

Irrigation management transfer

Worldwide efforts and results



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Irrigation management transfer

Worldwide efforts and results

FAO
WATER
REPORTS

32

by

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Documents available on CD-ROM

- Irrigation Management Transfer country profiles, case studies and WUA legislation country profiles for a number of selected countries, i.e. Albania, Argentina, Armenia, Australia, Bangladesh, Bolivia, Bulgaria, Burundi, Chile, China (Hebei), China (Hubei), China (Hunan), China (Ningxia), China (Shaanxi), China (Shenyang), Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Ghana, India (Andhra Pradesh), India (Karnataka), India (Madhya Pradesh), India (Orissa), India (Rajasthan), Indonesia – large systems, Indonesia – small systems, Italy, Kyrgyzstan, Mali, Mexico, Morocco, Nepal, Netherlands, New Zealand, Niger, Nigeria, Pakistan (Punjab), Pakistan (Sindh), Peru, Philippines, Romania, Senegal, South Africa, Sri Lanka, Sudan, Swaziland, Taiwan Province of China, Tunisia, Turkey, United States of America and Zimbabwe.
- International e-mail conference on irrigation management transfer (2001) organized by FAO and the International Network for Participatory Irrigation Management.
- Bibliography and links.

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- Adobe Acrobat® Reader (not included on CD-ROM)

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Preface

The process of devolvement of authority and responsibility from government agencies managing irrigation systems to private-sector entities (often a water users association) established for such a purpose is known as irrigation management transfer (IMT) and has been utilized as a tool for irrigation sector reform in more than 60 countries. The introduction of the IMT process can be traced back to the mid-1970s. However, the apex of the application of IMT occurred in the early 1990s after governments faced increasing financial difficulties in maintaining the irrigation systems and when increasing disenchantment with their performance reached its peak. Thus, the accumulated experience with the application of the IMT process now covers almost 40 years, with the last 15 years or so providing an increasing wealth of information.

The Water Development and Management Unit (NRLW) of FAO decided that IMT was an important issue that needed to be documented and analysed. Together with a number of collaborators, with the International Water Management Institute (IWMI) being the major one, NRLW designed a strategy to implement a set of activities that would (i) acquire in-depth knowledge on how countries were applying IMT, on their approaches, on successes and failures; and (ii) derive lessons and provide feedback to those same countries (and new ones in the process of initiating IMT activities). These activities included: an e-mail conference on the subject; various studies to gain specific information from countries engaged in the process; field visits to key countries; and a worldwide literature review. These activities spanned a period of almost 6 years.

The present water report is the final product emanating from efforts by FAO, IWMI and others to document and understand the implications of the irrigation sector embarking on a wide reform process. However, this document concentrates mainly on the results derived from the surveys undertaken in 33 countries. In order to carry out these surveys, three types of document were prepared: (i) IMT case studies, seen as in-depth documentation of the IMT process in countries where a major effort had already been undertaken or was underway; (ii) IMT profiles, involving a large set of countries and derived through a brief questionnaire; and (iii) legislation on water users associations (legislation country profiles), with an emphasis on legal issues emanating from newly established associations.

The lessons that have emerged from these efforts are both encouraging and reasons for concern. Much is now known about the conditions that need to be met if a reasonable degree of success from the interventions is to be expected. For example, political support at the highest level is essential. Similarly, IMT is not a “time-bound” intervention; each country or region needs to move at its own pace and adapt to its particular cultural and socio-economic environment. It follows that there may not be a single IMT “model”, and that trying to impose outside experiences will probably end in failure. On the other hand, the lessons already learned should provide the basis for others to keep in mind and build on those experiences.

Parallel to the introduction of IMT, there are many other issues that countries involved in the process need to consider, e.g. a clear legal framework for water rights, establishment of users associations, and land tenure. The IMT process does not stop once the management transfer has occurred. Indeed, it may be just the starting point for greater interventions, including the formulation of an entirely new structure for providing services to the emerging and revitalized irrigation systems. Thus, the introduction of IMT may open the door for further reforms relating to credit access, marketing and improvements in other support services.

However, key questions remain as to who will be responsible for the long-term rehabilitation or modernization of transferred schemes, how should governments guarantee the sustainability of support services to irrigated agriculture, how IMT will affect current water rights arrangements and how farmers' organizations can be made effective in representing farmers' interest at scheme, river basin and national levels. Answering unequivocally the above-mentioned questions is part of the work ahead.

It is hoped that this water report will provide a valuable contribution to the irrigation sector.

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List of acronyms

DSI	General Directorate of State Hydraulic Works, Turkey
GVO	Gross value output
ID	Irrigation district
IMT	Irrigation management transfer
INPIM	International Network for Participatory Irrigation Management
IWM	Integrated water management
IWMI	International Water Management Institute
M&E	Monitoring and evaluation
NGO	Non-governmental organization
O&M	Operation and maintenance
PIM	Participatory irrigation management
PPP	Public–private partnership
WUA	Water users association

Chapter 1

Introduction

Agriculture is by far the largest user of the world's water, soil and biodiversity. Today, it finds itself at the centre of the debate on how to conserve the world's environments. It accounts for 70 percent of the total water withdrawals of the globe, a percentage that is close to 85 percent when considering only the developing countries. As the world's welfare improves, demands from other water subsectors are increasing. Domestic water supply, industry and manufacturing, and the environment itself, are now in direct competition with the agriculture sector for increasingly scarce water resources.

Thus, competition for water resources can only lead to the agriculture sector having to review, and adjust accordingly, its share of water. The international community is increasingly scrutinizing and monitoring water consumption patterns in agriculture and its corresponding water-use allocation and efficiencies. The approximately 1 260 million ha under rainfed agriculture (corresponding to 80 percent of the world's total cultivated land) supply 60 percent of the world's food; while the 277 million ha under irrigation (the remaining 20 percent of land under cultivation) contribute the other 40 percent of the food supplies. On average, crop yields per hectare under irrigated agriculture are 2.3 times higher than those from rainfed areas. Together with the figures from the previous paragraph, these numbers demonstrate that irrigated agriculture has had, and will continue to have, an important role to play both in the provision of the world's food supply and beyond.

Parallel to the concern about natural resources management, two other major movements have been emerging across the globe and shaping policy: (i) liberalism; and (ii) a call for a more participatory development approach. The former is centred around the idea that in order for countries to move forward – to progress – they should *inter alia*:

- open their economies to competition;
- remove trade barriers;
- open markets;
- deregulate;
- eliminate subsidies;
- privatize their industries;
- diversify providers of goods and services;
- expand their commercial frontiers based on the principle of comparative advantage.

The participatory movement has advocated that the size of government should be reduced and that people should participate more in governance, management and financing resource development in order to promote sustainable and equitable development. Participation promotes the subsidiarity principle of making decisions at the lowest level possible, thereby increasing stakeholder participation. In combination, liberalization and participation have led to the concept of self-reliance coming to the forefront of the development strategy.

Moreover, in order to comply with the structural adjustments required by the international financing institutions in the last few decades, governments have devised ways to decrease public spending in most sectors. This disengagement has not spared agriculture (in particular, the irrigation sector).

Within the above context, governments across the world have responded and embarked on a process of irrigation reform meant to tackle the increasing demands on irrigated agriculture and to enhance its performance while coping with both liberalization and participatory strategies. Among reforms in irrigated agriculture, irrigation management transfer (IMT) has appeared as the most important and far-reaching reform thus far.

RATIONALE FOR AND OBJECTIVES OF THIS REPORT

Towards the end of the twentieth century, many developing countries were moving in the direction of major change in their economic policies, including reductions in the size and budgets of government. Pressure was mounting on the agriculture sector to become more efficient. Many governments made efforts to collect irrigation service fees but few were successful. The time for more basic change in the irrigation subsector was ripe. One such reform, IMT, was emerging worldwide. The philosophy behind IMT lies in the perception that increased ownership, decision-making authority, and active participation in the operation and maintenance (O&M) of irrigation systems would create or force a binding commitment from water users to be more effective and responsible towards their obligations. If farmers were to assume the costs of running the irrigation systems, the incentives to succeed in their management were bound to increase. This is the principle of subsidiarity, or that decisions are made at the lowest level possible, a pillar of what is now perceived as “good” water governance. On the other hand, governmental irrigation agencies (usually constrained by bureaucratic procedures, dwindling budgets and rigid policies) became inefficient and had unmotivated personnel and low system performance. Therefore, IMT emerged in response to the need for sector reform, the merits of self-sufficiency, and the drive for increased participation of water users in irrigation system management.

In line with the preceding paragraphs, this report has several objectives. First and foremost, it is intended to be a knowledge synthesis document that captures the global experiences emerging from a wide-reaching process targeting the reform of the irrigation sector: IMT. It is also intended to bring to closure a long-running programme (undertaken by FAO and partners) initiated in the year 2000 that was designed to assist countries with the exchange of information regarding all aspects of the reform. In this connection, this report is a natural follow-up to FAO Irrigation and Drainage Paper No. 58 *Transfer of irrigation management services – guidelines* (FAO, 1999), which is a reference tool to orient policy-makers, planners, technical experts and other agents of reform engaged in programmes to design and implement effective, comprehensive, integrated and sustainable irrigation sector reform. Finally, this report will further enrich the worldwide database on IMT that has resulted from all the studies reported herein. These have led to a specialized Web page on the subject managed by FAO (available at http://www.fao.org/nr/water/topics_isr.html).

Irrigation management transfer has been applied to fit diverse reform needs, ranging from pilot areas of a few hundred hectares to large schemes of several hundred thousand hectares and a national effort encompassing millions of hectares. Similarly, as shown in the following chapters, the reform can take place at various hydraulic levels and result in a variety of institutional arrangements. Such a far-reaching process of irrigation reform needs to be documented and analysed, and its key lessons need to be identified. These are the purposes of this report.

The report consists of five chapters. This first chapter provides a brief introduction to set the stage of why irrigation sector reform has emerged. This is followed by the rationale and historical background about how the concept of IMT developed. It then summarizes the current situation across the globe, and ends by examining the scope and breadth of activities undertaken by FAO and the International Water Management Institute (IWMI).

Chapter 2 presents the policy and legal framework for IMT. Regarding policy, it examines the requirements for supporting IMT programmes as well as for establishing water users associations (WUAs), the cornerstone of the transfer process. It also examines: policies for tackling financing irrigation; how to secure the reforms of irrigation agencies or similar government bodies; and how to assure fundamental support services that must be generated as a result of the reform. In respect of the legal framework, it discusses the scope and basis for both WUAs and the management transfer process itself. It touches briefly on other legal aspects, such as water rights, dispute resolution and support services.

Chapter 3 focuses on the elements present in the implementation of IMT programmes. It addresses IMT strategies (e.g. the scale of transfer, the scope of activities included, and the speed of implementation). It examines how to mobilize support and create public awareness to strengthen the process, how WUAs are organized, what type or extent of capacity development activities are included, and how the actual transfer takes place. It then explores aspects related to the need for rehabilitation and modernization (and their financing). The chapter closes with a discussion on accompanying support services (generated or lacking), and on how or whether the public-sector organizations involved need reform.

Chapter 4 brings together the outcomes and impacts derived or expected from IMT reform. Regarding outcomes, it focuses on: irrigation system management, WUAs, the irrigation subsector organizations, and the emerging private-sector service providers. Regarding impacts, it analyses the effect on agricultural productivity (land and water), including crop yields and cropping intensities. It then analyses aspects related to economic productivity, such as gross value output (GVO), farm income, employment and poverty. The chapter also examines the socio-economic and political relationships as well as the impacts on the environment.

Chapter 5 summarizes key conclusions and recommendations. It summarizes the emerging types of IMT models and programmes, the main constraints on IMT (and how they have been overcome), and the role of IMT in the context of integrated water management (IWM). Following a discussion on whether the current concept of IMT (rationale and objective) should be revised in the light of the lessons learned, the chapter closes with some specific recommendations for future IMT programmes.

HISTORICAL BACKGROUND OF IMT, AND DEFINITION OF CONCEPTS

The emergence of IMT as a process for subsector reform can be traced back to the early 1970s, when a general disappointment with the performance of irrigation systems (following huge investments by governments and international agencies in the 1950s and 1960s) began to take hold. More often than not, irrigation agencies established with the purpose of supplying water to those systems under a rigid, top-down approach failed in their objectives. Farmers who were meant to pay for these services in order to keep the operation sustainable began to falter in their obligations and to demand better services tailored to their needs. A vicious cycle of non-payment and infrastructure deterioration ensued. By the 1980s, the world economic downturn had forced governments to revise their policies of trying to keep the irrigation systems running from their meagre budgets after lack of payments of water charges by farmers had only increased. The need for reform was ripe. Thus, typical objectives of IMT programmes became:

- Eliminate or reduce recurring government expenditures for operation and management of irrigation systems.
- Establish financially self-reliant water service providers to replace the public agency in the management of systems.
- Reverse the increasing rate of deterioration of infrastructure.

- Provide transparency in management and accountability of the service provider to water users.
- As an end-result, the main objective of IMT was to achieve improvements in the performance of the irrigated agriculture sector, including both productivity and financial and physical sustainability.

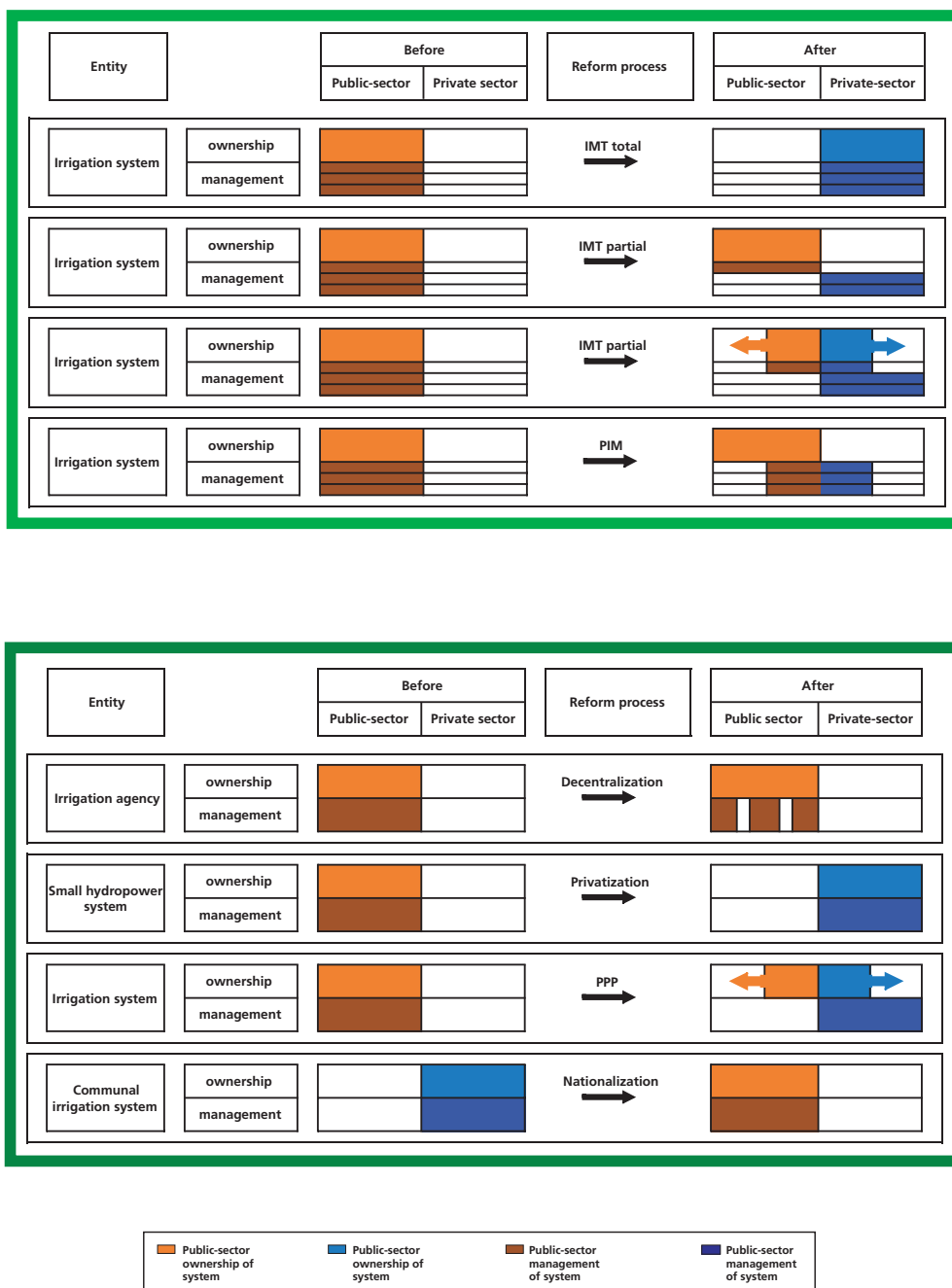
The concept of IMT normally refers to the process that seeks the relocation of responsibility and authority from the controlling government agencies managing irrigation systems (under the public sector) into the hands of non-governmental organizations (NGOs), such as WUAs, or other private-sector entities. Usually, these are established as recipients of the transfer or handover of management.

In dealing with IMT issues, a second, interrelated concept, referred to as participatory irrigation management (PIM), is often encountered. Normally, this refers to the increased involvement of water users in irrigation management, along with the government; thus, it consists more of a behavioural or attitudinal change than a reform process per se. Thus, while the IMT concept intends to replace the role of the government, PIM seeks to strengthen the relationship between water users and government by adding farmer participation to government management. The concepts intersect at the “comanagement” stage of IMT, where, before a final transfer takes place, the government agency and the recipient organization agree to share responsibilities. The point here is that, while having intersecting elements, the two concepts are not exactly the same and, therefore, they should not be interchangeable. However, owing to a number of factors, mostly related to the acceptance of terms, PIM is widely used in many circumstances and contexts that really correspond to the concept of IMT.

In order to further capture the meaning of IMT, it is worth defining other concepts that are found in the realm of institutional reform and that often touch irrigation. Decentralization is the movement of decision-making authority to regional or local levels from a central authority, but still within the same organization. Privatization refers to the transfer of ownership of assets from the government to the private sector. In the case of irrigation, the assets would be represented by the systems themselves (irrigation and drainage network) and by equipment. As shown in Chapter 2, governments rarely transfer the ownership of the irrigation and drainage networks and, therefore, the use of the term applies to few cases. The concept of public–private partnership (PPP) refers to an arrangement in support of irrigation reform that can be viewed as a “third way” or link between farmers, government and the private sector. A final concept worth mentioning is nationalization, defined as the transfer of ownership from the private sector to the public sector. An example of this in the context of irrigation would be a government irrigation agency taking over a communal system.

Figure 1 uses diagrams to represent the reform concepts discussed. They are all provided in the light of irrigation subsector reform. The upper “block” shows several degrees of IMT and PIM. The lower “block” includes all the other related concepts. For simplicity, and recognizing that a weakness may be introduced, the entity to undergo the reform process is portrayed through the standing conditions of its “ownership” and its “management” (left side of Figure 1), with the “governance” component included in the latter. The “before” and “after” conditions as a result of the reform process (arrows) are indicated. Taking as an example in the upper block the second IMT partial condition in the diagram, both ownership and management previous to the reform are in the hands of the public sector. After an IMT “partial” reform, the management is now “shared” between the private and public sector. The sliding arrows indicate that the percentage of public–private management can vary and is a function of whatever particular agreement is conceived under the reform process. In the lower block, on decentralization, the diagram shows that, after the reform process, ownership remains the same but management is now divided into different areas or regions but still within the public sector.

FIGURE 1
Schematic diagram on definitions of irrigation sector reform



EXTENT OF IMT WORLDWIDE

Irrigation management transfer is taking place in five continents. This type of reform began to be implemented as far back as the 1960s in Taiwan Province of China, Bangladesh and United States of America; in the 1970s, in Mali, New Zealand and Colombia; and in the 1980s, in the Philippines, Mexico, Tunisia and the Dominican Republic. The bulk of the irrigation reform peaked in the 1990s, when countries such as Morocco (1990), Australia (1994), Turkey (1994), Peru (1995), Albania (1996) and Zimbabwe (1997) initiated the process. The new century already shows examples of interventions taking place in the Sudan and Pakistan (2000), India (2001) and China (2002), each of which has experienced a unique process and result. Today, more than 57 countries have embarked on some type of irrigation sector reform that has IMT. This corresponds to 40 percent of countries reporting more than 10 000 ha under irrigation. These represent 72 percent of the world population as they include among others China, India, the United States of America, Indonesia, Pakistan and Bangladesh, and represent 76 percent of the irrigated area of the world (FAO, 2007).

The list of 57 countries includes the 42 countries listed in Table 1 plus: Cyprus, Georgia, Ethiopia, Guatemala, Jordan, Kazakhstan, Lao People's Democratic Republic, Madagascar, Mauritania, Moldova, Poland, Tajikistan, The former Yugoslav Republic of Macedonia, Ukraine and Viet Nam. In addition, there are other countries where the application of IMT is traditional (prior to 1960), e.g. Germany, Italy, Netherlands and Spain, and the traditional irrigation systems of France.

IMT-RELATED ACTIVITIES UNDERTAKEN BY FAO AND THE IWMI

The present report is the culmination of an IMT-related programme on the subject of irrigation sector reform initiated by FAO and its partners in 2000. With the generous support of the Ford Foundation and in collaboration with the IWMI, a broad set of activities were designed. Other organizations, such as the World Bank and the International Network for Participatory Irrigation Management (INPIM), also made specific contributions.

The programme was designed around five distinct but interrelated initiatives:

- An international e-mail conference, held from June until November 2001, and for which more than 400 participants from 80 countries registered. This conference led to the establishment at FAO of an IMT specialized Web page that is still active today and the hub of the activities of the programme. This page, now renamed Irrigation Sector Reform, provides a worldwide forum for identifying and sharing lessons and concerns about the growing global experience with irrigation sector reform (available at http://www.fao.org/nr/water/topics_isr.html).
- The preparation of a range of specific IMT case studies in countries that have gone through a major process of IMT.
- The compilation of IMT country profiles (meant to be an abbreviated version of case studies).
- The compilation of WUA legislation country profiles.
- The compilation of and links to key studies and other documentation on IMT carried out by a range of renowned institutions.

This publication summarizes the efforts of three of these five activities. With respect to the IMT country case studies, a total of 13 cases have been prepared, covering 11 countries. These provide in-depth assessments of the experiences of those specific countries in carrying out their IMT interventions. They document the:

- context,
- strategy,
- policy and legal framework,
- implementation process,
- outcomes and impacts,
- lessons learned.

These types of studies have required a considerable amount of time from professionals that have been closely associated with the process.

The IMT country profiles provide more concise assessments of IMT for a much wider geographical coverage. These documents summarize the IMT strategy, results and lessons learned for a particular country, province or pilot area. A total of 43 profiles are included, representing 33 countries. Some larger countries, such as China and India, have several profiles for different states or programmes. These country profiles have been prepared by experts directly involved or very familiar with the reform process. It is recognized that, because a mostly qualitative questionnaire was used to gather the information, a bias may have been introduced by having persons that were directly involved or responsible for the IMT implementation. In several cases, this was the only option available for gathering the information needed for this study.

Finally, and with respect to the WUA legislation profiles, the FAO Water Development and Management Unit, jointly with the Development Law Service, conducted a worldwide inventory on the legal and regulatory framework supporting WUAs. It includes a summary analysis of readily available primary and secondary legislation governing their:

- establishment,
- internal structure,
- functions and powers,
- funding,
- dissolution,
- control by government.

In two cases, in addition to the WUA study, the legal and regulatory framework supporting IMT has been documented. These profiles focus on legislation governing the transfer of functions and powers from the government to WUAs. A total of 30 cases representing 28 countries are included in the WUA legislation profile inventory.

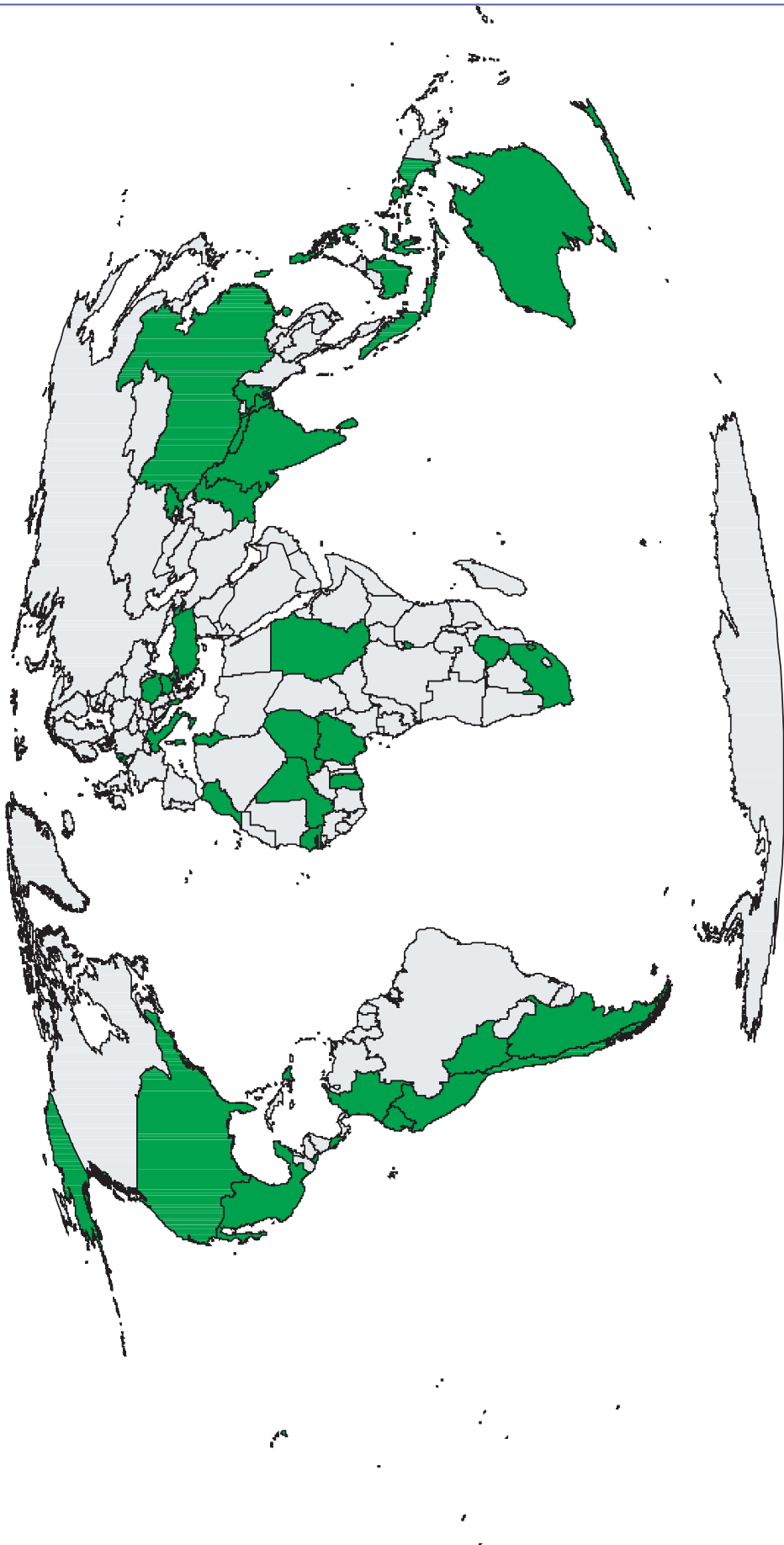
All the studies mentioned are included on the CD-ROM that accompanies this publication. Table 1 presents the particular countries and the type of studies conducted in each one. In the remaining part of the text, reference is made to the particular type of survey (country profile, country case, or WUA legislation profile) or countries (Table 1) depending of the type of analysis made. Figure 2 shows the location of these countries worldwide.

TABLE 1
FAO irrigation sector reform studies, by country and type

No.	Country (province/state/region)	IMT country profiles	IMT country cases	WUA legislation profiles
1	Albania	X		X
2	Argentina	X		X
3	Armenia	X		X
4	Australia	X		
5	Bangladesh	X		
6	Bolivia			X
7	Bulgaria	X		X
8	Burundi			X
9	Chile			X
10	China (Hebei)	X		
10	China (Hubei)	X		
10	China (Hunan)	X		
10	China (Ningxia)	X		
10	China (Shaanxi)	X		
10	China (Shenyang)	X		
11	Colombia	X	X	X
12	Costa Rica	X		X
13	Dominican Republic	X	X	X
14	Ecuador	X	X	X
15	El Salvador			X
16	Ghana	X		
17	India (Andhra Pradesh)	X	X X*	X
17	India (Karnataka)	X		
17	India (Madhya Pradesh)	X		
17	India (Orissa)	X		
17	India (Rajasthan)	X		
18	Indonesia – large systems	X		X
18	Indonesia – small systems	X	X	
19	Italy			X X X
20	Kyrgyzstan	X	X	
21	Mali	X		
22	Mexico	X	X	X
23	Morocco	X		X
24	Nepal	X		X
25	Netherlands			X
26	New Zealand	X		
27	Niger	X		
28	Nigeria	X		
29	Pakistan (Punjab)	X		X
29	Pakistan (Sindh)			X
30	Peru	X		X
31	Philippines	X		X
32	Romania	X		X
33	Senegal	X		
34	South Africa		X X	X
35	Sri Lanka	X		X
36	Sudan	X	X	
37	Swaziland			X
38	Taiwan Province of China			
39	Tunisia	X		X
40	Turkey	X	X	
41	United States of America	X	X	
42	Zimbabwe	X		
	Total number of studies/countries	43/33	13/11	30/28

* Number of Xs indicates number of studies conducted under each type.

FIGURE 2
Map of countries represented in the study



Chapter 2

Policy and legal framework for irrigation management transfer

This report defines IMT as the transfer of responsibility and authority for management of irrigation systems from government agencies to private-sector organizations that are meant to represent the interests of water users. Most commonly, these are WUAs, which provide a forum whereby water users act collectively to govern an irrigation system or subsystem. This may include the roles of deciding which irrigation services should be provided, how and by whom they will be provided, and under what terms and conditions. The actual management of the irrigation system (i.e. delivery of services) may be done by the WUA or third parties. After IMT has been adopted, such services may be financed entirely by farmers or with some combination of resources provided by farmers and government.

This chapter examines sample cases of IMT from around the world in order to discover how the policy, legal and institutional framework for IMT has been constructed in many different contexts. Annex 1 summarizes basic information on how IMT was structured in the 43 cases for which there are IMT country profiles.

RATIONALE FOR ADOPTING IMT

A significant aspect of IMT is its relative similarity across different parts of the world. This is partly related to the basic need for sustainable irrigation management under declining levels of government investment. It is also related to the similar ways whereby the technical, agricultural, organizational and economic aspects of irrigation systems have to interact with one another in order to ensure productive and self-sustainable management.

There are five main expectations held by governments, financing institutions, technical experts and even farmers that motivate them to promote IMT:

- It will reduce the burden of costs, staff requirements and technical or management problems faced by governments. Although in the beginning IMT may increase the cost of irrigation for farmers, it is expected that farmers organizations will impose more cost-effective measures and that over time the productivity of systems will increase more than will their costs for farmers. Thus, the most commonly stated reasons for adopting a policy of IMT are to reduce financial and managerial burdens on governments and to stimulate a more productive and self-reliant irrigated agriculture.
- It will lead to improvements in the agricultural productivity and economic profitability of irrigation systems because this is the core concern of farmers, whereas it may not be an essential concern of bureaucracies. Farmers will be inclined to manage irrigation systems so as to increase the area irrigated, cropping intensities and/or crop diversity, yields and economic returns.
- It will motivate farmers to pay more for their irrigation system because they will be empowered to take over the authority to define what their irrigation services will be, who will provide them, and how and at what costs these will be provided.
- Because of farmer interest in results, governance by farmers organizations will improve the accountability of irrigation system management to farmers, and this will produce more efficient and equitable water delivery, canal maintenance and settlement of disputes.

BOX 1
Adoption of IMT in Albania

In 1994, Albania adopted IMT after a period of civil unrest that followed collapse of the central government in the early 1990s. By 1994, most of the irrigation infrastructure was badly deteriorated or damaged. At first, the irrigation agency resisted management transfer. Farmers lacked money to pay the cost of O&M. However, the Government and the World Bank agreed on a programme to transfer management to WUAs and rehabilitate irrigation systems. The WUAs played a key role in planning, supervising rehabilitation, collecting water charges, and paying part of the cost of rehabilitation. This participatory role helped to generate a new feeling of ownership of the systems by farmers. Extensive training was given to farmers in technical, financial, administrative and agricultural topics. Agency staff were trained and reassigned. By 2001, Albania had 404 WUAs and 22 WUA federations, serving a total area of 169 550 ha.

Source: Vermillion (2004).

➤ Collective organization for irrigation management will probably produce collective action in related areas, such as in the group purchase of agricultural inputs, development of agribusiness ventures and marketing. It is expected that this larger collective action will promote development of more responsive support services and will create pressures to ensure more reliable provision of water to the system.

The FAO/IWMI database of IMT profiles provides data on key factors that motivated the adoption of IMT in locations around the world. By far (24 cases) the most important motivation for adopting IMT programmes was the shortage of government funds for irrigation O&M (Table 2). Box 1 illustrates that the implementation of IMT in Albania responded to most of the expectations described above.

Two other related factors are the inadequate collection of water fees (first or second most important reason in 15 cases) and poor O&M of irrigation systems (first or second most important reason in 22 cases).

Finally, with respect to motivation for transfer adoption, IMT is sometimes promoted primarily by farmers (as originally in Colombia) and sometimes by donors and technical assistance agencies (as in Indonesia and Romania). It is often part of a broader pattern of liberalization and privatization in the economic policies of the government (as in Mexico and Andhra Pradesh, India). In Uzbekistan and the Kyrgyz Republic, it accompanied the political and economic transitions following the demise of the Soviet Union.

TABLE 2
Factors motivating adoption of IMT

Factors	Number of countries where factor is:	
	Most important	Second most important
Shortage of government funds to allocate to irrigation O&M	24	6
Poor maintenance of irrigation systems	5	13
Government not able to collect enough fees from water users	4	11
Part of general liberalization policies of government	3	0
Poor operation of irrigation systems	2	2
Farmers requested to take over management of schemes	2	4
Donors and international agencies	2	0
Political transition in former Soviet Union countries	2	0
Pressure from central department (such as planning or finance)	0	3

POLICY AND LEGAL BASIS FOR IMT

Where irrigation agencies are strong and/or transfer policies are modest, IMT policies can be adopted by the sectoral line agency, as was the case in 26 of the 43 country profiles of IMT from the survey. However, in 20 cases, the policy was adopted by the head of state, and in 19 cases it was adopted by an act of parliament or the legislature. In 15 cases, the policy was issued by a cross-sectoral department (e.g. a finance or planning ministry).

TABLE 3
Authority transferred

Function devolved	Number of countries where authority is:			Total
	Fully devolved	Partially devolved	Not devolved	
Operations	31	12	0	43
Maintenance	30	13	0	43
Finance O&M	21	19	1	41
Can apply sanctions & resolve disputes	20	20	0	40
Can develop cooperative business	17	9	9	35
Finance rehabilitation & modernization	10	18	9	37

Table 3 shows that full authority for operations or water delivery was transferred in 31 cases whereas partial authority (i.e. where the agency still plays a role) was transferred in 12 cases. A similar pattern exists for transfer of maintenance responsibility. There was less of a tendency to transfer full financial responsibility to WUA. The policy to transfer responsibility for future financing of rehabilitation and modernization of systems was often less clear than that of O&M, but in 10 cases it was apparently fully devolved. This tends to be a function that agencies prefer to retain because of the ability to access funds from loan programmes. The authority to apply sanctions and resolve disputes was similarly fully devolved in only half the cases. In the other half, rights of appeal or larger problems required involvement by the government, and explicit measures were retained for this. In 17 cases, WUAs had the right to develop cooperative businesses beyond just managing irrigation O&M. This was often because of a desire by farmers to either subsidize the cost of water or to increase the productivity of the WUA. This result represents a discontinuity from the former management of the system by the public sector (which was normally concerned only with the activities related to the management of water). However, it also indicates the desire of farmers to run their activities in a more collective manner.

Irrigation management transfer occurs at different hydraulic levels of irrigation systems. The question of up to what level IMT should be implemented is often a complex issue involving considerations of:

- agency staff displacement;
- managerial or financial capacity of the government;
- financial and governance capabilities of farmers;
- availability of alternative management capacity;
- fragility of the infrastructure.

In 25 cases, IMT has been implemented up to the distributary or secondary canal level. This means that the WUA only manages the system directly up to the distributary level. Although WUAs at the distributary level may send representatives to a main system council, they do not have management authority above the distributary level.

Although most of the WUAs now manage subsystems at distributary level, this has often been the result of an evolution from lower levels. In several countries (Argentina, Armenia and Indonesia), IMT processes were started by developing WUAs at the tertiary canals (watercourses). However, in general, such small organizations have shown little financial autonomy and reduced technical capacity for an efficient operation of the system. As a result, a migration process from lower to higher hydraulic levels has often taken place. In some cases, it has taken the form of a federation of the smaller associations. In others, the larger association has integrated some of the elements of the smaller associations but remains the main body for governing the system.

In 10 cases, IMT includes main and branch canals; and in another 10 cases, it includes the entire system, including the head works (i.e. dam or weir). In some cases, where IMT was, in the beginning, officially declared to be implemented up to the main system level, such as in Andhra Pradesh, India, and in Mexico, subsequent experience

TABLE 4
Type of organization taking over management after transfer

Type of organization	Number of country profiles	Examples
Water users association	39	Widespread
Irrigation district	5	United States of America, China
Mutual company	3	United States of America, Spain
Local government	3	Turkey
Public utilities	2	France
Joint government / farmer committee	1	Sri Lanka, Philippines
Limited responsibility entity	1	Mexico

being used, by far the most common type is the WUA (WUA-based entity), to which management has been transferred in 39 cases (Table 4). Management has been transferred to irrigation districts in five cases. Districts often have a higher level of legal recognition than WUAs, including receipt of water rights, legal status as a semi-municipal entity, and infrastructure property rights. In three cases, mutual companies took over management. Generally, these are companies owned and governed by farmer shareholders. Public agencies may also transfer management to local governments (Turkey), public utilities (France), joint government/farmer organizations (Sri Lanka), and limited responsibility entities (Mexico). Often, these organizations already existed and were adapted, or they were established for the purpose of IMT.

In small irrigation systems or in distributary and tertiary blocks of large systems, it is common to see WUAs that handle both governance and management functions after transfer. Here, governance means mobilization of authority, adoption of policies, and selection and supervision of key management staff. Management means the mobilization of staff and resources to deliver those services mandated by the governing authority. In larger systems or at higher hydraulic levels, it is common for WUAs to handle only governance or oversight functions, while professional staff or third-party companies handle day-to-day management tasks. However, in countries as diverse as Nepal, China, the United States of America and Taiwan Province of China, WUAs hire and manage their own staff and mobilize farmers for occasional maintenance works for systems as large as 10 000–100 000 ha.

Table 5 details which parties have provided water delivery and canal maintenance services after IMT at field, distributary and main system levels. In 38 out of 42 cases, either farmers or WUA staff have been responsible for water delivery at the field canal level after transfer. In 32 of 38 cases, either farmers or WUA staff have been responsible for canal maintenance at the field canal level after management transfer. In the majority

TABLE 5
Entity providing water delivery and canal maintenance after IMT

Entity delivering water	Water delivery			Canal maintenance		
	Field level	Distributary level	Main system level	Field level	Distributary level	Main system level
Farmers coordinated by WUA	17	5	4	14	8	3
Staff of WUA	16	14	9	15	10	6
Farmers not coordinated by WUA	5	0	0	3	1	0
Staff of government agency	3	11	14	2	10	14
Staff of private-sector contractor	0	1	2	2	3	1
Staff of public utility or state-owned enterprise	0	3	2	0	3	4
Staff of company owned or contracted by WUA	1	1	0	2	2	1
Total cases reported	42	35	31	38	37	29

has shown a reluctance to do this for large-scale systems. Political resistance (mainly from irrigation agencies) and technical/financial challenges for farmers organizations can make this level of transfer more problematic.

Another key policy issue for IMT is the question of what kind of governance and/or management entity will take over authority and responsibility for irrigation management after the transfer. While several types of organizations are

of cases where farmers are performing water delivery and canal maintenance at the field canal level, farmers are coordinated by their WUA. In about 38 percent of case, WUA staff provide water delivery or maintenance of field canals. This indicates a high proportion of WUAs where staff takes full management responsibility from the head to the lowest level of the system.

At the distributary canal level, the most common situation is for staff of a WUA or farmers under the coordination of the WUA to manage water delivery along the distributary canal (19 cases). For canal maintenance, in 19 cases, routine canal maintenance is handled either by farmers or staff of the WUA, compared with only 10 cases where distributary canal maintenance is handled by staff of the government agency.

At the main system level, the predominant entity responsible for water delivery and maintenance is the staff of government agency, with 14 cases for each category, out of 31 and 29 cases, respectively. Nevertheless, the number of cases where the management entity is the WUA staff or farmers coordinated by WUA is also significant (13 and 9 cases for the respective categories of water delivery and canal maintenance).

POLICY AND LEGAL BASIS FOR WUAS

There is a diversity between countries in the institutional framework for WUAs that is established prior to or during adoption of management transfer. In most cases, this framework is only partial at the time of policy adoption and is elaborated further over time.

Table 6 shows the number of countries that have adopted each of several key policy and institutional features of WUAs. The right for WUAs to make profits is restricted in many countries owing to the requirement that WUAs maintain a tax-exempt status.

Table 7 shows (for 24 cases) the kinds of legal rights and responsibilities that have been granted to WUAs. In 15 cases, the WUA has been granted a water-use right, but often this is not an absolute legal right and is more an official allocation rule by government. In the 14 cases where the WUA has been established voluntarily, this means by approval granted through a majority vote of a general assembly of the members.

Water users associations vary in their mandates that they have received from governments. However, in all 24 cases reported, irrigation management is the key function (Table 8). An issue in many countries is whether or not WUAs should focus only on irrigation management or whether they should take on other secondary functions, such as managing water used for non-irrigation uses (e.g. fish, livestock, or domestic use), developing agribusiness, and marketing. In some countries, farmers may feel the

TABLE 6
Institutional framework for WUAs

Element included in institutional framework	Number of countries
WUAs have clear right to use & maintain irrigation infrastructure	32
WUAs have legal status to obtain credit & enter into contracts and to enforce sanctions against members who break rules	29
Arrangement for settling irrigation-related disputes, including process of appeal	26
Arrangement to extend technical advisory service to WUAs	24
Legal water right for WUAs	20
A policy to reorient the mandate of the irrigation agency	18
A policy to redeploy agency staff previously assigned to O&M	14
Legal water right for individual water users	14
WUAs have legal right to develop businesses and make profits	12
Organizational link for the WUA to water basin management	7
Virtually no specific policies or legal framework for IMT/WUAs	5

TABLE 7
Legal rights of and responsibilities granted to WUAs, 24 countries

Legal rights and responsibilities granted to WUAs	Number of countries
WUA pays for O&M	24
WUA has legal status	23
WUA has water use right	15
WUA established voluntarily	14

TABLE 8
Purposes of WUAs as specified by law

Purposes of WUAs as specified by law	Number of countries
Irrigation	24
Drainage	19
Groundwater	7
Agribusiness	6
Manage watershed	5
Construct or extend system	4

TABLE 9
Legal rights of WUAs

Legal rights of WUAs	Number of countries
Have bank accounts & make contracts	18
Can fine members	17
Water right or water-use right	15
Can own property	11
WUA canals have rights of way	7
Can cut off water supply to users	6

TABLE 10
Rights and responsibilities of WUA members

Rights and responsibilities of WUA members	Number of countries
Pay O&M fees	23
Voting rights	23
Membership is voluntary	13
Water rights held by members	7
Must give land for irrigation & drainage infrastructure	6
Members can obtain compensation for damages	3

(24 countries). The most important of these are obligations of WUA members to pay O&M fees and the right of WUA members to vote in general assembly elections. Despite pressures in many places for WUA membership to be mandatory (in order to ensure financial and managerial viability of irrigation systems), it is often kept voluntary. This is often done with the proviso that non-member water users have to pay more for the water charge and are still under obligation to obey WUA rules. Water rights are more often held by individual members in Latin American countries, Europe and the United States America than elsewhere. Farmers are often required to give land away for the installation of irrigation canals and other structures but they often receive some compensation. In most cases, the actual water right is held by the WUA, which in turn grants rights to the users. The criteria for granting such rights should be reflected clearly in the by-laws of the association, but this is not always the case.

In all 24 cases, WUAs have a general assembly of members, an executive council of representatives, and a chief executive officer. In 19 out of 24 cases, the WUA can federate to higher than base levels. WUAs are often simple organizations that lack significant checks and balances to prevent misuse of power within them. WUAs had audit committees in only 7 cases of the 24 cases reported.

One issue of growing concern is the role of gender in WUA membership and management of WUA. Inequalities occur where women play significant roles in water use or management and have key interests in irrigation management but are not represented in the WUA. However, people often find it easier to place trust in women when they are not perceived to have significant roles in factions. In some cases, such as Turkey and Nepal, efforts are being made to include more women on WUA boards

need to engage in secondary business enterprises in order to cross-subsidize the cost of irrigation maintenance (as is often the case in China). In Sri Lanka and the Philippines, some WUAs organize the provision of agricultural inputs and other services to farmers who lack such support from government or private-sector sources. In the Philippines, Indonesia and Romania, WUAs develop agribusinesses in order to increase the profitability of irrigated agriculture for their members.

Table 9 indicates the legal rights that have been granted by governments to WUAs. The most common of these (18 out of 24 cases) is the right to enter into contracts with third parties (including the government) and hold bank accounts. Although most of the legal rights mentioned in Table 9 are desirable in WUAs, a significant number do not possess them and, hence, the scope for improving their legal structure is considerable.

Table 10 indicates the rights and responsibilities that have been legally granted to WUA members

and in WUA positions, including that of treasurer and WUA head. Box 2 reports an interesting initiative in Madhya Pradesh (India) to promote greater opportunities for women to vote and be represented in the management committees.

Box 3 illustrates a case where the government can authorize a WUA to expropriate land within their service area for reasons of public interest.

IMT AND FINANCING IRRIGATION

A key issue for IMT is how to make irrigation become financially sustainable. As indicated above, transfer of management responsibility to farmer organizations is normally accompanied by transfer of financial responsibility to water users. There are a number of policy questions related to financing irrigation management. These become prominent for countries considering or implementing IMT. Key financial policy issues include:

BOX 2

Helping to ensure that WUAs represent women's concerns

The state of Madhya Pradesh in India recently adopted an act that includes many aspects of PIM that are similar to the reform in Andhra Pradesh. Although the act states that the management committee of the WUA should include a woman member with a voting right (if she were not formally a landholder, she would not have a voting right). Some officials and others believe that the issue of gender representation has not yet been addressed effectively. Some are proposing that the Land Revenue Act be amended to enable a wife or other woman family member of a landholding family to, if elected, automatically have the landownership be transferred to her temporarily so that she could be made a member of the management committee and have equal voting rights with other committee members. The issue is still under discussion but the principle of representation of women

Source: R.K. Chachondia, personal communication, 2003.

BOX 3

Theoretical process for establishing WUAs in Morocco

In Morocco, WUAs are public-interest associations and have legal status. They are established voluntarily, and membership is open to all owners and tenants of land within the irrigation scheme. They can be established either on the initiative of the Government or on the initiative of two-thirds of the owners or tenants of the lands served by the same irrigation system. Existing agricultural associations (associations syndicales agricoles) that are involved in water resources management for agricultural purposes can also be transformed into WUAs. The law provides a model statute for WUAs.

The WUA general assembly elects six out of a total of seven members of the council, the remaining one being a representative of the Government. The council is responsible for preparing the annual budget of the WUA and for implementing the decisions taken by the general assembly. The functions of WUAs are specified in an agreement stipulated between each WUA and the Government. These agreements include *inter alia* the rates of contributions of the WUA and the Government to cover the costs of maintenance and repair works, and the responsibilities of the WUA to carry out all works and to cover all costs related to the delivery of irrigation water and canal O&M.

WUAs are responsible for determining and collecting the annual dues to be paid by their members. In addition to this revenue, they can receive government subsidies. Moreover, the Government can delegate WUAs to collect other government charges from their members. In relation to rights and powers, although WUAs in Morocco are not granted specific water rights or rights on the irrigation infrastructure, the Government can delegate to them the power to expropriate land within their service area for reasons of public interest.

Source: Morocco IMT country profile (2003).

- Who should pay for irrigation – owners of irrigated land, farmers who rent or sharecrop on irrigated land, those who use irrigation for non-farming uses (e.g. rural industry, household use or livestock), or consumers of irrigated crops? In most cases, the owner is responsible for the payment, but this responsibility can be delegated to renters of any kind if stipulated in the rent contract. However, this varies between countries, and how this is done depends on political pressures and other local factors.
- Are water users already paying for part or all of the cost of irrigation when they pay land taxes that are higher on irrigated land?
- Can farmers afford to pay the full cost of irrigation? Under what conditions are subsidies justified?
- How should water charges be designed so as to not only pay for irrigation but also provide incentives for careful water use and accountable provision of service? Evidence from China and other countries where volumetric fees have been instituted suggests that this is a key tool for improving water-use efficiency.
- How to increase the collection of fees? In Maharashtra, India, even strict enforcement of fee collection with police involvement rarely obtains more than a 50-percent collection rate. Introduction of WUA and IMT can provide incentives to farmers to increase their payment of fees. This has happened in the Philippines, Indonesia, and Mexico.
- How should the funds raised be allocated? The allocation of funds collected by WUAs should be allocated according to the pre-established priorities set by farmers, which further increases the incentives of farmers to pay water charges. Should government play a role in this allocation? In principle, government should refrain from such interventions, but where it finances part of the O&M costs (Box 3), it could play a role.
- How to finance rehabilitation and modernization of systems? Prior to the transfer, rehabilitation and modernization works were financed by the government. However, governments often lacked the necessary financial resources, and this has led to a state of malfunctioning of many irrigation systems. After the transfer, farmers and WUAs are keen to make their system function well or improve it, and they are willing to contribute to the financing. However, in most cases, they cannot afford to pay the full cost of the rehabilitation works. Some examples of how to share the financial burden are given below.

In the late 1990s, the collection of the irrigation service fee in Indonesia had fallen to very low levels. It was based on having the fee collected and channelled to district revenue departments. However, it was unclear to what extent the funds collected were actually reallocated to the irrigation systems from which the funds were collected. At the outset of a new nationwide IMT programme at the turn of the century, the Government decided to allow WUAs to set, collect and allocate the fees themselves. This increased substantially the incentives of farmers to pay their fees, insofar as their WUA was viable and trustworthy.

The main challenge in financing irrigation management after IMT is to collect and allocate enough funds to prevent rapid deterioration that leads to premature demands for rehabilitation. Around the world, countries experience the cycle of irrigation construction, followed by underinvestment in maintenance, followed by rapid deterioration, followed by pressures for “premature” rehabilitation, which weigh heavily on the debt burdens of developing countries. This is a widespread problem, especially in developing countries.

In response to this problem, collaboration between the World Bank, the Government of the Netherlands and the Government of Indonesia has resulted in pilot implementation of a new model to replace the widespread pattern of premature and repeating rehabilitation programmes. As part of recent water sector reforms, the

Government of Indonesia, through sample provinces and districts in Java, experimented in 2002 and 2003 with a district, or “kabupaten”, irrigation improvement fund. The fund is set up at district level using district and/or provincial funds (and perhaps loan funds for startup). A simple formula is established whereby funds are allocated among irrigation systems to federated WUAs that have submitted proposals. The funds are mainly used for incidental repairs and improvements. In order to submit a proposal, an irrigation system must have an established WUA and should be conducting an agreed standard of maintenance. Districts adopt certain criteria for prioritizing proposals, such as the amount of WUA investment pledged, and the number of farm families who will benefit. It is expected that the fund will operate annually and will diminish the need for rehabilitation programmes through increasing investment in routine maintenance and incremental repairs and improvements. In Mexico, the government contributes 50–75 percent of the cost of the works. As in the case of Indonesia, the governing bodies of WUAs define the works to be undertaken in cooperation with the public irrigation agency. The financing arrangements are only for short periods, and this limits considerably the affordable amount of the works to be done.

Regarding the issue of how IMT programmes themselves are financed, the survey indicated that, financing for IMT programmes came primarily from international sources in 19 countries (through loans). In 15 countries, IMT was financed primarily from national funds. In five cases, IMT was financed about equally by international and national sources of funding. In most cases where international assistance is involved, some grant funds are also provided by bilateral public or NGO sources. This is particularly the case in the early stages of reform in order to conduct pilot testing and to derive a methodology appropriate for national dissemination.

REFORM OF IRRIGATION AGENCIES

Irrigation departments tend to resist IMT where they perceive it to be a threat to their jobs, budgets or decision-making powers. Irrigation agencies may be able to reassign their staff to higher hydraulic levels (above the level of transfer), to relocate staff to systems where IMT is not taking place, to assign them to other functions than irrigation O&M, or to have staff deputed to work for WUAs (as has happened in Andhra Pradesh and Madhya Pradesh, India). Where such options are feasible only to a limited extent, irrigation agencies may slow or resist the process of reform.

Table 11 displays the main roles that government irrigation sector agencies continue to play during and after IMT has occurred. The most common of these are to make policies, laws, strategies and plans about irrigation and WUAs. In most cases, governments continue to construct, rehabilitate and modernize irrigation systems after

TABLE 11
Roles of government irrigation sector agencies relative to WUAs and water users

Roles	Asia (11)	Latin America (7)	Africa (3)	Europe (3)	Worldwide (24)
Make policy, laws, strategy, plans about WUAs	11	7	3	3	24
Establish WUAs & approve WUA statutes	11	7	3	3	24
Regulate, supervise & inspect WUAs	11	6	3	3	23
Provide technical assistance & training	10	3	3	3	19
Construction & rehabilitation	10	2	2	2	16
Manage main system/large systems	9	3	2	1	15
Help settle disputes	7	4	2	0	13
Grant water allocations & concessions	5	6	1	1	13
Conduct technical & management audits	6	3	1	1	11
Arrange maintenance contracts with WUAs	4	0	0	1	5
Approve WUA O&M plans & budgets	1	2	1	0	4
Set water service charges	3	0	0	0	3

IMT. They also tend to continue to manage higher hydraulic levels of irrigation systems and help settle disputes with WUAs. In cases where the government retains a close role in irrigation management, the irrigation agency may arrange maintenance contracts for WUA and review and approve WUA O&M plans and budgets. In countries where the government prefers to retain a common level for water charges between different irrigation systems, it may continue to set water charges.

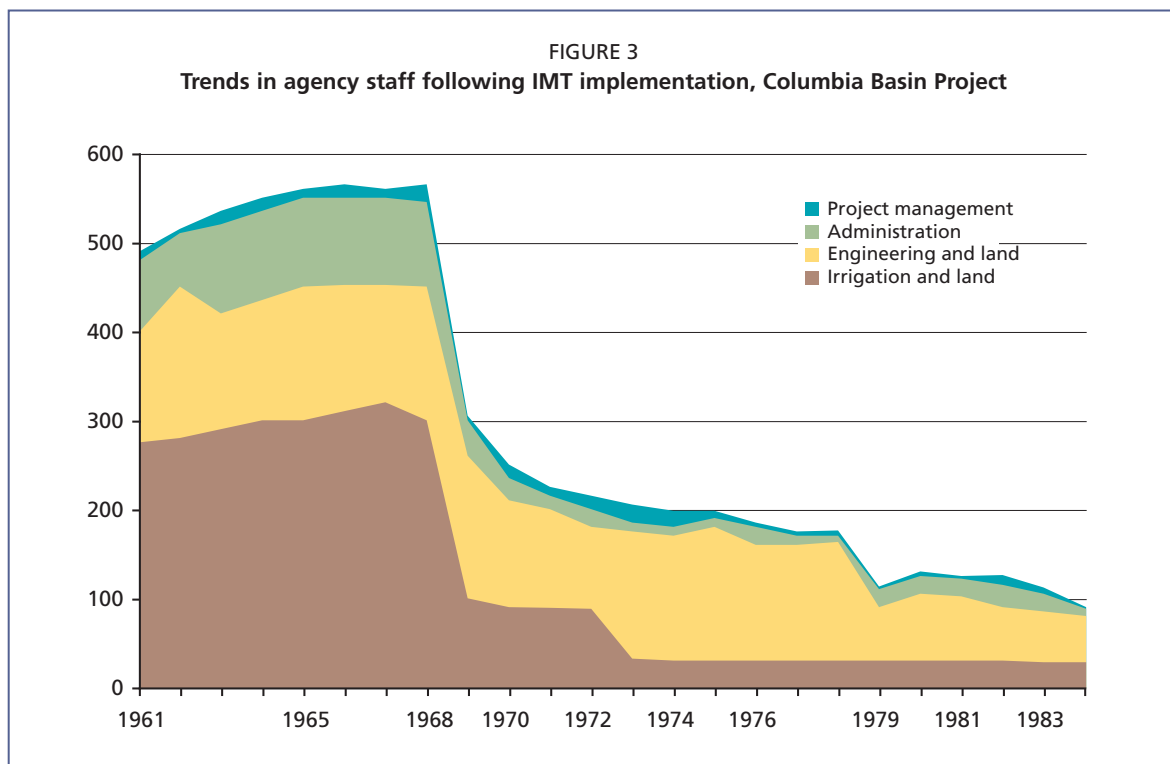
In south Australia, South Africa and the “Office du Niger” in Mali, IMT programmes have included comprehensive strategic planning and restructuring of the irrigation agency. In the United States of America, IMT has included negotiations between farmers and bureau staff about changes in staff jobs, assignment of expenses, and benefits and responsibility for payment of pensions and insurance for staff transferred to farmer-managed irrigation districts. Agency reform may include:

- downsizing or “rightsizing” of the agency;
- staff re-deployment;
- training;
- early retirement;
- compensation packages;
- restructuring of the agency;
- changing the roles of the agency.

Figure 3 shows the downsizing effects of IMT in the case of the Columbia Basin Project in the United States of America.

New roles that are taken on by agencies after IMT include:

- more river basin management tasks;
- regulation of water use;
- watershed protection;
- monitoring water quality;
- providing technical and financial support to WUAs;
- monitoring and auditing WUA performance.



Source: Svendsen and Vermillion, 1996.

IMPROVEMENTS NEEDED IN THE INSTITUTIONAL FRAMEWORK

The experts who provided the IMT profiles were asked about the policy and institutional problems and issues that arose during IMT or remained thereafter. Table 12 ranks these in order of how frequently such problems and issues were identified by the respondents. The most commonly mentioned problem was the lack of clarity about what financial and technical assistance the government would provide to WUAs after management transfer (28 cases). This is related to three other common concerns about financing (Table 12).

The issues listed in Table 12 were all key issues requiring further consultation, negotiation and agreement with the stakeholders involved. They give an indication of the extent of complex issues that accompany an IMT reform process. They also indicate the importance of providing extensive negotiations and opportunities to build the institutional framework and common support for IMT.

TABLE 12
Policy and institutional issues for IMT

Outstanding policy or institutional issue	Number of cases
Political support provided for IMT	28
Unclear legal status of WUA	28
Unclear who pays for rehabilitation in the future	22
Unclear water-use rights	17
Unclear rights over infrastructure	14
Inadequate policy or legislation	13
Unclear role & authority of agency	11
Farmers cannot afford O&M	8
Unclear who owns equipment/machinery after IMT	7
Interference of government in WUA affairs	6
WUA lacks authority to apply sanctions	6
Need new water fee system	6
Unclear land tenure or fragmentation	4
WUA leaders unaccountable to WUA members	3
Debt settlement after IMT	3
WUA not based on hydraulic boundaries	3
Subsidies for irrigation after IMT	1

Chapter 3

Implementing irrigation management transfer

This chapter summarizes information obtained from the IMT country profiles about how IMT has been implemented in the 43 cases in the sample. Annex 2 provides data on the scale and rate of implementation of IMT for the 43 cases.

MOBILIZING SUPPORT AND PUBLIC AWARENESS

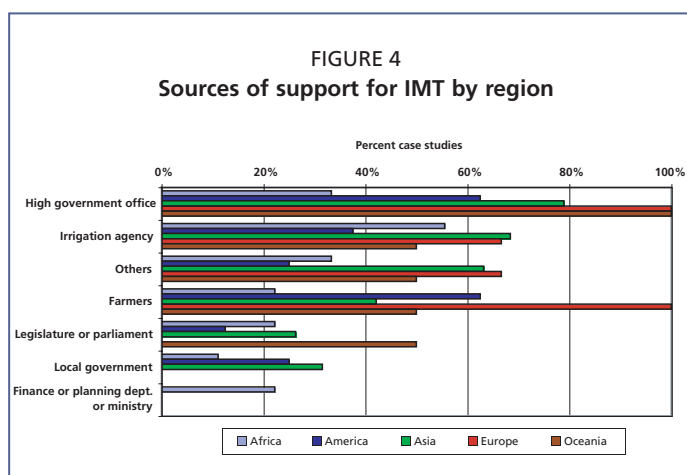
Normally, an IMT programme is supported and developed initially by a small group of proponents, being government officials, NGOs, technical experts or donors. In the beginning, IMT is sometimes promoted by farmer representatives (as in Colombia), but more often it is promoted by central governments and donors. It is often resisted, especially in the early stages, by: (i) irrigation agencies that fear they will lose jobs and funds; (ii) farmers who do not think they can pay for the full cost of irrigation; and (iii) by politicians who want to offer free water services to rural populations.

There are a number of approaches whereby sector reform organizations promote or generate a common vision of IMT among stakeholders. The most common of these are:

- workshops and policy/planning meetings;
- adoption of liberalization or privatization policies related to the agriculture and irrigation sectors;
- holding negotiations with farmer groups;
- pilot projects;
- research;
- study tours;
- attendance at international meetings;
- loan programmes and related consultations from international financial institutions;
- making assistance from international agencies or government contingent on adoption of IMT;
- public awareness campaigns;
- stakeholder consultations;
- adoption of preliminary policies and a legal framework that supports IMT.

Before Mexico adopted its IMT programme, senior water resources officers made several visits to farmer-governed irrigation districts in the United States of America. Prior to Turkey launching its management transfer programme, several of its lead water resources officers went to Mexico to study its experience with IMT. In Indonesia, government staff and experts held stakeholder consultations around the country in order to present their views and generate support for IMT. The World Bank, FAO and other technical assistance agencies, foundations, NGOs, and the INPIM have sponsored study tours, pilot projects, and meetings whereby government officials, technical experts, and farmers have witnessed firsthand progressive experiences around the world with implementing IMT.

The most common main source of support for IMT has been central government at the national or provincial level (32 cases). There are a large number of sources of support, and irrigation agencies were identified as a main source of support in 25 cases. Farmer organizations (19 cases), financing organizations and international technical agencies (16 cases), legislatures or parliaments (14 cases) and local governments



(9 cases) were also significant sources of support for IMT programmes. Support was also generated by pilot projects and the media. By region (Figure 4), it seems that Africa shows much less support across sources than all others. It is also interesting to note that support at the higher levels of government and farmers has occurred in the developed world (Europe and Oceania) while the irrigation agencies seem to have provided more support in Asia and Africa.

It is often the case that initial resistance by irrigation agencies and local governments changes to support

after a period of raising awareness, pilot projects and negotiations. One interesting case is that of the Columbia Basin, United States of America. The main IMT activity was a five-year period of negotiating agreements on a number of issues, including staff jobs and benefits, and assignment of costs and responsibilities for different components of the irrigation system. After the negotiations, all the parties concerned supported management transfer. This case highlights the fact that the time frame for real negotiations can be an important element in the IMT process.

Change Finance or Planning dept or Ministry to Finance or planning dept. or ministry

IMPLEMENTING IMT AND PROBLEMS ENCOUNTERED

Implementing IMT involves *inter alia*:

- creating formal farmers organizations such as WUAs;
- preparing water users to take over the governance and management of irrigation schemes;

TABLE 13

Process of implementing IMT

Steps included in implementing IMT	Number of countries
Creation of WUAs	35
Democratic selection of WUA leaders	33
Technical training in O&M for WUA leaders/staff	32
Farmer contribution to cost of repairs/rehabilitation works (money, labour and/or materials)	32
Farmer participation in identifying repairs/rehabilitation works	31
Training for WUA leaders & staff in finance & administration	30
Training for irrigation agency staff	27
Repair, rehabilitation and/or modernization of infrastructure	27
Formation of an IMT programme steering/coordination committee	24
Planning & review meetings with farmer participation	23
Monitoring & evaluation programme	23
Agency O&M staff previously in units that were transferred have been assigned new jobs or moved to other locations after IMT	17
Agency O&M staff have remained in units transferred to WUAs but have been put under direction of WUAs after IMT	13

- making essential technical and physical improvements in irrigation systems with farmer participation;
- reforming the irrigation agency;
- training staff for new functions, introducing new forms of auditing and monitoring.

Table 13 shows the number of cases where each of the potential steps in implementing IMT has been included in IMT programmes. Many steps are common across the world.

Part of the reason for this commonality in approaches across countries is the extensive involvement of international financing agencies and technical assistance agencies in IMT programmes. Less common in IMT are actions to restructure or reform the irrigation agency (implemented in Mexico, Colombia and the United States of America), issuance of new

water rights (Mexico), transfer of ownership or clear legal use and repair rights for irrigation infrastructure (the United States of America, New Zealand and transfer of use/repair rights in Indonesia), and building an effective support system for WUA in irrigated agriculture. Both Mexico and Colombia have developed WUA networks that provide support services to WUAs. Although agency reform and support services for WUAs are also important to ensuring success, they are more sensitive or complex and are often not implemented. Box 4 provides an example on the process followed for IMT implementation in Colombia.

Creating a WUA normally involves adopting a constitution (or charter of authority or articles of association) and by-laws. This is often followed by the preparation and adoption of a transfer agreement. These constitute the essential rights, responsibilities, authority and rules that guide WUAs, the government and third parties. Annex 3 provides a brief indication of what these key documents includes. The WUA may prepare irrigation service plans on an annual basis. These detail responsibilities, schedules, and budgets for O&M works to be undertaken. Where third parties help in providing management services, irrigation service agreements may be prepared by both the WUAs and third-party service providers.

BOX 4

The Colombian IMT methodology

The Government of Colombia has not promulgated a formal, standard IMT model or methodology. Rather, it has followed an ad hoc series of negotiations between the irrigation agency and the water users, on a case-by-case basis. However, based on interviews with key officials, a general format for the Colombian IMT process is summarized below:

- Promotion. Once a system has been chosen for transfer, users are informed of the purpose and scope of the programme, as well as their rights and obligations.
- Assessment of district conditions. The agency (directly or through a contract) conducts an assessment of the physical, administrative and organizational conditions of the system.
- Preparation of an IMT “support plan”. Based on the results of the previous step, the agency and the WUA prepare a support plan to structure the transfer process. The plan is based on the particular conditions of each district. It includes training and strengthening of financial and organizational aspects.
- Agency–WUA negotiations. This is the core of the IMT process. It is done on a district-by-district basis. In general, the main issues negotiated concern the extent and nature of rehabilitation, the amount and conditions for subsidies, and the extent of training required.
- Agreement on key issues. Generally, implementation of IMT and the support plan begins as soon as an agreement is reached on key issues. It is an iterative process. The support plan is generally implemented partly before transfer and continues well afterwards.
- Signing of “administrative concession”. This occurs when all negotiations are settled and transfer conditions have been agreed on. Law 41 mandates that a “concession” or “contract” between the Government of Colombia and a WUA must be signed in order to enact transfer. The concession transfers virtually full powers for management to the WUA, with the exception that ownership of scheme infrastructure remains with the government.
- Formal transfer of the district. Transfer of an irrigation district to a WUA is formalized with the signing of the concession.
- Agency-sponsored monitoring and evaluation. It is the responsibility of the agency to supervise and assist the district in order to monitor and evaluate the management performance of the WUA-governed district for six months to a year after transfer.

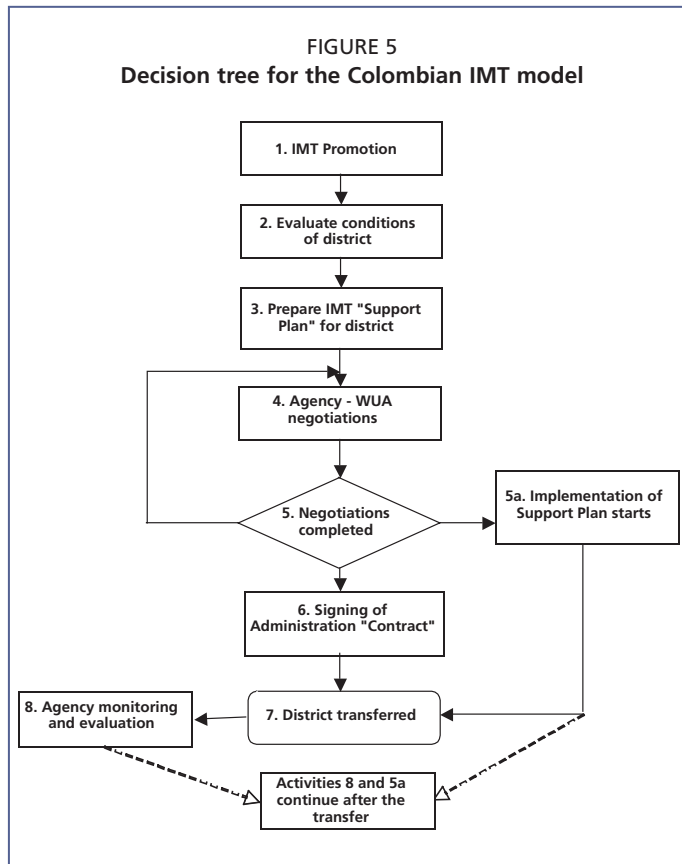


Figure 5 is a schematic representation of the decision-making process adopted in Colombia for the implementation of the IMT programme. At some point, if the farmers do not agree with the plan proposed by the Government, the negotiations will continue until agreement reached or the system concerned is left out of the IMT programme.

Several unforeseen problems have emerged during the implementation of IMT. Table 14 shows (by continent) the most commonly reported problems and issues involved in implementing IMT. Again, many of these problems are universal. Thirty-one of 43 cases reported that the irrigation agency resisted IMT, either in terms of slowing it down, making it more modest in scope, or stopping it. This was the case in the majority of countries in Asia, Latin America, Africa and Eastern Europe. However, as noted above, initial resistance often switches to support later on, after negotiations and adjustments are made to protect some of the interests of agency staff.

In addition to the main key problems listed in Table 14, other specific problems or issues that arose during implementation of IMT have included:

- disagreements over whether WUAs should be profit-making or not (Colombia, Morocco and Romania);
- late or poor disbursement of funds for IMT activities (Ecuador, Andhra Pradesh in India, and Indonesia);
- lack of markets for private-sector providers of support services for WUAs (Niger, Tunisia and Argentina);
- difficulties in registering WUAs as legal entities (Rajasthan in India, and Indonesia);
- concerns about outstanding debts of WUAs or farmers (the United States of America, and Colombia);
- organizational problems related to water shortages (Costa Rica);
- problems caused by WUAs not being based on hydraulic boundaries (Armenia and Indonesia);
- inadequate public awareness about IMT (Hebei in China, and Madhya Pradesh in India);
- cumbersome government procedures for implementing IMT (Orissa in India, Sri Lanka and Indonesia).

Boxes 5 and 6 illustrate different approaches for IMT implementation in New Zealand and Mali. The experience of the Office du Niger, Mali, suggests that a series of modest infrastructure improvements and reform steps work well and are easier to adopt when government resources are limited.

TABLE 14
Problems and issues in implementing IMT

Problems & issues in implementing IMT	Asia (21)	Latin America (7)	Africa (9)	Eastern Europe (3)	United States of America, Australia, New Zealand (3)	Worldwide (43)
Resistance to IMT by agency	16	5	7	2	1	31
Inadequate training of WUA	18	2	4	1	0	25
Difficult for govt. to finance IMT	12	0	3	0	0	15
Irrigation systems heavily deteriorated	6	2	4	1	1	14
Weak capacity to train WUA	11	0	2	0	0	13
Weak legal framework for IMT	9	2	2	0	0	13
Inadequate farmer payment for O&M	7	0	4	2	0	13
Weak techn. & mngt. capacity of WUA	10	1	1	0	0	12
Inadequate training for govt. staff	11	0	0	0	0	11
Agency reform & staff disposition	5	3	1	0	1	10
Farmers resist IMT	4	4	1	0	1	10
No clear/single IMT policy or programme	5	3	1	0	0	9
Resistance to IMT by local government	8	0	0	0	1	9
Democratic elections of WUA officers difficult to achieve	7	0	1	0	0	8
Conflicts between farmers/villages	4	1	3	0	0	8
Politicians resist IMT	6	0	1	0	0	7
Inadequate support services	3	0	3	0	0	6
WUA cannot apply sanctions	3	0	2	0	0	5
Farmers lack access to credit	2	0	3	0	0	5

REHABILITATION AND MODERNIZATION OF SYSTEMS

In 31 out of 43 cases and without regional differences, it is reported that farmers have contributed towards financing the repairs and rehabilitation works either in the form of cash or by providing labour or materials. However, this is the lowest ranking aspect when considering the extent of authority devolved to users in general (Figure 6). This is an indication that financing of the rehabilitation and modernization remains in most cases in the hand of governments or remains unclear. Different arrangements are being experimented with in order to find the right proportion of government and farmers funds, e.g. the examples of Indonesia and Mexico mentioned above. However, in most cases, long-term financing arrangements are missing and most countries have not defined a policy to resolve this important issue. In spite of the importance of the subject, the number of responses and the limited information available did not permit a deeper analysis.

BOX 5

Characteristics of IMT implementation in New Zealand

As an example of what countries have considered to be important elements to include in the transfer programme, the list below shows the case of New Zealand. Characteristics of the implementation process:

- formation of an IMT programme steering/coordination committee;
- planning and review meetings with farmer participation;
- creation of WUAs;
- democratic selection of WUA leaders;
- technical training in O&M for WUA leaders/staff;
- repair/rehabilitation/modernization of infrastructure;
- farmer participation in identifying repairs / rehabilitation works;
- farmer contribution to cost of repairs / rehabilitation works;
- agency O&M staff remained in units transferred to WUAs but were put under the direction of WUAs;
- agency O&M staff previously in units that were transferred were assigned new jobs or moved to other locations.

Source: New Zealand country profile.

BOX 6

Incremental change in the Office du Niger, Mali

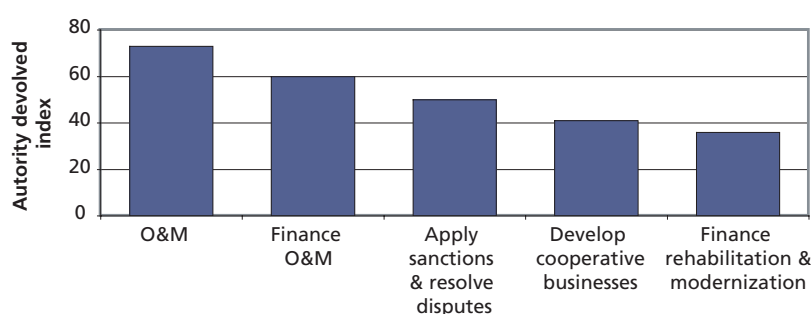
In the early 1980s, financing agencies stimulated reform gradually by promoting small steps of change, such as establishment of village-level WUAs that could implement maintenance at secondary and tertiary canal levels. The Office du Niger agreed to allow tenant farmers to have long-term rights to remain on their plots. By 1984, the financing agencies had obtained the agreement of the government to grant farmers freedom to market their grains. They promoted successful distribution of small threshers and hullers, which broke the dependence of farmers on the Office du Niger for threshers and hullers. In 1987, financing agencies promoted adoption of a new farming licence that gave farmers permanent tenure if they agreed to cultivate rice intensively and pay the water charge.

Adoption of PIM occurred in Mali in the mid-1990s with an act of parliament and policy declarations by the prime minister. This reform granted partial authority of WUAs over O&M and dispute resolution and full responsibility to pay for O&M. Staff of the Office du Niger were made responsible to elected farmer representatives through joint management committees at secondary and main canal levels. Elected farmers represented half of the membership of these committees. Farmers prioritized maintenance works and arranged three-year O&M contracts, which are now signed between government, farmers and the Office du Niger.

Market liberalization and better land tenure gave farmers the incentives to improve production, and rice yields increased from 2 tonnes/ha in 1982 to 6 tonnes/ha in 1996. This gave farmers sufficient confidence in scheme management that they agreed to a 50-percent increase in the water charge. The experience of the Office du Niger suggests that a series of modest infrastructure improvements and reform steps worked better than if financing agencies had refused to provide assistance unless the Government agreed to a comprehensive reform all at once.

Source: Mali country profile, 2003.

FIGURE 6
Authority devolved index



Notes:

Based on data in Table 3.

The authority devolved index is calculated as the sum of countries or cases where an IMT responsibility has been transferred to users affected by the following coefficients: if the activity is partially transferred, the number of cases is multiplied by 1, but if the activity is fully transferred, the multiplier is 2. The final value is the sum of both terms. Example: Operations has been fully transferred in 31 cases and partially transferred in 12 cases. The ADI is: $(31 \times 2) + (12 \times 1) = 74$.

SUPPORT SERVICES

Table 15 shows the kinds of support services needed by WUAs after IMT. Significantly, the top six identified are all concerned with training and consultation. Improvement of irrigation infrastructure was still needed in 16 cases. Availability of credit for farmers

TABLE 15
Support services needed by WUAs after IMT

Support services needed	Asia (21)	Latin America (7)	Africa (9)	Eastern Europe (3)	United States of America, Australia, New Zealand (3)	Worldwide (43)
Train WUA in technical aspects	19	7	8	1	1	36
Train WUA in financial aspects	20	6	6	0	1	33
Train WUA in administration	17	6	6	0	1	30
Technical consultation	16	6	3	0	2	27
Extension, agribusiness, marketing	8	5	6	0	3	22
Train & motivate agency for IMT	16	0	1	0	0	17
Rehabilitation & modernization	11	1	3	1	0	16
Credit for WUA & farmers	4	2	5	0	1	12
Legal support / dispute resolution	5	3	0	0	1	9
M & E of management performance	7	0	1	0	0	8
Subsidy for cost of water	3	0	1	1	1	6
Private-sector extension service	0	3	3	1	2	9
Communications with agency	4	0	0	0	0	4
Govt. ensures fair WUA elections	4	0	0	0	0	4
Formation of WUA networks	3	1	0	0	0	4

and WUA was noted in 12 cases. This is frequently inaccessible to farmers in many countries.

Additional support services that were needed included:

- environmental monitoring and regulation (Colombia, Shaanxi in China, and Indonesia);
- private-sector management service providers (Niger, Tunisia and Argentina);
- crop price supports (Nigeria and Uzbekistan);
- technical/managerial auditing (Andhra Pradesh and Madhya Pradesh in India, and Indonesia);
- assistance to develop a capital replacement fund (Australia and Indonesia).

REFORM OF PUBLIC-SECTOR ORGANIZATIONS

One of the changes that should accompany IMT is reform of public-sector organizations, especially the irrigation agency. However, often this does not happen. The respondents were asked in what ways the irrigation agency needed to change, in relation to IMT. Table 16 summarizes their responses. The most common response (34 out of 43 cases) was that the agency needed to withdraw from O&M at lower hydraulic levels that have already been transferred to WUAs. This suggests that agencies frequently do not withdraw their staff from canals that have, ostensibly, already been transferred to WUA for management. A key challenge is how to make needed reform of the irrigation agency happen – both to accommodate and support management transfer and to provide needed support services to WUAs after transfer.

In addition to the points summarized in Table 16, respondents also suggested the following way in which the irrigation agency needed to be reformed or reoriented:

- increase the role of the irrigation agency in producing and communicating information to WUAs and to others in the sector (Australia, Madhya Pradesh in India, and Uzbekistan);
- greater activity in developing strategies for the sector (Australia, Turkey and Uzbekistan);
- increased role in water and agricultural extension (Senegal, Andhra Pradesh in India);
- restricting the role of the agency to higher level maintenance and rehabilitation (Indonesia and Bulgaria).

TABLE 16
Reorientation of the irrigation agency

Ways agency reorientation is needed	Asia (21)	Latin America (7)	Africa (9)	Eastern Europe (3)	United States of America, Australia, New Zealand (3)	Worldwide (43)
Withdraw from O&M at lower hydraulic levels	19	5	6	1	3	34
Restructure/decentralize	11	3	8	2	3	27
Increased role in building capacity of WUAs	15	5	4	1	1	26
Downsize/reassign staff	11	4	6	1	2	24
Increased role in providing technical & financial guidance	16	0	0	0	2	18
Increase regulation of irrigation sector	5	4	2	2	2	15
Increase management at main system & river basin levels	6	2	2	1	2	13
Become financially self-reliant	5	0	1	0	1	7
Increase M&E	3	1	2	0	1	7
Increased role in water rights administration	3	1	1	0	0	5
Need plan and commitment to reorient agency	4	0	0	0	0	4

LESSONS LEARNED DURING IMT IMPLEMENTATION

Key informants who provided the IMT profiles identified a number of additional institutional changes that were needed after IMT had been adopted (Table 17). The list is diverse and shows the wide scope of issues that may be related to IMT. Regarding the suggestions for new agricultural policies and programmes, these tended

TABLE 17
Institutional changes needed after IMT adoption

Additional institutional changes needed	Asia (21)	Latin America (7)	Africa (9)	Eastern Europe (3)	United States of America, Australia, New Zealand (3)	Worldwide (43)
Law on WUA & IMT	12	3	3	2	0	20
Regulation on water charges & WUA finance	10	1	3	2	1	17
Water rights & allocation law	10	2	2	1	1	16
Regulation on ownership of irrigation infrastructure	6	3	3	1	0	13
Restructure irrigation agency	8	2	1	0	2	13
Increased regulation of WUA	5	1	1	0	1	8
Right of WUA to decide O&M plan & budget	6	0	1	0	0	7
Regulation for WUA federations & networks	5	0	1	1	0	7
Regulation on who pays for rehabilitation & modernization	2	2	0	1	1	6
Land tenure reform	1	0	5	0	0	6
Institutional arrangements for water basin management	4	1	0	1	0	6
Update agricultural policy and programmes	4	1	0	0	0	5
Improve enforcement of contracts, fees & debt payments	3	1	1	0	0	5
Tax waiver for WUA	4	0	0	0	1	5
WUA become profit-making	2	1	1	0	0	4
Speed up settlement of disputes	2	0	2	0	0	4
WUA needs authority to apply sanctions	4	0	0	0	0	4

to include measures to improve the profitability of irrigated agriculture for farmers, such as through new methods of extension to WUAs to promote innovations in water management, agribusiness and marketing.

Altogether, the suggestions in Table 17 seem to indicate that IMT is often adopted and implemented initially with a relatively narrow view of the reform. Then, as implementation proceeds, it becomes necessary to expand the scope of the reform in order to make it viable.

In addition to the above-mentioned institutional changes, respondents also mentioned the needs for:

- regulations for compensation for land used for irrigation infrastructure (Ghana);
- bank loans for WUAs (Indonesia and Morocco);
- environmental regulations, including for water quality (Australia and Turkey);
- drainage boards (Albania);
- establishment of water service enterprises (Argentina).

Table 18 gives an example of the IMT implementation stages and the implications for the different types of management adopted in Turkey. This shows the legal orientation of IMT in Turkey, where legal establishment of the irrigation associations and transfer protocols are key steps. Moreover, formal training is less important than ongoing technical guidance and consultation between irrigation agency staff or municipality engineers and irrigation association officers.

Table 19 summarizes the key lessons learned from implementing IMT. Again, there is a common relevance of similar lessons across continents. One of the most common lessons stated by the informants was that more clarity and details are needed on the actual roles, responsibilities and authority of WUA, the irrigation agency and towns and village governments after transfer (25 cases). There is a tendency for these to become confused when the policy is not clear or where there is resistance to IMT. Regarding support for the process, the most common lessons mentioned were: the need for more financing for IMT; the importance of pilot projects, study tours, sharing of experiences, public awareness campaigns; and efforts to ensure more democratic election of WUA leaders.

In addition to these points, respondents also mentioned the following lessons learned from implementing IMT:

- there is a need for a market of O&M service providers that can be acquired by contract or hiring of staff (Argentina and Niger);
- farmers need to have free crop choice in order to be able to support IMT (Indonesia, Sudan and Uzbekistan);
- different forms of support services are needed for large commercial farms and small subsistence farms (South Africa).

TABLE 18
Stages in the transfer of irrigation schemes, by type of management, Turkey

Stage	Irrigation agency (IA) management	Village management	Municipality management	Cooperative management
1. Initiation	Initiative generally comes from the General Directorate of State Hydraulic Works (DSI); involves meetings with muhtars, mayors & local assemblies. Agreement to continue must be given by muhtars, mayors and their respective assemblies.	Initiative generally comes from DSI; involves meetings with the muhtar and council of elders. Agreement to continue must be given by the muhtar and the council of elders.	Initiative generally comes from DSI; involves meetings with the mayor and municipal assembly. Agreement to continue must be given by the mayor and municipal assembly.	Initiative must come from a minimum of 15 farmers prior to construction of a groundwater or surface scheme.
1a. Legal establishment of the management agency	1) Application for the legal establishment of an irrigation association signed by muhtars and mayors with the authority of their respective local councils. 2) Reviewed by the provincial governor's office. 3) Reviewed by the Ministry of Interior. 4) Approved by the Council of Ministers.	Not necessary.	Not necessary.	Cooperative registered as a legal entity in accordance with cooperatives legislation administered by the Ministry of Agriculture and Rural Affairs.
1b. Selection of chairperson & board	1) General Assembly constituted by muhtars, mayors (automatic members) and 2-3 times as many additional members selected either by the automatic members or (less often) by irrigators. 2) The general assembly elects a chairperson and 4 members of the management committee.	Constituted by the muhtar and the council of elders.	constituted by the mayor and the municipal council.	Elected annually by the general assembly made up of member/partners of the cooperative.
2. Transfer agreement	1) Prepared by DSI. 2) Signed by the chairperson of the IA with the approval of the IA management committee. 3) Signed by DSI regional office. 4) Reviewed in Ankara by DSI O&M Transfer Section. 5) Approved by Minister of Public Works and Settlement	1) Prepared by DSI. 2) Signed by muhtar with the authority given by the village council of elders. 3) Signed by DSI regional office. 4) Reviewed in Ankara by DSI O&M Transfer Section. 5) Approved by Minister of Public Works and Settlement	1) Prepared by DSI. 2) Signed by the mayor with the authority given by the municipal council. 3) Signed by DSI regional office. 4) Reviewed in Ankara by DSI O&M Transfer Section. 5) Approved by Minister of Public Works and Settlement.	Incorporated in the regulations relating to the establishment of the cooperative.
3. Transfer protocol	Prepared by DSI; sets out the characteristics of the irrigation system.	Prepared by DSI; sets out the characteristics of the irrigation system.	Prepared by DSI; sets out the characteristics of the irrigation system.	Prepared by the General Directorate of Rural Services in accordance with the provisions of cooperative legislation.
4. Preparation of O&M plans	Prepared by DSI with management committee and staff appointed by the management committee.	Prepared by DSI with muhtar and other staff appointed by the muhtar.	Prepared by DSI with mayor and other staff appointed by the mayor.	Prepared by operational staff employed by the cooperative under the supervision of a 5-person board of directors elected annually by the general assembly, which is made up of all its partners/members.
5. Implementation	Responsibility of the chairperson, the management committee and staff appointed by the chairperson.	Responsibility of muhtar and other staff appointed by the muhtar	Responsibility of mayor and other staff appointed by the mayor	Responsibility of the board of directors and operational staff employed by the cooperative.

Note: A muhtar is the head of a village (normally elected).
Source: Turkey case study.

TABLE 19
Key lessons learned about IMT

Key lessons learned	Asia (21)	Latin America (7)	Africa (9)	Eastern Europe (3)	United States of America, Australia, New Zealand (3)	Worldwide (43)
Need clarity on roles, responsibilities, authority of WUA, agency & towns	14	5	4	1	1	25
WUA & agencies need substantial training	17	3	5	0	0	25
Need to reorient agency & handle staff disposition	14	4	3	1	3	25
Need clear legal framework	14	3	3	1	3	24
Address financial capacity of WUA along with IMT	14	3	3	2	1	23
High-level political commitment essential	13	3	3	0	2	21
Need clearer water rights & infrastructure rights	11	3	3	0	2	19
Multistakeholder involvement important	14	1	3	0	2	20
Need more government financial support for IMT	11	1	3	0	0	15
Pilots, study tours, information sharing important	10	2	2	0	0	14
Need to address severe deterioration of infrastructure	7	3	2	1	0	13
Need public awareness campaign	9	0	1	0	1	11
WUA should be able to make profits	6	0	3	0	1	10
Need to better design & enforce water charge collection	6	1	2	0	0	9
IMT supports financial sustainability of irrigation	3	2	2	0	1	8
Need democratic selection of leaders	8	0	0	0	0	8
IMT should address disposition of equipment	1	2	1	2	1	7
IMT should be adaptive & flexible	2	1	3	0	1	7
WUA need banks & credit	4	0	1	0	1	6
Need dispute settlement & contract enforcement	3	1	1	0	1	6
Need independent organization to direct IMT	5	0	0	0	0	5
Integrate agribusiness & extension with IMT	4	0	1	0	0	5
Incremental better than rapid, comprehensive reform	2	0	3	0	0	5
Link WUA to local governments	5	0	0	0	0	5
WUA should act according to members' interests	3	0	0	0	1	4

Chapter 4

Results of irrigation management transfer

Annex 4 contains tables summarizing the outcomes and impacts of IMT.

OUTCOMES

Performance of WUAs after management transfer

It is not yet clear what proportion of WUAs worldwide are established democratically, function effectively and become sustainable. However, Table 20 provides an indication of the extent to which WUAs are active in performing basic water delivery and canal maintenance functions after management transfer. According to

IMT profile informants, in 22 cases out of 25 reported, WUA were performing their basic water delivery and canal maintenance functions at the field canal level after management transfer. In 17 cases out of 23 reported, WUAs were performing their basic water delivery and canal maintenance functions at the distributary canal level after management transfer. In six cases, only half or fewer than half of these basic water delivery and canal maintenance functions were performed by WUAs. This indicates that, in general, WUAs have the potential to perform their basic functions but that they need sustained training, consultation, support services and a proper legal basis in order to enable them to function effectively.

The informants were also asked the difficult question of, according to their observations, the extent to which WUAs were raising adequate amounts of funds and labour to perform their irrigation management duties. Of 21 cases reported on, in 11 cases the WUA was reported to have mobilized 75–100 percent of the funds and labour required. In 4 cases, it was reported that the WUA had obtained 50–75 percent of the funds and labour needed for adequate water delivery and canal maintenance; while in 6 cases, it was reported that the WUA was only able to raise less than 50 percent of the funds and labour needed for maintenance.

Table 21 shows the sources of financing for WUAs after IMT programmes for a sample of 27 cases. In 26 cases, water charges and dues were collected by WUAs from members. In most of these cases, this was probably the main source of revenue for the WUA. Fines were used worldwide but were not a major source of revenue. In 15 cases, subsidies and contracts awarded by governments and loans from public and private sources provided revenue to WUAs, but the specific amounts were not reported. In 12 cases, private-sector business and sales also provided revenue for WUAs. The extent to which government funds, loans and business provide revenue for WUAs suggests there is a general need for WUA to add revenue and diversify their financing sources beyond what they can obtain from only water charges and dues from members. Private business has not penetrated the financial management of WUAs in Africa and Eastern Europe to the extent that it has in Asia, Latin America and the more developed countries.

TABLE 20
Performance of basic O&M functions by WUAs after management transfer

Basic O&M functions performed by WUAs after management transfer	Number of cases	
	Field canal level	Distributary canal level
All	8	5
Most	14	12
Half	2	3
Fewer than half	1	3
Total cases reported	25	23

TABLE 21
Sources of financing for WUA after IMT, 27 cases

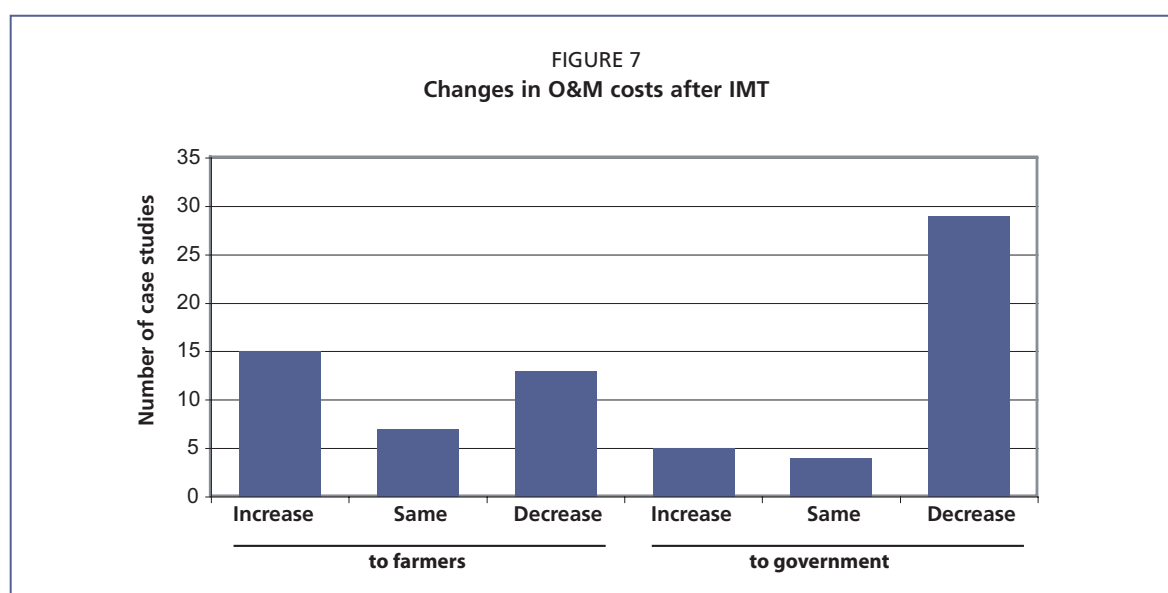
Sources of financing	Asia (11)	Latin America (7)	Africa (3)	Eastern Europe (3)	United States of America, Australia, New Zealand (3)	Worldwide (27)
Water charges & dues	10	7	3	3	3	26
Fines	7	7	1	3	3	21
Govt. subsidies & contracts	6	4	2	1	2	15
Loans	5	4	2	1	3	15
Private sales & business	5	4	0	0	3	12

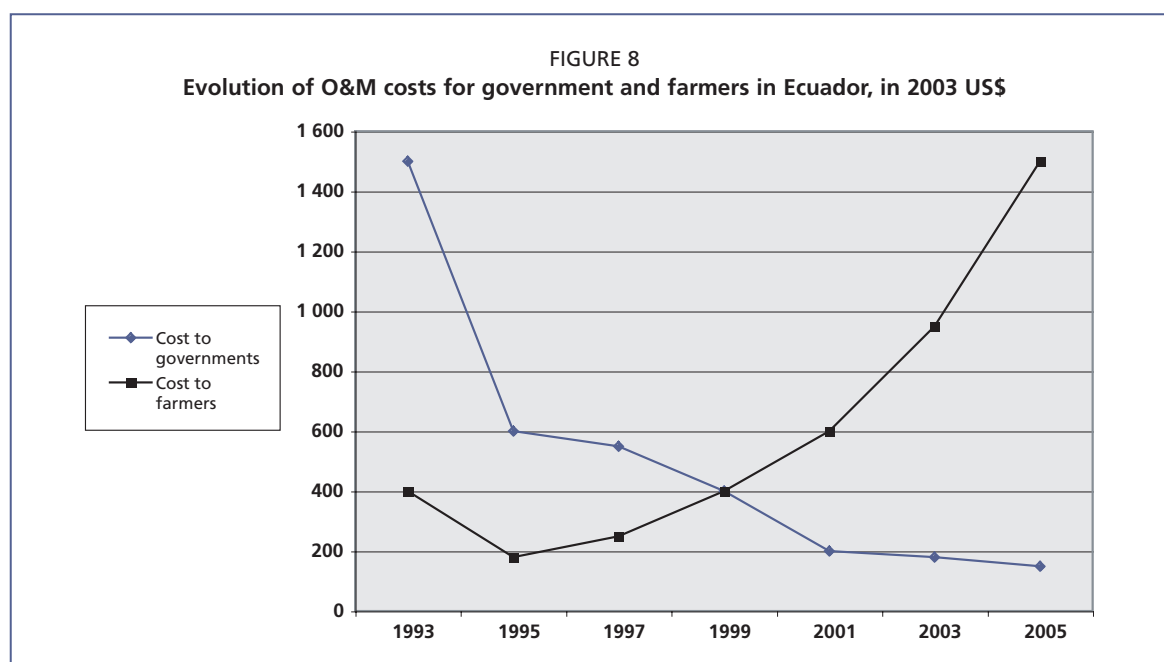
Operation and maintenance costs

One of the most common reasons for governments to start considering the possibility of turning the management of irrigation schemes over to users is the lack of public funds to cover the O&M costs of the scheme (Table 2). Some bureaucrats argue that governments cannot subsidize large irrigation schemes by bearing the O&M costs indefinitely. They argue that when projects mature and farmers reach a stable level of income, these costs should be covered by farmers alone. Although in principle it may be difficult to argue against this premise, it is well documented (Aw and Diemer, 2005) that, even under favourable conditions, often decades may pass before farmers are in an economic position to take full responsibility for the O&M costs of a scheme.

The rate of collection of water fees to cover O&M costs is often used as an indicator of the financial sustainability of a transferred scheme. However, a thorough assessment of the effect of transfer on the financial health of the scheme would also need to consider the change in the amount of resources allocated for O&M costs before and after the transfer.

However, in the set of case studies included in this report, an attempt was made to understand perceptions about changes in O&M costs. In the questionnaire used, a differentiation was made between the perception of change in these costs for the farmers and for the government. The results are mixed, particularly with regard to the change in costs to the farmers. The results are similarly distributed among those cases in which costs to farmers have increased (43 percent of cases), those in which costs have decreased (37 percent of cases), and in the 20 percent of cases where the costs to farmers have remained the same (Figure 7). However, the level of O&M before the transfer was not reported in the survey. It could have been very good, adequate or





Source: Ecuador IMT case study.

inadequate and, therefore, the direction of the costs reported after IMT was necessarily tied to the pre-IMT condition of O&M.

Thus, from this sample of case studies, it cannot be argued that the IMT process will necessarily result in a decrease or increase in costs to farmers. Indeed, unless rehabilitation is undertaken before transfer, logic would suggest that because there has been deferred maintenance in the past (when government agencies were struggling because of lack of resources), O&M costs would have to increase after transfer at least for a period in order to raise the quality of operation to a satisfactory level. This would also explain why the cost of O&M to farmers has increased in many schemes. In cases in which it has decreased, it has been because of savings in staff or other expenditures that have allowed the WUA to save enough money to offset the increased responsibility to pay for O&M, such as reported in Mexico and Colombia. Alternatively, in some cases, maintenance is still being deferred, and financial problems have arisen in the short to medium term (Turkey and Peru). As an example of the information collected, Figure 8 depicts the evolution of costs to cover O&M costs for both the government and the farmers in Ecuador.

On the other hand, in the majority of cases (76 percent), the costs of O&M to governments were perceived as decreasing, and in 11 percent of cases as remaining unchanged.

These mixed results may simply reflect the fact that irrigation schemes are quite different from one another in respect of their O&M costs and in the intensity and complexity of the management they require to be run and maintained properly. Box 7 presents the IMT case of Romania, where the pumping costs of irrigation systems are so high that they can be afforded only with heavy government subsidies. The transfer to WUAs has led to a remarkable reduction in the irrigated area owing to their high O&M costs.

Although there is no single ideal methodology to determine how much has to be allocated for O&M activities, the principle of not deferring maintenance should prevail if schemes are to be sustainable. If financial sustainability is to be achieved, the funds to replace equipment or infrastructure after their life cycle is completed should also be considered.

BOX 7

Operation and maintenance in Romania

In Romania, irrigation systems depend considerably on pumping. Out of a total of 3.1 million ha of developed land, about 2.85 million ha were developed for sprinkler irrigation. Irrigation water is delivered to the first terrace after a primary pump station lifts water from a canal off the Danube River or one of its tributaries. On the first terrace, secondary pressure pump stations extract water from the canals and deliver it to buried pipelines that supply water to sprinkler laterals. Higher terraces are supplied by successive second and third lift pump stations on the main supply canals. The overall static lift to the first terraces is usually 60–70 m while secondary pressure pumps add another 50–60 m of lift to provide water under pressure to sprinklers. Lift for the highest terraces can reach more than 200 m, and including the secondary pressure pumps, the dynamic pumping head for these terraces can exceed 270 m.

After the dissolution of state and collective farms in 1990, there was no clearly designated authority for water distribution or for the O&M of irrigation infrastructure. Initially, an attempt was made to give this responsibility to SNIF (National Land Reclamation Society) and RAIF (Autonomous State Company for Land Reclamation), but these organizations had neither the staff nor the budgetary resources to take over responsibility for O&M.

Cutbacks in government budgets and falling farm incomes resulted in a massive reduction in real investment in irrigation O&M. As a result of ageing of the irrigation infrastructure complicated by an inability of both the Government and farmers to pay for energy costs, the earlier annual irrigation demand of about 2 500–3 000 m³/ha dropped to about 1 000 m³/ha. This has had an impact on O&M as the fees collected for the partial use of the irrigation network are not enough to pay for the maintenance of all the infrastructure. In addition, on-farm equipment and modular pump sets used on many systems have been destroyed, stolen, or are too old to operate properly.

The Land Reclamation Law of 1999 (modified in 2004 and 2005) formalized the creation of WUAs and completely restructured SNIF to a land reclamation agency which included significant staff reduction, and transfer of authority to regional offices, as well as a stronger WUA role in systems management.

Currently, canals and secondary pressure pump stations are operated by WUA staff (normally former SNIF staff hired by the WUA), also responsible for fee collection. Moreover, the new law allows WUAs to be created to take over the management all the way from the primary pumps to the river.

At present only about 700 000 ha are being irrigated owing to lack of maintenance of the irrigation systems and the age of the large pumping units as well as the costs of energy. The Land Reclamation Law established that an irrigation system can only be operated if there is a demand for water of at least 20 percent of its command area both at the distributary canal and overall system levels. The challenge for the WUAs remains that of being able to maintain enough area under irrigation to be able to properly maintain the existing infrastructure.

At this stage, IMT involves transferring the secondary pressure pump stations, the buried distribution network as well as some of the open channels.

Source: Romania IMT country profile.

In more than 60 percent of the cases analysed, water users were given the responsibility to carry out O&M, and a slightly lower percentage of cases also received the responsibility to fund these activities. These results are homogeneous among the regions studied.

Quality of maintenance

Out of the 43 cases included in the survey, only four reported that the quality of maintenance had decreased after IMT implementation. However, all four cases are in

Africa. The situation that emerges from some of the African countries included in the survey is that governments have decreased their contribution towards O&M drastically, and farmers have not been able to increase their share in the same proportion. The most obvious consequence of this situation is an accelerated deterioration of the infrastructure. For example, the case of Morocco shows how the lack of funds delayed unnecessarily the process of WUAs creation and hampered adequate maintenance. This also demonstrates the need for a well-thought, properly funded capacity-building plan to be carried out in order to put farmers organizations in a position in which they can on their own take care of the long-term needs of their irrigation schemes.

Notwithstanding the foregoing, there are some positive outcomes in Africa as well. The Sudan case study describes how, after the transfer of management, farmers increased their in-kind contribution by dedicating more time to seasonal maintenance. They do not see this as an additional burden as it is carried out at the end of the growing season when they are less engaged in other activities. Farmers have soon realized the direct link between improved maintenance and a reliable and equitable water delivery service. Moreover, the farmers' monetary contribution towards maintenance is paid only after they have sold their harvest. The opposite has occurred in Senegal, where decreased quality of maintenance has meant that the problems of inequity continue with no sign of improvement owing to the low management capacity of WUAs and the low rate of fee collection (which has not improved since the transfer).

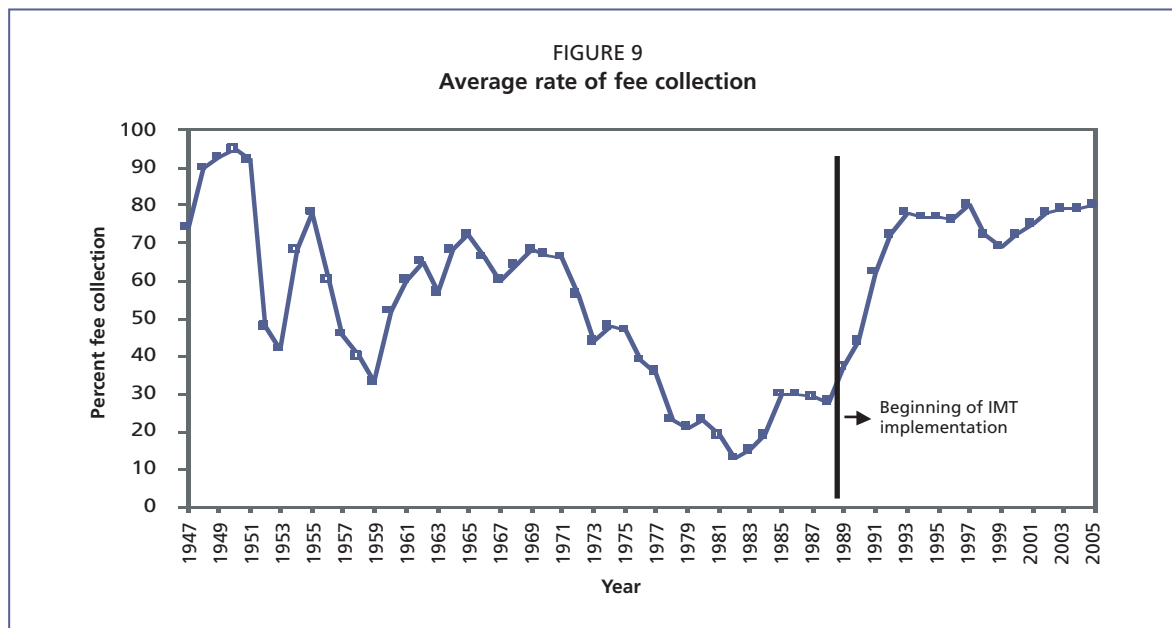
Another positive case comes from Mali, where the Office du Niger irrigation scheme has undergone a profound change through a comprehensive process of reform. Farmers have been given full responsibility not only for carrying out O&M activities but also for their financing. Farmers have decided to outsource maintenance activities to contractors, and the performance is monitored by the farmers themselves. However, this has required substantial training of the WUAs in the technical and legal aspects of the outsourcing process.

Rate of fee collection

In 75 percent of the cases studied, the rate of fee collection has increased. This result is particularly remarkable as it has occurred despite higher water fees in some cases. As an example, the IMT country profile of Mali shows that although water fees rose by 50 percent over 3 years, the efficiency of fee collection also increased in the same period. This result can be traced to increased user participation and to the improved quality of the service delivered. Andhra Pradesh, India, raised its water charges threefold with IMT, while collection rates increased, owing to the support of farmers for the policy that 90 percent of funds collected would be kept and used by the WUAs and federations of WUAs.

There are only 3 out of 43 cases in which a decrease in the rate of fee collection has been recorded. From these results, it can be inferred that farmer organizations taking over the management of their schemes have been able to at least provide the same level of water delivery service, as otherwise it is unlikely that users would pay increased fees more willingly than in the past. However, farmers' willingness to pay is related not only to the quality of the service provided but also, among other factors, to the existence of control mechanisms and transparent water-pricing methodologies.

Mexico provides a typical example of what governments often expect to achieve by embarking on the process of management transfer. Before turning management over to farmers organizations, the government used to pay about 85 percent of what was being used for O&M (with farmers contributing the remaining 15 percent). However, it is recognized that even this amount was inadequate to operate and maintain the schemes properly. As a result, farmers received a low-quality service for which they were not keen to pay. Indeed, prior to transfer, the rate of fee collection was about 30 percent. This meant that there was not enough money to operate and maintain the system



Source: Mexico IMT case study (2004).

properly, and this is how the downward vicious spiral was set in motion. The results were a decaying irrigation infrastructure, and farmers who were becoming increasingly dissatisfied with the service and less willing to pay for it.

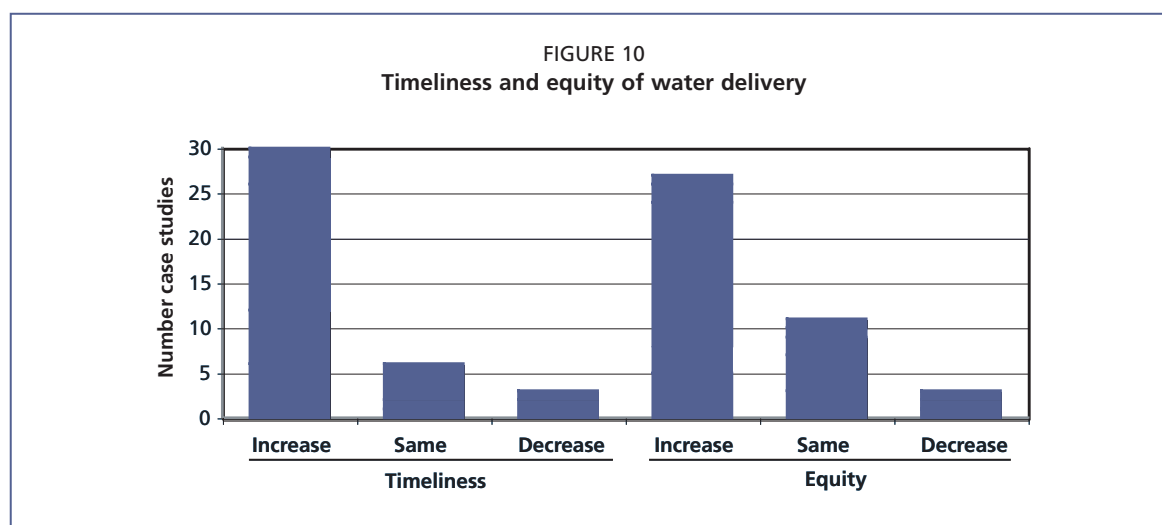
After the transfer, the rate of collection more than doubled in 5 years, peaking in 1997 at a rate of 72 percent. In Figure 9, cost recovery is the ratio of collected fees to the planned O&M costs expressed as percentages. These values are an average of all irrigation districts (IDs) transferred. The original aim of the IMT process was that IDs should achieve financial autonomy for O&M. In the season 2000–01, they collected on average 72 percent of their O&M needs. However, there was considerable variability in the performance of IDs, as by that time some were already financially autonomous while others were only collecting 20 percent of their O&M needs and, therefore, still needed government support. These figures suggest that a considerable number of irrigation districts are still a long way from achieving financial sustainability.

Timeliness and equity of water delivery

Timeliness of water delivery is one of the indicators that have reached high consensus in the countries studied. Indeed, 30 out of 39 replies reported an improved timeliness in the delivery of water, while in only three cases was a worsening registered (Figure 10). That is, farmers are receiving water closer to the moment they need it and have asked for it. As mentioned above, this is partly because of better maintenance but also to simpler operational practices and improved communications. The positive change in timeliness has been reported in all the regions surveyed.

A similar situation emerges in relation to the equity of the service provided to farmers (Figure 10), meaning that users located towards the tail end of canals were receiving a better share of the water resources available. In the only three cases in which a negative impact in the equity of water delivery has been reported, it has been linked to: land tenure problems (Zimbabwe); lack of an adequate transfer programme (Peru); and not receiving enough support, funding and training from central government (Hubei Province, China).

It could be argued that such a clear improvement in these two indicators is per se sufficient reason to advocate the direct involvement of farmers in the governance of irrigation schemes.



IMPACTS

Irrigated area

In 25 out of 39 cases studied, an increase in the area irrigated has been reported. An improved management of water delivery would normally lead to an increase in the cropping intensity or to an expansion of the irrigated land. Adopting one of these possibilities depends on local conditions, but increasing the irrigated area permits a better adaptation to additional water volumes. During processes of reform, there may be changes in the recorded irrigated area that may not necessarily reflect actual changes in land use but may merely bring records closer to reality (Huppert, 2005). The most important change in decreasing irrigated area in the last 15 years has taken place in several of the countries of the Commonwealth of Independent States, largely associated with their difficulty in funding the energy costs to operate the irrigation schemes and their deterioration for lack of maintenance (Box 5). The incipient reforms taking place in the region have already shown potential to increase area under irrigation, as the Kyrgyz Republic country profile reports. Owing to the high heterogeneity of irrigation practices in the region, this potential is yet to be proved under different circumstances. Loss of area under irrigation in the Central Asia region may also be attributed to loss of skills in water management as the public sector has shrunk.

Crop yield

It is not possible to identify distinctively the effects of the reforms in the irrigation sector in crop yields from the many other factors that may affect their seasonal value positively or negatively. Sudden changes in crop yield may stem from major technological changes (positive or negative) or from political decisions unrelated to water use (e.g. changes in access to fertilizers). There are also other elements in crop yield changes that may have a small but cumulative effect over time on crop yields, such as the release and adoption of improved varieties, the uptake of improved agricultural practices, and overall improved management. Under irrigated conditions, the vagaries of weather are attenuated, and the interseasonal climate variability does not affect crop yield noticeably under optimal management conditions.

However, 21 out of 33 replies in the survey reported an increase in crop yields, while another 11 informants reported no change. Most of the cases showing an improvement in crop yield are from Asia. Improvements in crop yield may reflect the normal positive trend in crop yield changes registered in Asia in the last four decades.

An important result is that the information collected did not show a decrease or stagnation in crop yields in areas where water management is being taken up by

farmers organizations. However, in order to determine the real impact of IMT on crop yields, it would be necessary to conduct studies of “before” and “after”, and “with” and “without”, the reform process. No such studies were reported in the survey.

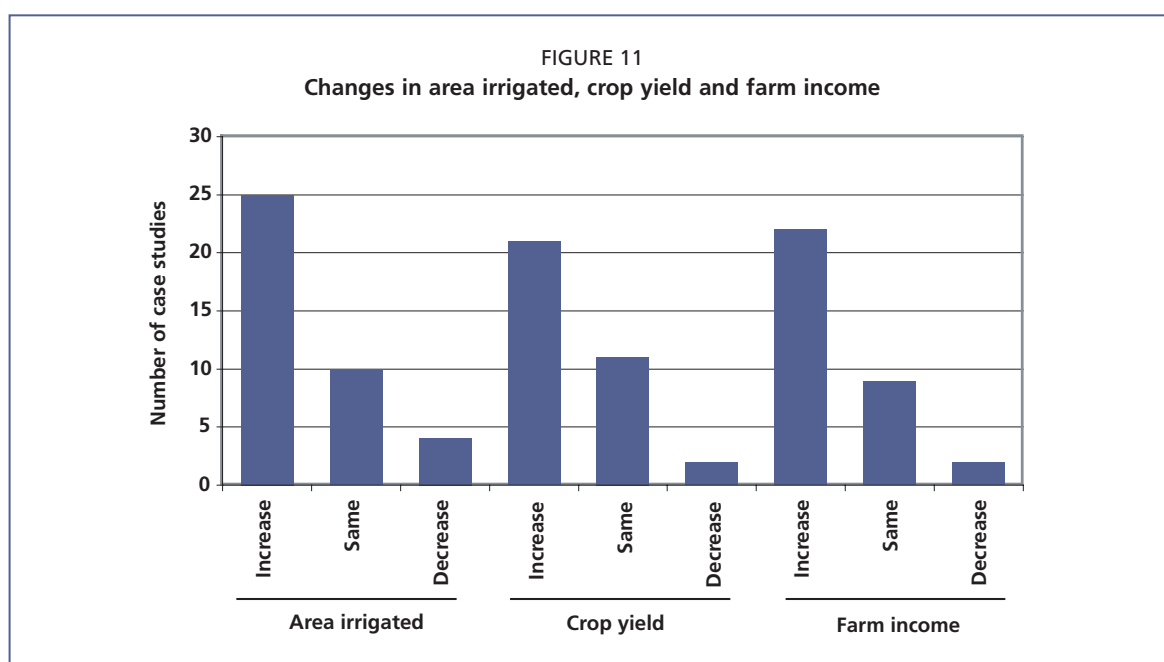
Farm income

Farm income is not a good performance indicator for IMT processes. The reason is that it reflects all the positive and negative impacts stemming from a wide range of factors, such as farm location, ability to produce the adequate crops, access to inputs, access to markets, access to transport facilities, and farmer’s managerial skills. Policies and management decisions do have an important bearing on farmers’ economic performance, but to single out the causes for its fluctuations is rather difficult and would require far more detailed data than that collected through the questionnaire developed for this survey.

The results of the survey show that an increase in farm income was reported in 22 out of 33 cases of those who replied to these questions. During the process of IMT, farm income may increase for a number of reasons. Hypothetically, if things were to evolve according to the common features included in an IMT process, fee collection would improve and more money would be available for O&M activities, which would result in an improved water delivery service. In an improved situation, receiving water in a timely fashion and in the adequate volumes would mean, other factors being equal, that yields could be increased or that the quality of the produce could be improved. If there were no other major limiting factors, this higher production would in turn have the potential to increase farm income per hectare.

When looking at these three indicators together, namely, irrigated area, crop yield and farm income, the results of the survey show a clear tendency confirming the above statement. Most countries reported larger irrigated areas, increased crop yields and increases in farm income (Figure 11).

However, one case shows a decrease in farm income. The report is from Ghana and refers to a pilot case. The reasons for this abnormal outcome can be found in the decreased quality of maintenance as a consequence of both a low fee-collection rate and a lack of technical capacity in the WUA.



Soil salinity and waterlogging

The information collected through the questionnaires and case studies in relation to soil salinity and waterlogging is limited as in few cases were these situations reported as existing or as recognized as an issue. However, out of the 15 countries that reported waterlogging as an issue, seven reported that it had decreased since IMT and only one country reported that it had increased. The remaining seven countries reported no change.

The studies have not provided any direct evidence that the IMT process has translated into a negative environmental impact on the systems involved. At worst, the effect, particularly on salinity and waterlogging, has been neutral, meaning no deterioration has occurred or it has remained as it was prior to IMT.

Chapter 5

Integrating lessons learned into future interventions

SUPPORTING OBJECTIVES AND EXPECTATIONS OF IMT PROGRAMMES

As might be expected from any complex reform process, there are implementation aspects that lead to partial or non-achievement of original objectives. After years of ongoing IMT processes in some countries, there is now evidence of the need to critically review the validity of the common reasons for embarking on reform processes in the irrigation subsector.

Overall, the results of the IMT process undertaken across the globe can be perceived as a mixture of successes and failures. Now that the process is better understood and its implementation has taken hold, efforts should concentrate on the M&E component of the process. This will allow feedback to make corrections for both past and ongoing IMT efforts.

The following sections summarize the main findings from this survey in relation to achievement of the initially envisaged IMT objectives.

Reduction in government costs

Irrigation management transfer has partially achieved this particular government objective. Although some of the main objectives of governments at the onset of the process have been achieved (e.g. decreased government expenditure, or the reorientation of institutional arrangements in the irrigation subsector in some cases), this has been coupled with government disengagement from financing irrigated agriculture, thereby hampering the provision of some support services that basic to the agriculture sector (below). In general, IMT has reduced the cost of government allocations towards the O&M of irrigation systems. However, some irrigation systems were unsustainable, from a financial point of view, before the transfer, and their sustainability after transfer has depended considerably on the government capacity to intervene and prevent the systems from collapsing. In other words, the decrease in government costs has been less than expected.

The role of WUAs in increased accountability and more efficient water supply

The IMT process has forced a new look on the way services are provided to users. This has been perhaps one of the most remarkable achievements of newly established WUAs. There has been growing concern (and pressure) about the need to move from supply-driven to demand-driven services. This is particularly true for the provision of bulk water deliveries at strategic nodes of the systems. The closer involvement of WUAs has resulted in increased accountability, transparency and responsibility, as has been reported from Mexico and China, for example.

Renewed support services to agricultural production

Although WUAs tend to remain responsible for providing services related to water distribution, some farmers organizations have also started to look into the provision of a wider range of agricultural services to their members, making the scope of the reform process more comprehensive. Some governments had high expectations that the private sector would become involved in the provision of some of these basic support services. It seems now that these projections were either too optimistic or poorly conceived, and often the private sector did not or would not react to fill this gap.

Improved payments for irrigation services

The performance of water services in terms of fee collection has been erratic. Initially, in a good number of cases, IMT led to significant increases in the fee collection ratio, but this has not always been sustainable. There are large variations between irrigation systems within the same country and among countries. It has not been the “silver bullet” that was originally presented as one of the main reasons for introducing the reforms. However, the level of cost recovery is higher than before the transfer.

Improving agricultural productivity

Irrigation management transfer does not necessarily lead to increases in cropping intensities or yields. There are only a few documented cases where there appears to be a direct relationship between the reform and agronomic improvements. These can normally be traced to the efforts of pilot studies taking advantage of the reform-derived interventions. However, in most cases, the link to improvements in agricultural productivity cannot be easily made. On the other hand, there is no reference, or case, where decreases in agriculture productivity have been reported.

Enhanced communication between users and managers

In general terms, the IMT process has led to an improvement in communication related to the management-related activities of irrigation systems. There has been an increase in both accountability and responsibility pertaining to the quality of the service provided, which has enhanced the nature of the relations between users and managers. While the magnitude of quality improvement can not be asserted from these studies, in a few countries at least such a change has been reported.

There is ample indication that communication between system management and end users has increased. This creates a better understanding of the water distribution process and its requirements, which translates into enhanced satisfaction of the service provided and received by each party.

In summary, expected objectives have been met but not to the degree initially expected. Therefore, the need to undertake national M&E programmes in order to learn more about how to improve the results obtained is becoming a pressing reality. In general, there has been a tendency to overstate the objectives and expectations of IMT programmes, creating expectations that have not always been fulfilled.

MAIN ISSUES FOUND IN IMPLEMENTING IMT PROGRAMMES

From the information collected in this survey, it can be seen that, in some cases, countries started the adoption of IMT programmes without a thorough previous analysis to evaluate the existence of adequate conditions to support the process. In some cases, correct information would have shown that the country did not have the capacity to engage in a reform of the scope and scale required and that, probably, alternative solutions such as transfer of pilot schemes or of smaller areas would have produced better results.

Essentially, there have been three major constraints. First, there has been a lack of political support in some countries. This has resulted in poor funding of the reforms and inadequate support to the process. The second one is of a legal nature. Often, governments have not wanted to face the difficulties of changing the existing laws through parliamentary processes and have tried to implement the reforms with existing, unsatisfactory legislation or with ministerial decrees that have lacked the necessary weight and authority. The result has been that often the legal responsibilities and nature of WUAs are not clear or do not cover well the real responsibilities. The third and final constraint has been the lack of managerial skills within the WUAs, which has resulted in poor provision of water services.

The following sections present some considerations arising from the results of the survey.

Legal status and degree of authority of WUAs

There is a widespread need for a clearer legal status and clearer water rights given to WUAs and farmers. Without clear legal status, the leaders of WUAs cannot operate properly because they do not know the extent of their responsibilities. In many parts of Asia and Africa, water rights do not exist or they are not functional. Farmers may need greater confidence in their water rights before they will be willing to take responsibility and make investments to ensure the productive and sustainable use of the infrastructure as well as of agricultural inputs.

The degree and type of authority to manage fully the physical infrastructure and the socio-economic aspects of the WUA need to be considered carefully. Where the transfer of authority is partial, the management of the WUA will be limited in a scope and not fully accountable for the results.

Delivering water and providing maintenance

Improvement in the delivery of water and undertaking maintenance has been a central issue for IMT. Various solutions have been adopted, including management by farmers directly, WUA staff, and staff of a governing agency. There have a few cases where the private sector or public utilities are responsible. Although the predominant modality of water delivery and maintenance is by WUA staff, other solutions and combinations appear to work satisfactorily depending on the local situation and local arrangements made at different hydraulic levels.

Purposes of WUAs

The mandates of WUAs vary considerably. Although irrigation management remains the key function, other mandates (drainage, groundwater, etc.) are often added. An issue is whether or not WUAs should focus only on irrigation management or whether they should also take on secondary functions such as developing agribusiness and marketing. The survey has revealed that the number of associations that are taking the second approach is becoming significant, particularly in Asia.

Rights and responsibility of WUA members

While voting rights are generally granted to all members, only in a few cases are water rights held by members. Despite the pressures in many places for membership to be mandatory, it has remained voluntary in nearly half of the cases surveyed. This approach limits the financial and managerial viability of irrigation systems. Representation of women in the governance of the WUAs remains very low, and this is an issue of growing concern. Only in some cases do WUA statutes provide enough safeguards to ensure that small farmers are adequately represented.

Financing irrigation improvements

The deterioration of existing infrastructure needs to be addressed in a sustainable manner. This can be done in two ways. First, where deterioration is severe, rehabilitation and/or modernization may be required before farmers will support IMT (but shortage of government funds is often a strong limitation to this alternative). Second, new arrangements should be found for farmer involvement in prioritizing works and in designing creative investment that will prepare farmers to share more responsibility for financing rehabilitation works in the future. There are successful examples of incremental improvements where financial responsibilities have been shared between government and farmers according to their financial capacity to contribute to the works.

Coping with irrigation agency reform

The large loss of jobs in the public irrigation sector that was feared by irrigation agencies as a consequence of IMT has not occurred in most countries. Where it has occurred, it has not been to the extent expected. While results vary from country to country, mechanisms have been developed to offset these effects including: absorption of staff by the WUAs; transfers to other working areas of the government; or uptake of jobs in the private sector. In general, the impact has been important on the irrigation agencies but not on the irrigation sector.

Irrigation agencies have continued to play a relevant role after transfer. The most common tasks are to make policies, laws, strategies and plans for the irrigation sector and WUAs. This includes: establishing training; inspecting; advising; and resolving conflicts in WUAs. They also continue to manage higher hydraulic systems.

Capacity building of WUAs

With few exceptions, the process of capacity building of the staff of WUAs and leading farmers has been unsatisfactory. This has had detrimental effects on the performance of WUAs during the initial years, which are the most critical ones. The reasons for this deficiency are associated to the insufficient funds allocated to the IMT programmes, but also to a lack of understanding of the training needs of the WUAs.

THE PROCESS OF IMPLEMENTING IMT

Matching IMT with the conditions of the country

As the IMT process gained momentum across the world, several international bodies tried to develop an ideal IMT model that could be easily implemented anywhere in order to facilitate and promote the implementation efforts. What is now perceived from the evidence is that it is not possible to design a model that can cater to different physical, institutional, socio-economical and cultural conditions that are evident not only across regions and countries but often also within countries themselves. Notwithstanding the above, there are common elements and steps in most of the IMT programmes.

The pace of implementation is largely related to the degree of political support that the programme receives. However, in any case, the implementation times are long and rarely less than 10 years. Even in countries where implementation has been rapid, one can observe an initial period where the transfer has been very intensive followed by a slower one where the number of systems transferred per year has decreased substantially, indicating the difficulty of incorporating irrigation systems that are marginally sustainable from an economic and technical point of view.

Thus, there is a need for a much greater focus worldwide to design and implement IMT programmes in a more comprehensive manner in order to enable the sustainable financing of irrigation systems.

Mobilizing support and awareness

Irrigation management transfer programmes require the support of stakeholders, such as local governments, the private sector and civil society, in order to be able to reach their intended goals. For example, the survey presented a case where a town council resisted the establishment of WUAs because they were perceived as a competitor for power. This led to a situation where implementation became hampered because of mutual distrust among important actors. Support can be obtained by actively involving all parts from the early stages of the programme development.

Awareness campaigns were essential elements of IMT programmes in several countries, and there is a certain correlation between the pace of implementation and the intensity and coverage of the campaigns. Resistance by irrigation agencies and local governments has often changed to support after a period of raising awareness and negotiations.

Addressing financial and capacity-building constraints

Financial support from governments has often fallen short of IMT needs. Many of the cases in this survey have been underfunded. This has led to insufficient support for important issues such as:

- a promotion campaign to facilitate the implementation process;
- building the capacities of WUAs and irrigation agencies;
- addressing land and water rights;
- adjustments in agricultural support services.

Training of staff from irrigation agencies responsible for the implementation of the IMT is of great importance for an effective implementation of the programme and the establishment of WUAs.

The need for monitoring and evaluation

Most of the IMT programmes have been characterized by a lack of M&E systems that would have permitted lessons to be learned from the implementation process. In the few cases where such M&E systems have been implemented, the scope has been limited to financial and other programmatic aspects. This has been a missed opportunity that remains important for the future.

RECOMMENDATIONS FOR FUTURE IMT PROGRAMMES

From the section above, it is possible to draw some lessons both from the survey and from other experiences concerning the transfer of management that should be taken into consideration by those governments or entities that are engaging in this type of reform. A few issues to consider are introduced below, divided into two main groups: (i) recommendations that will strengthen interventions already planned as part of the IMT process; and (ii) those that have emerged but were not initially contemplated.

In relation to existing interventions:

- High-level political commitment is essential, but it is often lacking or short-lived. In order to be successful, IMT programmes require strong political commitment at the highest possible level for a sustained period of time. Where it is weak, efforts should be made to strengthen it. To this end, sharing information from the M&E component of the programme may provide new impetus. Study tours to countries where IMT has been implemented successfully have proved useful in encouraging political support.
- The process of IMT should be adaptive and flexible. There is a tendency for international financing institutions to promote IMT programmes and to adopt fixed institutional arrangements and implementation schedules. When complexities and issues arise during implementation, they may cause governments to ignore negotiated settlements or establish WUAs rapidly and undemocratically. International financing institutions and governments should allow IMT programmes to be learning opportunities and to be flexible so that essential tasks can be done effectively and with full farmer support.
- Irrigation management transfer programmes generally need systematic public awareness campaigns, consultations, and involvement of all key stakeholders. Once the decision to activate an IMT programme has been made, there is a need to generate public awareness and support for IMT and to help farmers see that IMT is a programme with broad recognition, legitimacy and support. Where irrigation-related disputes exist, consultations with stakeholders may be needed in order to arrive at acceptable solutions. All key stakeholders of irrigation systems should be involved in the planning and implementation of IMT. This is essential not only to generating commitment but also to designing a better, more appropriate IMT programme.

- Irrigation management transfer programmes should address the financial capacity of WUAs and their strategies for financing irrigation management. This should include honest assessments of farmers' financial capacity in the context of the changing productivity of irrigated agriculture. It should include helping WUAs to design needs-based budgeting and water charges, and new arrangements for joint investment by WUAs and agencies in rehabilitation, perhaps including incremental rehabilitation.
- Irrigation management transfer programmes should include the important need to reorient the irrigation agency and plan how to support agency staff to adapt to the new situation. Without this, agencies tend to resist IMT and may sabotage its implementation. As a minimum, agencies need to redeploy staff from transferred canals and build their capacity to train, establish and strengthen WUAs. They may also need to intensify their roles in the management of main canals in large schemes, sector regulation and river basin management.

In relation to emerging interventions:

- WUAs and irrigation agencies need substantial and prolonged capacity development. Commonly, IMT programmes provide training and other complementary activities to WUAs only during their establishment, but many survey respondents say that all these activities should be part of a long-term programme that eventually evolves into a consultative, problem-solving process. Many irrigation agencies lack knowledge and experience in assisting WUAs to organize and manage their new responsibilities. Moreover, many irrigation agencies also have difficulties in directly providing capacity building related to technical aspects to the newly created WUAs. Consequently, training irrigation agency staff is essential to providing these services. Survey results show that this training is often either underestimated or wholly lacking.
- Checks and balances should be created to ensure that WUAs act according to members' interests. This may include a variety of measures, such as requirements for approval by WUA members of irrigation management plans, budgets and fees and irrigation management audits.
- The possibility for WUAs to make profits and engage in agribusiness should be explored. Most governments resist this and do not allow WUAs to engage in activities other than irrigation system management. However where permitted, WUAs have often developed cooperative purchases of inputs, agribusiness activities and group marketing that have proved viable particularly in Asia. These activities build on the social capital created by the WUAs and can build stronger loyalty to the WUA if managed properly. Recognizing the importance and potential of this, but also the limited capacity of newly created WUAs, a two-step approach has been used in some countries. Namely, the new WUAs concentrate on activities related only to irrigation system management for a certain period in order to ensure the necessary organizational capacity is present before the WUA is allowed to enter into other areas such as those described above.
- The IMT process has brought the issue of system rehabilitation to the fore either as a precondition for IMT or as an urgent element of the process. There are many unresolved questions pertaining to who will be responsible for future improvements and what the role of the government can be. Moreover, policies and legal frameworks must be clear about this issue in order to prevent relapses into deferred maintenance.
- Irrigation management transfer should clearly address the disposition of equipment and the authority over irrigation infrastructure. Many IMT programmes do not make clear the extent to which farmers are responsible for maintaining the irrigation system and have the authority to repair irrigation structures (which may belong to the government even after transfer). Irrigation management transfer

should have “transfer agreements” between the WUA and irrigation agency that make these matters clear, especially that farmers have sufficient authority to make rational decisions about maintenance and repairs.

- The IMT process should not translate into a negative impact through the decrease in data collection for statistical analysis of irrigation system performance. A job once done by the agencies has less appeal to WUAs, who still see no special incentive to invest in regular data collection. With time, this will have a deteriorating effect on the M&E of the schemes.
- Irrigation management transfer programmes need to be accompanied by M&E systems that will permit a progressive learning through the implementation process. However, in countries where IMT has already been established for some time, an evaluation of the results obtained and the impact produced in the agriculture sector will be a source of important lessons.

This study indicates that IMT is an approach for irrigation sector reform with the potential to improve the sustainability of irrigation systems. However, in order to reap its benefits, IMT should involve a wider array of changes, including both “soft” and “hard” interventions. The process requires *inter alia* strong political commitment, negotiations among stakeholders, and long-term capacity development. Irrigation management transfer should not be seen as a process that has a clear “beginning” and “end”. While the former can be more easily identified, the latter is much more difficult to determine. In fact, IMT can be the initial stage of a long reform process that will evolve as IMT progresses. For example, IMT can lead to a full restructuring of how agricultural services are provided in a region or country, or to an in-depth irrigation modernization process that was not even considered in terms of both its nature and extent at the outset. Irrigation management transfer could well lead to the reorganization of the entire institutional setup for the agriculture sector and to wide changes in economic policies in support of irrigated agriculture. However, what is certain is that irrigation sector reform is now necessary and that few countries can afford to disregard the potential benefits that it offers.

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All Irrigation Management Transfer country profiles, case studies and WUA legislation country profiles are included in the CD-ROM attached to this publication and described in page vii.

Annex 1

Types of IMT programmes in country profiles

Country/State	Administrative level at which transfer applied	Schemes for which management is transferred to WUA	Highest hydraulic level transferred*	Amount of O&M authority transferred
Albania	National	All govt. schemes	Headworks	Full
Argentina: Mendoza	State	All govt. schemes	Headworks	Full
Armenia	National	All govt. schemes	Distributary	Full
Australia: Victoria	State	All govt. schemes	Headworks	Full
Bangladesh	National	Nearly all govt. schemes	Distributary	Partial
Bulgaria	National	All govt. schemes	Distributary	Full
China: Guanzhong (Shaanxi)	Pilot system	Pilot scheme	Distributary	Full
China: Hebei	Pilot system	Pilot schemes	Distributary	Partial
China: Hubei	Pilot system	All govt. schemes	Main	Full
China: Hunan	Pilot system	All govt. schemes	Distributary	Partial
China: Liaoning	Pilot system	Pilot schemes	Distributary	Partial
China: Ningxia	Two pilot systems	Two pilot schemes	Distributary	Partial
Colombia	National	All govt. schemes	Headworks	Full
Costa Rica	National	Undetermined	Headworks	Full
Dominican Republic	Pilot system	All govt. schemes > 1 000 ha	Distributary	Partial
Ecuador	National	All govt. schemes	Distributary	Full
Ghana: Volta Basin	River basin	Small-scale govt. schemes < 100 ha	Distributary	Partial
India: Andhra Pradesh	State	All govt. schemes	Distributary**	Full
India: Karnataka	State	All govt. schemes	Distributary	Partial
India: Madhya Pradesh	State	All govt. schemes	Headworks	Full
India: Orissa	State	All govt. schemes	Headworks	Full
India: Rajasthan	State	All govt. schemes	Distributary	Partial
Indonesia (SSI)	National	All govt. schemes < 500 ha	Headworks	Full
Indonesia (Watsal)	National	All govt. schemes	Distributary**	Full
Kyrgyz Republic	National	All govt. & collective farms	Distributary	Full
Mali (Office du Niger)	System	Pilot scheme	Main	Partial
Mexico	National	All govt. irrigation districts	Phase I Main Phase II Headworks	Full
Morocco	National	All govt. medium & small schemes	Distributary	Full
Nepal	National	All govt. schemes < 500 ha in hills & < 2 000 ha in plains	Headworks	Full
New Zealand	National	All govt. schemes	Headworks	Full
Niger	National	All govt. schemes	Headworks	Full
Pakistan	Sindh & Punjab	All govt. schemes	Distributary	Full
Peru	National	All govt. schemes	Main canal	Full
Philippines	National	All govt. schemes	Distributary	Partial
Romania	National	All govt. schemes	Distributary	Full
Senegal	National	All govt. schemes	Main/branch	Full
Sri Lanka	National	All govt. schemes	Distributary	Partial
Sudan (Gezira)	Pilot system	One large govt. scheme	Distributary	Full
Tunisia	National	All govt. schemes	Distributary	Partial
Turkey	National	All govt. schemes	Distributary	Full
United States of America (CBP)	System	All govt. schemes	Subsystem	Full
Uzbekistan	National	All govt. schemes	Distributary	Partial
Zimbabwe	National	All govt. schemes < 80 ha	Schemes < 800 ha, Distributary	Partial

* In descending scope of transfer: headworks, subsystem, main/branch, distributary.

** Full and partial transfer by contract included.

Annex 2

Rates of implementation of IMT programmes

Country	Location	Start year	Target area	Area transferred	percent of target transferred	Average area transferred per year
			(ha)	(ha)	(%)	(ha)
Albania	Nationwide	1996	180 000	110 000	61	15 714
Argentina	Mendoza Province	1985	360 000	360 000	100	20 000
Armenia	Nationwide	1995	200 000	90 000	45	11 250
Australia	Victoria State	1994	-	243 557	-	27 061
Bangladesh	Nationwide	1960	160 000	-	-	-
Bulgaria	Nationwide	1995	-	-	-	-
China	Shaanxi Province	1998	456 485	323 710	71	64 742
China	Liaoning Province	2001	8 542.4	5 034.5	59	1 678
China	Hebei Province	2000	4 121	3 910	95	1 303
China	Hubei Province	1995	38 800	70 300	181	8 787
China	Ningxia Province	1998	275	120	44	24
China	Hunan Province	1994	60 000	27 000	45	3 000
Colombia	Nationwide	1990	337 283	238 000	71	18 308
Costa Rica	Selected schemes	-	-	-	-	-
Dominican Republic	Selected schemes	1987	270 000	107 000	40	6 687
Ecuador	Nationwide	1995	67 637	70 830	105	8 854
Ghana	Volga River Basin	1999	-	200	-	50
India	Andhra Pradesh	1997	4 840 000	4 840 000	100	806 666
India	Karnataka	1987	-	15 000	-	938
India	Madhya Pradesh	2000	2 000 000	1 500 000	75	500 000
India	Orissa	1996	2.700 000	702 000	26	100 286
India	Rajasthan	1990	2 000 000	50 000	.25	3 846
Indonesia	Nationwide (WATSAL, large & medium schemes)	1997	1 470 000	235 000	16	39 167
Indonesia	Nationwide (SSI, small schemes)	1987	854 214	446 000	52	27 875
Kyrgyz Republic	Nationwide	1997	1 000 000	550 000	55	91 667
Mali	Office du Niger	1993	60 000	60 000	100	6 000
Mexico	Nationwide	1989	3 400 000	3 236 000	95	231 143
Morocco	Nationwide	1990	-	333 630	-	25 664
Nepal	Nationwide	1995	50 000	30 000	60	3 750
New Zealand	Nationwide (lift schemes)	1989	118 858	118 858	100	8 490
Niger	Nationwide	1982	12 500	12 500	100	595
Pakistan	Punjab & Sindh Provinces	2000	-	87 166	-	29 055
Peru	Nationwide	1995	400 000	200 000	50	25 000
Philippines	Nationwide	1984	678 549	534 389	79	28 126
Romania	Nationwide	1999	-	200 000	-	50 000
Senegal	Senegal River Basin	1987	12 928	80 903	626	5 056
Sri Lanka	Nationwide	1996	350 000	205 000	59	29 286
Sudan	Gezira Scheme	2001	54 000	3 000	6	1 500
Tunisia	Nationwide	1987	215 000	130 000	60	8 128
Turkey	Nationwide	1994	2 000 000	1 600 000	80	177 778
United States of America	Columbia Basin	1969	230 000	230 000	100	46 000
Uzbekistan	Ferghana Valley	2000	2 000 000	?	?	?
Zimbabwe	Nationwide	1997	12 000	4 000	33	667

Annex 3

Contents of basic documents for WUAs and IMT

CONTENTS OF A WUA CONSTITUTION (OR ARTICLES OF ASSOCIATION)

1. Basis of authority for the WUA
2. WUA mission statement
3. Basic roles and structure of the WUA
4. Legal status and basis of authority
5. Area of jurisdiction
6. Criteria for membership (including for non-agricultural water users)
7. Basic rights, powers and obligations of the WUA and its members
8. Structure of leadership
9. Method for amending constitution

COMMON CONTENTS OF WUA BY-LAWS

1. Procedure for admitting and expelling members
2. Leadership positions and functions
3. Procedure for selecting and removing leaders
4. Tenure of leaders in office
5. Description of water delivery and maintenance objectives and rules
6. Rules and sanctions about irrigation service payments
7. Decision-making procedure for policy and tactical decisions
8. Procedure for entering into contracts
9. Protocol for forming federations and having external relations
10. Procedure for amending by-laws

COMMON CONTENTS OF IMT AGREEMENTS

1. Inventory of infrastructure and equipment transferred to the WUA
2. Service area and membership of the WUA
3. Role and jurisdiction of the WUA
4. Basic rights, authority and obligations of the WUA
5. Terms and conditions for transfer to occur or be revoked
6. Protocol for interaction between the WUA and government or other third parties
7. Rights, authority and obligations of the government towards the WUA
8. Procedure for dispute resolution
9. Purpose and procedure for irrigation management service agreements and audit

Annex 4

Summary tables of impacts and outcomes by continent

The legend for interpreting the tables in this annex is:

Legend	↑	Increased	↔	Remained about the same
	↓	Decreased	↕	Variable within systems
	?	Information not available	■	Not applicable

TABLE A4.1
IMT outcomes and impacts – cases from Africa

	O&M costs to farmers	O&M costs to government	Efficiency of fee collection	Quality of maintenance	Timeliness of water delivery	Equity of water delivery	Area irrigated	Crop yields	Farm income	Soil salinity	Water logging
Africa											
Ghana	↑	↑	↑	↓	↔	↔	↓	↓	↓	■	↔
Mali	↑	↓	↑	↑	↑	↑	↑	↑	↑	■	↓
Morocco	?	?	↑	↓	↓	↔	↑	↑	↑	■	■
Niger	↑	?	↑	?	↑	↑	↑	?	?	■	■
Nigeria, Hadejia Valley	?	↓	↑	↑	↑	↑	↑	?	?	■	■
Senegal	↑	↓	↔	↓	↓	↔	↔	↔	?	?	↑
Sudan	↓	↓	↑	↑	↑	↑	↑	↑	↑	■	■
Tunisia	↓	↓	↔	↔	↑	↑	?	?	?	↔	↔
Zimbabwe	?	↓	↑	↓	↑	↓	↓	↔	↔	■	■

Source: IMT country profiles.

TABLE A4.2
IMT outcomes and impacts – cases from the Americas

	O&M costs to farmers	O&M costs to government	Efficiency of fee collection	Quality of maintenance	Timeliness of water delivery	Equity of water delivery	Area irrigated	Crop yields	Farm income	Soil salinity	Water logging
America											
Argentina, Mendoza	↑	↔	↑	↑	↑	↑	↑	↓	↓	■	↓
Colombia	↑	↓	↓	↑	?	↔	↑	↔	↔	↔	↔
Costa Rica	↓	↑	↑	↑	↑	↔	↑	↔	↑	■	■
Dominican Republic	↔	↔	↑	↑	↑	↑	↑	↑	↑	↑	↔
Ecuador	↓	↓	↑	↑	↑	↑	↑	↑	↑	↔	↔
Mexico	↑	↓	↑	↑	↑	↔	↓	↔	↑	■	■
Peru	?	↓	↔	↑	↑	↓	↔	↑	↔	■	■
USA, Columbia River Basin	↓	↓	↔	↔	↔	↔	↑	↔	↑	■	■

Source: IMT country profiles.

TABLE A4.3
IMT outcomes and impacts – cases from Asia

	O&M costs to farmers	O&M costs to government	Efficiency of fee collection	Quality of maintenance	Timeliness of water delivery	Equity of water delivery	Area irrigated	Crop yields	Farm income	Soil salinity	Water logging
Asia											
Armenia	↑	↑	↑	↔	↑	↑	↑	↑	?	■	■
Bangladesh	↔	↓	↔	↑	↑	↑	↑	?	?	■	■
China, Hebei	↓	↓	↑	↑	↑	↑	↔	↑	↑	?	■
China, Hubei	↓	↓	↑	↑	↓	↓	↔	↑	↑	■	↓
China, Hunan	↓	↓	↑	↑	↑	↑	↑	↑	↑	■	↓
China, Ningxia	↔	?	↑	↔	↑	↑	↔	↓	↔	↔	■
China, Shaanxi	↔	↔	↓	↑	↑	↑	↑	↑	↑	■	↓
China, Shenyang	↓	↓	↑	↑	↑	↑	↔	↑	↑	?	↓
India, Andhra Pradesh	↓	↑	↑	↑	↑	↑	↑	↑	↑	■	■
India, Karnataka	↓	↓	↑	↑	↑	↑	↑	↑	↑	■	■
India, Madhya Pradesh	↓	↓	↑	↑	↑	↑	↑	↑	↑	■	↓
Indonesia, large schemes	↑	↓	↑	↔	↔	↑	↔	↔	↔	■	?
Indonesia, small schemes	↔	↓	↔	↔	↔	↑	↔	↔	↔	■	?
Kyrgyz Republic	↑	↔	↑	↑	↔	↑	↑	↑	↑	?	?
Nepal	↑	↓	↑	↑	↑	↑	↑	↑	↑	■	■
Pakistan	↔	↓	↑	↑	↑	↑	↑	?	?	?	?
Philippines	↔	↓	↑	↔	↔	↔	↔	↔	↔	■	■
Sri Lanka	↑	↓	↔	↑	↑	↑	↔	↔	↔	■	■
Turkey	↑	↓	↑	?	↑	↔	?	?	?	■	■

Source: IMT country profiles.

TABLE A4.4
IMT outcomes and impacts – cases from Europe

	O&M costs to farmers	O&M costs to government	Efficiency of fee collection	Quality of maintenance	Timeliness of water delivery	Equity of water delivery	Area irrigated	Crop yields	Farm income	Soil salinity	Water logging
Europe											
Albania	↓	↓	↑	↑	↑	↑	↑	↑	↑	■	■
Bulgaria	↓	↓	↓	↑	↑	↑	↓	↑	↑	■	↔
Romania	↑	↑	↑	↑	↑	↔	↑	↑	↑	■	■

Source: IMT country profiles.

TABLE A4.5
IMT outcomes and impacts – cases from Oceania

	O&M costs to farmers	O&M costs to government	Efficiency of fee collection	Quality of maintenance	Timeliness of water delivery	Equity of water delivery	Area irrigated	Crop yields	Farm income	Soil salinity	Water logging
Oceania											
Australia	↑	↓	↑	↑	↑	↔	↑	↔	↔	↔	↔
New Zealand	↓	↓	↑	↑	?	↑	↑	?	↑	■	■

Source: IMT country profiles.

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Irrigation management transfer

Worldwide efforts and results

Towards the end of the twentieth century, many developing countries were moving in the direction of major change in their economic policies, including reductions in the size and budgets of government. Pressure was mounting on the agriculture sector to become more efficient. Many governments made efforts to collect irrigation service fees but few were successful. The time for more basic change in the irrigation subsector was ripe. The perception that increased ownership, decision-making authority and active participation in the operation and maintenance of irrigation systems would create a binding commitment from water users to be more effective and responsible towards their obligations inspired the process of irrigation management transfer (IMT). Therefore, IMT is the process of devolvement of authority and responsibility from government agencies managing irrigation systems to farmers' organizations and has been utilized as a tool for irrigation sector reform in more than 60 countries.

The present water report is the final product emanating from efforts by FAO, IWMI and others to document and understand the implications of the irrigation sector embarking on a wide reform process. It is intended to be a knowledge synthesis document that captures the global experiences emerging from a wide-reaching process targeting the reform of the irrigation sector.

This study indicates that IMT is an approach for irrigation sector reform with the potential to improve the sustainability of irrigation systems. However, in order to reap its benefits, IMT should involve a wider array of changes, including both "soft" and "hard" interventions. The process requires *inter alia* strong political commitment, negotiations among stakeholders, and long-term capacity development. Irrigation management transfer should not be seen as a process that has a clear "beginning" and "end". While the former can be more easily identified, the latter is much more difficult to determine. In fact, IMT can be the initial stage of an evolving long reform process.

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