



## Participation in the Irrigation Sector

*The irrigation sector provides a rich source of experiences and lessons in user participation. Participation by farmers in system design and management helps to ensure the sustainability of the system, reduce the public expenditure burden, and improve efficiency, equity and standards of service. Mobilizing support at all levels and establishing the participatory process, however, involves costs; it also demands knowledge of the incentives facing each group of stakeholders, and of the essential elements in building effective users' organizations.*

### Benefits

Efforts to increase user participation have been spurred by the poor performance—in terms of efficiency, equity, cost recovery and accountability—of many large scale irrigation systems managed by government agencies. Greater participation by farmers, through water users' associations, has helped to overcome many of these problems.

### System Performance

The overriding reason for increasing participation in irrigation is to improve system performance. Clear gains in efficiency and in the standards of service are achieved when design and management of the irrigation system are transferred to farmers. System design benefits from local knowledge. And farmers have the means and incentives to minimize costs and improve services. For example, irrigation user associations can reduce labor costs by paying lower wages than government agencies; local farmers can provide closer supervision of staff than distant agency supervisors; and breakages and waste are reduced when farmers feel a greater sense of ownership. In Senegal, for instance (Box 1), electricity requirements were reduced by half. Ultimately, as a result of more timely water delivery and repairs, farmers' yields are higher. In the Philippines (Box 2), dry season rice yields increased by 12 percent and farmer net income by 50 percent.

### Public Expenditure

One of the most noted effects (although this has nothing to do with farmers' motives for participation) is the reduction in government staff and expenditure requirements, due to farmer management and contributions of cash, labor and materials. Farmer associations have proved more effective collectors of user fees than government agencies. It is not unusual for farmers to be willing to pay more than the original user rates after transfer of the system to their control. However, increased collection of fees does not motivate farmer participation. Participation must also result in direct benefits to participants.

### Sustainability

Building irrigation systems which are wanted, supported and owned by users themselves provides the best assurance of sustainability. Physical and fiscal sustainability of the irrigation system beyond the project is enhanced when operation and maintenance costs are met from user fees rather than high levels of government subsidy.

### Equity

More equitable organizational arrangements and water delivery have been noted when participatory approaches are followed. A contributing factor is the socioeconomic status of the leadership, which tends to be closer to that of

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*Dissemination Notes represent the views of their authors and are not official publications of the World Bank.*

**Box 1**  
**Senegal - Creating Incentives for Farmer Participation**

Early efforts in Senegal to transfer irrigation system management to farmers by establishing village units showed little success because of unclear plans, timetables, and provisions for transfer, and because of the failure to provide control or incentives for the farmers.

Recognizing these problems, the 1990 Bank-assisted Irrigation IV Project required total transfer of operation and maintenance (O&M) to farmers as a precondition for financing rehabilitation works. Getting farmers to agree to take over these systems required considerable negotiation, particularly because they perceived existing irrigation fees as too high, let alone the additional costs and responsibilities of covering full O&M.

Increasing the control of farmers over irrigation services was the key factor which convinced them to agree to assume responsibility for system management and cost recovery. Farmers demanded the right to hire their own staff, choosing agency operators only if they had performed well, and even then reducing their salaries from the full civil service package. Following the transfer to farmers of ownership of rehabilitated operating systems with their infrastructure, agency staff would be allowed to enter the schemes only with farmers' permission. To improve farmers management capacity, manuals were prepared for each system; and training in basic literacy as well as technical and financial skills for organizational leaders was incorporated. Farmers were willing to pay at least part of the training costs.

Although the long-term sustainability of the project is difficult to assess at this stage, the accomplishments to date are impressive. Before the transfer, assessed fees covered only 17 to 21 percent of maintenance and replacement costs, and less than a quarter of these were actually collected (Nguyen, 1994). As a result, maintenance suffered, electricity often was not paid for, and system reliability was very poor. After the transfer, farmers paid fees four times as high, covering full O&M and a replacement fund for capital. The benefit to the farmers was greatly improved irrigation reliability. Moreover, because they were able to monitor the pump operators and had an incentive to save on energy costs, electricity requirements were reduced by half. Savings to the government included huge reductions in agency staff costs, as farmers took over functions.

the ordinary member, involving more tenants and small farmers than in non-participatory systems.

**Spillover Effects**

The transformation of water users from beneficiaries to partners in irrigation development can have a widespread impact, as farmers become trained and organized. It can increase local capacity to coordinate input supplies, for example, and to deal with other government agencies involved in rural development.

**Costs and Risks**

Establishing user participation involves costs in mobilizing field staff, training and organizing farmers and carrying out socioeconomic research. However, these additional costs are usually offset by subsequent savings in construction costs and higher loan repayment rates.

A bigger problem can be the additional time needed to establish a participatory approach and get the project off the ground, especially in the absence of existing local institutions for cooperation. Developing farmer organizations is often a slow process, less under the project's control than constructing dams or delivery

structures. Once the participatory approach has been established, however, it is not unusual for participation actually to reduce the implementation period. The kinds of problems which typically delay the implementation of non-

**Box 2**  
**Evidence from the Philippines**

The first and best documented nationwide program to build in participation as a cornerstone of irrigation policy occurred in the Philippines. Beginning with a pilot project in 1976, the approach was expanded in 1980 to cover all communal systems, and even extended to large scale national irrigation systems. The National Irrigation Authority has evolved from an agency primarily concerned with construction to one committed to developing and supporting the management capacities of farmer irrigation associations.

A 1993 study of three irrigation systems reported substantial improvements in performance after ownership and management responsibility were transferred to farmers: collection efficiency for service fees increased from 45% to 74%; recurrent maintenance costs were reduced by 60% and personnel costs by 44%; dry season rice yields increased by 12%; and, taking costs and labor contributions into account, farmers' net income increased by 50%. These gains were most dramatic for tail end farmers who saw major improvements in water delivery.

participatory irrigation projects—such as difficulties in negotiating rights of way, or obstruction by farmers or local politicians—may be avoided or solved through effective participatory processes.

## Conditions for Success

### Mobilizing Support

User participation changes but does not eliminate the role of government agencies in irrigation development. Building support from policymakers and agency staff as well as farmers and other water users is essential for successful participatory projects and involves paying close attention to the incentives relevant to each group. The greatest receptivity to participation is often found in crisis situations, as was the case in Mexico (Box 3), when management problems or revenue drains are most apparent.

In building the confidence of policymakers and senior agency staff, pilot projects have been used effectively to demonstrate the capacity for

farmer management, the potential improvement in system performance, and potential saving in government expenditure and improvement in cost recovery rates. Building alliances with supportive individuals in government has been facilitated by participatory economic and sector work, by enabling task managers to spend several years working in a country, and supporting them with good social analysis.

Project implementation rests ultimately with agency staff. Internalizing support for participation within irrigation agencies often involves structural changes, to link agency budgets firmly to farmer contributions instead of government allocations, and to promote a more service oriented approach. Since agency staff typically come from engineering backgrounds and are not oriented toward dealing with farmers, incentives for them to support farmer participation need to be backed up by training programs. Study tours to farmer managed irrigation districts can be particularly effective, not only for their demonstration effect but also

### Box 3 Mexico - Rapid Change in a Crisis Situation

Mexico experienced rapid and widespread incorporation of user participation in the irrigation sector. The objective was to make the national irrigation system financially self-sufficient as well as to obtain full cost recovery over time for major works already constructed. The cornerstone of this policy was the transfer of irrigation management to Water User Organizations.

Crisis situations in irrigation system financing and management provided the impetus for sweeping changes. By the end of the 1980s, an estimated 1.5 million ha (out of 6.1 million) of irrigated land went out of irrigated production because of lack of funding for completion of infrastructure and operation and maintenance (O&M). Bank management was influential in pointing out the need and direction for change, and the Bank provided a loan (co-financed by the Inter-American Development Bank) for the Irrigation and Drainage Sector Project. The three pillars of this project were decentralization and transfer of irrigation districts to Water User Organizations, self-sufficiency in fee collection to cover full O&M costs, and efficiency in budget allocation.

The transfer is done in two stages. The first gives producers, organized in Water User Organizations (covering 5,000 to 18,000 ha), responsibility for operation and maintenance of large lateral canals and drains. In the second, these organizations take responsibility for the main irrigation and drainage canals and the machinery and equipment required for O&M through the creation of an enterprise or *Sociedad*. Farmer groups are set up as organizations, rather than less formal associations, so that, under Mexican law, they can operate as legal entities and obtain loans. These organizations are meant to become financially self sufficient through collection of water charges. Each organization hires a professional team to carry out O&M, including a manager and a group of water masters (one for approximately 3,000 ha) and a chief of maintenance (all graduate engineers) as well as their support staff.

To educate farmers about the changes and convince them to support the program, Mexico relied heavily on mass media campaigns prepared by communications specialists from FAO, along with universities and industry. These were followed by detailed training of the staff of farmer organizations in, among other subjects, computer applications and use of maintenance machinery. Districts in the best financial condition were transferred first (after deferred maintenance was done) to ensure a successful start and build confidence.

The process of transferring management to farmers already has exceeded targets. Since 1991, thirty-three irrigation districts covering 2.3 million ha have been transferred, and an additional eleven are in process. O&M cost recovery rates have increased from 18 to 78 percent.

in raising the prestige of participation, exposing staff to new possibilities and creating a bond amongst participants.

The strongest opposition to farmer participation is often encountered at the field technical level, especially where civil service unions are strong. When field staff perceive the proposed changes as a threat to their jobs and livelihood, these vested interests can retard or even sabotage participatory projects. Clear directives are needed from policymakers, supported by performance measures linked to bonuses and promotions, to encourage greater accountability to the farmers. The new ethos can only develop gradually. Sudden cuts into the status quo should be avoided and the composition of staff allowed to change gradually.

### **Building Effective Farmers Organizations**

Teams of trained specialists acting as community organizers have proved to be the most successful catalysts in participatory irrigation projects. Wherever possible, existing organizational capacity should be built upon, as in Nepal (Box 4), for example. In cases of very hierarchical social structure and inequitable distribution of assets, it may be unrealistic to expect fully democratic local organizations. To control vested interests, the varying incentives of different categories of farmers should be identified and accounted for in project design (for example, in defining water rights), along with the resulting problems of achieving collective action.

Appropriate incentives are needed if farmers are actively to support the user associations which are essential channels for participation, and to assume the additional costs in time, materials and fees (as experience in Pakistan has demonstrated). The most important of these incentives are improved irrigation services, and a voice in management decisions through a user organization which is fully accountable to its members. The support of farmers is most likely to be sustained, and organizational capacity developed, when they are involved from the beginning in decisions on system design, and when their organization has full ownership and management control of the system. It is essential, for example, that specialized staff be selected by and accountable to the farmer organization, even if they have been trained by government agencies.

To be successful, farmer organizations must interact constructively with government agencies and technical experts. This relationship works best when consistent rules and procedures are established, and supported by government regulation, for the turnover of responsibility to farmers throughout the project or sector. Building the necessary organizational capacity for this turnover involves training farmers for a variety of new functions, from basic literacy, accounting, how to hold meetings, and how to deal with agencies, to legal regulations, and possibly even computer applications, as well as water management and operation of equipment.

Fundamental to meeting all these conditions, a strong and transparent legal framework for the organization is needed from the outset, providing farmers with rights and benefits as well as duties and responsibilities. This framework should also be flexible enough to allow farmers to evolve their own organizational structure, and to permit the organization's responsibilities to grow in line with its capacity.

#### **Box 4**

#### **Nepal - Building on Traditional Strengths**

Nepal has a long tradition of direct farmer participation and cooperation in irrigation development. About 70,000 farmer managed irrigation schemes, ranging in size from very small to thousands of hectares, account for 70%-80% of the country's irrigation. In general these systems achieve high levels of performance over long periods of time without government cost or involvement. However, such systems are frequently damaged by landslides and floods beyond the capability of farmers to repair alone, and most can be improved substantially with modern materials and construction techniques.

The Bank's Irrigation Line of Credit (ILC) was designed to assist these schemes by building on the farmers' traditional capabilities to organize and cooperate together. To participate under the ILC, farmers had to form legal Farmer Irrigation Associations, agree ahead of time to contribute to capital costs, pay full operation and maintenance costs, and maintain full control and responsibility for all decisions regarding their irrigation schemes. Such stringent requirements had never been attempted before under a Bank project in Nepal. But in practice these requirements simply formalized the farmers' traditional mode of irrigation development and provided an avenue for Bank assistance which would strengthen rather than destroy the traditional farmer institutions. The ILC approach proved highly successful, has become strongly demand driven, and is now being expanded to government managed projects.