Farmer participation experiments also occur in Sri Lanka, where experience with modern irrigation systems are less glorious than the ancient irrigation traditions would suggest. Water was first issued to what was then the country’s largest irrigation and settlement project, Gal Oya, in 1951; by 1978, it required massive rehabilitation. A USAID-financed scheme sought farmer involvement in constructing, operating, and maintaining the rehabilitated system. Since then, participation has become a major goal for the government. The potential for improvement is great as was evidenced by the Minipe scheme. In 1978, a combined effort of a Buddhist society, a few dynamic government officials, and farmers resulted in a dramatic increase of water to the tail end. Still, the question remains: will farmers generally be so cooperative?

The privatization of government-built deep tubewells in Bangladesh may add a note of caution to the panacea of farmer participation. CARE helped organize farmer cooperatives to rebuild the distribution system on 63 deep tubewells; the irrigated area was doubled as a result. Similar results were obtained from other projects where farmers were assisted from outside. But can farmers cope with management responsibilities when left to themselves?

The expansion of irrigation has been spectacular, but we have still not learned how to build systems that work the way we say they will. The problem is often planners and administrators who see farmers not as customers but as mules. Engineers complain that farmers are eager “to throw dust into the eyes of authority.” Irrigation professionals refuse to admit that, with all their specialized knowledge, they need the active cooperation of the farmers who will use the system. All around us we see what happens when we rely on technology or impotent laws to impose our wishes on farmers, Capitulation? Giving farmers whatever they want? Nonsense. So government policy limits the amount of water that a farmer is to get? Fine; the engineer can live with that. He tells the farmers that he can do nothing for them unless they can work out a way of enforcing the agreed-upon policy. If a solution can be reached or an institution created, fine: work goes ahead. If no settlement can be reached, too bad; either the policy should be changed or the project should not be attempted. Pretending that the problem does not exist and going ahead with construction only results in wasted money.

**FARROWER ORGANIZATIONS AND IRRIGATION MANAGEMENT: A RECONSIDERATION**

*D. Groenfeldt*

Participatory development, whereby the targeted beneficiaries are encouraged to take an active role in shaping the development that will affect them, has become a popular theme among international donor agencies and private organizations. A generally accepted doctrine in the field of irrigation management says that farmers should play a more active role in local infrastructure management and water allocation, and that this should be accomplished by establishing formal irrigation associations. This policy has been developed with little research on the extent to which farmer Organizations are effective in improving the physical performance of irrigation systems. While cooperation among farmers is the sine qua non of efficient irrigation management, organizing farmers into formal associations is only one means of attaining the requisite cooperation. Alternative approaches involving government management and enforcement might give better results in some situations.

The Need for Cooperation

Managing limited irrigation water at optimal efficiency requires that individual farmers receive less water than they desire so that society as a whole can receive the highest possible returns to investment. With limited supplies, for example, total wheat production will be higher if water is spread thinly over the entire command area than when the same limited supply is concentrated in only part
of the area. The farmer’s interest in wanting enough water for maximum yields is at odds with the interest of the collectivity of farmers, each of whom wants as much water as possible. In order that each farmer gets his fair share, some form of cooperation is necessary. An irrigation system with enough water to support maximum yields is actually an inefficient system. Full water supplies and satisfied farmers are not necessarily indicators of a successful project; they may be symptoms of poorly designed systems whose command areas should be expanded to spread existing supplies more thinly and productively.

Given a water supply at the outlet which is less than the water demand below the outlet, the question of equitable allocation becomes problematic. Farmers at the head reaches can increase their yields by using extra water but this will create serious water shortages for tail-enders, and over-all production within the service area will fall. How can farmers be induced to share a limited supply of water in an equitable fashion? In some cases, head-enders might voluntarily share water with tail-enders in spite of the economic cost involved (e.g., if they are related or recognize mutual social obligations). If voluntary measures are insufficient, coercion and/or legal sanctions might be necessary.

Organizational Alternatives to Promote Cooperation

The appropriate method for encouraging farmers to cooperate depends on the circumstances. In some cases, formal farmer associations may be beneficial but they should not be seen as a blanket solution. A critical factor in evaluating the potential for voluntary farmer cooperation is the history of the irrigation system and of the farmers themselves.

There are three historical situations to consider: first, indigenous irrigation systems built and operated by stable, traditional communities represent situations where farmers enjoy a long tradition of cooperation. While the allocation of irrigation water may not be equitable, farmers follow an accepted procedure and there is little or no need to establish new institutions to promote farmer cooperation. Second, new irrigation systems running through old established farming communities are another situation where pre-existing social and political relationships need consideration before any new organizations are introduced for irrigation management. And, third, farmers in new irrigation systems within new settlement schemes may be social strangers. The socio-economic bonds that link families in stable communities have not yet had time to develop and the level of farmer cooperation necessary for efficient irrigation management can be attained only through government supervision and/or by establishing formal irrigator associations.

Depending on the ability of farmers to cooperate among themselves (which in turn is dependent on their settlement history), one or more of the following approaches might be appropriate:

1. Indigenous organization. If existing social institutions are adequate for irrigation management, a "hands-off" policy is appropriate. Most indigenous systems, as well as some new systems built in stable community environments, would fall under this category.

2. Government management. If farmers cannot manage their irrigation supplies effectively, or can manage only a portion of the system, some government involvement would be required. Nearly all large-scale systems fall in this category, with the extent of government's optimal role depending on the ability of farmers to cooperate informally among themselves.

3. Induced organization. If farmers cannot manage their irrigation supplies effectively, the government may choose to encourage or "induce" their participation in lieu of direct government management. The popularity of this approach is growing, largely because of the experience of the National Irrigation Administration in the Philippines.

While cooperation among irrigators is an economic imperative, the magnitude of such cooperation depends on specific social and historical conditions. These conditions must be considered before proposing an organizational solution to improve local management of irrigation resources.