

ELECTRONIC LEARNING GUIDEBOOK ON PARTICIPATORY IRRIGATION MANAGEMENT



A handbook to get the involvement of irrigation users in all aspects of irrigation management, and at all levels.



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**Environment and Natural Resources
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- Participatory Irrigation Management (PIM) refers to the involvement of irrigation users in all aspects of irrigation management, and at all levels.
- This electronic learning guidebook is a self-paced learning tool for acquiring knowledge about PIM and how to implement and promote PIM at the country level.
- The intended users of this learning guidebook are task managers, staff of borrowing countries, irrigation managers, consultants, trainers, and NGO's
- Use the menu to browse through the sections of the guidebook for a self-paced tour of PIM and how to implement and promote at the country level
- Users can directly access country cases, lessons learned, information about WBI's training program, and reference materials through the menu, or indirectly by browsing through the self-paced guidebook.

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1. CHAPTER-1: PIM: WHAT AND WHY

A process of improving productivity and sustainability of irrigation systems

Participatory Irrigation Management (PIM) refers to the involvement of irrigation users in all aspects and all levels of irrigation management. "All aspects" includes the initial planning and design of new irrigation projects or improvements, as well as the construction, supervision, and financing, decision rules, operation, maintenance, monitoring, and evaluation of the system.

- What are the problems of irrigation management without participatory management
- What is participatory management and its relationship to the solution of irrigation management problems.
- The rationale for participation
- What is Participatory Irrigation Management (PIM)



1.2 WHAT ARE THE PROBLEMS OF IRRIGATION

In a national seminar on PIM in India held in 1994, the participants identified the following problems, or issues, with irrigation management. While one can debate whether some of these are "problems" or "symptoms" of problems, they are certainly issues familiar to all of us:

- Inadequate water availability at the lowest outlets
- Poor condition/maintenance of the system
- Lack of measuring devices and control structures
- Inadequate allocation for O&M
- Inequitable distribution of water
- Lack of incentives for saving water
- Poor drainage

In particular countries and particular irrigation systems, some problems may be more critical than others. There are always additional problems or issues that could be added.

1.3 HOW CAN PARTICIPATION IMPROVE IRRIGATION?

Now let us consider the problems with irrigation management and think about whether and how participatory management approaches can help solve them. We will consider them one by one.

- Inadequate water availability at the lowest outlets**
- Poor condition/maintenance of the system**
- Lack of measuring devices and control structures**
- Inadequate allocation for O&M**
- Inequitable distribution of water**
- Lack of incentives for saving water**
- Poor drainage**

This new perspective of irrigation management has been applied to both projects as well as policies and has greatly expanded our understanding of why some irrigation systems work better than others. It is not only a physical problem; irrigation also involves a much broader set of management issues. For example, how is the system financed? What type of monitoring is carried out and how is this fed back into the O&M process?

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. What is happening is a rationalization of the respective roles of government and users. The pendulum that had shifted far towards the direction of strong government involvement in all aspects of irrigation management is now swinging the other way, towards a more sensible equilibrium.

1.3.1 Inadequate water availability at the lowest outlets

If the water availability is inadequate because there is inadequate supply, then there are clear limits within which to suggest improvements. But even here, participation in the sense of transparency and dissemination of information about the water situation (e.g., through a system-wide organization) can engender good will from farmers vis a vis the system managers, thus minimizing the likelihood of intentionally breaking gates to increase water supply.

When the users understand the constraints faced by management, they are far more likely to cooperate. If the water availability at the lowest outlets is inadequate because of water thefts upstream, then part of the solution could entail bringing upstream and downstream users into a single management entity that would be accountable to all the users. This principle of including as many stakeholders as possible in a single organization underlies the very large water user organizations found in Mexico, for example. Participation of the users in managing the system is not the only possible solution, of course. More diligent management by government irrigation engineers could also solve the problem. But what are the incentives to a government engineer who will be paid by his agency at the same (usually low) rate regardless of how diligently he supervises water use between the upstream and downstream users.

Compare this situation with that of an irrigation engineer hired by a water user organization to oversee water distribution between upstream and downstream users. If he does not satisfy both sets of farmers, he will lose his job, and, at least in the case of Mexico, his salary may be double that of his agency counterpart. This engineer has a

very strong incentive to distribute water equitably throughout the system, so that he remains in good favor in the eyes of all farmers.

1.3.2 Poor condition/maintenance of the system

The almost universal problem of deferred maintenance resulting in deteriorating infrastructure is on everyone's list of irrigation management concerns. Can participation help? When the users of the system are also in charge of maintenance, they have every incentive to perform timely repairs, to monitor the quality of the work, and to protect structures from vandalism. When the users also participate in initial design decisions, with the understanding that they will inherit the system as their own, they have a strong incentive to demand a system whose operation poses no technical problems, to monitor construction quality, and if they will repay some of the capital costs, to minimize the overall costs of construction. Most often this translates into reduced demand for lining canals except where it makes good operational sense.

The conservative tendency on lining which participation encourages may in itself result in substantial cost savings initially, and long-term improvements in maintenance (since users are reluctant to repair lining that they do not consider essential).

1.3.3 Lack of measuring devices and control structures

When irrigation managers are engineers employed by the government irrigation agency, there is little incentive to measure actual water flows. The philosophy of "no news is good news" is the standard approach to measurement. Similarly, control structures require both operational attention and maintenance which may be beyond the interest and/or budgets of the managing engineer. Would this situation change if farmers were in charge of management?

Imagine a situation in which the managing engineer would have to prepare weekly reports to a governing board of farmers, to whom the engineer owes his job. Would he now have an incentive to know how much water is going into each outlet? Would he now have an incentive to control the water so that he can adhere to his operational plan? This type of performance-based management by which the governing board holds the engineer accountable for water flows is theoretically possible under a government administered system. But if we can imagine two governing boards of an irrigation system, the first comprised of elected farmers who themselves depend of that irrigation water, and the second comprised of civil servants who enjoy job security, which of these boards is more likely to demand high performance? Which of these boards would be more likely to be interested in the flow rates in various reaches of the system?

1.3.4 Inadequate allocation for O&M

Inadequate allocation implies either high costs, or low recovery, or both. The costs of both operating and maintaining the system are increased when farmers deliberately intervene to disrupt the scheduled operation, or to damage structures, and costs are reduced when farmers respect the operating plan and report maintenance problems promptly. Cost recovery appears to be enhanced when farmers can see that the money is going into system O&M (**see Vicious Cycle of Public Irrigation**), and when they perceive that they are receiving valuable services from the system, i.e., the timely provision of water. Can participatory irrigation management contribute to lower costs and higher recovery? When farmers are directly involved in the design of the system itself and the placement of structures and when they have input into establishing the operational plan, they will be more likely to both understand and protect the facilities and the plan.

When farmers are clearly the owners of the physical system, so that the maintenance costs are their own responsibility, they will have a strong incentive to protect the physical integrity of the system to reduce their overall costs. The cost recovery issue is complex. When farmers are involved in management they have a better understanding of how the funds are being used, and this knowledge is likely to render them more willing to pay the fees. To the extent that irrigation management is improved with user involvement, the farmers may feel more willing to pay for improved service (although these links are difficult to prove). Perhaps the best evidence for a relationship between participatory management and cost recovery comes from actual experience. In the Philippines, the payment rate for irrigation service fees is significantly higher in those systems where water user associations have been formed. In Mexico, payment rates are close to 100% because the system managers -- controlled by a board of irrigation users -- will refuse to give water without prior payment. Political realities would not allow this type of ultimatum were the managers part of the Irrigation Department.

1.3.5 Inequitable distribution of water

Disparities in the supply of water available to farmers are not only due to the physical problems of reaching the tail end of large systems. Disparities may also be caused by intentional tampering with the system, either by physically enlarging outlets, or offering bribes to the water masters. The result is that influential farmers can take more than their due share, thus depriving others who have the misfortune of being located downstream. Can management participation by the water users help solve this well-known situation? Or would the withdrawal of state authority actually encourage powerful farmers to take even more water, with no fear of government sanctions? Social theory suggests that under user management, tampering with water distribution becomes much more difficult. There is greater transparency and accountability rendering illicit water deliveries more difficult to conceal and even more difficult to defend. Whereas thefts of "government" water might be tolerated by other farmers, when the water supply is allocated to the collectivity of farmers, any theft of water implies stealing from a fellow farmer, and a fellow member of the association.

1.3.6 Lack of incentives for saving water

What are the incentives that can encourage farmers to conserve water? Can such incentives become operative more readily under user management or under government management? The set of factors that determine water conservation behaviour are complex. One factor is security of supply. If farmers know when they expect to irrigate next time, they may be more modest in applying water, whereas if they are afraid they might have to wait a long time for the next irrigation, they will be apt to over-irrigate as insurance against this uncertainty. Another factor may be information and management confidence. If farmers are aware that there is an overall scarcity of supply and they believe the scarce water will be equitably distributed, they will may be more likely to limit their own consumption, or at least refrain from taking more than their share. A third factor is the transferability of water rights. If farmers in one part of the command area do not need water this week, but may need extra water after three weeks, can they forgo water now and use it three weeks from now?

While these three types of incentives -- security of supply, information and management confidence, and transferability of water rights -- can be found under both government management and user management, they are more likely to be found under user management. The reasons have to do with accountability. When the manager are accountable to the users, those managers have a direct incentive to keep supplies regular, and to inform the users of any problems. The continued employment of the managers depends upon the management confidence of the users. Similarly, the transfer of water rights from one user to another, or from one association

to another, is not impossible under government management, but it is unusual and perhaps non-existent. Water markets are the formal manifestation of transferring water rights. While water markets are very much a novelty in the irrigation sector, there is a promising potential for tapping market forces to provide economic incentives for saving water, and for using it in the most productive manner.

1.3.7 Poor drainage

Investments in drainage are notoriously under-valued in government managed irrigation systems. The emphasis is nearly always on increasing the supply of irrigation water, rather than on facilitating disposal of drainage water. It would be unrealistic to claim that farmers are necessarily more foresighted than government agencies in giving attention to drainage, but there is evidence from Mexico that more attention is given to drainage after transfer to user management. Part of the reason in the Mexican case is that the user-managers are able to operate the irrigation system at an overall lower cost, and therefore have funds available for drainage O&M. Another part of the reason is that the government agency continues to subsidize drainage through monitoring soil and water quality and helping the new managers address priority problems strategically. In Mexico the water user organizations are responsible for both irrigation and drainage. In the Chambal project in Rajasthan, India, separate drainage committees are being established to operate and maintain new investments (by the government) in on-farm drains.

1.4 RATIONALE FOR PARTICIPATION

Why participation? Another question might also be asked: "Why should the government be involved in irrigation?" Clearly, there are investments that only the government can make, or where the government has a definite advantage vis-à-vis farmers, even very well organized associations of farmers. Construction of dams and barrages, for example, or large canals, would be extremely difficult for farmers to handle. Governments provide us with available institutional resources -- departments, agencies, trained staff, etc -- which can be used to get things done. Why re-invent the wheel and ask farmers to organize their own arrangements for building a dam?

- Comparative advantages**
- Improved design, construction, and O&M.**
- Lower costs to government.**
- Social capital.**

1.4.1 Comparative Advantage

Farmers have some **comparative advantages** as well. They have direct incentives to manage irrigation water in a productive and sustainable manner; they offer an on-the-ground presence that even the most dedicated off-site agency staff cannot equal, and they have an intimate knowledge about their fellow irrigators. The logic of the PIM approach is that both governments and farmers have separate comparative advantages. At the moment, governments are trying to do much more than they can do well. What are the advantages that management by farmers -- by the users -- can offer?

1.4.2 Improved design, construction, and O&M

When farmers are directly involved in the design process, whether for new systems or rehabilitation of old ones, they will provide useful design input and they will come away with an understanding of the design logic of the system they will be managing. During construction, farmer input has the functions of quality control (ensuring design standards are met), cost savings (through guarding against needless spending, and substituting some costs with farmers' own labor), and construction knowledge. Knowing how the system is constructed will help in repairs later on. The advantage of farmer inputs into O&M, either as direct managers or as the overseers of technical managers, has been discussed.

1.4.3 Lower costs to government

Cost savings to the government irrigation agency is often the driving force behind irrigation policy reforms. Government run systems are chronically short of maintenance funds leading to deteriorating systems and more difficult operation. Management transfer of major levels of the system to users offers government agencies an escape from this vicious cycle. While some critics see this as merely passing the costs on to farmers, the picture is not usually so bleak. Evidence from Mexico and Turkey suggest that farmers can manage better and more cheaply than their government predecessors. Thus, both farmers and government can benefit from these cost savings; farmers can enjoy better service, and cost savings; the government incurs less management cost and can then afford to improve service in the main system.

1.4.4 Social capital

The organizations that farmers establish for managing their irrigation systems constitute a form of social capital that can have spin-off effects in other aspects of social and economic life. The network of contacts among agency staff and the water user organization leadership, for example, can bring the farming community into closer touch with related services, e.g., credit, education opportunities, or even political access. And the skills that farmers learn through their experience with their water user organization -- accounting, budgeting, planning, organizing -- constitute a set of knowledge that can be used in many other productive endeavors.

1.5 WHAT IS PIM?

- PIM means "Participation" -- not only in O&M and financing, but in making decisions that will affect the O&M -- and financing
- Continuum of management approaches and levels of participation
- The concept of users' organization and transfer of management to users is different from PIM

1.5.1 PIM means Participation

Participation refers to a **continuum of involvement in management decisions**. One meaning of "PIM" may be that the irrigation users have total control and responsibility over the operations and maintenance of part or all of the 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 are outlined below.

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 evaluations
- 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 committees/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, September 1994, p. 12.

1.5.2 Continuum of Involvement in Management Decisions

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. In between these two ends of the continuum is a very large gray (or blue) area where a government agency performs some management functions and farmers perform other functions. For purposes of discussion, we can divide the continuum into four types from more to less government involvement:

<p>Type 1: Government does everything. In Malaysia, the Department of Irrigation and Drainage provides for the operation and maintenance of the main and secondary canals, while government sponsored farmers' organizations are responsible for providing water to individual farms. Farmers have no responsibility, and make no management decisions, about the water upstream from their outlets.</p>	<p>Type 2: 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 a dam or river diversion, and the main, secondary, and larger tertiary canals, while farmers are responsible for managing water distribution and maintenance along the lowest level canals. Typically this entails farmer groups of between 10 and 50 farm families who are expected to work out sharing arrangements on their own.</p>
<p>Type 3: Users dominate; state facilitates. In some countries, associations of water users enter into contractual agreements with state water agencies for the provision of specific water services. In the case of Mexico, the National Water Commission manages the headworks and main canals, while legally recognized water user associations employ their own technical staff for the management of the secondary and tertiary levels of the canal networks. Farmers pay their associations for the water, and a small portion of that fee is passed on to the National Water Commission for their services.</p>	<p>Type 4: Farmers do everything: In the Hill regions of Nepal 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 provides a valuable pool of local knowledge that can be tapped in developing new irrigated areas.</p>

1.5.3 Users' Organizations Different than PIM

Management approaches in irrigation generally fall into three categories: (1) public sector management, (2) private sector management, and (3) users' organizations. This last type can be termed "userism," and the process of transferring management to users can be termed "**userization**". 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 system from the government and then hire out irrigation services to farmers. Rather, the PIM concept is more akin to an employee owned business that gives equal shares . Countries can be ranked according to their level of "userization" in the irrigation sector. While the ranking is rough, the trends are real.

At the upper end of the "userization" graph we find the United States, France, and Japan. Irrigation users have largely replaced the state in managing the irrigation sector

although the government retains regulatory functions. At the lower end of the scale, where the state continues to dominate most aspects of irrigation and down to the tertiary or even quaternary levels, we find Morocco, India, Pakistan, etc.

The strategies that countries have taken in implementing PIM policies may be characterized according to three basic approaches: (1) the rapid "big-bang" approach 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 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.

Is participation always necessary? Doesn't participation interfere with efficient management in some circumstances? Do we have to allow farmers to come into our board rooms and advise us on how to do our jobs? Aren't there some natural limits to what irrigation professionals should be responsible for and what farmers should become involved in?

A good rule of thumb is that a participatory dimension is important to all management functions. Perhaps there are exceptions to this general rule, but within the field of irrigation management, it is difficult to imagine any. This does not mean that a farmer's council has to be consulted before any decision is taken. If the water availability is so small that only 40% of the demand can be met along a given canal, do farmers need to be asked if they want the water? However, the farmers who receive only 40% of their demand do need to know about overall water availability so they can plan their response, and perhaps suggest better ways of utilizing their reduced share.

"Userism" as a Management Type

by Peter Sun, World Bank World Bank Institute

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 users' 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.

2. CHAPTER-2: IMPLEMENTATION STRATEGY

The opportunities for participation are different in each phase of the project cycle. Much of the emphasis on PIM has focused on participation in O&M, and particularly in the recovery of O&M service fees on behalf of the irrigation agency. While this aspect of participation is of great practical importance, there are many ways other aspects of irrigation management where participation can be incorporated. These include: (1) participation in irrigation project identification, planning, and design; (2) participation in system layout and construction; and (3) participation in project monitoring and evaluation.

In short, any aspect of irrigation management can have a participatory dimension. We have discussed why participation is important. In this section we will consider how to achieve it: how to implement participatory irrigation management. There is no recipe for this; indeed, the process of formulating a strategy that fits the specific features of any given country is the first -- and ongoing -- step. There are some common issues to consider, however, of which we will discuss two:

- (1) creating an enabling environment, and
- (2) start-up, pilots, and expansion phase.

2.1 CREATING AN ENABLING ENVIRONMENT

- Willingness and interest of stakeholders**
- Strengthening interest and commitment**
- The role of a PIM "promoter"**
- Building consensus about the need for change**
- Building Consensus among Farmers**
- PIM as one part of a broader "package"**

2.1.1 Interest and Willingness of Stakeholders

- For participation to work, the government, the incumbent power broker and major "stakeholder" in most national irrigation sectors, must be willing and interested. At least three sections of the government must be willing and interested to support PIM: Political leadership, Administrative leadership, Irrigation agency leadership.
- A second, and some would argue more powerful stakeholder must also be brought into any discussions of PIM policies at the earliest stage. We refer here to the farmers themselves, who have the most to lose -- and also to gain -- from changes in the way their irrigation systems are managed. The membership of farmer stakeholders overlaps with governmental stakeholders in the form of political leaders who represent farming constituencies. These political forces who can speak on behalf of both government and farmers, can be particularly important in both designing and promoting PIM reforms.

2.1.2 Strengthening interest and commitment

- Expressions of interest in PIM on the part of these entities can be strengthened by facilitating participation in workshops where international experiences are shared (e.g., WBI seminars in Mexico, 1994; Turkey, 1996; Tokyo, 1997; IIMI/FAO seminars in China, 1994; Thailand, 1996). Specific study tours to "model" countries and schemes can be arranged. The World Bank had arranged such study tours to Spain, Mexico, and recently to Argentina and Chile. Teams of political and administrative leaders

have participated in these visits. The first such visit to Mexico by Turkish senior policy-makers was followed by study tours of several contingents of government officials from the Public Works Department. These visits and the shared experiences clearly contributed to the speedy implementation of the PIM program in Turkey. In Egypt, a tour of the USAID-assisted Irrigation Improvement Project was organized for legislators by the Ministry of Water Resources. The tour contributed to a much better understanding of, and subsequent policy support for, shared financing and management of the irrigation system by the government and water users. Methods and tactics for promoting PIM is explored in detail in another section of this Handbook.

2.1.3 The role of a PIM "promoter"

□ One clear lesson from participatory experience is the importance of a PIM promoter or "champion" who is effective in mobilizing support within the government/irrigation agency. Typically this role is played by a key official within the agency. In the Philippines, for example, the Assistant Administrator of the NIA is rightfully considered the father of participation in that country's irrigation sector. In Mexico, there were well placed champions within the national water agency (CNA). Perhaps it is possible to rely on a senior consultant (who has the ear of top officials) to mobilize support within the agency. This is the approach being tried in Orissa, India, where a consultant on "farmer organization and turnover" will serve as a guide, but not a direct supervisor, to irrigation department field staff re-trained as organizers. A cadre of specialized social organizers will also be involved as assistants to these engineers. The job profile of the consultant on farmer organization and turnover is given in Annex One.

2.1.4 Building Consensus about the need for change

□ Stimulating a policy dialogue about the need for change and options to be considered can be based both on experience within the country, and by examples from outside the country. Within the country, public discussion of problems faced by farmers whose water services are unreliable or inequitable could be complemented by highlighting other cases where management reforms have resulted in improvements. Universities and centres of higher learning can help organize public discussion events. The media can help in reporting the outcome of these events and highlight key issues in the debate. NGOs can assist in seminars with water users. In Egypt, a professionally-made video film was made available to television stations that attracted large rural audiences in a pilot project area.

□ Bringing policy makers into contact with PIM cases in other countries is a high priced activity, but can be a powerful ingredient in swaying long-held opinions. Study tours, if carefully arranged and if the right people are involved, can make dramatic differences in the outlooks of individual officials. When Turkey was considering reforms

2.1.5 Building Consensus among farmers

□ A danger in designing and implementing PIM programs (and a cause for their failure) is the lack of attention to farmer interest and support. Since the impetus for PIM oftentimes originates in the perilous state of irrigation agency budgets, the focus for PIM from the agency's perspective could be quite limited, e.g., targeting financial contributions from farmers. The question, of course, is: why should farmers be interested in organizing themselves, if only to pay higher fees? Improvement in services and potential for income enhancement are better motivators for user

organization. Farmers' incentives cannot be assumed, but rather must be assessed through field interviews and discussions with a representative sample of the community concerned. Farmers' involvement in designing a management model for PIM which builds-in strong incentives is a critical and often neglected step in the overall PIM implementation process. These issues are explored in another section of this handbook.

2.1.6 PIM as one part of a broader "package"

□ Farmers are interested in much more than just the irrigation system; they want to improve their agricultural production, and more broadly, to improve their livelihoods. In Mexico, when the National Water Commission first met with farmers to discuss their interests, and what their priorities would be for irrigation improvements, the Commission expected that the farmers would ask for more lining of their canals. This is an expensive but important improvement to canal networks in many areas. The Commission was surprised to hear from the farmers that what they were most interested in was full management autonomy. Instead of a physical improvement, they were looking for an institutional improvement. Both types of improvements were within the authority of the government to arrange, but through different means; one required a simple financial outlay; the other required legal changes.

2.2 START-UP, PILOTS, AND EXPANSION PHASE

The design of an implementation strategy involves planning for the start-up, piloting and expansion phases of a PIM program.

□ **Start-up.** To begin with, management responsibility for PIM must be assigned at the strategic management as well as the operations management levels. At the strategic level, a steering committee could be formed of key officials in the respective ministries, say, public works/ irrigation/water resources, agriculture, planning, and finance. This group would approve of the PIM program -- its goals, strategies, and a specific work program and budget on an annual basis. At the operations level, responsibility for PIM would be assigned to a specific senior manager. Experiences as to who should be assigned the responsibility vary among countries. In some cases, a senior manager is designated exclusively for Farmers' Organization. In others, a senior manager for Planning or O&M is assigned the additional responsibility. There is no formula for the assignment but whomever is chosen should be interested and committed to PIM ideas. This senior manager would need a group of interested staff from various levels, and representing social science as well as engineering, to help him implement the program.

□ The start-up phase would also need resources for preparatory work for the PIM program. In-house expertise may be adequate for this purpose, but often external consultancy inputs may be required. A budget to prepare a pilot three-year program would be a good start and would have to be secured. Sources of financing could be the government's own funds or other external agencies such as bilateral and multilateral donors.

□ **Piloting.** PIM is usually not a new concept to the region or the country. Farmer managed systems exist in most countries. Nevertheless, what is usually new is PIM in all stages of the project cycle, from planning and design to construction and O&M or PIM in the form of irrigation management transfer. In this context, it is useful to talk of

"experimenting" with or piloting the PIM idea to test the appropriateness of the various PIM elements to local conditions in the country.

□ Yet because PIM implies a new paradigm for the government's relationship with farmers, piloting is not possible in the conventional sense of the term. The irrigation agency must establish a commitment to the basic principles of PIM as a precondition for success in the pilot. The purpose of the pilot should be to help inform the agency how best to operationalize PIM policies, and to demonstrate what kinds of PIM approach would be feasible. It should not be seen as a "wait-and-see" test of whether PIM is a good idea. Inevitable, there will be an internal demonstration function of any PIM pilot, but the management of the agency, at the very least, should support the concepts of PIM at the time the pilot is launched.

□ The objectives of piloting are to learn from experiences on a small scale so that a manageable irrigation system or subsystem can be the focus of implementation, monitoring, and learning. The implication is that the pilot projects should cover a range of conditions and be carefully monitored so that changes can be introduced in the original PIM model. For instance, in Egypt, 6 pilots covering about 70000 acres were launched in various parts of the country in the late 1980s. These experiences were evaluated in the early 1990s so that the lessons could be used in another set of irrigation schemes serving a command area of about 250000 acres.

□ Selection of pilots needs careful consideration. Selection criteria would normally include:

- interested farmers in the area
- relative lack of conflict among farmers or a keen desire to end the conflict
- water delivery system that functions relatively well
- tangible improvements can be demonstrated in a relatively short period of time
- supportive irrigation O&M field staff enjoying good rapport with farmers
- local government officials do not oppose the pilot
- size of the pilot scheme is neither too large (and therefore unmanageable) nor is it too small (results have no visible impact on the rest of the government-managed schemes)

□ To ensure their relevance, pilots must be part of a phased program that includes start-up, pilots, and expansion. Thus, the Mexican program aimed at the management transfer of all of its large scale irrigation systems (below the secondary canal level) covering nearly 3 million ha in a phased program, learning from experience during implementation. All of the phases should ideally be designed before pilots are implemented, thus placing them in the overall context of a country's institutional reform program. An additional problem with pilots is that they attract a great deal of resources, sometimes disproportionate to the size and scope of the experiment. Replicability becomes a casualty.

□ **Expansion.** At the end of the pilot phase, policy makers and managers would have derived lessons regarding the scope for user participation in the management of water, funds, operation and maintenance and capital development of the system. They would also be wiser about current government policies and procedures that help or hinder effective participation. The period before the large-scale expansion phases presents an opportunity to bring about changes in existing laws, policies, financing arrangements and procedures as the need may be. Without this intervention, an expanded program could run into severe problems. What was possible in an informal, small scale setting during the pilot phase may not be easy during the expanded large scale phase.

□ In addition to required changes in current policies, agency managers have to face the question of institutional capacity -- trained staff, budget, managerial resources -- to undertake a large scale expanded program that would cover a larger geographical area. Some time may have to be initially spent during the expansion phase in

strengthening institutional capacity to manage the effort. These issues will be further explored in the section on Training Strategies(see below).

Training Strategy:

II. What training do the organizers need?

Assuming that agency staff will be used for the organizing, and assuming that their professional training has been in irrigation engineering, they would need to be retooled as organizers. First of all they would need a thorough understanding of the rationale for PIM, so that they can present a clear message both to the farmers and to their own colleagues within the irrigation agency. Secondly, they will need training in communication skills (including listening skills) for effective interaction with the users. Thirdly, they will need training in social analysis, including an understanding of social stratification (by caste, ethnicity, or class), kinship, patron-client relations, labor relations, religious factors, political affiliation, land tenure (tenants, share-croppers, owners), etc. And fourthly, they would need training in methods for gathering information from farmers (e.g., participatory rural appraisal) and in methods for organizing farmers.

3. CHAPTER-3: LEGAL FRAMEWORK

The legal framework for the establishment of WUAs, and for enabling them to operate and maintain such parts of the irrigation system, consists basically of three sets of legal instruments, namely:

- The enabling law,
- The bylaws of the WUA, and
- The transfer agreement between the irrigation agency and the WUA.

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 the bylaws and transfer agreements, 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.

3.1 THE ENABLING LAW

For a WUA to be established as a legal entity, there has to be a law authorizing its establishment. This law could be a general comprehensive "Water Law" that deals with all aspects related to water, including establishment of WUAs. The National Water Act in Mexico, and the Water Resources Act in Nepal, are examples of such a comprehensive law. The enabling law could also be special rules and regulations dealing specifically with WUAs, and deriving their authority from a basic law, such as the "Implementing Rules and Regulations on the Provisions of Republic Act No. 7607" on small farmers in the Philippines.

Because of the absence of a basic law specifically on water or on WUAs, the states of India have relied on different laws to establish WUAs. In the Indian State of Maharashtra, WUAs have been established and registered as co-operative societies under the "Co-operative Societies Act." On the other hand, in the State of Tamil Nadu and the State of Orissa in India, WUAs are established and registered as societies, under the "Societies Registration Act."

The law establishing WUAs would usually include provisions indicating that the WUA to be established is a legal entity. Such enabling law would also address the relationship between the WUAs and the irrigation agency, the duties and obligations of the irrigation agency, and those of the WUAs, and the structure of water rates and the operation and maintenance and other fees. The enabling law may also lay down some of the main issues to be addressed in the bylaws of the WUA, and in the transfer agreement.

All societies, including WUAs, registered in any state in India under either the Co-operative Societies Act, or the Societies Registration Act, are legal entities capable of contracting, opening and operating bank accounts, and instituting and answering suits. However, because of their general nature, those two Acts do not address certain WUA related issues that are usually addressed in special water law or through a law establishing WUAs. It is for this reason that specific legislation dealing specifically with WUAs is often desirable.

3.2 BYLAWS OF THE WATER USER ASSOCIATION

Whether established under a separate law or under an umbrella enabling law, the WUA would normally be required to prepare and agree on its bylaws before it can be registered as a legal entity. Those bylaws may be called "Regulations," "Constitution," "Charter" or "Articles of Associations." The issues that such bylaws need to address include:

(i) **Basic Facts About, and Objectives of, the WUA:** The basic facts would include the name of the WUA, the law under which it is registered and its registration number, its address, and a clear definition of the area that the WUA is serving or its area of operation. This area of operation could be an entire irrigation district, or an entire command of a distributary, minor, sub-minor or a water course. It could also be defined by its size in acres or hectares.

A broad statement on the objectives of the WUA is usually included in the bylaws. Such objectives would include: participation in the management, operation, maintenance and upgrading of the irrigation infrastructure works that the WUA has taken responsibility for, collection of water charges, and provision of irrigation and drainage services to the members of the WUA.

(ii) **Criteria for Becoming a Member of the WUA:** Most bylaws restrict membership of the WUA to the registered land owners in the hydraulic unit, who are engaged on a full-time basis in farming. If any member of the WUA sells his land, his membership will be automatically canceled, and the new owner will be eligible for the membership of the WUA. However, the bylaws in some countries extend the right to become a member to both owners and tenants. In the Indian State of Maharashtra membership of the WUA is extended to "Any owner/cultivator/permanent tenant/protected tenant in the area of operation of the society" These bylaws extend membership of the WUA beyond owners and tenants to include other categories of users such as sharecroppers and encroachers who are prevalent in some parts of India.

(iii) **Number of Farmers Required for the Establishment of a WUA:** Most of the bylaws state that at least 51% of the registered land owners in the command area where the WUA would be established should be enrolled as members before the WUA can seek registration, and before it can be allowed to operate. However, some bylaws allow the WUA to seek registration based either on the number of farmers enrolled, or the size of the land holdings coming under its operation regardless of the number of farmers enrolled. In Orissa "At least 51% of the registered land owners in the command area covered by the Association should be enrolled as members, or the land holdings of the members should cover at least 51% of the total area under the proposed Association." Moreover, in some cases, once 51% of the farmers are enrolled and registered in the WUA, all other farmers within the command area will be deemed to have become members in that WUA. In Mexico "all users listed in the register who, while not founder members of the Association, apply and pay for irrigation services, thereby tacitly agreeing to belong to the Association, shall also be deemed to be members with the same rights and obligations."

(iv) **The WUA as a Legal Entity:** Although the enabling law would usually specify that the WUA is a legal entity, further details regarding what this entails are usually included in the bylaws. It is usually stated that the WUA is authorized to enter into contracts in its name, and that the WUA can sue in its own name, and answer suits instituted against it. The WUA can also be authorized to borrow funds from private sources, using, if necessary, its assets as a collateral.

(v) **Structural Organization and Internal Management:** Although WUAs may be organized differently, the two most common ways of organizing a WUA at the membership level are: (i) a general body of the WUA which would consist of all registered members who are current in the payment of their dues, as in Mexico, Nepal, and the Indian states of Maharashtra, Orissa and Tamil Nadu; or (ii) a general body, which could be called the general assembly, which would consist of delegates directly elected to represent the different irrigation districts or sub-units within the hydraulic unit, as in the case of some WUAs in Turkey. In the latter case, there is an absence of one single forum encompassing all members.

The executive body would usually consist of a president (or chairman), a vice president (or vice chairman), a secretary, a treasurer, and other specified number of members, and those posts do not, in many countries, carry remuneration. One exception is Turkey where the president of the WUA is paid a salary, and the other members of the executive body are paid honoraria.

Membership of the executive body may also be extended to non-governmental organizations (NGOs) or any other institutions interested in irrigated agriculture, including a representative of the irrigation agency, but such members usually do not have the right to vote.

A bank account in the name of the WUA is usually opened, with separate sub-accounts for water charges, operation and maintenance fund and membership fees. The executive body would also approve work expenses, engage labor, organize labor contributions from members, keep systematic accounts and records of amounts collected and those spent on the water charges, operations and maintenance fund, and membership fees. The executive body is usually required to have such accounts and records audited annually, and submit such accounts and audit reports to the general body during the annual meeting for approval. The executive body could include members who are specifically designated as auditors.

(vi) **Operation and Maintenance:** One of the primary objectives of the WUA is to operate and maintain the transferred irrigation and drainage system efficiently and economically, and with the full and active participation of all the members. Operation would include receiving water in bulk from the irrigation agency at a prescribed rate at the head of the minor/distributary and distributing such water equitably and in a timely manner, as per procedures and criteria agreed with the irrigation agency, to all farmers in the hydraulic unit, whether members or non-members. The bylaws would lay down, in agreement with the irrigation agency, the criteria for allocation of water to both members and non-members, which could be based on the type of crop grown or the size of the area to be irrigated, or both. The bylaws would also include the criteria for assessing water charges and operation and maintenance charges from both members and non-members. The operation and maintenance fund could include sources other than charges from farmers.

(vii) **Water Charges:** Reference to water charges is usually included in the enabling law. Other details on water charges are also included in both the bylaws and the transfer agreements. Inclusion of provisions on water charges in the bylaws would serve the purpose of establishing the payment obligations of each member of the WUA, whereas the provisions in the transfer agreement would establish the payment obligations of the WUA, as a legal entity, vis-à-vis the irrigation agency.

The transfer agreement would usually include provisions on the manner in which water charges are calculated, and the due date or dates for payment of the water charges by the WUA to the irrigation agency. It may include provisions for the payment of commission or discount by the irrigation agency to

the WUA on water charges collected by the WUA. The transfer agreement would also include provisions giving the irrigation agency the right to suspend delivery of water if the WUA fails to make the payments of the water charges within the prescribed or extended time limit. Moreover, non-members of the WUA may be required to pay higher water rates than those paid by members.

(viii) **Rights and Obligations of Members:** Under most WUAs, each member of the WUA has one vote regardless of the size of his land holding. The bylaws would also need to address the issue of proxy voting - whether it is allowed, and if so, the maximum number of proxy votes one member may cast on behalf of other members. Failure of a member of the WUA to meet his membership obligations as described in the bylaws, such as failure to make payments, permit inspection of the irrigation system in his land, comply with the terms of the transfer agreement, carry out proper maintenance, or allow delivery of water to other users may subject such a member to sanctions. Such sanctions may include suspension of such a member until all outstanding obligations are met.

(ix) **Interpreting and Amending the Bylaws:** Provisions would usually be included in the bylaws themselves describing the procedures for interpreting provisions of the bylaws in case there are different views as to what a certain provision may mean. Procedures and quorum required for amending the bylaws would also be included in the bylaws. Usually interpretation of provisions of the bylaws would be referred to a central body such as the Registrar of Societies, or the irrigation agency, and amendments would be effective after approval of such body.

(x) **Establishment of a Federation of WUAs:** The bylaws of some of the WUAs, as in Mexico, Colombia, Tamil Nadu and Orissa, include provisions enabling the establishment of a federation encompassing registered WUAs in one command area. Those bylaws specify the responsibilities of the federation, and the relationship between such a federation and each of the affiliated or member WUAs. Usually, the presidents of each of the WUAs that decided to establish or join such a federation would represent their WUA in that federation. The federation would have an advisory non-binding role over the member WUAs, and may be used to resolve any disputes among such member WUAs, or between WUAs and the irrigation agency.

3.3 BYLAWS OF THE WATER USER ASSOCIATION

The transfer agreement is the agreement between the WUA and the irrigation agency in which the irrigation agency agrees to transfer to the WUA responsibilities for operation and maintenance of certain parts of the irrigation system, including the drainage system, and the collection and remitting of water charges; and the WUA agrees to carry out such responsibilities. This agreement may also be called "Memorandum of Understanding (MOU)," "Transfer Protocol," "Concession Agreement" or just "Concession." The issues that such transfer agreement would need to address include:

(i) **Area and Irrigation System to be Transferred:** The agreement would need to define clearly the irrigated area to be transferred, specifying the size of the area, and the command under which it falls, and including the irrigation system existing there that is being transferred. The system to be transferred is usually the irrigation system at the level of primary, secondary and tertiary, including the drainage of such areas too. A copy of a map showing such area may be attached to the agreement. The agreement would specify whether the ownership of the irrigation system, including the land and structures and works thereon, remains with the irrigation agency or is being transferred to the WUA, together with the operation and maintenance of such irrigation system.

Provisions should also be included clarifying whether the ownership of any ancillary equipment is being transferred.

(ii) **Interim Joint Management:** Some agreements may provide for a joint management of the irrigation system for a short period of time by both the irrigation agency and the WUA. The rationale for such joint management is to prepare the WUA, during this interim period, for taking over full responsibility for operation and maintenance of such irrigation system. During this interim period which may run for up to one year, officers of the irrigation agency would train WUA representatives in compiling necessary data, and preparing and testing operation and maintenance plans for the distributaries, minors and subminors to be transferred to them. They would hold joint inspections to identify any problems in the irrigation and drainage system, and to agree on how to deal with them.

(iii) **Transfer of the Irrigation System:** Transfer of the irrigation system to the WUA will normally be preceded by a number of actions, including the preparation of an inventory of the works, structures and equipment to be transferred, joint inspections of those works, structures and equipment by both the irrigation agency and the WUA representatives, carrying out of necessary testing, and repairs, if any, at the irrigation agency cost, and handing over management of the system, along with all necessary documents and instructions, to the WUA. The WUA would need to satisfy itself that the system is, indeed, in a good working condition, as the transfer agreement would include provisions that the irrigation system, at the time it is transferred, was in good working condition.

(iv) **Responsibilities of the Irrigation Agency:** The agreement would spell out clearly the responsibilities of both the irrigation agency and the WUA. Responsibilities of the irrigation agency would include handing over the system in a reasonably operating manner, delivery of water to the WUA in bulk at the agreed time and providing the WUA with any agreed upon financial assistance and other benefits. The agreement could include provisions absolving the irrigation agency from liability should it be unable to deliver the agreed upon amount of water, or unable to deliver it at the agreed time, for reasons of force major, or act of God. In periods of water scarcity or emergency, after the demand for domestic and other priority uses is satisfied, the irrigation agency would usually have the authority to decide that the remaining water for irrigation shall be allocated to crops of utmost importance to the community there.

(v) **Responsibilities of the WUA:** A number of the responsibilities of the WUA detailed in this section of the agreement are usually spelled out in the bylaws of the WUA, but may still be included in the transfer agreement to clarify the obligations of the WUA towards the irrigation agency. Such responsibilities would include: operating and maintaining the irrigation system transferred to it, including the drainage system, in a proper and satisfactory manner; receiving water in volumetric basis, and distributing such water equitably and in a timely manner, based on clearly defined criteria, to both members and non-member farmers in the operation area, and collecting the water charges agreed with the irrigation agency. The responsibilities also include establishing the operation and maintenance fund, and maintaining and repairing, in a satisfactory manner, all the field channels, field drains, minors, subminors and distributaries, together with the structures thereon in the operation area of the WUA. In addition, the WUA may be responsible for the maintenance and repairs of any equipment and machinery transferred to it. Such equipment and machinery may be transferred to the WUA as part of the irrigation system for which it is now responsible, or may be separately leased by the irrigation agency to the WUA at an extra cost.

The WUA would also be responsible for the security of the infrastructure transferred to it, and such responsibility could either be carried out by the members of the WUA themselves, or through hired labor. Maintenance would usually include silt clearance and removal of weeds from all water courses under the WUA. It would also include earthwork to restore banks and repairs to other structures, in addition to maintenance of service roads. Usually minor repairs are carried out by the WUA and major repairs by the irrigation agency. Definitions of what is "minor" and what is "major" should be included in the transfer agreement (repairs to damage caused by natural disasters such as heavy rains, floods or earthquake are usually considered major repairs). The WUA may be required to prepare an annual maintenance program for the irrigation system under its responsibility, including any machinery and equipment, and to submit such program to the irrigation agency for approval prior to implementation. Operation and maintenance of the irrigation and drainage system, other than the one transferred to the WUA, would continue to be the responsibility of the irrigation agency.

The agreement would authorize the irrigation agency to suspend supply of water to the WUA if maintenance and repairs were not being carried out properly, or to carry out the repairs itself and recover the cost from the WUA. The agreement would also include provisions on how disputes between the WUA and the irrigation agency, arising in the course of the operation and maintenance of the transferred irrigation system, would be settled. Such disputes could be referred to a committee comprising one representative from the irrigation agency and the water users' federation.

(vi) **Termination of the Transfer Agreement:** Although the enabling law may include provisions on the termination of the transfer agreement, usually more detailed provisions are included in the transfer agreement itself. The agreement terminates after expiry of the number of years specified in the transfer agreement, which may be as high as twenty years as in Mexico. However, the agreement would usually be subject to renewal for another similar period. Moreover, failure by the WUA to comply with the provisions of the agreement, including the failure to properly operate and maintain the irrigation system transferred to it, or to make timely payment of water charges, or to take corrective measures within a specified period of time, as agreed with the irrigation agency, would give the irrigation agency the right to terminate the transfer agreement.

4. CHAPTER-4: ORGANIZING PROCESSES

PIM implies the establishment of an organization of water users. In cases of management transfer, the establishment process focuses on a level of user organization where no organization presently exists, that is, at a level of the irrigation network previously managed by the government irrigation agency. Typically this entails organizing federations of user groups at the tertiary level under a secondary-canal association. The challenge of creating a new organization of users is perhaps the most central feature of the management transfer process. The act of management transfer from the agency to the users depends upon a user organization that is capable of assuming those management responsibilities.

Before any organizing of the users is carried out, there needs to be a package of incentives in place for both the users and the agency staff whose jobs would be affected by the transfer program. Such incentives are needed both to make the program work, and to maintain credibility with farmers whose long-term support will be required. If organizing is attempted before an adequate incentive structure is established, the transfer program could well collapse, thus setting the entire program back by several years, as well as causing short-term hardships to those concerned. Thus, if the incentives are not clear and attractive to farmers, the organizing process should be delayed until the incentives are clarified.

First determine:

I. Who will do the organizing?

II. What training do the organizers need?

III. Who will provide the training?

Then,

The organizing steps for transfer of management to users

4.1 WHO WILL DO THE ORGANIZING?

The first step is to decide on the type of organizers who will work directly with farmers in helping establish the organization. [We use the term "water user association" (WUA) to refer to this new organization, although the term, "WUA" can also refer to organizations at the tertiary level of the system which have always been outside the management control of the government irrigation agency.] In the Philippines, a special cadre of social organizers was recruited and trained by the National Irrigation Administration in the late 1970s and early 80s. These organizers were mostly social workers or social scientists selected for their ability to work easily with farmers in village conditions. They were trained in irrigation management so they could better understand the technical problems of the farmers they were trying to organize.

The work of the Philippines social organizers was effective, yet this approach has not been widely replicated by irrigation agencies in other countries. The investment and bureaucratic difficulties involved in recruiting new temporary staff from a different discipline has led many irrigation agencies to try other approaches. In Mexico's transfer program, the National Water Commission's own staff were used along with staff from a sister agency, the Institute for Water Technology (IMTA). In addition, a few consultants were brought in on a case by case basis. In India, some state irrigation departments have relied on extensionists from the Agriculture Department under the Command Area Development Program. Also in India, several NGOs have been involved in organizing, at the request of the irrigation departments. But the organizers

of choice, for most irrigation agencies, will be their own field staff. These staff are already within the bureaucratic structure of the agency, so the lines of authority are clear, there is little additional expense involved, and these staff are already familiar with the physical systems and with the local farmers.

The problems with using irrigation agency field staff for organizing work, however, are considerable. These staff are not necessarily interested in organizing farmers, They have not received any prior training in social work (in most cases), and their superiors have also no training (nor interest) in these tasks. These would-be organizers must be re-trained for their organizing tasks, and just as importantly, their job assignments need to be re-defined to reflect their new role. In addition, their superiors need to be trained and re-oriented so they understand and appreciate the new role to be played by their field staff.

4.2 WHAT TRAINING DO THE ORGANIZERS NEED?

Assuming that agency staff will be used for the organizing, and assuming that their professional training has been in irrigation engineering, they would need to be re-tooled as organizers. First of all they would need a thorough understanding of the rationale for PIM, so that they can present a clear message both to the farmers and to their own colleagues within the irrigation agency. Secondly, they will need training in communication skills (including listening skills) for effective interaction with the users. Thirdly, they will need training in social analysis, including an understanding of social stratification (by caste, ethnicity, or class), kinship, patron-client relations, labor relations, religious factors, political affiliation, land tenure (tenants, share-croppers, owners), etc. And fourthly, they would need training in methods for gathering information from farmers (e.g., participatory rural appraisal) and in methods for organizing farmers.

4.3 WHO WILL PROVIDE THE TRAINING?

Irrigation management training institutes?
universities?
administrative staff colleges?
NGOs?

- What capacity building do these organizations need?

skills training: TOT course on PIM?
structural change in the organization itself? (IMTI case)
financing?
new or clarified mandate?

Building support for capacity building may require training and consensus building at political levels, just to provide an enabling environment for the PIM program to get started.

4.4 ORGANIZING STEPS

Note: This assumes there are reasonable incentives for farmers to take over system, and for the government irrigation agency to hand over the system; if not, go back and work on the incentives!

- Organize the organizers: Arrange for supervision/support for the organizers, and clear lines of communication with Departmental staff responsible for the overall project (Ensure that PIM component of program is well integrated with rest of project).
- Meet the farmers and other irrigation stakeholders / Discuss plans formulated during participatory design phase:
 - village head
 - local administrative officials
 - local political leaders (MLAs/MPs)
 - leaders of other farmer organizations (producer cooperatives)
- Identify key power relations among farmers; develop strategy for organizing
- Establish provisional boundaries of the system (through consultation with key power brokers among the farmers); conduct inventory of potential members; draw map showing command area and irrigation system.
- Arrange series of meetings between farmers and Departmental field staff to discuss improvements that need to be made prior to handover.
 - arrange canal walk-through to discuss specifics of design/infrastructure improvements
 - discuss general terms of WUA contracts
- Arrange farmer visits to other associations to discuss with those farmers (and invite those farmers to visit new association).
- Organizational Assistance:
 - Help prospective WUA leaders arrange farmer meetings to discuss plans
 - Help formulate/revise by-laws
 - Advise on elections/selections
 - Assist with legal registration
 - Arrange management training for WUA leaders
- Arrange meetings between WUA leaders and Department staff to discuss details of WUA contract and terms of transition phase leading to hand-over;
- Advise on staff recruitment(?)
- Assist with formal hand-over
- Visit periodically to monitor WUA's performance

5. CHAPTER-5: REORIENTING AGENCIES

Agencies implementing PIM need to reorient themselves to a new style of water and infrastructure management. No longer is the agency the sole manager of the water system; rather, the agency staff become management partners with farmers. The agency retains control over the water supply and headworks (in most cases) and perhaps the main canal network. Their management must be closely coordinated with the management of the lower levels of the system, now under the control of user associations. Under this new arrangement, the agency has both a direct management role (for the highest levels of the system) and an indirect management role -- facilitating and supporting the work of the user associations.

- **Restructuring the Irrigation Agency**
- **How agencies do NOT Change under PIM**
- **Facilitating and Hindering Factors**

5.1 RESTRUCTURING THE IRRIGATION AGENCY

Even without an explicit PIM program, changes over the past two decades in the irrigation and water policy context clearly point to needed changes in agency roles and functions. Irrigation agencies are being forced -- by citizen concern as well as by the conditions imposed by international financial organizations -- to pay a great deal of attention to social and environmental impacts of irrigation activities. These have become important aspects of project assessments in the 1980s (see Box). Similarly, as user participation has gained importance, irrigation agencies have had to re-evaluate their roles and functions with respect to irrigation development and management.

Incorporating PIM requires a range of new functions and new organizational structures for the irrigation agency; it must shrink and shift to make room for user management. It must shrink in staff and functions, and it must shift from directly doing O&M to indirectly supporting O&M within the user managed level of the system. Specifically, changes in agency roles require the agency to perform new tasks as explained below.

- **Revised Structure.** At least some field-level staff of the agency, and perhaps most field staff, would be replaced by the new staff of the WUAs. As a general rule, higher level staff of the agency would be less affected by the transfer of O&M responsibilities.
- **Consultation.** Staff in the various functional departments of the agency need to commit to and gain expertise in farmer consultation.
 - for those staff in planning and design, PIM implies a consultative step that would provide farmer inputs into prioritising system improvements, selecting designs and layouts, and determining outlet locations. On the part of agency staff and their consultants, consultation with farmers for planning and design requires listening skills and an ability to present technical details in simple language. It also implies the flexibility to change plans and designs based on farmers' suggestions.
 - for O&M staff, PIM implies the ability to respond to feedback on system performance from water users. Field staff would need to reorient themselves from carrying on as operating engineers to performing

advisory functions -- a role in which they may have little experience or expertise.

- **Accountability.** The accountability of irrigation staff increases considerably with PIM and the formation of WUAs. Both the agency and the WUA need to maintain accurate records of water delivery (planned and actual) to ensure that the agreed amount of water is delivered/received. Where PIM is introduced at the survey and design stage itself, information on initial designs and comparative costs would have to be shared with water users. The importance of shared information increases significantly with PIM, since now agency staff are not only providing information "upwards" to their bosses but also "downward" to their clients, the managers of the WUAs.
- **Advisory Services.** Agency staff need to reorient themselves to extend technical and managerial advice to water users. PIM is effective only when informed water users participate knowledgeably in the planning, design, construction and management of irrigation systems. In Egypt, where water users are organizing themselves around a common pump at the head of the tertiary canal, the Ministry of Public Works and Water Resources has established an Irrigation Advisory Service to extend assistance to WUAs.

5.2 HOW AGENCIES DO NOT CHANGE UNDER PIM

Many of the irrigation agency's core functions continue after PIM is introduced. In most cases of PIM, the public irrigation agency maintains the legal responsibility for overseeing the wise use of the irrigation facilities. Under most contracts, the WUA is managing these facilities for a set period of time (25 year concessions in Mexico). Cases of outright privatisation -- where the government agency permanently sells or cedes the ownership of the infrastructure to a WUA -- are very much the exception. Thus, the public irrigation agency has not only a right but an active responsibility to regulate, for example, groundwater levels and soil and water quality.

Management functions also continue, with the agency maintaining responsibility for the headworks and (usually) main system. The agency also has a monitoring role in ensuring that the WUA is adhering to the contractual agreement of management transfer, and is properly maintaining the infrastructure and adequately delivering water to the WUA members.

5.3 FACILITATING AND HINDERING FACTORS

Incentives within the agency are often opposed to the establishment of strong WUAs. Organized users pose a threat to the agency's control and to the endemic problem (in many countries) of bribes and kick-backs on contracts. Management transfer programs which aim to expand the role of WUAs threaten the jobs of agency staff. And the task of mobilizing the formation of WUAs becomes an added responsibility for these same staff, and not a task in which they have either professional training or interest. Finally, because irrigation agencies are engineering organizations, the professional rewards and recognition are in design or construction of physical schemes, not in dealing with farmers' demands.

Given this situation, which naturally varies considerably from country to country, how could PIM possibly gain a foothold? How can an agency transform its own management culture? There are a number of tools for doing this:

- **Performance evaluation criteria:** Including work with WUAs in the job descriptions and performance evaluations of agency staff is one way to create incentives for PIM. Supervisors (whose own job descriptions also need to

incorporate PIM criteria) need to monitor their subordinates' performance in working with WUAs, and request feedback from farmers on how helpful staff members are. Publicizing the performance plans of agencies among users may strengthen agency and staff accountability. While the number of associations registered is relatively easy to measure, it is not an adequate indicator of staff performance with WUAs because it does not take into consideration how well the WUAs and joint management work. Fee collection rates from farmers or from WUAs may provide a better indicator of farmer satisfaction.

- **Monetary and non-monetary rewards:** Monetary rewards are often difficult in the context of civil service regulations. In some cases, where the agency is an autonomous corporation, a reward system may be possible. The National Irrigation Administration, a semi-autonomous agency in the Philippines, was able to offer higher than regular civil service salaries to its staff. However, this was contingent upon maintaining a balance between expenses and cost recovery, which gave staff an incentive to work with WUAs to reduce agency costs and raise irrigation service fees. Non-monetary rewards can also provide a powerful motivator for agency staff. In Nepal, a special medal was awarded to an Irrigation Department engineer who had made extraordinary efforts to establish a WUA. Some already motivated staff will derive job satisfaction from challenging new tasks such as WUA organization, provision of technical assistance, monitoring and regulation, rather than routine O&M. But the agency's management must provide clear and consistent signals that such new roles are valued.
- **Reduced transaction costs.** Reduction in the number of conflict cases (or "hassle factors") to be resolved by the agency staff has also proved to be a valuable incentive for working with WUAs. The establishment of WUAs as an organized forum for communication can reduce the transactions costs for agencies and for farmers. Reduction in damage to structures, as farmers focus on protection of system facilities eases the burden placed on agency field staff. Thus staff may have to devote less time to field inspections and user management often results in greater vigilance over infrastructure and fewer complaints. Thus, there may be less need to deal with individual farmer demands as WUAs take on additional roles. In Chile, problems with the state management of irrigation are no longer "politicized" by farmers since users' associations and organized forums for articulation of problems have been established.
- **Skills Training.** Preparation is needed for two types of activities that could result from the introduction of PIM:
 - Activities dealing with user participation, including farmer organization, WUA establishment, technical assistance for WUAs, fostering agreements with informal and formal WUAs, public communication and information etc.
 - Activities that can be taken up by agency staff as a result of water users assuming a larger role in irrigation O&M thus freeing up time and resources for the agency.

Agency management will have to formulate a program of short and long term training to prepare the staff for changes in roles and functions and upgradation of expertise. It may not be possible to meet all needs through training of available staff. New staff may have to be inducted into the agency. Secondment from other departments of government, from universities or NGOs may also be

considered. For instance, in Egypt, the Ministry of Public Works obtains the services of agricultural extension staff through secondment from the Ministry of Agriculture. In Philippines and in India, community organizers are hired as consultants and contract staff.

6. CHAPTER-6: FINANCIAL ASPECTS

O&M can be financed directly (through a direct tax based on O&M costs) or indirectly through land taxes or other kinds of agricultural taxes. The relative share of government vs. farmer contribution varies dramatically across countries, with some countries using O&M as a vehicle for delivering subsidies to irrigated farmers.

- How to set O&M cost
- User participation in defining service levels
- Assessing users' willingness and capacity to pay
- Determine appropriate charging mechanisms
- Linking fees and services

6.1 HOW TO SET O&M COST

The managing agency needs to identify the various services it provides through the water delivery and drainage systems under its management control and then allocate costs to each service category. This information should be made freely available to farmers, and to their WUA leaders. Such information helps WUAs understand the respective contribution of government and farmers and helps the WUA determine which functions it might take over from government, and which functions it might prefer to pay government to provide. An aspect of the cost determination activity is the separation of "staff or administrative" costs and "works or program" costs. A clear rationale for the two types of costs is important in justifying the irrigation service fees which farmers are expected to pay. This is equally true for the water fee payable to the government agency, and to the fee payable to the WUA.

6.2 USER PARTICIPATION IN DEFINING SERVICE LEVELS

Involvement of farmers/WUAs early in project design to determine the level of service required by farmers is crucial. Users' involvement in setting service levels will ensure the genuine demand for those services, which will be expressed by a willingness to pay the fee required to support that level of service. Some examples of users working with the agency in determining what services the government should provide are given in the following:

- In Mexico, following the transfer of management of irrigation districts to WUAs, irrigation plans are prepared by WUA-hired managers at the level of the modulo, each covering about 5-8000 ha, taking into account cropping plans, conveyance losses, and equitable distribution. These are then negotiated with the national irrigation agency to determine the final allocation, generally based on an arranged demand pattern. O&M costs at the level of the secondary and below are met by user fees managed by the WUOs. In addition, WUOs contribute to a part of O&M costs of higher levels of the system.
- In the Office du Niger, Mali, joint committees have been established for O&M in every region. The committees have 5 to 10 representatives of producers and 5 to 10 representatives of the Office. These committees decide on types of services, costs including procurement matters, and water service fees. They also make decisions on the use of 50 per cent of the user fees collected for O&M.
- In Chile, the national federation of WUOs was consulted in the design of a Bank supported irrigation project. The federation and local WUOs played an active

role in project preparation especially in discussions of service options and costs. Subsequently, the project incorporated the condition of WUO approval for investment proposals and other project components.

6.3 ASSESSING USERS' WILLINGNESS AND CAPACITY TO PAY

The readiness of the user to pay will depend not only on the benefits to be derived, but on the level of payment to which the users have become accustomed. It is in the farmers' interest to pay as little as possible. But it is also in the farmers' interest to receive reliable supplies of water, and for this he will certainly be willing to pay something. In a rehabilitation project in Egypt which is introducing PIM, it has been estimated that users will derive incremental income from the project due to expansion of irrigated area and yield increases and that incremental costs of their participation in irrigation management would amount to about 20 per cent of this new income. Increases in income would also depend on agricultural extension services and these would have to be strengthened to allow farmers derive full benefits from the improved water services delivered by the project.

Financial viability of the WUA enterprise is critical to the sustainability of the organizations and the irrigation infrastructure. It is important to examine the total costs the WUAs have to bear, including staff, materials, travel to meet with government officials, and formal and informal payments that must be paid to government agencies. If the level of fees members must pay to meet these costs (which are often in addition to continued payments to the government) is too high a portion of gross or net income from irrigation, the WUAs are not likely to succeed. This is particularly problematic for pump irrigation systems, in which high energy and maintenance costs exceed what the organizations are able to collect from farmers.

In some cases, WUAs must depend on income from other sources to subsidize their irrigation activities. For instance, some irrigation districts in the Western United States rely on revenue from power sales to balance their irrigation budgets.

6.4 DETERMINE APPROPRIATE CHARGING MECHANISMS

There are a number of alternative charging mechanisms available to agencies and WUOs in structuring O&M fees. As a principle, the fee structure should be equitable, administratively simple, and easily understood by both users of a particular service and the staff that will administer and collect the fees.

- *User fees.* Generally, user fees are charged by area irrigated. The advantage of this method is that it is relatively simple to understand. However, it does not reflect the quantity of water used nor does it provide an incentive to conserve water. Volumetric charges address those concerns. However, there are many measurement difficulties in operationalizing this method in the field. Agencies often favour a combination of the two methods. In Mexico, for instance, the agency charges the WUAs volumetrically at the turnout of the secondary canal. In turn, the WUAs base their water charges to individual members on area irrigated and type of crop. In addition to unit area and volume, WUAs have also resorted to other bases such as charges for the entire season which clearly favour the high volume user. The design of irrigation fees should be a topic in WUA training programs so farmers understand the implications of various modes of charging user fees for efficiency and equity.
- *Property tax.* This is a charge based on the value of the land receiving the service. Irrigation and drainage enhance land value. The higher the land valuation, greater the service payments. The problem with this method is that generally land taxes are collected by the Treasury and are not transparently

linked with irrigation services. Also, the valuation and revaluation process demands a great deal of administrative resources.

- *In-kind contributions.* Contributions of labor, materials or both by the benefiting farmers towards O&M reduce the cost of services. In Viet Nam, the provincial and national governments finance schemes down to 150 ha for new irrigation development. Below this level, farmers must build the channels, with the government providing support for survey and design, as well as materials in some instances. After schemes are completed and taken over by farmers, each member must provide up to 20 person days per year towards maintenance of the tertiary as well as secondary systems.
- *Replacement of Assets.* A significant cost in irrigation services is depreciation of the asset base used to store, transfer and deliver water services to users. Facilities employed range from minor tools and equipment, buildings and housing, motor vehicles and heavy equipment, canals and drains, pumping stations, and where applicable, major structures including dams. Unfortunately, depreciation costs are usually neglected in estimates of cost of water services whether provided by irrigation agencies or by WUAs. Assets are consumed at different rates and each year, a significant non-cash value is "lost" as assets depreciate, even with adequate maintenance. Without proper maintenance, service life will be shortened and depreciation will accelerate. The agreement between the irrigation agency and the WUA includes O&M standards to be maintained. Provision is also made for collecting and retaining disaster funds by WUAs. In Mexico, the Hydraulics Committee at the district level approves the annual O&M program proposed by the WUA.

Care of assets is vital to the sustainability of water system performance. Maintenance and the ultimate replacement programs for all assets need to be planned and implemented in an effective and economical manner. In parts of Vietnam, the estimate of costs of services (and hence of user fees) include provision for depreciation of assets. Adequate data about the location, age, condition and serviceability of all assets is therefore essential to this process. WUAs need to be trained and assisted in preparation of an asset inventory and in the formulation of a maintenance program.

6.5 LINKING FEES AND SERVICES

An obstacle to user contributions is the perception that their payments are not linked to the irrigation agency or its services. Often, money for services is collected by the central revenue department, and from there funds are allocated in the various government agencies, including irrigation, with little link between revenue earned and costs of service provision. To reverse this process, the money cycle must be transparent.

Ideally, WUAs would collect O&M fees and manage the system under their control and pay a service fee to the agency for that portion of the system under the agency's control. Under this arrangement, the agency and the WUA agree on mutual rights and responsibilities and the WUA is completely responsible for management of water, infrastructure, and finances for a part of the irrigation infrastructure.

If users are to pay service fees with the government managing the system, fee collection is preferably done through the WUAs. The Philippines experience has shown that fee collection is far better in systems where WUAs are organized and where they have a role and incentive for collection. For instance, in the pilot projects in Maharashtra, India, WUOs are allowed to retain a proportion of collections as a bonus. The cost of collection by WUAs is lower relative to government agents. Sanctions for

non-payment by individuals are easier when enforced by WUAs. The danger is that considerable time and energy are devoted to fee collection on the part of the agency staff as well of the WUAs and fees rather than reliable water services becomes the focus of management attention.

Where users pay service fees to the managing agency, fees are a good means of signaling satisfaction with services, as in the case of Indonesia. Such information is publicized and used for evaluation of agency services and management. In any case, transparent accounts and audits are fundamental in showing WUA members that the financial management of the organization is sound. General body meetings of the WUAs must discuss financial performance including the accounts and audits.

7. CHAPTER-7: WBI TRAINING PROGRAMME

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 cap-able of handling large modern projects requiring heavy capital in-vestment, complicated-ed 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 infra-structure. Yet some of these same systems show dramatic improvement when their management is transferred to water user associations (WUAs), which enter into contracts with the government for operating and maintaining portions of the sys-tem or in some cases entire systems.

Since the mid-1980s, countries including Mexico, Turkey, Indonesia, Philippines, Colombia, India, Srilanka, and Nepal have adopted policies to en-courage greater management participation by water users. One of the most dramatic management transfer programs has been in Mexico, where the government adopted a policy to gradually transfer all its large scale irrigation districts to 78 WUAs. As of mid-1993, the management of more than 1.2 million hectares (ha) of irrigated land has been transferred to WUAs.

In response to interest in participatory irrigation management expressed both within the World Bank and in a number of borrowing countries, the World Bank Institute of the World Bank has initiated a five-phase program on participatory irrigation management (PIM). The overall purpose of WBI's program on PIM is to stimulate high-level policy dialogue on participatory irrigation management within the country, leading to policy commitment and programmatic action.

The PIM training program has thus far been initiated in India, Pakistan, and Morocco. Several other countries, including Egypt, Indonesia, Nepal, and several African countries are anticipated to join the program during 1996. Selection of countries is based on the relevance of participatory irrigation management to ongoing or planned World Bank loans and on the level of interest ex-pressed by the host country and the concerned operational division.

For each country where it is offered, the program entails a series of three seminars (Phases 1-3) with the potential for further involvement in implementation (Phase 4) and evaluation/dissemination (Phase 5). The five phases are as follows::

- Phase 1** A national seminar to introduce policy makers to the implications of PIM, consolidate national experience, learn about best practices from other countries, and formulate an indicative action plan for enhancing participation in the irrigation sector;
- Phase 2** An international seminar held in a model country for PIM where participants can visit field sites to learn directly about the host country's experience and compare experiences with other participants;
- Phase 3** A follow-up national seminar to formulate a national action plan for PIM;
- Phase 4** Special-purpose seminars and/or training assistance to help support the implementation of a national PIM program; and
- Phase 5** Support for evaluating national PIM programs and disseminating lessons learned to other countries.

Style and Methods

The seminars in phases 1-3 are designed to encourage the active participation and open discussion of all participants. Each seminar has the very practical goal of drafting an indicative or revised action plan for implementing participatory irrigation management. Presentations from international and national cases, and in particular the field visits, provide ideas to consider for including in the action plan. Much of the real work of the seminar is done in con-current small group sessions where participants focus on a specific topic and discuss ideas in terms of their relevance to national conditions. The ideas that emerge from the small groups are presented to the plenary session for further discussion and possible incorporation into the indicative action plan.

Sponsorship and Cost-Sharing

Program activities are co-sponsored by WBI and one or more host country organizations, agencies, or ministries. The national co-sponsor normally covers all expenses for national participants (including air travel in the Part-II international seminar), with the understanding that funds can be drawn from ongoing World Bank loans. WBI generally covers the costs of international resource persons.

For More Information...

For more information regarding the seminar series on participatory irrigation management, please contact:

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