irrigation Management Specialist, Kings Valley, OR, USA (phone: 541-929-4811, fax: (541)929-4824, email: msvendsen@compuserve.com); Irrigation Transfer Specialist, Mexico D.F. (phone: 52-5-515-4404, fax: 52-5-271-4105, email: jtrava@infosel.net.mx); and Mexico Program Leader, IIMI (phone: 52-5-726-9091, email sjohnson@cimmyt.mx) respectively.

[2]Although non-farmers may be users of water from an irrigation system (a rural industrial plant, for example) it is assumed here that water users are farmers practicing irrigated agriculture.

campaign involving hired community organizers. This primary management unit is fairly small (less than 100 hectares), relies primarily on voluntary labor in carrying out its functions, and the most important relationships among members of the unit are social. In the other four cases, the organizational form of the irrigation systems can be termed "Irrigation Districts" (ID). Irrigation Districts are typically larger (several thousand hectares), rely principally on paid employees to perform its functions, and link farmer-members together mainly through ties of economic self-interest[3]. This and other key features of the five primary case studies are shown in Table 1.

The approach used in identifying and analyzing issues in this paper is based on a set of three basic categories. The first includes the processes used to introduce programs of IMT. The second category comprises the impacts of the introduction of a program of IMT. The third category consists of what are called second generation problems and possible solutions to them. The remainder of the paper is structured around these three categories.

The term "second generation" requires some explanation. Transferring substantial management authority to a locally-based organization is a complicated undertaking and may involve changes in national policy, regulations, and organizational structures; creation of new organizations at the local level; transference of equipment ownership; and changes in personnel, in addition to the shifting of management functions to the new managers. Any undertaking this complex, in addition to solving problems, will almost certainly create new problems which did not exist before or were not previously evident. An example might be inadequate technical capability of irrigation field personnel. These problems are here termed "second generation problems." In addition, there may be situations, such as low agricultural productivity, which were present prior to the transfer, but which were not acute problem when irrigation fees were low or non-existent. For our purposes, these are also included in the category of second generation problems. Some second generation problems may be a result of faulty processes used to introduce the new management system. Some may be a result of conscious choices made during implementation to defer consideration of certain potential problems in the interests of advancing program coverage. Others may be practically unavoidable, though the ability to anticipate major problems in advance should allow corrective measures to be put into place earlier than would be otherwise possible.

Problems are typically problems for some and not for all. Traffic congestion in an area may be an acute problem for those who live in or pass through that area, but may not inconvenience at all people living on the opposite side of town. Other situations may represent two-sided coins, where a solution for some represents a problem for others. Routing traffic off of clogged major highways and through residential neighborhoods to ease congestion is an example. In this paper, problems are analyzed from several different perspectives -- that of the water user, the irrigation association, the irrigation agency, and the government. In terms of these perspectives, a change, such as increased irrigation service fees, may be a problem for water users, but a benefit for the irrigation association and perhaps the government, if it reduces government subsidies.

The term "impacts" also requires some preliminary discussion. In general, impacts can be either positive or negative. When they are positive, they are "benefits", or "positive benefits." When they are negative, they are similar to what are called second generation problems here. In the paper, negative impacts will be noted in the discussion of impacts, but will be discussed in more detail in the following section on second generation problems.

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[3]This distinction is similar to the one drawn by Meinzen-Dick and Subaramanian. They term these two different models the "US" and the "Asian" models.

Table 1. Features of PIM Case Studies

	Turkey	Mexico	Argentina	Colombia	Philippines
Type of first-level management unit	District	District	District	District	Community-based
Beginning year of program:	1993	1989	1984	1976	1976[1] 1980[2]
Implementing agency:	DSI	CNA	DGI	INAT and IAs	NIA
Special law on transfer	No	Yes (1992/1994)	No	No	Yes (1974)
Total area of government irrigation systems	1,467,000	3,300,000	360,000	315,125	652,000
Share of area covered by program	61% (1995)	90% (1997)	100% (1997)	64% (1996)	90%
Number of levels of local management:	1	2	3	1	2
Average size of 1st level local mgt unit [Ha]	6,500	7,900	3,000	12,500	40
Average size of 2nd level local management unit [Ha]	-	107,000	20,000	-	275
Average size of 3rd level local management unit [Ha]	-	-	90,000	-	-
Number of staff/100 Ha (IA)	na	0.2	0.19	0.8	1.8 (vol) 1.1 (paid)
Average irrigation service fee [$/Ha/yr]	25 (1995)	40 (1996)	70?? (1997)	52 (1996)	77 (1997)
Fee base	Area/crop	Area/crop	Area	Area/crop[3]	Area/crop/source
Share of fee assessment recovery	72+% (1995)	92% (1997)	70%[4] (1997)	76% (1996)	58% (1995)
Share of O&M cost supported by fee income	most	85% (1997)	12% (1997)	52% (1996)	46% (1995)
Facilities ownership	Govt	Govt	Govt	Govt	Govt
Maintenance equipment transferred to IA	No	Yes	Yes	Yes	No
Transition phase of shared responsibility	Yes	Yes	Yes	No	Yes
National Association of IAs	No	Yes	No	Yes	No
Farmers can refuse transfer	No	Yes	No	na	Yes

[1] Communal Irrigation Systems
[2] National Irrigation Systems
[3] Fixed plus volumetric fee schedule in pump schemes
[4] Recovered by DGI

Process of Introducing New Forms of PIM

Introduction

As agreed upon in the workshop, participation by water users can take a wide variety of forms. With respect to the five developing countries presented, the process followed is irrigation management transfer (IMT) which is a more specialized form of PIM. However, whether the process involves PIM, or the more specialized term IMT, the underlying conditions and features including national policies, background conditions, mode of implementation and the type and nature of the irrigation association (IA) are critical in ensuring the success of the process.

Background Conditions

Based on the case studies, as well as IMT programs in a number of other countries, background conditions leading to the turnover process to be initiated include:

a) national budgetary crisis;
b) top level political will to restore economic growth through private investment in irrigation & drainage activities; and,
c) progressive deterioration of irrigation infrastructure due to deferred maintenance.

Only in one case (Colombia) of those reported at the workshop was it the farmers who initiated the process. At the irrigation systems level another set of "conditions" that also must be taken into consideration include:

a) physical condition of hydraulic network;
b) social, political and economical conditions; and,
c) water availability.

Political will at the highest level of the government was a main component in Mexico's IMT program. In 1989, with a new administration into office, comprehensive water management was recognized as a top priority issue, the National Water Commission (CNA) was created and a national policy on privatization took off. In Colombia it was the National Planning Department who in 1991 submitted the Land Reclamation Program 1991-2000. In Turkey, it was a budgetary crisis which led to a squeeze on financial allocations to the State Agency (DSI) which gave the program its initial impetus. In Argentina, the process to modernize the economy as a whole, which began in 1990 with the privatization of large electricity utilities, led to the turnover of water management to the provinces. In the Philippines the hybrid nature of NIA, created in 1963, enabled it to use funds from the government for constructing and rehabilitating irrigation systems. This was based on the underlying premise that irrigation would not only benefit farmers but the whole society as well. In 1974-75 NIA embarked on an ambitious program to reach the minimum and normal rice requirement of nation through irrigation alone. One of its legal requirements was for subsidies for the O&M of systems to be gradually phased out over a five year period at which time NIA would be directly dependent on collections from farmers for its O&M expenses.

For IMT programs to have a good chance of being successful hydraulic infrastructure should be in "fair condition" and the users should be "ready" to take over. Also, an affordable, reliable water supply should be available most of the time. By hydraulic infrastructure in "fair conditions" we mean a network still in "operating" conditions, i.e., capable of delivering water to farms in reasonable enough amount to satisfy crop needs and also in time. In addition; surface drainage of surplus water and salinity should not be a limiting factor. If these basic conditions are not satisfied then a rehabilitation plan should be considered.

In Mexico, although the irrigation districts included 50% of deferred maintenance, the IMT program took off quickly because at the beginning of IMT program, all of them were performing more or less satisfactorily with water conveyance efficiencies in the order of 60% at main and secondary canal network.

"Readiness" for the users has to do with political and social factors. For example, it seems clear water users from Saldana and Coello in Colombia were "ready" in 1976 when they asked their government to turnover the administration of their districts to them. Due to its political background and social context it is also obvious Argentinean farmers were also ready for the change. In most districts this was not the case in Mexico. In the first place there was the land tenure issue. After the 1910 Revolution land was divided between two distinct type of farmers, the "campesinos" or poor farmers ("ejidatarios") and the "small" landowners some of them belonging to the "hacendados" or landlords' elite. Second, there were numerous voracious, government controlled "ejido" leaders which, when consulted about the coming change, voted against it, suspecting this would mean a reduction of their present status. Promotional aspects of IMT in Mexico country were vital in order to overcome these difficulties.

National Policies

National policies for IMT implementation vary both in regard to objectives and reaches. In the Philippines the basic principles and framework for the appropriation, control and conservation of water resources are embodied in the "Water Code" of 1976. To promote water conservation for irrigation purposes, the appropriation of waters by an irrigator "association" or a merging of two or more such "associations" is encouraged over the request of individuals. A prime objective in the Philippines is rice self-sufficiency. A new strategy for developing IAs emerged in the country. This recognized that local irrigation associations had sprung up spontaneously among farmers throughout the centuries based on the use of relatively simple technical structures for transporting water. Although small, these associations encompassed complex social arrangements for allocation and distribution of the water.

In Turkey the General Directorate of State Hydraulics (DSI) is the main executive agency of the Government for the country's overall water resources planning, execution and operation. It was established in 1954 and is part of the Ministry of Public Works and Settlement. Since the early 1960s DSI has had a program to transfer O&M responsibility for secondary and tertiary distribution networks to irrigation groups (IGs). Under the program IGs entered into contractual arrangements with DSI to take administrative responsibility for tasks such as collecting and submitting farmer water demand application forms to DSI, managing water distribution below the secondary canal and cleaning and minor repair of canals and other small hydraulic structures. Although existing municipality law appears to be providing a workable initial basis for the formation of IAs, further development and evolution of them may require a law specifically for IAs.

In Argentina the country is a federal entity divided into 23 provinces, autonomous states with their own governors, congress and constitutions, which include their respective water laws. Given this federal system of government and the powers the province have retained all aspects related to water (rights, granting, duration, taxation, etc.) are essentially local. IMT programs began in 1990 because of the pressure set upon by the national government on provincial governments in order to reduce bureaucracy and render public administration more efficient.

In Mexico the Presidential Decree that created CNA gave her specific responsibilities which included among others: a) define the country's water policies and b) allocate water to users and grant the corresponding licenses and permits. Part of the new water policy included:

- The creation of self-financing and administratively autonomous water utilities to provide water services in cities and in irrigation districts;
- The efficient use of water by all users, including water reutilization and water quality conservation.;
- The development of technology capable of resolving the country's specific needs for efficient use of water and self-sufficient user systems; and
- The establishment of a new water culture in which efficient use of the resource will result from the total mobilization of Society.

In Colombia the long range policy on agricultural issues refers basically to:

- State participation in investments in regard to land reclamation.
- Financial and physical objectives.
  - For large-scale irrigation projects.
  - Middle-sized and small-scale projects.
  - Rehabilitation and expansion of irrigation areas.
- Strategies and implementation
  - Private irrigation & drainage (I&D) projects.
  - Public I&D projects
  - Users participation

Irrigation Service Fees

In the case of Mexico, for example, the IMT program was one of an entire series of changes in the economy including reductions in subsidies for agricultural credit and inputs, elimination of guaranteed support prices for the major agricultural crops, and increases in energy and fuel prices. Transfer of O&M responsibility for the irrigation districts, leading to the users having to pay the real cost of irrigation water, was seen as just another step in the liberalization of the economy. As an explicit part of this policy, the National Water Commission (CNA) was created in 1989 with a policy to shift the burden of O&M of the public irrigation districts to the users.

In a similar fashion, in the case of the Philippines, under Presidential Decree 552 (1974), the National Irrigation Agency (NIA) was authorized to delegate partial or full management of national irrigation systems (NIS) to duly organized co-operatives or associations. Under this decree, NIA was allowed to keep all irrigation service fees, with government subsidies for O&M expenses gradually phased out over time. Thus, at the end of the five years period NIA was to be directly dependent on ISF collections from farmers for O&M expenses.

The financial aspects of IMT in Turkey are also similar to Mexico in that the policy is designed to shift the burden of O&M costs from the government to the users. However, the government continues to subsidize maintenance which is not the case in Mexico and the Philippines. Colombia has implemented management transfer to the IA, including the shifting of the financial burden to the users, while irrigation schemes in Argentina are under joint management with fee collection both by the government and the IAs.

Water Laws

It was generally agreed that national water laws that clearly specified the rights of the IAs and the individual users were critical for the success of IMT. Without such rights, the IAs are extremely vulnerable to increased demands from other more powerful users.

In the case of the Philippines, transfer was implemented under a 1975 law but in addition, under a 1976 law the country attempted to develop a water rights register of all the water rights in the country, including specifying in a volumetric form the water rights of the national and communal irrigation systems. As part of the registration process all of the NIAs also must register their water rights. Once legally registered, water rights cannot be withdrawn except for failure to use them as stipulated in the law. These water rights are more or less the same as found in some states in Argentina.

This system can be contrasted to that of Mexico where the IAs are given a concession to use the irrigation infrastructure and the associated water supply, but do not have a clearly specified legal right to a volumetric supply. With domestic supply having priority, the IAs are not ensured a constant water supply over time. The concessions are also for a fixed time frame (20-30 years) after which they can theoretically be reassigned to another user. However, as none of the concessions have expired to date, it is unclear exactly what process will be used to determine granting of a second concession.

The country that appears to be the most vulnerable is Turkey where water is controlled by DSI and the individual districts have no water rights. This system works in areas where there is little competition for water but leaves the districts extremely vulnerable in the valleys where M&I use is expanding rapidly. Colombia is somewhere in between these two systems but still is dependent upon INAT as the country has yet to establish a legal water right system.

Mode of Implementation

The process of implementing a change to a more participatory type management system varies widely across the countries. Implementation modes range from the very bottom-up approach that has been used in the Philippines to the more top-down approach used in Colombia and Mexico.

In terms of promotion of the PIM process, Colombia has invested much less time and effort than the other countries. As a consequence the process of transfer was very quick but there have been second generation problems as a result of the fact that users have been less well informed and have been uncertain about their rights with respect to ownership and changes in management practices. As a number of the irrigation systems are based on river pumping, some of the more recent cases of transfer have involved more negotiations with respect to energy susbsidies.

Argentina has used information meetings and word-of-mouth to make a rapid transition to PIM, while countries like Mexico and Turkey have used much more organized information meetings with the users. These two countries also invested heavily in training their own staff while in the case of Mexico, audio-visual materials prepared by IMTA as well as professional firms were used to persuade the users that IMT was a positive change.

The Philippines has used the slowest process with intensive use of institutional development officers and farmer organizers to serve as catalysts. These organizers lived in the villages and organized exchanges between NIA and the users. However, NIA has now realized that too much dependence upon FOs slowed the process and has now reduced significantly the number of FOs.

In terms of transferring responsibility, most of the Colombia IAs appear to have had very little say in the process. However, this has changed somewhat as more recently the IAs have been negotiating energy subsidies as well as insisting upon rehabilitation prior to transfer. In the Philippines there has been more dialogue through the IDOs and the FOs but given that in most cases little transfer of responsibility has taken

place, this approach has not achieved rapid transfer of responsibility to the users. In contrast, both in Turkey and in Mexico there has been real negotiations concerning transfer terms. As a result the IAs have been able to exert some power and develop a partnership with the agency. In a number of cases they have also been able to ensure critical investments were made prior to transfer.

As the transfer of responsibility progressed, Mexico, Colombia and Turkey moved to a form of shared management between the agency and the IAs. The length of shared management varied by country and by district but usually was from 6-12 months. In contrast, in Argentina the systems were transferred much quicker while in the Philippines there has been a very gradual shift in responsibility from stage 1 to stage 2 to stage 3, with even after 15 years less than 15% of the districts are at the level of stage 3, or full user management.

Type/Nature of IA

The type and nature of the IAs is directly related to the structure of the economy as well as the type of irrigation found in the countries. In Mexico, Japan, Taiwan, Turkey, Argentina and Colombia, the IAs are larger (2,000-50,000 ha) and are organized more as more commercial entities which reflects the more commercial nature of the irrigated sector. Agriculture is developed on a cash basis and many of the staff are hired professionals paid in cash from the ISF. Given their large size, the IAs can afford to purchase and maintain their own transport and maintenance equipment.

In contrast the IAs in the Philippines are very small (100-300 ha) and are organized based on the village structure. Most of the labor is voluntary labor provided by the users and very few, if any, of the irrigation staff are hired professionals. Given the small size of the IAs there are diseconomies of scale and hence the organizations cannot afford to own specialized maintenance equipment. In the Philippines, irrigation service fees are usually paid in grain and therefore are very awkward to store and transport and also result in 10-15% losses due to damages during storage and transport.

In Argentina the IAs are public NGOs with full legal authority, including the power to tax. The IAs in the other countries have a limited power to establish and collect ISFs but do not have any other local taxation powers and therefore the majority of their income is from ISFs.

Impacts of New Forms of PIM

Implementing a program of management transfer is a complicated undertaking which involves incurring costs and affecting the lives and livelihoods of many people. It is thus not desirable to enter into such a program unless the benefits of the changes are positive and significant. Impacts, of course, may be either positive or negative, and they can be either qualitative or quantitative. And because the change in management patterns will usually occur simultaneously with other changes in physical, economic, and social conditions, it may be difficult to separate the effects caused by management changes from those caused by other factors.

As a starting point, a number of potential positive and negative impacts of a program of IMT are shown in Table 2. Generally only some of these will be present in a given case. Note that some impacts are shown in both positive and negative columns, indicating that an overall evaluation is far from simple.

Table 2. Potential impacts of IMT

FARMER PERSPECTIVE	
Positive Impacts	Negative Impacts
Sense of ownership	Higher costs
Increased transparency of processes	More time and effort required to manage
Greater accessibility to system personnel	Less disaster assistance
Improved maintenance	No assured rehabilitation assistance
Improved irrigation service	Less secure water right
Reduced conflicts among users	Decreased agricultural productivity
Increased agricultural productivity	

GOVERNMENT PERSPECTIVE	
Positive Impacts	Negative Impacts
Reduced costs to government	Less direct control over cropping patterns
Greater farmer satisfaction	Need to reduce staff levels, sometimes over union opposition
Reduced civil service staffing levels	Reduced ability to implement new agricultural policies through the irrigation agency
Reduced costs to the economy (greater economic efficiency)	

IRRIGATION AGENCY PERSPECTIVE	
Positive Impacts	Negative Impacts
Fewer conflicts to deal with	Reduced bureaucratic and political influence
Reduced operational involvement	Uncertainty over agency role
New responsibilities	Reduced opportunity for rent seeking
Reduced opportunity for rent seeking	Reduced control over water resources
Reduced political interference	
Reduced O&M staff levels	

The nature of the impacts which occur will be shaped by the social, political, and economic characteristics of the countries involved. Some common themes do emerge, however, from among this diversity. Impacts are also conditioned by the perspective from which they are viewed. Important perspectives in this case include those of water users, the associations they have already created, the irrigation agency and the national or state government under whose overall control these systems operate. What is positive from one perspective might be negative for another. Judgement is thus required in evaluating the overall impact of a program in terms of its positive and negative results, and the tradeoffs in positive and negative benefits among the various groups affected.

The following sections presents impacts in terms of legal and organizational factors and operational procedures.

Legal and Organizational Factors

Some of the countries first build on a new national water Law before moving forward into a transfer program (Mexico, the Philippines and Colombia). Others move into transfer supported only by either old national laws or local laws (Argentina and Turkey). There has been a lot of discussion on the issue of water rights from the perspective of ownership versus concession. In general, in most of the countries all water belongs to the governments, either at federal or provincial levels. Irrigation Districts were usually created based on constitutional mandates that clearly defined the system's physical limits and thus the water "right" implicit to it. In some countries such as Argentina, however, the right of individual appropriation prevailed.

After turnover, irrigation associations (IAs) receive the concessions which enable them to have access to collective water rights. This has not changed the system of water rights and priorities. In most of the case study countries, agricultural uses are subordinate to municipal uses, which often include domestic and industrial use.

Sense of ownership

The formation of IAs generally creates a stronger sense of ownership of the system on the part of users. In Japan, the Philippines, Colombia, and Argentina (Mendoza) this has been the case for many years. In Mexico and Turkey this change has taken place more recently and has been an exhilarating condition for some users. What is called in Mexico, the "concession", the ability to collect water fees and provide services, is the main cause of this feeling. In fact, in all case study countries, actual ownership of system facilities remains with the government. In Colombia some consideration is being given to transferring actual facilities ownership to IAs, an idea supported by some INAT staff and some IAs officers. This idea has also been discussed in the Philippines. Generally there are a number of problems with this step, including loss of the right of eminent domain which is held by governments only and allows land condemnation for system expansion, and increased exposure to liability for accident and injury on the part of the IAs. Such a move may also weaken an IA's claim on public assistance for rehabilitation and emergency repairs.

A sense of ownership is also developed because users now have a greater voice in selecting system boards of directors through the IA general assembly. With leaders elected in this more democratic manner, needs are expressed more readily. The opposite situation is presently occurring in Taiwan, where the users are turning systems back to the government. This is a result of the declining importance of agriculture in the Taiwanese economy and the high costs of system O&M which cannot be sustained by many IAs.

Transparency

All of the countries report that their transferred irrigation districts are now managed with more "transparency", meaning by this that major decisions are exposed to the association's members or their representatives through general assembly meetings. In Mexico, a representative assembly, formed by delegates selected by the general assembly takes routine decisions without summoning the general assembly which may be composed of hundreds or even thousands of users. In Turkey a similar body made up of 30 to 70 local government officials and farmers is also called the general assembly and serves the same function.

Transparency also has to do with managing money. Before transfer, the government collected fees and was generally supposed to invested the fees back into the system where they were collected. However, due to bureaucratic rules and procedures collected fees were not necessarily applied in the systems where they originated. This resulted in complaints by users, and the agency was seldom forthcoming with information on financial accounts relative to particular systems. With associations collecting and managing funds, and with accounting done on the basis of the unit managed by the IA, users can get a better understanding of how their money is being used, thus the increased transparency of the process. However, strict supervision and monitoring of water fee collection and expenditures by an outside party is still necessary to avoid any possibility of money being diverted for unauthorized purposes.

Where the transferred units do not include an entire hydrologic unit, it may be more difficult for users to develop a sense of the disposition of the fees collected from them, due to sub-division of responsibilities among a number of IAs. In this case, accounts should separate out the portion of fee collections that are earmarked for O&M within the IA unit, and the portion allocated to higher level O&M. An alternative might be for the IAs to merge into a larger unit. However there a number of other factors to consider before taking such a step.

Water fees increase

Usually one of the immediate effects of IMT is an increase in water fees at the irrigation district level. In some countries the increase can be very dramatic, on the order of 100% to 200% or more (Mexico, Turkey). However to make a valid comparison, fee rates must be put in constant value terms before being compared. Irrigation service costs are generally considered appropriate if they constitute 5% to 8% of total production costs. In most countries, even after transfer, they tend to fall into this range. In the case of small holding sizes and lower value crops, however, the gross margin retained by farm households is also a relevant factor, and where this is already small, a doubling or tripling of ISF can create hardships for small farmers and their households.

A proposed increment in ISF may also have a negative psychological impact on water users that have come to expect heavily subsidized irrigation service. This kind of attitude may be gradually changed with promotion activities before transfer takes place and, of course, with efficient financial management and better service once the association is formed.

As can be seen in Table 1, ISF collection rates are above 50% in all five countries currently implementing IMT activities, and are above 70% in four of the five. However, in looking at the share of O&M costs covered by ISF collections, the picture is a bit different. For example, before transfer in Mexico, the ISF collection rate was around 100%, but this amount covered only 25% of O&M costs. After transfer,

the ISF collection rate is still 100% in transferred districts, but fees now cover close to 90% of O&M expenses. In order for transferred schemes to be financially self-reliant, they must achieve high rates of fee collection as well as having an ISF that covers O&M costs.

Subsidies

From the government's perspective an increase in O&M cost recovery normally means a reduction of subsidies. By "subsidy" we define here any kind of costs associated with the provision of irrigation services that the farmers should be paying instead of the government. Expenditures within an ID are usually related to:

a) O&M costs plus overheads;
b) acquisition of premises;
c) purchasing of machinery & equipment;
d) rehabilitation and/or modernization investments;
e) support for technical assistance and training; and
f) support for emergencies.

O&M plus overheads refer to expenses related to the daily administration of the system from the headworks down through the tertiaries. These expenses have to be paid in full, either by the government or the users or a combination of both, if a system is to be sustainable. In most of the countries involved in IMT the share of the costs between the governments and IAs is usually 40-60% and sometimes even less than this figure. The exception is Mexico with 10-90% and very rapidly approaching 0-100%. This illustrates the degree of satisfaction by the users in the turnover process.

Acquisition of installations refers to the premises IAs use as they provide service to farmers. In Mexico it was the Agency who provided the premises to IAs as part of the "concessions". After six years of turnover though, some associations have purchased their own offices, which they often refer to with a sense pride. The case studies provide little specific information on the issue of ownership of premises, although according to the participants the same has happened in Argentina, Colombia and Turkey.

Providing machinery and equipment to IAs has been a key issue for turnover to take place in some countries (Colombia and Mexico). In others, like Turkey and the Philippines machines are still under the control of the Agency. In Mexico this was a heavily subsidized action from the part of the government in order to encourage farmers to participate in the IMT program. Many of the machines given in concession to IAs had already completed their amortization life period thus the government had to subsidize the repairs. Other machines were purchased through a loan granted by the World Bank (WB). As lowering of maintenance costs represented great concern both for government and users emphasis was put on the purchase of more "modern" equipment, i.e., light machines to gradually substitute for the traditional heavy construction equipment which had been used in the ID for so many years.

Rehabilitation and/or modernization of hydraulic infrastructure is also a key issue for all countries involved in IMT programs. Although farmers usually ask for investments of this kind to be done before turnover takes place, due to financial restrictions governments often do not have the resources to fulfill these requests. As far as we know the only exception on this issue has been the case of Turkey. In other cases countries may use international loan funds along with the IMT program which enables the government to negotiate with farmers the "amount" of needed investment and/or the percentage of subsidy that users will

need to contribute. Cost sharing programs are often based on a 50%-50% share between the government and the IAs.

In most cases support for technical assistance and training is also a subsidized action of IMT programs. In Mexico, technical assistance to IAs is provided by the ID irrigation & drainage offices. Training, for both IAs and ID staff, has been provided by CNA through the IDs jointly with the Mexican Institute for Water Technology (IMTA), again, as part of an international loan by WB. More recently, starting in 1995, some IAs have signed private agreements with IMTA in which technical assistance is being provided on specific projects with a limited subsidy from the part of the Agency. In the Philippines, promotional and technical support to farmers is regularly provided by the government through different agencies and type of organizers (COs, FIOs, IDOs, etc.). Yet, in all countries the training needs for PIM programs by far exceeds current investments in training.

Subsidies are also present in the case of emergency (or extraordinary) situations. Although little specific information on this is currently available, all of the countries recognize the need of governmental intervention when such cases do arise. In Mexico, the presence of hurricanes is a normal situation, while in the Philippines typhoons will be the rule rather than the exception. Water scarcity conditions also create emergency situations for transferred IDs. For example, during the 1995-96 irrigation season an extraordinary drought took place in northern Mexico. Due to the lack of water, IAs did not have water to deliver to farmers, consequently, collection of fees dropped practically to zero. In this case, for many of the IAs the government had to come up with 100% subsidized programs to avoid a collapse of the associations. A minimum number of the IAs that were only partially affected by the drought, tackled the problem by hastily collecting a compensation fee from their farmers to implement a water reuse program to that allowed them to complement reservoir water availability.

Operational Procedures

It is expected that a shift to participatory local management will improve the efficiency of water delivery as well as the quality of maintenance. The case studies provided some details to document these impacts but there is still a need to obtain better information about the operational impacts of IMT.

Improved maintenance programs

One of the immediate consequences of IMT programs is that irrigation systems have improved maintenance programs. (Colombia, as recently reported, seems to be an exception). A recent study carried out in 1994 in Mexico by the Colegio de Post-Graduados reported that 84% of the sample users believed maintenance had improved substantially since IAs have been in charge of O&M. In some areas not only the users have completely eliminated the problem of the so called "deferred" maintenance but also they are now putting surplus money from O&M activities into programs for the modernization of hydraulic infrastructure.

Improved services

Although few specific studies on quality of services after IMT exist, there is the general impression that after turnover services have substantially improved in regard to timeliness, reliability and equity of water distribution. There are many reasons to believe this. In the first place, after turnover users usually have better access to irrigation service. Compared with the farmer-agency relationship that existed before, the farmer-association relationship is much better in terms of distance, personal contact and feedback on

complaints. Water conflicts among farmers also tend to be minimized because in farmers usually search for solutions to their problems at the IAs level which is always physically closer to them. At the same time, it is seen that there is a degree of farmers' self-control prevalent as the users know each other very well and therefore are able to regulate behavior among themselves.

In a recent 1994 study, among IAs in Mexico it was reported that 84% of the users expressed that water distribution had improved since turnover, 79% said they were receiving enough water, 79% were also receiving water in time and 64% indicated water was being allocated in the appropriate amount. However, water conflicts do arise between the IDs and IAs especially when water scarcity conditions show up. Recent lessons learned from the Mexican drought indicate that, under extreme competition for water, IAs were overwhelmed by the operational problems. This required prompt government intervention to keep the conflicts from getting out of control and become an explosive political issue.

Agency re-organization

Finally it should be recognized that IMT programs do have a significant impact on agency re-organization. A sharp reduction in regard to field personnel and O&M staff usually takes place. A change in the role of the agency with regard to water management in the systems follows.

From the two above mentioned impacts probably the most critical is the first. Once the government's employees perceive the possibility of losing their jobs as a consequence of IMT implementation they may even completely block the road to turnover. Clear legal arrangements between the parties are needed in order to overcome difficulties. Unfortunately, as the number of people involved in the process may be quite large. (in Mexico 5,000 out of 7,000 government personnel were to be released from the IDs because of turnover while the Philippines has reduced government NIA staff from 19,353 to 10,368), governments will always faces financial difficulties to pay for "early" retirement programs. In some instances, though, either re-assignment of personnel or re-hiring by IAs is possible.

Changing the role of the agency in IDs affairs usually should gradually take place. It requires not only willingness from the part of bureaucrats but also high level training for them on specific issues. One of the problems is to have government officials to understand there have been substantial changes already into place. For instance, it has been reported that in some countries the agency keeps asking from IAs the same type of information as if the ID had not already been transferred. In Mexico, after six years of turnover, changes in the governmental sector are still being carried out. Some of these changes have caused confusion among IAs.

One thing is for sure: once the turnover thoroughly takes place in a system, it is advisable for the agency to understand that its new role should be more oriented towards supervision, guidance, monitoring and application of the law in regard to concessions and water rights besides selected technical assistance support to IAs Management responsibilities of the systems should be in the hands of the users with the possible exception of headworks which when considered of strategic importance by the government should remain under the agency direct control and administration.

Using the above points, Table 3 details the impacts of IMT on the five developing countries participating in the workshop.

Table 3. Impact Types Drawn from the Case Studies

Type	Comments	Arg.	Col.	Mex.	Phil.	Trky.	Remarks
Sense of ownership	Transfer of O&M responsibility, ability to collect ISF, election of board and hiring of ditch tenders.	Yes	Yes	Yes	Yes	Yes	Level of IAs in Col., Mex. and Arg. Community level in Phil.
Transparency	Decisions made by assemblies, water fee collection by IA.	Yes	Yes	Yes	No	Yes	In Phil. ISF collected by NIA staff
Water fee change	Transfer of costs of O&M to the users	Yes	Yes	Yes	Yes	Yes	In real terms ISF in Col. are constant
Change in subsidies	O&M costs to government have been reduced dramatically	Yes	Yes	Yes	Yes	Yes	
Improved maintenance	Due to direct application of ISF at local level	Yes	Yes	Yes	?	Yes	Additional maintenance through volunteer labor
Improved services	In most cases, lack of specific studies to document this fact, water conflicts are and positive feedback on irrigation service	Yes	?	Yes	?	Yes	Some systems in Col. and Phil.suffer a decline in service
Agency staff change	Reduction in field O&M personnel due to IA assuming responsibility at lower levels	Yes	Yes	Yes	Yes	Yes	Initially restricted by law in Col.

Second Generation Problems and Solutions

As noted in the introduction, problems and solutions in a particular location will differ, depending on the perspective of the observer. The discussion below addresses problems from the perspectives of (a) the irrigation association, (b) farmers, (c) the irrigation agency, and (d) the government. Solving these problems can involve a variety of steps including revision of laws or implementing regulations and changes in organizational structure, organizational rules and processes, and funding mechanisms.

In addition, associations will require supporting services. Support services are services which come from outside the association itself but which are necessary for it to carry out its mission. They include such things as financing for equipment purchases, legal advice, computer programming assistance, and financial auditing services. Such services may be difficult for an association to generate internally , such as heavy equipment financing or be used only infrequently, such as specialized maintenance equipment, and hence be too expensive for an association to maintain on a full-time basis.

Support services can be procured by associations from a variety of sources -- private firms, public agencies, universities and institutes, non-government organizations, and national federations of associations. In the past, it has usually been assumed that any such services must come from government agencies. Today it is recognized that higher quality and less expensive services may be obtained from other sources, and that the government should generally serve as only one of many alternative, not as the sole source.

Irrigation Associations

Box 1. Major second generation problems for associations

- Insecure water rights
- Financial shortfalls
- Rehabilitation
- Lack of financial and administrative management expertise

Insecurity of water rights was identified as the most serious second generation problem affecting irrigation associations in the five case study countries. Water rights which are often absent, poorly-defined, or insecure, can (a) inhibit investment in new system facilities or rehabilitation, (b) encourage short-term thinking and behavior on the part of association managers and farmers, (c) result in heavy expenditures on legal costs to defend a poorly-defined water right, and, ultimately, (d) lead to a reduction in water supply and system collapse.

An effective water right should provide security, such that the association can depend on it over time, but must, at the same time, be adaptable so that water can be diverted to other more productive or higher priority uses as economic and demographic conditions change. In this event, there must be a provision for appropriate compensation to those who are giving up the water right by those who gain it. In Mexico, for example, the right of an association to water for irrigation use is always subservient to present **and future** municipal demands. This creates considerable insecurity for associations which share water sources with growing municipalities and violates both the principle of security and of just compensation.

An effective water right must also be specified in both quantitative and qualitative terms. Water quality degradation by upstream effluent discharges, as from a factory or an inadequate municipal sewage treatment plant, can render the water unusable by downstream agricultural right holders. It can also make the water suitable only for lower value crops, since biologically or chemically contaminated water may not

be useable for production of higher value fresh fruits and vegetables. This will become an increasingly serious problem as water reuse increases in response to growing demand from all sectors.

Establishing a water rights system where it is lacking, as in Turkey, or clarifying water rights where they are weak, ineffective, or inequitable, as in Mexico, will usually require action from the national legislative body or from top level executive leadership, or both. It is thus extremely important for associations to have adequate representation of their interests when these issues are taken up.

Two different types of support services are identified as being crucial for associations in attempting to establish or firm up their water rights. The first of these is legal advice and representation when the association faces challenges to its rights. Such representation is best secured from private law firms, if available. Such services secured from government sources may be of lower quality, and may be subject to pressures which would compromise their objectivity. Such representation is also important during the formative stage of an association, at the stage when negotiations with the government irrigation agency will establish the contract or concession which will control the relationship of the association and the government. Unfortunately, associations which are just forming may be unaware of the importance of high quality legal advice at this stage or may be unable to afford it. A national federation of associations could be valuable as a source of legal advice and assistance to newly forming associations.

The other type of support service required by associations is lobbying on their behalf in government policy making councils. Since other interests, such as municipalities and industrial water users, are usually larger than individual associations and likely to be more powerful politically, it is important for associations to establish regional or national federations representing many associations and a large number of farmers. This will give them political influence with which to counter the power of competing interests.

Another potential role for a federation would be to represent irrigation associations on the board of directors of the national irrigation agency. In Colombia this is currently the case.

Financial shortfalls comprise another high priority second generation problem affecting associations. A central feature of the IMT programs undertaken in all of the primary case study countries is financial autonomy. Financial autonomy is the condition where an organization generates all of the revenue it needs to support itself and to perform it's primary functions. It implies that the association is not directly subsidized by the government, or that if it is subsidized, that the subsidy is a fixed amount which does not vary according to the condition of the association's balance sheet. The principal source of revenue for most associations is irrigation service fee (ISF) collections. Financial shortfalls affect a number of associations in Colombia and

Box 2. Financial Problems in US Irrigation Districts

Irrigation Associations in developing countries are not the only ones to experience financial problems. According to *US Water News* (February 1997) the Maricopa-Stanfield Irrigation and Drainage District in Arizona (equivalent to an irrigation association) recently restructured $89.2 million in debt to end a 22-month effort to stave off bankruptcy. Two other Arizona irrigation districts filed for US Bankruptcy Court protection in 1994. Both subsequently negotiated agreements with their bondholders.

The Maricopa-Stanfield district was formed in 1962. In 1984, it sold bonds and took out an interest-free loan from the US Bureau of Reclamation to pay its share of the costs of building pumps, wells, and canals to deliver Central Arizona Project water from the Tucson Aqueduct to individual farms. However, reduced prices and yields on cotton, tight credit, and plunging land values hurt farmers and impeded their ability to make repayments. The settlement reached will extend the repayment period of the debts.

Argentina and are of concern in Mexico since the 1995 economic crisis.

Financial shortfalls are a function of several factors, including ISF rates, ISF collection percentages, the contribution of other sources of revenue, and expenditure patterns. One important factor is the structure of the ISF. Fees can be levied on flat rate or volumetric bases, each with advantages and disadvantages. A recommended structure for fees is a two-part one comprising both fixed and volumetric components. The flat portion would constitute a "connection charge", a charge for simply being within the boundaries of the system's service area whether or not water was actually taken from the system. This would reimburse the association for expenses incurred in maintaining the physical and administrative capacity to deliver water to the farm. The absence of this component in the fee structure of Mexican associations has created severe problems during years when drought greatly reduced the available water supply to the system's water users. The other portion of the fee would be based on the volume of water actually delivered during a cropping season, or some proxy for this amount, such as area irrigated and number of irrigations given. This would cover the costs incurred by the association which are related to the amount of water given, and would serve to limit excessive demand for water.

Revenue from ISF is also dependent on the percentage of the fees assessed which are actually collected, though associations in many countries do a reasonably good job in this regard. The Philippines and Argentina appear to be an exception to this rule. In particular, in the Philippines the low collection percentage has been a persistent problem for NIA.

Solving problems of revenue shortfalls that relate to fee levels and collection efficiency is largely an internal association responsibility. Outside assistance may be useful, in some cases, in estimating farmers ability to pay particular ISF levels, and in analyzing management systems set up for collecting revenue. This is discussed further in a following section.

Underlying difficulties in generating sufficient ISF revenue to sustain system operations, in many cases, is the low productivity of irrigated agriculture in system command areas. Low productivity can result from a large number of factors, but is often associated with small farm size, a subsistence orientation, production of low value crops such as grains, inappropriate agricultural policies, a poor natural resource base, and inadequate agricultural support services. In such cases, a solution to the association's financial problems may only be possible if the underlying problems in the agricultural sector are addressed. If these problems cannot be solved, then the options are for the government to (a) to have other agencies to provide technical assistance to increase production. And/or (b) provide the association with special subsidies. As a last resort, the government may have to consider to take back responsibility for system management and financing.

Yet, as irrigation service fees typically constitute only 3 to 10 percent of total production costs, reducing them will generally not solve an underlying problem of high production costs and low productivity.

Rehabilitation is identified as a third important second-generation problem for irrigation associations. All irrigation systems require periodic rehabilitation and modernization. While usually less expensive, in real terms, than the original construction, rehabilitation is a costly undertaking, and is usually beyond the financial and technical means of an association to undertake. A number of problems are associated with system rehabilitation. One is the usual absence of a clear and consistent government policy

on responsibility for rehabilitation[4]. In the absence of such a policy, the tendency is for associations to defer needed rehabilitation in the hope that the government will step in and take responsibility for the rehabilitation. In these case, IAs usually underinvest in system improvements between rehabilitations. This tendency is reinforced by the fact that, in all five primary cases, the government has retained ownership of system physical facilities, while transferring to associations the "use rights" of the facilities. Associations may thus regard the responsibility to rehabilitate those facilities as belonging to the government, unless the actual policy is clearly spelled out in the agreement between the government and the association.

Another problem is the often unclear nature of the cost sharing formula which is to be applied to rehabilitation. Because irrigated agriculture benefits people beyond the ranks of system irrigators, and because full coverage of rehabilitation costs is usually beyond the means of the irrigators themselves, a sharing of costs is appropriate. Assuming responsibility for even a share of the costs involved will tend to counteract the tendency of an association to defer maintenance, as noted above. A cost sharing formula should thus also be a part of the agreement between government and associations.

To cover its share of future rehabilitation costs, in some case associations need to accumulate a capital replacement fund over a number of years. There must thus be a legal basis for establishing such a fund and retaining funds in it from year to year. At the same time there should be incentives for establishing and contributing to such a fund. Unfortunately fiscal and monetary policies in many countries, such as Turkey and Mexico, have led to high rates of inflation and low or negative real interest rates on savings, which acts as a powerful deterrent to fund accumulation. Governments must either adjust these policies or create special investment opportunities for associations which allow them to earn reasonable rates of return on accumulated funds. Likewise, there should be incentives for making selective improvements in physical infrastructure between rehabilitations. One way to do this is to establish a trust fund, perhaps with donor financing, from which associations could request funds to complement their own investment funds. The matching ratio for such a funding facility should be established and made known in advance.

A number of support services are required to support system rehabilitation. One is a regular assessments of the condition of system facilities. This can be done jointly by the association and the government agency, as in Turkey. It can also be contracted out to an engineering consulting firm acceptable to both the association and the agency. Such an assessment can be used as a basis for annual maintenance planning, to suggest the need for selective improvements in system facilities, and for planning whole-system rehabilitation.

If an association is unable to accumulate its share of rehabilitation cost prior to rehabilitation and does not have the ability to assess a special charge on the members, it will need a source of credit. Credit can come from private banks, government banks or other lending facilities, or from insurance pools in the case of rehabilitation induced by natural disasters such as floods, typhoons, or volcanic eruptions. Such a credit facility could also be used as a source of financing for capital equipment needed for system maintenance.

Rehabilitation will also require external technical services for design and construction. Because of the sharing of costs, both the association and the government should be involved in decisionmaking relating to the selection of consultants and contractors and monitoring their performance. Advice and guidance to

[4]This policy may be left deliberately vague during a transfer program, while implying that support would be forthcoming, to increase farmer acceptance of the transfer.

the association on handing these tasks might usefully be given by a federation of associations, since rehabilitation occurs only infrequently in any one association.

Lack of financial and administrative management expertise is the final topic identified as a high-priority second generation problem. There are several possible responses to this problem. One would be skill enhancement through staff training programs. Skills can also be enhanced by replacing less skilled people with more capable ones. Contracting out for specialized services is another important way of addressing management deficiencies in associations.

One extremely important step in improving the quality of association management is to increase the transparency of management processes. This has a number of positive effects. It can (a) reduce the potential for misappropriation of funds, (b) help insure that salary levels and benefits are realistic, (c) help insure that maintenance allocations are appropriately targeted, (d) reduce favoritism in making personnel appointments, and (e) improve responsiveness of association staff to users.

A number of steps can be taken to increase transparency in association management. These include:

- regular external audits of financial accounts
- use of standardized budgeting and accounting frameworks
- wide dissemination of simplified budgets, plans, and financial statements
- active involvement of the board of directors in forward planning, budgeting, and auditing
- broad representation from among users on the association board of directors

There is broad scope for employing external support services in this problem area. Services that may be required include:

- advice on establishing and revising management systems and procedures
- advice on establishing financial budgeting and accounting systems, including software
- establishment of standard budgeting and accounting formats
- mandatory standards and requirements for regular external audits
- regular external audits
- management training

These services can be obtained by the association from a variety of sources, including private firms, a national or regional federation of associations, NGOs, government agencies, and universities and training institutes. Some services must generally come from a particular type of source, while others could be obtained from alternative sources. For example, the government is the logical party to establish mandatory standards and requirements for external audits. The audits themselves, however, could come from a government agency or from a private firm of chartered accountants. The later is probably preferable, in many cases, in terms of speed, quality, and objectivity. Other services, such as management and accounting system advice could come from a variety of sources, with private sources being generally preferred.

One argument in favor of the provision of these services by government agencies will often be that they can be obtained at no or low cost. What makes this lower cost provision possible, however, will generally be implicit government subsidies to the service providers. A preferred alternative would be to provide the funds supporting these subsidies instead to the associations as grants to be used for obtaining

management support services. This would allow the associations to shop for these services among alternative providers and select the sources which were most efficient and best met their needs. The demand-driven competition thus induced would be a very healthy force acting to hold down service prices and improve quality of services delivered. Provision of such grants during the transition phase from government agency to association management could be a very useful institution-strengthening activity.

Such support services may not be available in all cases and all regions of a country. In that case, financial and technical support might be provided by the government or an external lender to selected institutions during the transition phase to strengthen their capacity to provide training, accounting advice and other services subsequently. Services should be procured by associations on a fee-for-service basis, however.

Irrigation Agencies

Box 3. Major second generation problems for agencies

- Dislocation of staff
- Erosion of technical capacity
- Need to define and assimilate new role

Dislocation of staff is the most prominent problem experienced by agencies following IMT. This problem is typically dealt with is several ways. First, O&M staff levels are reduced by attrition. When positions become vacant due to retirement or resignation, they are left vacant or filled by internal transfers rather than new hiring. Second, financial incentives are often provided for early retirement of older staff. Third, existing staff are transferred to other positions which become vacant rather than filling them from outside the agency. In some countries such as China, where it is difficult to lay off staff, sideline enterprises are created which can generate income for the irrigation district and cover, at least the salary costs of the involved personnel. In the Philippines, this has taken the form of an irrigation consulting company, NIAConsult, which was created as a subsidiary of the National Irrigation Administration which provides irrigation advisory and design services within the Philippines and abroad. In some cases, redundant agency staff may be re-employed by the associations which take up management responsibility for the schemes. Such employment must be at the complete discretion of the association, however.

Loss of technical capacity in the national irrigation agency is a significant problem faced by most agencies which transfer significant irrigated areas to associations to manage. This is a result of the downsizing occasioned by the transfer of operational responsibilities. To address this problem, agencies can

- obtain specialized expertise from outside consulting firms as needed
- improve the salary schedule to attract and retain high-quality staff
- provide in-service training opportunities for staff
- revise job descriptions to bring in new staff with the desired qualifications

Support services associated with this problem include

- technical consultancies to provide specialized skills
- contracts for in-service training of personnel

Defining a new role for the agency is another important challenge. Operational responsibilities will often have been a major part of the agencies mandate. With these functions transferred to associations, scope exists for designing a new role to address emerging problems. Doing this requires that discussion takes place both among staff within the agency and at higher levels of the government, with broad participation by all involved parties. The aim should be to build broad consensus and political commitment for the new role. In some cases, changes in legislation may be required to enable the assumption of new responsibilities.

Box 4. Possible new roles for irrigation agencies

- technology transfer to associations
- advisory services to associations
- development of new policies and regulations
- monitoring of association performance
- arbitrating disputes
- river basin planning
- water resource allocation and monitoring
- project planning, design, and construction
- environmental monitoring and enforcement
- groundwater monitoring and control

The new mandate should contain a clear definition of roles and responsibilities and should define skill requirements to carry out the new responsibilities. It should also contain a timetable for accomplishing the shift to the new mandate.

Support services which could be useful in this process include

- comprehensive diagnosis of the agency/association relationship and the association support needs
- professional assistance with the agency's strategic planning process
- consulting services to design new management information systems for the agency
- research to solve problems experienced by associations and assess possible solutions

In Colombia, the national agency, INAT, is using professional consults to help them define a new role for themselves under an Inter-American Development Bank credit.

Farmers

Second generation problems experience by individual farmers relate mainly to the need to increase farm productivity to pay higher irrigation fees and to take advantage of possible improvements in irrigation service quality. Support services needed in this regard comprise the traditional roster of agricultural support needs, but with emphasis on a possible shift to higher value crops. These include

- production credit
- extension advice
- new technologies
- research results
- markets and market information
- access to inputs
- post-harvest services

Although government agencies are the traditional source of many of these services, in many countries, private or other organizations can play an expanding role in supplying some or all of the services listed above. There is also the question of the potential role of the association itself in providing other

agricultural services, in addition to irrigation service. In general, the association should have demonstrated competence in its core activity before considering such ancillary activities.

Government

The principal second-generation problem for government, beyond those already identified for the irrigation agency, is the reduced control which it will have over irrigation activities at the system level, and a diminished ability to use irrigation as a tool to implement other national policies and priorities. An example might be the government's wish to promote cultivation of upland crops rather than rice during a particular season. In the past it might have worked through the national irrigation agency to adjust water delivery schedules and volumes to try to achieve this end. Following transfer, this would be more difficult. There are other tools, such as support prices and subsidies, to achieve the same ends, however, and this should not pose a significant problem for agricultural policymakers.

Summary and Conclusions

Experience is now available from a number of developing countries which have recently implemented programs of IMT, a more limited form of the broader category of PIM. There is additional evidence for more developed countries which have transferred most irrigation management functions to locally-based organizations many years ago. In the case of developing countries that have recently introduced IMT, while the overall benefits have been positive, in some cases second generation problems have manifested themselves and, consequently, have tended to reduce the magnitude of the potential benefits.

With respect to the process of introducing IMT programs, political will at the highest level was a critical background condition that led to rapid and sustained takeoff of the transfer process. A second important element was that the irrigation infrastructure had to be in fair condition, such that it could deliver irrigation water as required. A national water law also is important for the long-term sustainability of the transferred systems. In the majority of the countries lack of clarity in water rights has led to second generation problems including conflicts with M&I users as well as other irrigation organizations.

PIM, or more explicitly IMT, is designed to shift the financial burden for irrigation service from the agency to the users that benefit from these services. This aspect has to be made very clear when the process of transfer is introduced. Failure to institute an adequate irrigation service fee and/or failure to collect the fee from all users, is one of the main reasons why countries are facing second generation problems. In general, the countries that have a clear policy on irrigation service fee rates and collection practices have been able to have more sustainable locally-managed irrigation systems.

The type and nature of the IAs are very dependent on the structure of the economy as well as the type of irrigation in the countries. Where the irrigation districts are relatively large and the economies are more advanced the IAs have tended to be more the irrigation district type. These IAs have economies of scale and can hire their own staff as well as owning specialized irrigation equipment. In contrast, in countries where irrigation service areas are very small and the economies are less developed, IAs tend to be small with diseconomies of scale. These organizations are less sustainable and tend to be more problematic in terms of management.

These changes in management structures and processes have had important impacts on four important target groups -- farmers, the irrigation association, the irrigation agency, and the government. As reported by the developing countries, impacts are both positive and negative. For example, while increased service fees have reduced the financial burden on the government and have increased the sustainability of the IAs, they have added to the costs of production for the users. On the other hand, from the perspective of the farmers transfer has resulted in a sense of ownership, reduction in conflicts and improved maintenance.

Transfer has reduced the O&M staff of the irrigation agencies as well as reducing the overall number of civil servants working in the irrigated agriculture sector. However, in a number of cases, this has reduced governments' ability to control cropping patterns and has also reduced governments' control over water resources and other resource policies, including environmental control. Reduced control has led to greater farmer satisfaction, more transparency in terms of operational decisions and greater overall economic efficiency.

As indicated , in some cases changes in management responsibility have resulted in a set of second generation problems -- some of which are already affecting the involved parties, while others are potential problems which are likely to have affects in the future. Insecurity of water rights was identified as the most serious second generation problem. The main solution is that it is necessary to establish a secure right that has both quantitative and qualitative terms. In the case of drought there should be a clearly established system of compensation to the users or the IAs. IAs as well as federations of IAs can help provide assistance and legal representation.

Financial shortfalls comprise another major second generation problem. With the principle source of revenue being the ISF, both ISF rates as well as collection percentages are equally important. A major means of improving ISF revenue is to shift to a two-part ISF with both a fixed connection charge as well as a volumetric charge. Increasing the productivity of irrigated agriculture is also an important element in increasing financial support to the Ias.

Rehabilitation was identified as a difficulty leading to second generation problems. It was agreed that there must be a clear and consistent policy related to rehabilitation. In the absence, maintenance is often deferred. As irrigation benefits not only the users, there is a valid argument for developing a cost sharing formula where the government pays a share and the users pay the remaining share. If possible, the IAs should have a savings account but when this is insufficient than it is necessary to have a source of affordable credit. Technical support, either from the government or the private sector, is needed to ensure the design for rehabilitation is technically sound.

The final second generation topic identified was a lack of financial and administrative management expertise. This calls for specialized staff training as well as improving the management system with increased transparency. External support services such as external auditors, ISF payments directly to the banks, use of micro-computers and standardized accounting packages, and contracting for maintenance equipment all are means of obtaining needed support services.

With respect to the irrigation agencies, they also suffer from a number of second generation problems. Dislocation of staff, loss of technical capability, and the need to define a new role for the agency are all problems found in the developing countries that are instituting PIM programs. In particular, the problem of what to do with excess staff is a difficulty faced by almost all agencies. Solutions include

attrition, extraordinary retirement incentives, creation of specialized consulting units, retraining and assistance with job placement, and transfer to other units.

Along with the problem of staff displacement, agencies also face the problem of the loss of specialized skills. These can be replaced by outside contracting and hiring private consultants but also may require the agency to provide some specialized training for the remaining staff in order to be able to adopt to the new roles of the agency.

Second generation problems of farmers are related to the need to increase agricultural productivity, including the need to shift to higher value crops. Services such as credit, agricultural extension, market access, technical inputs and post-harvest assistance are all needed. In some cases these will come from the government but in most cases these services will come from the private sector. The IAs themselves as well as a federations of IAs can also play a role in the provision of services.

In conclusion, a shift from public agency control to local participatory management is unlikely to happen without facing some second generation problems. Rapid institutional change will almost always require corrective measures to address unexpected problems. Countries that are more flexible with policies and procedures that can be adjusted will be able to address these problems better than countries with inflexible procedures. This document provides a number of solutions countries have used to solve their second generation problems.

Annexes

Annex I
Workshop Program

International Workshop on Participatory Irrigation Management: Second Generation Problems

Cali, Colombia
9-15 February 1997

Workshop Program

Revised - February 17, 1997 (11:16AM)

Monday 10 February

Chairperson: Herve Plusquellec

08:00 - 08:45	Registration	Sala Nariño
09:00 - 09:30	Opening ceremonies	CIAT DG: Grant Scobie INAT DG: Mario Montoya
09:30 - 10:00	Opening presentation	EDI: Peter Sun IIMI: Gil Levine
10:00 - 10:15	Introduction to the workshop	D. Groenfeldt, C. Garces
10:15 - 10:45	*Coffee*	*Hall*
10:45 - 11:30	Benefits and second generation problems	Sam Johnson
11:30 - 12:30	**Colombia** case study	L. E. Quintero
12:30 - 14:00	*Lunch*	*CIAT*

Chairperson: Enrique Palacios

14:00 - 15:00	**Philippine** case study	Namika Rabi
15:00 - 16:00	**Argentina** case study	J. Chambouleyron
16:00 - 16:30	*Coffee*	*Hall*
16:30 - 17:30	Panel: Lessons from the 3 case studies	C. Garces A. Subramanian J. Trava G. Diemer
17:30 - 17:45	Feedback on day one and introduction to day two	C. Garces
19:00	Welcome reception - cocktails and Bar B-Q	CIAT Swimming Pool

International Workshop on Participatory Irrigation Management: Second Generation Problems

Cali, Colombia
9-15 February 1997

Workshop Program

Revised - February 17, 1997 (11:29AM)

Tuesday 11 February

Chairperson: A. Gomez

08:25 - 08:30	Review of feedback from day 1	M. Svendsen
08:30 - 09:30	**Mexico** case study	E. Palacios
09:30 - 10:30	**Turkey** case study	M. Svendsen
10:30 - 11:00	*Coffee*	*Hall*
11:00 - 12:00	**Japan** case study	M. Shobayashi
12:00 - 12:45	**Taiwan** case study	Ko Hai-Sheng
12:45 - 14:00	*Lunch*	CIAT

Chairperson: S. Uskay

14:00 - 14:45	**Italy** case study	Atef Hamdy
14:45 - 15:00	Orientation to working group discussions	D. Groenfeldt
15:00 - 16:45	Working group **Session I: IMT Overview** *Coffee served in working groups*	
16:45 - 17:00	Orientation to field trip and review of day 2	C. Garces M. Svendsen
19:30 - 20:30	*Dinner*	CIAT

International Workshop on Participatory Irrigation Management: Second Generation Problems

Cali, Colombia
9-15 February 1997

Workshop Program

Revised - February 17, 1997 (11:29AM)

Wednesday 12 February

07:00 - 18:00	Full day field trip to RUT Irrigation System	
19:30 - 20:30	*Dinner*	*CIAT*

International Workshop on Participatory Irrigation Management: Second Generation Problems

Cali, Colombia
9-15 February 1997

Workshop Program

Revised - February 13, 1997 (7:49AM)

Thursday 13 February

Chairperson: R. Undan

08:30 - 08:45	Panel: Impressions from field trip	H. Yukiharu, M. Mathus, P. Sun
08:45 - 09:45	Continuation of Tuesday Working Groups	
09:45 - 10:15	*Coffee*	*Hall*
10:15 - 11:00	Working group presentations on **IMT Overview**	
11:00 - 11:15	Orientation to working group Session II	M. Svendsen
11:15 - 12:30	Working group **Session II: Exploring the Processes, Impacts, and Second Generation Problems of PIM**	3 Working Groups
12:30 - 14:00	*Lunch*	*CIAT*

Chairperson: J. Trava

14:00 - 14:30	Continuation of working group **Session II**	
14:30 - 15:30	Working group presentations on **Processes, Impacts and Problems**	3 Working Group Reporters
15:30 - 16:00	*Coffee*	*Hall*
16:00 - 17:00	Panel: Insights from inside the agencies Panel Facilitator: S. Johnson	S. Uskay A. Bocanumenth B. Mejia G. Davalos
17:00 - 17:15	Review of day 4 and orientation to Chiva tour	C. Garces
20:00 - 01:00	*Chiva tour*	*Cali*

Annex II
List of Participants

INTERNATIONAL WORKSHOP ON PARTICIPATORY IRRIGATION MANAGEMENTS:BENEFITS AND SECOND GENERATION PROBLEMS IIMI, EDI, WORLD BANK

CIAT, Cali, Colombia
February 10-15, 1997

LIST OF PARTICIPANTS

ARGENTINA

Jorge Luis Chambouleyron
Coordinador Programa Nacional de Riego y Drenaje
Instituto Nacional de Ciencias y Técnicas Hídricas
Centro Regional Andino, INCYTH
Belgrano 210-5500
Mendoza, Argentina
Tel: (54-61) 286993
Fax: (54-61) 288251

Miguel Mathus
Universidad de Cuyo
Rivadavia 42, Mendoza
Tel: (54-61) 511429
Fax: (54-61) 511429

Eduardo Roberto Herrera
Ingeniero Agrónomo
Facultad de Ciencias Agrarias
Universidad Nacional de Cuyo
Beltrán 2006 2o. Piso Dept. 2
5501 Godoy Cruz
Mendoza, Argentina
Tel: (54-61) 245460
Fax: (54-61) 960469

COLOMBIA

Luis Eduardo Quintero
Consultor
Consultores Regionales Asociados
Calle 47 No. 13-15 Apt. 1204
Santafé de Bogotá, Colombia
Tel: (571) 285-0192

Mario R. Montoya Negrete
Director General, INAT
Carrera 5 No. 15-80 Piso 20
Santafé de Bogotá, D.C.
Tel: (571) 283-6927
Fax: (571) 284-0157

Matilde Daza de Orozco
Subdirectora Adecuación de Tierras, INAT
Carrera 5 No. 15-80 Piso 16
Santafé de Bogotá, D.C.
Tel: (571) 283-9027-28
Fax: (571) 2840157

Alvaro Bocanumenth Puerta
Jefe Grupo Desarrollo Tecnológico
Sub-división Capacitación, INAT
Carrera 5 No. 15-80 Piso 22
Santafé de Bogotá, D.C.
Tel: (571) 3368127 ó 2841960
Fax: (571) 2841960

Rafael González Quiroga
Ing. Agrónomo, INAT
Carrera 5 No. 15-80 Piso 17
A.A. 35365
Santafé de Bogotá, D.C.
Tel: (571) 341-5350
Fax: (571) 282-0314

Armando Gómez
Presidente
Federriego
Calle 81 No. 10-32 Apto. 201
Santafé de Bogotá, D.C.
Tel: (571) 2578896
Fax: (5787) 602098

Manuel Alvaro Ramirez Rojas
Asistente Unidad de Desarrollo
Departamento Nacional de Planeación
Calle 26 No. 13-19 Piso 7
Unidad de Desarrollo Agrario
Santafé de Bogotá, D.C.
Tel: (571) 3361600 ó (571) 2816737 Ext. 2113
Fax: (571) 2816737
E-mail: mramirez@dnp.gov.co

Carlos Garcés Restrepo
Especialista en Riego
Director Proyecto Regional Andino, IIMI
IIMI c/o CIAT Apartado Aéreo 67-13
Cali, Colombia
Tel: (572) 4450-000 Ext. 3716
Fax: (572) 4450-073
E-mail: C.Garces@CGNET.COM

Charlotte de Fraiture
Experta Asociada, IIMI
IIMI c/o CIAT Apartado Aéreo 67-13
Cali, Colombia
Tel: (572) 4450-000 Ext. 3717
Fax: (572) 4450-073
E-mail: c.fraiture@CGNET.COM

THE NETHERLANDS

Geert Diemer
Department of Irrigation Soil and Water Conservation
Wageningen Agricultural University
Nieuwe Kanaal 11
NL 6709 PA Wageningen
The Netherlands
Tel: (31-317) 484583/4190
Fax: (31-317) 484759
E-mail: Geert.diemer@users.tct.wan.nl

ITALY

Atef Hamdy
Director of Research
International Center for Advanced Meditarranean
Agronomic Studies (CIHEAM - MAI-B)
Via Ceglie, 23
70010 Valenzano
BA-Italy
Tel: (39)-80-7806287 ó 7806111
Fax: (39)-80-7806206
E-mail: iamdir@vm.csata.it

JAPAN

Mikitaro Shobayashi
Deputy Director
Irrigation and Drainage Division
Agricultural Structure Improvement Bureau
Ministry of Agriculture, Forestry and Fisheries (MAFF)
1-2-1 Kasumigaseki Chiyoda-ku
Tokyo, Japan 100
Tel: (81-3)3502-8111 Ext. 3821
Fax: (81-3)5511-8252

Harada Yukiharu
Deputy Director
Overseas Agricultural and Development Center (ARDEC)
Japanese Institute of Irrigation and Drainage (JIID)
1-21-17 Toranomon Minato-ku 105
Tokyo, Japan
Tel: (81-3)3502-1387
Fax: (81-3)3502-1239
E-mail: jiidcmn@magical.egg.or.jp

MEXICO

Sam H. Johnson
Program Leader, Mexico
IIMI c/o CIMMYT
Lisboa No. 27 Colonia Juarez
Apartado Postal 6-641
C. P. 06600 Mexico, D. F.
Tel: (52-5) 7269091
Fax: (52-5) 7267558 ó (52-5) 7267558
E-mail: SJOHNSON@CIMMYT.MX

Wim Kloezen
Associate Expert
IIMI-Mexico
c/o CIMMYT-Texcoco
Calle M_nte Blanco #321
Col. Arboledas, 2da Sección
Celaya, Guanajuato, México
Tel: (52-5) 7269091
Fax: (52-5) 7257558
Fax: Cortazar, Guanajuato (415) 51308
E-mail: wkloezen@mail.mindvox.ciateq.mx or
iimi_mex@cimmyt.mx

José L. Trava Manzanilla
Ph.D. Agricultural Engineering
EDI-Banco Mundial
Constitución 13-C
Col. Escandón.
México, D.F. C.P. 11800
Private Consultant
Tel: (52-5) 5154404
Fax: (52-5) 2714105
jtrava@infosel.net.mx

Enrique Palacios Velez
Profesor Investigador Titular del Colegio
de Postgraduados, Montecillo
Texoco 56230
México
Tel: (52) 595 10170
Fax: (52) 59511555
E-mail: epalacio@colpos.colpos.mx

Guillermo Dávalos Samaniego
Asesor Privado
Comisión Nacional del Agua
Rafael Buelna 722 Oriente
Fraccionamiento El Parque
Los Mochis, Sinaloa, Mexico
Lada (681) México
Tel: (52-681) 128375
Fax: (52-681) 157293

PHILIPPINES

Rodolfo C. Undan
Assistant secretary for soils, irrigation, research and training
Department of Agriculture
BSWM Bldg, Elliptical Road
Diliman, Quezon city
Philippines
Tel: (632) 923 0428
Fax: (632) 920 9178

Billy M. Mejia
Department Manager, Institucional Development Department
National Irrigation Administration
National Government Center
EDSA, Diliman
Quezon City
Philippines
Tel; (63)-2-927-7802
Fax: (63)-2-926-2846

TAIWAN

Ko Hai-Sheng
Research Scientist
Agricultural Engineering Research Center
No. 196-1 Churg Yuan Road
Chung-Li
Taiwan, Roc
Tel: 886-3-452-1314
Fax: 886-3-452-6583
aercom@m58.hinet.net

TURKEY

Savas Uskay
Director of Operation & Maintenance of State Hydraulic Works
DSI (State Hydraulic Works)
DSI Genel Mudurlugu
Yucetepe, Ankara
061100 Turkey
Tel: (90 312) 418 3392
Fax: (90 312) 418 3385

UNITED STATES OF AMERICA

Gilbert Levine
Senior Associate, IIMI
71 Brooktondale Road, Ithaca, NY 14850
United States of America
Tel: (1) 607 2773409
Fax: (1) 607 2759745
E-mail: gl14@admini.is.cornell.edu

Namika Raby
Consultant
Edi World Bank
5719 Briarcrest Avenue
Lakewood, CA 90713
United States of America
Tel: (1) 310-867-6652
Fax: (1) 310-985-1535
E-mail: nraby@csulb.edu

Mark Svendsen
Consultant
24144 Price Creek Road
Philomath, OR 97370
United States of America
Tel: (1) 541-929-4811
Fax: (1) 541-929-4824
msvendsen@compuserve.com

Annex III
Working Group Tasks

Working Group Tasks

Session I - IMT Overview

Prepare a set of posters on flip chart paper identifying important similarities and differences among countries in terms of:

1. The **process** of introducing PIM-based changes in irrigation management and the conditions under which changes were introduced

2. The **impacts** of PIM-based changes in irrigation management

3. The **second generation problems** which are arising following the introduction of the changes

Session II

Group A

Beginning with the lists of key features of the process of introducing PIM-based changes in irrigation management developed in the first working group session, organize the key features under the following headings:

1. The way in which the changes were promoted and implemented

   Who (agency staff/organizers)
   What(types of activities)
   Intensity/duration
   Other

2. The nature of the locally-based organizations that were formed

Session II

Group B

Beginning with the lists of impacts of PIM-based changes in irrigation management developed in the first working group session:

1. Separate the impacts into those appealing principally to the groups below. (Listing an impact in more than one group is fine):
   a. Farmers
   b. The local irrigation association
   c. The public irrigation agency
   d. The national government

2. Identify 3 to 5 key impacts in each category

3. Identify countries where key potential benefits were realized

Session II

Group C

1. Using the lists of second generation problems reported from the first working group session, list problems in terms of the following 3 perspectives: (a) the Irrigation Association, (b) the farmer, (c) the public irrigation agency, and (d) the government. Identify the country programs experiencing the problems you report.

2. From each perspective, select the three most important second generation problems identified and indicate the roots of the problem.

Session III

Identify possible solutions in the to the key problems shown below in the area of action assigned to your group.

Group A

Structure, functioning, and financing of Irrigation Associations

Group B

Support Services

Annex IV
Case Studies

International Workshop on Participatory Irrigation Management: Second Generation Problems

Cali, Colombia
9-15 February 1997

Case Studies

Participatory Management of Irrigation: Benefits and Second Generation Problems, The case of Colombia. Luis E. Quintero-Pinto

Benefits and Second Generation Problems, the Case of Mexico. Enrique Palacios

Irrigation Management Transfer in Turkey: Process and Outcomes. Mark Svendsen and Gladys Nott

Second Generation Benefits and Problems of Participatory Irrigation Management: Argentina Case Study. Jorge Chambouleyron, Eduardo Herrera, and Miguel Mathus

Participatory Irrigation Management in the Philippines: The Learning Process Approach in the National Irrigation Systems. Namika Raby

Problems on Participatory Irrigation Management in Taiwan. Ko Hai-Sheng

Participatory Irrigation Management and Second Generation Problems: Case Study of Japan. Mikitaro Shobayashi

Second Generation Benefits and Problems of Participatory Irrigation Management: Italy Case Study. Atef Hamdy, Cosimo Lacirignola, and Giuliana Trisorio Liuzzi

Annex V
Results of Final Workshop Evaluations

International Workshop on Participatory Irrigation Management: Second Generation Problems

Cali, Colombia
9-15 February 1997

Results of Final Workshop Evaluation

A questionnaire was given out on the final morning of the workshop and filled in by 15 participants.[1] Five of these were completed in Spanish and 10 in English. A copy of the questionnaire is attached.

With regard to the question regarding achievement of workshop objectives, half of the participants (6) responding to this question indicated that the three objectives were fully achieved, one indicated "90%", one indicated "80%", one person felt that objective 1 was not achieved, two persons felt that objective 2 was not achieved, and one that objective 3 was not achieved. A listing of workshop objectives is attached.

The most valuable parts of the workshop for most respondents (8) were the working group discussions, followed by panel presentations and discussions (3), and the case studies (2). Single respondents mentioned informal discussions, meeting colleagues, working group presentations, general discussions, preparation of proceedings (presumably meaning that doing this as an integral part of the workshop structure was good), and the field visit.

With respect to parts of the workshop that participants felt could be reduced or eliminated, 4 mentioned the case studies. The sense of these responses was that in presentation, some, at least, were too long and too unfocussed. One mentioned the Italian case in particular. One respondent felt that the field visit didn't contribute to the workshop, and another felt that the first panel session was not useful.

As suggestions for improvement, 5 respondents recommended shortening the case studies and targeting the presentations on workshop issues. Two respondents each recommended more discussion time after working group presentations, and advance distribution of the papers. Suggestions by single individuals included the following:

- Clearer instructions for working group I
- Introducing individual participants at the beginning of the workshop
- Eliminating the Japan, Italy, and Taiwan case studies
- More thorough and better structured discussion of issues
- More "field" in the field visit
- Case studies on countries about to begin transfer programs
- Better plenary session time control

---

[1] A number of the participants had left by then. Nearly everyone who remained returned the questionnaire

Average numerical ratings received in Part 2 of the evaluation on a scale of 1 to 5 were the following.

- Satisfaction with coverage of the workshop topic 4.3
- Satisfaction with the way time was allocated 3.6
- Satisfaction with the working group discussions 4.3
- Satisfaction with the plenary sessions 3.9
- Satisfaction with location and facilities 4.4

Seventy-three percent (11) of the respondents felt that the length of the workshop was about right. Three persons felt that it was too short, while one felt that it was too long, suggesting that it could have been one day shorter.

Some of the comments connected with the numerical ratings duplicated those given by the respondent in Part 1. Others are indicated below.

- I learned more than I contributed
- Workshop title (second generation problems) implied a specific topic, while the workshop was mainly about general impacts (real and assumed) and problems of IMT/PIM
- Conclusions did not capture all of the preceding discussion
- When working groups were well led they were very useful -- when there was less direction, they were less effective
- Plenary chairmen did not always lead discussion
- Lack of intervention by chairmen during first few days when speakers deviated from subject; last few days improved dramatically
- Workshop design generated broad participation which was valuable (numerous)
- Topics are of importance to everyone
- Good handouts
- Nice mix of people from different countries and backgrounds
- Needed opportunity to discuss "participation" versus "turnover"
- Good overview and feedback (plenary)
- Good synthesis by presenters (presumably the last day)
- Organizers were flexible in responding to changing needs
- Excellent facilities and arrangements (numerous)
- Too far from city
- Evening programs very well organized
- Bar access needed to facilitate informal dialog
- Have more meetings like this

Seminar Objectives

1. To identify cross-cutting lessons regarding the process of introducing PIM-based changes in irrigation management from the experience of the case study countries

2. To describe, in detail, impacts of PIM-based changes in irrigation management

3. To identify second generation problems of PIM-based changes in irrigation management and possible solutions to those problems.

International Workshop on Participatory Irrigation Management: Second Generation Problems

Cali, Colombia
9-15 February 1997

Final Evaluation

Revised - February 17, 1997 (10:55AM)

Please help us improve future workshops by reflecting back over the entire workshop and letting us know your opinions on this form. Please answer the following questions. Continue onto the back of the page, if necessary.

PART ONE

1. To what extent has the workshop achieved stated purpose and expected outcomes? (See attached purpose statement.)

2. What have been the best parts of the workshop for YOU? Why?

3. What parts could have been de-emphasized or eliminated?

4. What improvements do you suggest?

PART TWO

By marking the scale, indicate your satisfaction regarding the various parts of the workshop:

5. Level of satisfaction with the coverage of the workshop topic?

1----------2----------3----------4----------5
dissatisfied moderately satisfied very satisfied

WHY?

6. Level of satisfaction with the way available time was allocated among different aspects of the workshop topic?

1----------2----------3----------4----------5
dissatisfied moderately satisfied very satisfied

WHY?

7. Level of satisfaction with the small group discussions in the workshop?

1----------2----------3----------4----------5
dissatisfied moderately satisfied very satisfied

WHY?

8. Level of satisfaction with the plenary sessions in the workshop?

1----------2----------3----------4----------5
dissatisfied moderately satisfied very satisfied

WHY?

9. Level of satisfaction with the location and facilities.

1----------2----------3----------4----------5
dissatisfied moderately satisfied very satisfied

WHY?

10. Length of the workshop:

❑ too short ❑ about right ❑ too long

11. Other comments: (on back)

Brad-5