Participatory irrigation management: gaining benefits and rising problems

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Hamdy A. (ed.), Tüzün M. (ed.), Lamaddalena N. (ed.), Todorovic M. (ed.), Bogliotti C. (ed.).
Participatory water saving management and water cultural heritage

Bari : CIHEAM
Options Méditerranéennes : Série B. Etudes et Recherches; n. 48

2004
pages 3-20

KEYNOTE PAPERS

PARTICIPATORY IRRIGATION MANAGEMENT: GAINING BENEFITS AND RISING PROBLEMS

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SUMMARY - In most developing countries, irrigation development projects and their operation and management are heavily dominated by the public sector. Conventional wisdom has assumed that only the State was capable of handling large modern projects requiring heavy capital investment, complicated technical inputs, the legal mandate to distribute water and collect fees. Recent experience challenges these assumptions. Government-operated irrigation systems are often poorly maintained with steadily deteriorating infrastructure. Yet, some of these same systems show notable improvement when their management is transferred to water users' associations (WUAs) which enter into contracts with Government for operating and maintaining portions of the system or, in some cases, entire systems. Nevertheless, transferring substantial management authority to a locally-based organization is a complicated undertaking and may involve changes in national policy, regulations and organizational structure, creation of new organizations at the local level, transference of equipment ownership, and changes in personnel, in addition to the shifting of management functions to the new managers. Any undertaking of this complex, in addition to solving problems, will almost certainly create new problems which did not exist before or were not previously evident. In this paper, these problems are termed "second generation problems" and are analyzed from different perspectives: the water user, the irrigation association, the irrigation agency and the Government.

Keywords: Participatory Irrigation Management (PIM), Water User Associations (WUAs), irrigation water management.

INTRODUCTION

Since the 1950's, the total irrigated area in the World has expanded rapidly. About 240 million hectares (17% of the world crop land) are irrigated. The irrigated land produces one third of the world's food. Between 1961 and 1990, the area under irrigation increased by almost 100 million hectares. The annual growth rate of irrigated area exceeded 2% during the 1960's and 1970's. Today the growth rate has slowed down to a moderate 0.8%. The medium variant estimates of world population growth, as indicated by the UN's World Population (the 1992 revision), indicate that from 1995 to 2020, the population will increase to 8.1 billions. The question is how to meet the future food demands for the ever growing population. According to the FAO (1993), the share of world food production which comes from irrigated agriculture must increase from the presently 34 to 45% in the year 2020. In this regard, the major obstacle is the availability of water resources. Water is becoming scarcer and scarcer relative to rising demands. At the global level, more than 80% of the available water resources are allocated to irrigation; possibilities for water saving in agriculture are enormous, water use efficiency is less than 50%! The reasons for this disappointing performance of irrigation are many, however, the failure we all recognise in this sector could be fully attributed to the poor irrigation water management.

We believe that a set of vital elements are needed to manage irrigation systems effectively and sustainably; among them the following are identified:

- clear and recognised management responsibilities and authorities;
- irrigation infrastructure which is compatible with the water right and local management capacities;
- adequate financial and human resources for management;
- clear and sustainable water rights; and
- supportive accountability and incentives for the managing entities.

A realistic characterisation of the situation, where the State is the central actor of water management in the irrigation sector, confirms that those vital elements are partially or completely absent. These are the basic elements which led to a revolutionary approach in water management, from the State being a central actor towards a greater participation of other actors including local governments, non-governmental organisations and beneficiaries. Many governments are committed to share irrigation management responsibilities with water users and, in some cases, to hand them over completely to the private. This is a trend of world-wide dimensions: as many as 25 countries in the world are actively engaged in such programmes and every few months new countries are added to the list. Such programmes are elaborated under different names: *Disengagement* in Senegal, *Participatory Management* in Sri Lanka, *Privatization* in Bangladesh, *Commercialization* in Nigeria, *Self-Management* in Niger, *The Responsibility System* in China, *Turn-over* in Indonesia and *Irrigation Management Transfer* in many other countries. All these reforms, in common, involve a transfer of responsibility and authority from the government to non-governmental entities. Implementing a programme of management transfer is a complicated undertaking which involves incurring costs and affecting lives and livelihoods of many people. In spite of this complexity, it should be asked whether management transfer is the final solution for launching the integrated management revolution we have all been waiting for or is it just the latest in a series of partial reforms which will lead to partial results and further imbalances in irrigation management? The search for an answer to the above raised questions implies a complete analysis of management transfer impacts in terms of legal organizational factors and operational procedures. Equally, the analysis should be carried in view of the perspectives of water users, the irrigation association, the irrigation agency and the national or state government.

Impacts, of course, can be either positive or negative, and they can be either qualitative or quantitative. In this paper, emphasis will be given to the management transfer impacts concerning the positive ones, "the benefits", and the negative impacts, those referring to the new problems created during the management transfer implementation programme which did not exist before or were not previously evident "second generation problems".

BACKGROUND

Before entering into details of assessing the irrigation management transfer impacts it is worthwhile to dedicate some time to review the nature of PIM process, its main types and approaches and last, but not least, the types and categorisation of WUAs.

Participatory Irrigation Management Process and Approaches

Enough experience has already been accumulated in this process to enable us to understand the numerous problems and questions that may be raised during the Irrigation Management Transfer (IMT) programmes. The causes are many, ranging from technico-economic to socio-institutional but, in many cases, it is a matter of insufficient resources and weak capacity building at all levels.

The first point to be made here is that Irrigation Management Transfer (IMT) programmes are political processes and they need considerable time for their execution. In order to give some answers and orientations regarding the main issues, it is necessary to subdivide the process into main stages to further analyse the critical decisions and issues at every stage. With this purpose, the following four stages can be differentiated:

1st stage: *Gaining political support for the programme*
- obtaining highest political support
- defining the scope of the programme
- ensuring the financial resources

2nd stage: *Preparing the National PIM Programme*
- redefining the institutional roles
- creating a favourable legal framework
- define the phases and priorities for its implementation
- define incentives for transfer

3rd stage: *Implementation of the National PIM programme*
- define responsibilities for implementation

- define conditions and modalities for transfer of responsibilities
- training of government staff
- use of information media to convey message to farmers
- undertake training programmes for farmers leaders and technical staff of WUA
- redeployment/training programmes for government staff
- implement incentives programmes to strengthen WUA

4th stage: *Monitoring and assessment of impact*

- establishment of performance indicators
- sampling of farmers
- monitoring of financial viability of WUA
- technical assistance services to WUAs by government staff

The division of the process in phases is for clarity purposes and, in reality, these phases do not occur in a sequential manner but overlap to some extent; in other cases, unfortunately, some of the phases may be lacking completely.

Main Types of Participatory Irrigation Management (PIM)

Many classifications and variable types have been developed to differentiate the somewhat different approaches to Participatory Irrigation Management. We can characterize the range of State-user relationships as a continuum from the State doing everything on behalf of the users, to the case of the State doing nothing for the users, other than leaving them alone. Between these two ends of a continuum there is a very large gray (or blue) area where a government agency performs some management functions and farmers perform other functions.

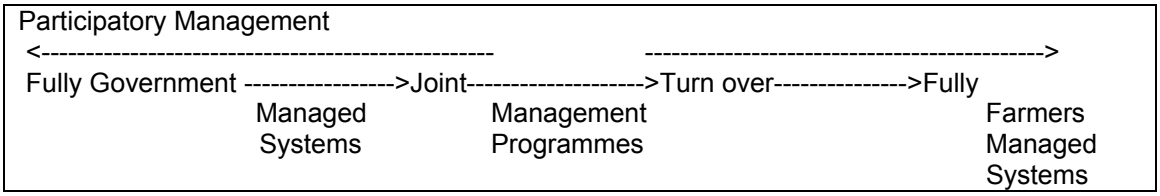
In view of the degree of government involvement, the continuum can be divided into the following types:

- Government does everything. The governmental institutions provide for the operation and maintenance of the main secondary canals, while government-sponsored farmers' organizations are responsible for providing water to individual farms. Farmer has no responsibility and make no management decisions, about the water upstream from their outlets.
- State dominates; users help. The conventional management division in large irrigation systems is that the State takes responsibility for operation and maintenance of the headworks such as dam or river diversion, and the main, secondary, and large tertiary canals, while farmers are responsible for managing water distribution and maintenance along the lowest level canals. Typically this entails farmer groups of 10 to 50 farm families who are expected to work out sharing arrangements of their own.
- Users dominate; State facilitates. In some countries, associations of water users enter into contractual agreement with State water agencies for the provision of specific water services. The governmental institutions manage the headworks and main canals, while legally recognized water users' associations employ their own technical staff for the management of the secondary and tertiary levels of canal networks. Farmers pay to their associations for the water, and a small portion of that fee is passed to the State for their services.
- Farmers do everything. This situation is dominant in hilly regions where most of the irrigated area is in the hands of local communities who have constructed their own canal systems, generally tapping small stream flows. Similar examples of local, farmer-managed systems can be found in nearly every country where irrigation is important, and the rules and customs of such systems provide a valuable pool of local knowledge that can be tapped in developing new irrigated areas.
- Indeed, if we do a straight line projection of what is happening, we would perhaps predict that the State will eventually disappear entirely from the irrigation over the next several decades. But no-one is realistically predicting the demise of the State's role in managing irrigation, there will continue to be an essential management role for the State. There are several functions involved in water resources management that only government can provide. For instance, the regulatory framework and broad oversight required to manage a nation's indispensable resource, particularly when under pressure, the one which is considered to be the most important and most difficult function can only be provided by governments. Equally, even after irrigation transfer, the government retains a role in providing future assistance to farmer-managed irrigation organizations for rehabilitation or system improvement and to support

irrigation associations in backing up sanctions, conflict resolution and legitimizing the association. In addition, governments could play an essential role through providing technical guidance to farmer management organization to help to protect the integrity of irrigation structures and protect against unwanted externalities such as environmental damage. In fact, what is happening nowadays is a rationalization of the respective roles of government and users.

- In this regard, perhaps, the approach to participatory irrigation management that responds more to the most common case is viewing it as a management continuum (Fig. 1) where joint management and turnover processes are part of the same long-term approach.

Fig. 1 Management continuum



The analysis of such continuum management approach shows that, at one end of the continuum the systems would be fully operated by the government, while, in the other, farmers will be fully responsible. Between these two extremes there are several intermediate stages where many countries are actually engaged. Indeed, experience and empirical examples indicate clearly that both full farmer and full agency management are becoming rare, whereas in between both extremes lie many forms of joint management and turnover.

Joint Management of the System

The management of the system jointly implies many forms and several options (Table1). These options are based on which entity (Agency or WUA) has responsibility for control over regulation, ownership, operation and maintenance and user representation. In short, the allocation of functions between agencies and WUAs varies with the system. A greater degree of agency control is generally found at higher levels of the system, with greater WUAs role at lower levels. However, a clear definition of responsibilities of each party and efforts to foster a collaborative working relationship are critical for any programme to strengthen overall irrigation management.ù

Table 1 - Joint Management Options

Activity	Agency O&M (user input)	Shared management	WUA O&M	WUA ownership (agency regulation)
Regulation	Agency	Agency	Agency	Agency
Ownership of structures, water	Agency	Agency	Agency	WUA
O&M responsibility	Agency	Both	WUA	WUA
User representation	WUA	WUA	WUA	WUA

The turnover of management to farmers

The strategies that countries have taken in implementing PIM policies can be characterized according to the three basic approaches:

1) the rapid "big-bang" approach; the case of Mexico where water users are strongly pressured to establish an organization to replace the government;
2) the "bottom-up" slow approach of the Philippines (Box 1), with a strong focus on organizing and consensus building, and
3) a hybrid approach which adopts a moderate pace, such as that adopted by Turkey.

The lessons learned during the PIM implementation revealed that the approach fundamentally based on phase handing over programmes, is the one much more favorite by most countries rather

than the rapid and quick transfer approach. The general belief is that a phased programme has better chance of success and provides more opportunities to change course, if required.

Box 1
The Philippines: Developing a Participatory Approach to Irrigation

The first and best documented nationwide program to build participation as a cornerstone of irrigation policy occurred in the Philippines. Among other factors, legislation passed in 1974 to make the National Irrigation Administration financially autonomous was crucial to the agency's active support for farmer's participation. As a financially independent agency, NIA's subsidies were phased out, and all expenditures, including staff salaries, have to be met from irrigation service fees. This created powerful incentives for the agency to devolve recurrent O&M to farmers and increase collection of irrigation fees. The latter, in turn, required improving irrigation service so that farmers would be willing to pay, while cutting costs, so the payments would be minimized. The process of institutionalizing this approach entailed workshops, training programs, and information dissemination within the agency and the farming community. This "learning process" was carried out with the help of outside consultants, academic researchers and donors, but the initiative came from within the agency. A number of elements of the NIA approach have been borrowed by other countries, including:
legal recognition of user groups prior to their active collaboration with government;
use of in-house community organizers;
performance measures for irrigation personnel which encourage greater accountability to the farmers they serve;
increased participation of farmers in key decisions and in up-front planning and development of the physical systems;
development of cost recovery mechanisms which made farmers more responsible and instilled a sense of collective ownership of systems; and
development of budget systems which can be adjusted to be responsive to clients.
Through these changes, NIA has evolved from an agency primarily concerned with construction to one committed to developing farmer irrigation associations and supporting their management capacities once projects are completed.
Adapted from Participation in Irrigation, by R. Meinzen-Dick, R. Reidinger, and A. Manzardo, World Bank Environment Department Papers on Participation, No.003

The Foundation of Management Transfer

Before beginning a transfer programme, there must be a critical assessment of the "respectivity" and support for the handover of existing government responsibilities and the concurrent increase in the customers' role in rendering the service. Major institutional adjustments can proceed only where there is a sound cultural, political and institutional foundation for change. Such a foundation is necessary because fundamental changes in government responsibilities are more than just a routine adjustment for a single agency: they mean a shift in power, functions and work that may stir the present service providers and the customers alike. Thus, the first action before contemplating a reassignment of responsibilities is to confirm the appropriateness of the institutional changes and the degree of support for the programme. In our opinion, any government or organization contemplating such transfer programmes should invest sustainable time in obtaining a solid background.

Participatory Mechanisms

Participatory Irrigation Management refers to the involvement of irrigation users in all aspects of irrigation management and at all levels (Box 2).

Box 2
What is Participatory Irrigation Management (PIM)?

The involvement of irrigation users in all aspects
and all levels of irrigation management.
It is a continuum of involvement in management decisions.
All aspects: planning, design, construction, operation & maintenance, financing, and policy matters.
All levels: quaternary, tertiary, secondary, main system, project and sector.

One meaning of "PIM" may be that the irrigation users have total control and responsibility over the operation and maintenance of part or all irrigation system. Another meaning of PIM may be that a farmer council plays an advisory role, with real power remaining in the hands of the irrigation agency.

Various levels of participation and participatory mechanisms are outlined in (Box 3).

Box 3
Participatory Mechanisms

1. Information sharing

Translation into local languages and dissemination of written material using various media
Informational presentations and public meetings

2. Consultations

Meetings
Field visits and interviews

3. Joint Assessments

Participatory assessments and evolutions
Beneficiary assessments

4. Shared decision-making

Participatory planning
Workshops and seminars to determine positions, priorities, roles
Meetings to resolve conflicts, seek agreements, engender ownership
Public reviews of draft documents

5. Collaboration

Formation of joint agency/stakeholder committee/task forces
Joint work with user groups, NGOs, or other stakeholder groups
Stakeholder groups given principal responsibility for implementation

6. Empowerment

Capacity building of stakeholder organizations
Hand-over and self-management by stakeholders
Support for new, spontaneous initiatives by stakeholders.

Adapted from The World Bank and Participation, Operations Policy Department, Sept. 1994, p.12

The Types and Categorisation of WUAs

So far the term WUA has been utilized in a general sense, but there are many types of WUAs (Vermillion, 1996) and (Turral, 1995). From the point of view of management, two categories can be distinguished:

- *Farmers' Management*
  These are WUAs where most of the management and technical activities are carried out by the farmers elected by members of WUA or directly by the farmers themselves. Most of these functions are carried out without financial compensation although sometimes a very specific function, requiring a full time dedication during the irrigation season, receives a financial compensation in cash or kind. This type of WUA tends to be associated with irrigation schemes -or part of them- of small size. In fact, small associations do not have, normally, the financial resources to hire staff that will perform some of the technical and accounting functions that are required.

- *Contracted Management*
  These are WUAs where the main responsibility for managing the irrigation system is contracted to a professional (manager), who can hire other technical and clerical staff to perform the activities. Such associations cover a relative large physical area and must have a sound financial basis to be able to perform as indicated. However, this should not be interpreted as a limitation. In many rural areas, the younger generation has often academic degrees and professional experience and is willing to provide the technical assistance required for a reasonable compensation or even as free service to their communities. Therefore, a contracted management is not necessarily expensive.

Userism as a Management Type

Users' organization can be termed "Userism" and the process of transferring management to users can be termed "Userization" (Box 4). The concept of "Userism" is quite different from "Privatization" in that we are talking about transferring management not to a third party "Owner" who would purchase the irrigation systems from the government and then hire out irrigation services to farmers.

Box 4
"Userism" as a Management Type

We may broadly classify management relationships into three kinds: the first is public management such as the irrigation department; the second is private management such as the Continental Corporation which produces Sparkletts mineral water; a third type of management is neither public nor private in the usual sense. We may call this a user's entity, such as a water user association. To describe this type of entity, we may use the term, "user-ism". You will not find this word in any dictionary; it was coined by Mr. Asif Kazi, Special Secretary in Pakistan's Ministry of Water and Power. We have adopted the term because it captures in one word the process of transferring management from the public sector to organizations of users.

Among these three basic types of management, as applied to irrigation systems, the most rare type is private management. This is mainly because irrigation water is a social good involving large numbers of small farmers, and it is very difficult for a commercial company to manage it with profit. This type of management is clearly not a general option for the irrigation sector.

What about management by the public sector? While this is the most common type of management that we see today, in most cases public management has low efficiency and requires substantial subsidies. Experience from many sectors, including irrigation, tells us that it is almost impossible to bring public management into high levels of efficiency. Certainly it is possible to improve the management of public irrigation systems, but it is an uphill battle. The interests of the public managers are unlikely to coincide with the interests of the actual users.
The remaining management option is management by users, or participatory irrigation management (PIM). Under this situation, the managers have a direct incentive to manage the irrigation system efficiently because they are themselves users or are directly accountable to the users. This is the logic of userism: we can ensure a coincidence of interests between managers and users because the users are themselves the managers, or the employers of the managers.
by Peter Sun Recommendations, The World Bank, USA

Impacts and Benefits of Transfer

It is important to be indicated that the nature of impacts either positive or negative (Box 5) will be shaped by the social, political and economic characteristics of the countries involved. Impacts are also conditioned by the perspective from which they are viewed, particularly those of water users, the associations they have already created, the irrigation agency and the national or state government under whose overall control these systems operate. What is positive from one perspective might be negative for another. Therefore, judgment is thus required in evaluating the overall impact of a programme, and the trade-offs in positive and negative benefits among the various groups affected.

Since the change in management patterns will usually occur simultaneously with other changes in physical, economic and social conditions, it may be difficult to separate the effects caused by

management changes from those caused by other factors. This can be noted in (Box 5), where some impacts are shown in both positive and negative columns, which indicates that an overall evaluation is not a simple process.

Box 5
Positive and Negative Impacts of IMT

FARMER PERSPECTIVE	
Positive Impacts	*Negative Impacts*
Sense of ownership	Higher costs
Increased transparency of processes	More time and effort required to manage
Greater accessibility to system personnel	Less disaster assistance
Improved maintenance	No assured rehabilitation assistance
Improved irrigation service	Less secure water right
Reduced conflicts among users	Decreased agricultural productivity
Increased agricultural productivity	
GOVERNMENT PERSPECTIVE	
Positive Impacts	*Negative Impacts*
Reduced costs to government	Less direct control over cropping patterns
Greater farmer satisfaction	Need to reduce staff levels, sometimes over union opposition
Reduced civil service staffing levels	Reduced ability to implement new agricultural policies through the irrigation agency
Reduced costs to the economy (greater economic efficiency)	
IRRIGATION AGENCY PERSPECTIVE	
Positive Impacts	*Negative Impacts*
Fewer conflicts to deal with	Reduced bureaucratic and political influence
Reduced operational involvement	Uncertainty over agency role
New responsibilities	Reduced opportunity for rent seeking
Reduced opportunity for rent seeking	Reduced control over water resources
Reduced political interference	
Reduced O&M staff levels	

Adapted from: Svendsen, M.; Trava, J. and Jonson, S.H. (1997).

Implementation Strategy for involving Water Users in Irrigation System Management

The design of an implementation strategy involves planning for the start-up, piloting and expansion phases of a PIM programme. The process of formulating a strategy that fits the specific features of any given country is the first -and going- step. Indeed, PIM is usually not a new concept to the region or the country. Farmers managed systems exist in most countries. Nevertheless what is usually new in PIM in all stages of the project cycle, from planning and design to construction and O&M, is PIM in the form of irrigation management transfer. In this context, beside the importance of a well made planning for the start-up, the experimenting or piloting the PIM idea to test the appropriateness of the various PIM elements to local conditions in the country should be carefully considered. The experience of different countries demonstrated its utility in identifying how best to operationalize PIM policies and what kinds of PIM approach would be feasible. Piloting should not be seen as a wait-and see- test of whether PIM is a good idea, but, its objectives should be directed to achieve experiences on a small scale so that a manageable irrigation system or sub-system can be the focus of implementation, monitoring and learning and the changes required can be introduced in the original PIM Model.

This is the case in Egypt, (Box 6) where 6 pilots covering about 70,000 acres were launched in various parts of the country in the late 1980s. These experiences were evaluated in early 1990s so that the lessons could be used in another set of irrigation schemes serving a command area of about 25,000 acres.

Box 6
Six Phases in Egypt's WUA Formation

***Phase 1*: Entry**

Introduction to local leaders
Collection of information on the canal
Preliminary canal profile
Building a relationship with the water users
Identification of initial problems

***Phase 2*: Initial Organization**

Introduction to the PIM program and benefits
Exploration of willingness to form WUAs
Visit to "good practice" sites, if any
Election of WUAs
Deciding WUA roles and responsibilities
Carry out baseline survey on user satisfaction with services

***Phase 3*: Participation in Planning/Design**

Plan WUA involvement in planning and design issues
Rapid joint appraisal of water delivery problems
Discussion on problems and solutions
Finalization of design

***Phase 4*: Implementation**

WUA review of contractor work plan and agreement to facilitate construction
Transfer of management responsibilities, if planned
Training and TA for WUAs in system and financial management
Discussion of O&M plans

***Phase 5*: WUA Operations**

Select WUA monitoring committees
Continuation of training in O&M, finance, and related issues
Review performance of agency and WUAs
Survey user satisfaction and take corrective action, if necessary
Establish permanent conflict resolution mechanism

***Phase 6*: WUA Federation**

Determine needs and purposes
Develop roles and functions of federation and officers
Form federation, if ready

Adapted from Essam Barakat, Egypt's Experience with the Irrigation Improvement Program, presentation at the Nation PIM Workshop, Amman, December 1996.

SECOND GENERATION PROBLEMS AND SOLUTIONS

This part will address and discuss the problems from the perspectives of: the irrigation association, farmers, the irrigation agency and the government.

Irrigation Associations

Major second generation problems for irrigation associations are given in (Box 7).

Box 7
Major second generation problems for associations

Insecurity of water rights
Financial problems and shortfalls
Rehabilitation and modernization of irrigation systems
Shortage of financial and administrative management skills

Insecurity of Water Rights

The lessons we have learned about the management transfer phenomenon as well as the countries experiences, all highlight and fully confirm that insecurity of water rights is the most serious second generation problem affecting irrigation associations. A good rule of thumb is that in the majority of countries, either those with further advance or the ones that lately started the transfer management programmes, the water rights are often absent, poorly defined and are ineffective.

Insecurity of water rights can result in many side-effects, some of them being:
- inhibit investments in new systems facilities and rehabilitation;
- heavy expenditures in legal costs to defend a poorly defined water-right;
- encourage short term thinking and behavior for both association managers and farmers; and
- lead to reduction in water supply and even system collapse.

Effective water rights real means

- provide security to the association and at the same time be adaptable so that water can be diverted to other more productive or higher priority uses in view of the economic and demographic changes;
- should be specified in both quantitative and qualitative terms. Degradation of water quality is becoming an increasingly serious problem due to the growing water demand from all sectors.

Establishing water rights systems where they are lacking or where they are weak, ineffective or inequitable, will usually necessitate actions from the national legislative body or from top level authorities, or both. The existence of a basic law on water, or on WUAs, is certainly an important parameter for the other parts of the legal framework because the basic law would usually specify the main issues that need to be included in by-laws and transfer managements, and would also determine the manner in which those issues are addressed. Those issues would usually include the procedure for establishing WUAs, the rights and duties of the WUA and the irrigation agency and the relationship between them, and the structure of the water rates and other fees. When these issues are taken up, it is extremely important for water user associations to have adequate representation of their interests. WUAs legal nature, relations with the irrigation agency, statutes and other related matters must be very clearly defined, otherwise, contradictory situations are likely to arise and need to be spelled out clearly.

Unfortunately, associations which are just forming may be unaware of the importance of high quality legal advice at this stage or may be unable to afford it. A national federation of associations can play a valuable role as a source of legal advice and assistance to newly forming associations. It is important for associations to establish regional or national federations representing many associations and a large number of farmers and thereby, giving the associations a powerful political influence to face other interests raised by both municipalities and industrial water users.

Financial Problems and Shortfalls

Financial shortfalls is a major second generation problem facing WUAs not only in developing countries but also in the developed ones. An important aspect to achieve a sound programme of transfer is to ensure the financial resources to carry out such programmes. Several governments have fallen into the mistake of believing that transfer programmes are a matter of decree. Experience shows that this approach has been largely a failure whenever it has been tried out. A central feature of the PIM programmes undertaken in many countries is financial autonomy. No irrigation scheme can be successfully transferred if its economic autonomy cannot be ensured. In fact, it very often happens that IMT programmes progress very satisfactory at the beginning when the irrigation schemes having more favourable economic conditions are transferred and suddenly become stuck when arriving at those with an unsustainable economic viability. Financial autonomy expresses the conditions where an organization generates all the revenue it needs to support itself and to perform its primary function (Small and Carruthers, 1993). It implies that the association is not directly subsidized by the government, or that if it is subsidized, the subsidy is a fixed amount which does not vary according to the condition of the association's balance sheet. We would like to analyse this latter option since it is a controversial one. There are some irrigation schemes -mainly those using pumped water- where the O&M cannot be fully afforded by farmers; in fact, they can only subsist as long as the government is willing to subsidize part of these costs, otherwise, the farmers will refuse the transfer of such schemes under their responsibility. Although continuing with the subsidies by the government, will facilitate the transfer of those irrigation schemes beside diminishing the financial shortfalls of the WUAs, yet, it could place these schemes in a privileged situation with respect to the others. In order to avoid such a discrepancy through the implementation of IMT programmes, it may be advisable to find an indirect way to subsidise those exceptional schemes; the application of special tariffs for power to cover the O&M costs, could be suggested as a possible solution. The principal source of revenue for most associations is irrigation service fee (IFS) collections.

Arrangements based upon irrigation service fees (IFS), where fee and service have a direct and locally determined relationship that reflects local cost levels, have not yet resulted in consolidated systems and procedures that actually generate most or all of the required funds; yet, there may be a good future in this type of arrangement. Indeed, the financial shortfalls are functions of several factors, particularly the IFS rates and their collection effectiveness beside the contribution of other sources of revenue and expenditure patterns. In our opinion, the structure of IFS can play an important role on the economic viability and the financial sustainability of the IMT programmes. A recommended structure for fees is a two-part fee consisting of fixed connection charge and a volumetric charge. The connection charge is collected for simply being within the boundaries of the system's service area whether or not water is actually taken from the system. This charge would reimburse the association for the expenses required in maintaining the physical and administrative capacity to deliver water to the farm. The other portion of the fee is the one based on the volume of water actually delivered during a cropping season, or some proxy for this amount, such as area irrigated and number of irrigations delivered. This charge could be used to cover the costs incurred by the association concerning the amount of water given.

Financial shortfalls to sustain system operation, in many cases, is the resultant of the low productivity of irrigation agriculture in system command areas. Low productivity is the sequency of a large number of factors, but, is often associated with small farm size, inappropriate agricultural policies, a poor natural resource base, inadequate agricultural support services, and production of low value crops. In such cases, a solution to the association's financial problems may be possible only if the standing problems in the agricultural sector are addressed. In several irrigation schemes, a trend has been observed to reduce water fees beyond what is reasonable for proper maintenance of the irrigation systems. However, as irrigation service fees typically constitute only 3 to 10 percent of total production costs, reducing them will generally not solve underlying problems of high agricultural production costs and low productivity.

From the analysis of the papers and case studies presented in the International Conference on Irrigation Management Transfer, Wuhan-China (1994), it can be hypothesised that in countries where governments have the political will to increase and maintain water fees close to the real 0&M costs, the process of irrigation management transfer has been smoother and more sustainable.

In general, it is difficult to quantify the impact of transfer programmes in economic terms. In fact, there is little information available about the costs of irrigation-management programmes, but even less on the returns or benefits that they can generate. What is clearly observed is that several irrigation schemes are suffering from negative cash balances which lead to a reduction in technical staff and routine maintenance, and leaves the WUA in the same situation as before the transfer. A usual complaint of many WUAs is that often they are not considered as subjects worthy of credit by the banks and that they cannot undertake construction/improvement contracts and, therefore, cannot improve their economic viability. The solution lies in the incentives that the government may offer the WUAs to facilitate and sustain the transfer programmes, particularly in those irrigation schemes where the economic viability of irrigated agriculture is very dubious or where the government has been neglecting the maintenance. Some of the incentives that government can consider are rehabilitation of the irrigation infrastructure, credit programmes for the WUAs so as to strengthen their economic capacity keeping some subsidies to finance part of the favourable conditions to share in constructional improvement contracts.

Counting on the incentives the governments can offer, as well as the outside assistance, will not fully solve the problems of revenue shortfalls that relate to fee levels and collection efficiency. It is largely an internal association responsibility to find out the ways and establish the conditions for the achievement of its financial autonomy. However, this can be realized only if governments are willing to provide a supportive and enabling institutional and policy framework, positive incentives for local users to take full responsibility and authority for their system, and sufficient training and technical support.

Rehabilitation and Modernization of Irrigation Systems

Rehabilitation poses a number of second generation problems for irrigation associations. The single, possibly most important factor responsible for disappointing returns on irrigation investment in the larger systems, is the failure of proper, reliable and responsive management of the main system. Little attention was paid to the "softer" issue of maintenance, sometimes not at all. Government run systems are chronically short of maintenance funds and the organizational concepts regarding maintenance are primitive. Maintenance was left up to whoever was interested, undersigned, unorganized and totally under-budgeted. As a result, the irrigation systems built at such considerable cost, deteriorated and gradually lost their service capacity. The answer quite often was to launch rehabilitation projects, investments to cater to backlog maintenance. The point here to be stressed is: what are the roots of the problems that have fed the rapid deterioration in irrigation system? The problem often lies in the poor attention and the limits of real influence given to the farmers. Farmers are not directly involved in the design, planning, operation and maintenance of the system. The process of bringing farmers together in decision-making and resource management and establishing a meaningful interface between farmer and agencies, is often underestimated or only gone through in a shallow manner.

Moreover, participation in most larger systems is severely constrained by the unwillingness of middle and higher echelons in irrigation agencies to share power with lower levels and with farmers. Further, much of the actual management of the system is not subject to systematic control: nor by farmers or by agencies. This, again, confirms the striking lack of accountability of agencies' staff and the weakness of managerial arrangements. This is one side of the problem, the other one concerns the farmers. It should be clear that handling additional responsibilities at farmer level will require new or more capacity at individuals as well as collective level. The former has to understand well that the IMT does not only or mainly present benefits to farmers. The withdrawal of direct public involvement has its price: at least a financial one, as a large share of operation and rehabilitation costs will be borne by the water users.

Collective costs for rehabilitation of irrigation systems can be high to farmers: the burden of financial and logistic management can be considerable and demands level of organizational competence that cannot be taken for granted. Identifying, accessing and using specialist services for equipment, repair and energy, resolving internal disputes and mobilizing internal resources are among the many tasks now to be shouldered collectively.

Indeed, rehabilitation is a costly undertaking, and is usually beyond the financial and technical means of an association to undertake. Another point which, in reality, is creating several problems to

the associations in having the responsibilities of the irrigation systems rehabilitation is the absence of a clear and consistent government policy on responsibility for rehabilitation. In this case, the tendency is for associations to defer needed rehabilitation in the hope that government will step in and take responsibility for it. Such tendency is reinforced by the government retaining ownership of the physical system, while transferring to associations only the use rights of facilities. However, such mechanism does not provide the ownership of the system by the farmers. When farmers are clearly the owners of the physical system, so that the maintenance and rehabilitation cost are their own responsibility, they have a strong incentive to protect the physical integrity of the system to reduce their overall costs. It is the author's opinion that physical irrigation system should be transferred to the WUAs, but, because full coverage of rehabilitation costs is usually beyond the means of the irrigators themselves, costs should be shared between government and the association. Such share of costs will tend to counteract the tendency of an association to defer maintenance. Associations to cover their share in rehabilitation costs, usually need to accumulate a capital replacement fund over a number of years and to be established on legal basis. There should also be incentives for establishing and contributing to such a fund to motivate the associations to make improvements in the physical infrastructure. One way to do this could be provided by governments through creating special investment opportunities for associations which allow them to earn reasonable rates of return on accumulated funds. The other way is to establish a trust fund, perhaps with donor financing from which association could request funds to complement their own investment funds. Beside the incentives provided to the associations, a number of supporting services are required specifically for systems rehabilitation. These include: assistance with maintenance assessment practices and technical design and construction services. Finally, because of the sharing of costs, both the association and the government should be involved in decision making in relation to the selection of consultants and contractors and monitoring their performance. These tasks might be usefully handed to a federation of associations, since rehabilitation occurs only infrequently in anyone association.

Shortage of financial and administrative management skills

This topic is a high priority second generation problem the WUAs will face. There are several possible responses to this problem. One would be skill enhancement through staff training programme. Contracting out for specialized services is another important way for addressing management deficiencies in associations. Indeed, one of the most critical aspects of IMT programmes is the training of farmers and technical staff that will lead the management of the WUA. There is considerable concurrence that such training is always needed but there is considerable divergence about the kind of training that may be needed. Some hold the view that training should be addressed to the farmer leaders so that they understand better their leading roles and can do a more effective job considering that WUAs are capable of having technical staff able to deal with both technical or financial issues. The other view is in favour of the technical staff training as the operation of the system is a complex one and requires considerable upgrade of the expertise. In our opinion, training should be addressed to both the technical staff and the leaders of the WUAs.

The major training bottleneck is the training of the leaders of the WUAs because wide differences exist in their understanding of the job and capacity to carry it out efficiently. The complexity in the training needs of the leaders of the WUAs is that they are made up mostly of illiterate farmers with little experience. This is one of the reasons that explains why the transfer of irrigation systems may be a long-term exercise in some cases and this should be carefully considered when determining the training needs of the programme. Equally, it is easy to define the contents of the training programmes beforehand, but, what is absolutely wrong is the anticipation of associations training needs. To achieve the beneficial impacts of training, it is advisable that an assessment should be made of what they visualize as major problems, and starting from this information the aspects that can be improved by training can be determined. Training is nowadays receiving the attention of governments, national and international organizations. But, before training can be given, the institutional capacity for the training institute may have to be considerably upgraded. The new paradigm of PIM implies the need for new trainers, new curricula and often new mandates for training institutes. Indeed, training is too important to be left for training institutes, the irrigation and agriculture agencies, also planning ministers need to play active roles in PIM. The role of training institutes can become that of facilitators to help staff of these various agencies, as well as NGOs and consulting firms, to become active in PIM promotional activities. Recently, in Italy the first annual training course on "Capacity Building for implementing PIM" was held in Bari Institute in the period 1/18 September, 1997. The course was jointly sponsored by The World Bank -Economic Development Institute- (EDI) and the Mediterranean

Agronomic Institute of Bari (MAIB). Participants came from Morocco, Tunisia, Egypt, Turkey, Jordan, India, Pakistan, Nepal, Vietnam and Brazil. If there is a single result of the course, it is simple reminding that capacity building is for everyone involved in PIM programmes. Training programmes on PIM need to target the full range of stockholders. All stockholders of PIM need to contribute to the dialogue, and to real action, leading to the implementation of a PIM approach that is tailored to the local context. For the implementation of PIM it is important to develop manuals and other technical tools (such as computer software) that the technical staff can refer to when operating the system. In this regard, it is most helpful to collect the experience of the agency that, for years, has been managing the irrigation system. Dissemination of such manuals together with some in-class training is very important to ensure proper operation for the system. In addition, other mechanisms could be successfully used to reach so many stockholders. For instance, some media such as radio and TV broadcasts, can nearly reach all stockholders simultaneously, a video documentary or drama depicting PIM (as has already been done in Egypt) is one approach. Publicity materials such as calendars and diaries is another tool to convey a few simple messages of PIM. For many stockholders, targeted workshops or seminars will be most effective, perhaps limited to politicians from a certain region, or to University researchers or NGO leaders. In almost all cases, discussion groups and seminars for different kinds of farmers (often separately) will offer a fruitful way to listen and respond to the interests of the ultimate beneficiaries, too often forgotten among the mass of stockholders.

Transparency in association management

One extremely important step in improving the quality of association management is to increase the transparency of management processes. This could result in the following positive effects: a) to reduce the potential for misappropriate use of funds; b) to insure that salary levels and benefits are realistic; c) to insure that maintenance allocations are appropriately targeted; d) to improve responsiveness of association staff users and (e) to reduce favouritism in making personnel appointments.

Several steps can be taken to increase transparency in association management, among them the following:

- use of standardized budgeting and accounting framework;
- wide dissemination of simplified budget plans, and financial statements;
- regular external audits of financial account, and
- broad representation of users in the association board of directors.

However, such steps outlined to increase transparency and sequentially improve management of the associations require external support services. These services can be obtained from a variety of sources, including private firms, a national or regional federation of associations, NGOs, government agencies, universities and training institutes.

One argument in favour of provision of these services by government agencies will often be that they can be obtained at no or low cost. In reality, the government in major cases is subsidising the service providers. To allow the associations more choices to contract for these services among alternative providers, a preferred alternative would be to provide the funds allocated to supporting these subsidies to the association as grants to cover the management support services cost.

Irrigation Agencies

It is not clear, in most countries, where the process of decentralization, devolving and sharing irrigation management responsibilities will end. But one thing is clear: IMT will affect the irrigation agencies as much as it will affect farmers. In fact, it probably will change the character of these agencies to such an extent that the well-known triangle of user-system-agency might lose its basic characteristics.

Second Generation Problems for agencies could be identified in:

- Dislocation of staff
- Need to define and assimilate new roles
- Loss of technical capacity

Dislocation of staff

It is the most prominent problem experienced by agencies following irrigation management transfer to users. The reason for that is, in most countries, that the agency that has been traditionally responsible for management of the irrigation system also becomes responsible for IMT programme.

Although this seems unavoidable, it naturally creates many problems as, in fact, the implementation of the programme means the reduction in the staff of the agency. For this reason, it is of great importance that from the beginning this situation is explained clearly to the staff. Experience shows that newly established WUAs can absorb some of the government staff in their cadres but, naturally, they tend to select the best. As a reduction in staff is inevitable, plans for anticipated retirement and compensation of staff wishing to leave must be devised. Retraining of staff in other functions must also be included in the plans. Another drawback when government agencies are made responsible for implementing IMT programmes is the unwilling feature and natural resistance to speeding up the implementation of the programme. To avoid such situation it is necessary to set targets and monitor implementation of the programme, otherwise, the implementation of IMT programme will be a long-term affair.

Define and assimilate new roles

This is an important challenge for the agencies. It is not an easy task considering the possible new roles for irrigation agencies (Box 8).

Box 8
Possible new roles for irrigation agencies

- Water resources allocation and monitoring
- Groundwater monitoring and control
- Environmental monitoring and control
- Development of new policies and regulations
- Advisory services to association
- Technology transfer to association
- Monitoring of association performance

Indeed, agencies with their operational responsibilities transferred to associations, are in need to design a new role to address emerging problems and to change their working style. These points towards the need for institutional reform: preparing, facilitating and effecting deliberate choices with regard to the mix of public, private and voluntary institutions that, interacting with water users associations, can take up these new challenges. These institutions separately and jointly, need to match resources, opportunities and activities with respect to irrigation and drainage in increasingly specialized and sophisticated ways and also in increasingly intensive and dynamic interaction with an expanding range of other institutions. The need for conceiving, executing and monitoring long-term policies concerning a more selective and responsible use of water is increasingly felt. The absence of institutions capable of dealing with such a level of complexity and controversy and, at the same time, capable of moving back and forth between abstract, long-term analysis and vision and very mundane levels of administering, sanctioning and regulating is obvious. This absence will become more evident in a situation where public agencies are redefining and often reducing their roles. All these points toward the need for policy reform, which will go beyond the present emphasis on IMT and PIM programmes and the emerging trend towards institutional reform noted above.

Loss of technical capacity

This is a common problem the national irrigation agencies are facing due to transfer management of significant irrigated areas to associations. To avoid such problem several proposals could be addressed, to be followed by the agencies, including:

- to obtain specialized expertise from outside consultancy firms when needed
- to increase the salaries to attract and retain high quality staff
- to provide in service the training opportunities for staff and
- to provide incentive to the staff for promoting ideal participatory irrigation system management.

This job should be made part of the job description of the agency staff.

Farmers

Participatory irrigation management (PIM) aims at the involvement of farmers for improving irrigation efficiency and effectiveness.

Without discussing the merits of participatory versus transfer approach it has to be considered here that if a participatory approach is desired, it has to begin with learning from the farmers. What are their needs? What are the problems in meeting those needs? What the solutions do they propose? If those points are not fully covered, the experience demonstrates that the achievement of perspective goals desired by implementing the PIM approach will be doubtless.

The problems the individual farmer is facing nowadays, particularly in developing countries, will not greatly differ from the second generation ones, unless, corrective actions and proper solutions are taken. Generally, the broad problems related to individual farmers could be outlined in:

Lack of financial support

Irrigation systems in many countries have not been maintained properly over the years resulting in deterioration and decay. Before the system is handed over to the farmers for O&M, they do expect it to be in running conditions. The rehabilitation of the system requires substantial financial inputs the farmers are always unable to provide.

Lack of training and awareness

The abrupt transition from a non-participatory management system to participatory management system in most countries was being carried with little preparation of the concerned farmers or the technical staff. There is a problem in helping to assimilate a new set of duties and responsibility.

Unfortunately, there is a dearth -or near absence- of institutions which can impart training in the IMT programmes. There is need to revamp the training institutions by improving their physical infrastructure as well as building their capacity for training.

Defining what to transfer

The management level and the specific tasks to be transferred to the farmers is still not clearly defined. The tendency is toward a progressive strategy that consists of proceeding step by step to adapt to the specificities of each case in the best way possible and to ensure the understanding and support of irrigation users.

Shortage in support services

Support services required by farmers may include: production credit, extension advice, new technologies, markets and market information, access to inputs, and post harvest services.

Although government agencies are the traditional source of many of these services, yet, they are provided in ways not at all satisfying the actual requirements of the farmers.

In this regard, beside governments, private or other organizations can play an expanding role in supplying some or all of the services previously listed.

The question is whether the association itself can have a potential role in providing other agricultural services in addition to the irrigation ones.

Our opinion, as a general rule, is that the association should be fully involved in the core activity of irrigation management before considering such ancillary activities as providing other agricultural inputs.

Governments

The principal second generation problem for government, beyond those already identified for the irrigation agency, is the reduced control it will have over irrigation activities at the system level and its low ability to implement other national policies and priorities regarding the agricultural sector. This was possible before IMT programmes, as through the national irrigation agency it was possible to

adjust delivery schedules and volumes and implement the desired policies. However, following transfer, there are other tools, such as support prices and subsidies, to achieve the same ends without posing any significant problem for agricultural policy makers.

CONCLUDING REMARKS AND RECOMMENDATIONS

Evaluating the impact of management transfers from agencies to farmers is particularly difficult because many cases are too recent to have impact assessment available. Identifying and isolating the benefits achieved exclusively through participation is even more complicated, because the casual linkage between WUA activity and actual gains derived from it is not distinctly separable from other factors, such as better farm management, a sound environmental policy and more favorable market conditions.

However, to the extent that WUAs contribute to improvements in management or to the sustainability of physical system improvements, a careful and systematic evaluation of the contribution of WUAs in the overall management transfer process are still needed, ideally using a combination of cross-sectional comparisons between systems with and without strong WUAs and time series of the same system before and after transfer.

Although the transfer programmes have mostly been initiated in recent years, already some lessons are being learned and some issues identified that should be carefully considered to overcome, on one hand, the problems already really raised with the implementation of PIM approach and IMT programme and, on the other one, to eliminate the appearance of the new problems termed here “second generation problems”:

- A transfer programme needs strong political support at the highest political level of the country. Furthermore, changes to the water laws are often required and there should be political will for such changes.
- Farmers must understand what the transfer programme means: their roles and responsibilities, how to organize, clear rules and regulations for the operation of the system, financial implications, etc;
- Just as technology, agencies, and markets alone generally fail to result in a high level of performance from irrigation systems, so one cannot expect WUAs to achieve acceptable and sustainable levels of system performance by themselves. Along with the institutional structure of WUAs, a combination of appropriate technology, supportive state agencies and policies, and positive economic forces, including clear property rights and profitability of irrigation enterprises, are required for sustainable water users' associations, as well as for sustainable irrigation systems.
- Although the appropriate role for the state changes as WUAs take on additional responsibilities, government support should continue, particularly in establishing and adjudicating water rights; monitoring and regulating externalities and third party effects of irrigation; maintaining a supportive legal framework for WUAs; providing technical and organizational training and support to WUAs; and occasionally providing design, construction or financial support for major rehabilitation.
- WUAs must be legalized and their rights, obligations and attributions must be clearly spelled out and integrated in the water codes or regulations of the country.
- Transfer programmes imply that one or several government institutions will see staff drastically reduced or will have to assume different responsibilities. Consultations with the concerned staff are of great importance in these situations.
- In any type of WUAs, the benefits to farmers must outweigh the costs of participation. This applies at both the farmer and the enterprise level. For the farmers, benefits of physical system improvements, improved water supply, increased farm income, empowerment, and conflict resolution obtained through WUAs should offset the substantial time, materials, cash and interpersonal transaction costs of being active in local irrigation organizations. This requires that irrigated agriculture be profitable enough to create a demand for water, and that WUAs have a demonstrable effect in improving farmers' control over irrigation water.
- A supportive policy and legal environment are crucial to the sustainability of WUAs. State policies of administrative and financial decentralization have provided the impetus for many management transfer programs that shrink the role of the State and expand the role of WUAs.
- Training of the farmers and the technical staff that will have responsibility for the management

of the system are also an important consideration. Government must take some initiative in this matter and bear some of the costs. Without this support, farmers will experience considerable difficulty in managing the systems during the initial years.

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