

Shashi Kolavalli
Consultant Economist, Bangalore, India,
Post Box 429 A, Basavanagudi, Bangalore 560004, India
Fax: 93-80 6602909; Email: shashik@blr.vsnl.net.in

and

Jeffrey D. Brewer
Social Scientist, International Water Management Institute, Colombo, Sri Lanka.
c/o Agrohydrology Research and Training Center, 35660 Menemen, Izmir, Turkey
90-232-831-3565; j.brewer@cgnet.com

Global Themes - Water/watersheds/irrigation
Economics/anthropology

ASSESSING COMMON PROPERTY INSTITUTIONS¹

1. Introduction

While there are numerous cases of successfully functioning traditional common property institutions, building new ones continues to be challenging. This is particularly true where the intention is to make groups of users take on the management of resources which have been under government control. Though there is considerable interest in transferring management functions to users in irrigation systems for example, albeit half-hearted in many countries, organizing the users to take on the functions has been difficult. Effective means for facilitating collective action among the users are yet to be evolved. The thrust of such effort in organizing irrigation users tends to be the deployment of community organizers.

The features which make common property institutions successful are understood (Ostrom, 1990). On the other hand, why some groups are more successful in assuming those features than others is less well understood. Empirical works which focus on individual incentives to participate in collective action fail to explain the situations where collective action does not come forth even in the presence of strong individual incentives. The organizational aspect of collective action relating to costs tends to be ignored in most studies.

In this paper, we focus on the processes in collective organizations with greater attention to costs of working together. In order to examine the role of various factors, we develop a methodology to evaluate the performance of several user organizations. First, we examine the processes involved in developing and maintaining a common property and the choices faced by individuals and the influence of various factors on these decisions. We then develop criteria for the comparison of performance of disparate organizations which work with different objectives and opportunities. The performance of organizations are then rated. These ratings

¹ Paper prepared for the 1998 Meetings of the International Association for the Study of Common Property, 10-14 June 1998, Vancouver, British Columbia, Canada. ¹The data reported here was gathered as part of a study carried out by the Indian Institute of Management, Ahmedabad, and International Water Management Institute and supported by the Ford Foundation.

are then related to various factors hypothesized to contribute to successful collective effort to identify their contributions.

We test some of these hypothesis using information from 21 case studies of water user associations (WUAs) in three states in India. They include various organizations managing various forms of irrigation water resources (Table 1). Some are associations of users served by a minor or an outlet in large surface irrigation systems. Others are groups of users of irrigation tanks or owners of systems to lift water from public irrigation systems or rivers. Some associations have been functioning for nearly 15 years while others were started recently. They are also different in the cultural milieu that they work in. See Brewer et al 1997 for a complete report on the study.

Table 1: Water User Associations Studied

Water User Associations ^a		Type	Source of Irrigation Water	Year Est.	Area (ha)
Brief Name	Full Name				
Gujarat					
Anklav	Sardar Patel Ag. Dev.Coop. Soc.	canal	Mahi-Kadana System	1992	1000
Baldeva	Baldeva Left Bank Water Coop. Society	canal	Baldeva Tank	1993	1100
Mohini	Mohini Irrigation Cooperative Society	canal	Ukai-Kakrapar System	1979	337
Pingot	Pingot Right Bank Canal Coop. Society	canal	Pingot Tank	1990	889
Bhima	Bhima Lift Irrigation Society	lift	Panam Main Canal	1986	157
Maharashtra					
Datta	Shri Datta Coop. Water Dist. Society	canal	Mula System	1989	361
Ozar	Ozar Societies ^b	canal	Waghad System	1991	1151
Shevare	Laxmi Narasimha Coop Water Dist Soc	canal	Bhima System	1991	169
Hadshi	Sri Datta Water Users Coop Society	tank	Hadshi Tank	1992	558
Parunde	Sri Brahamanath Water Users Coop Soc	tank	Parunde Tank	1992	181
Kadoli	Sambhaji Warana Coop Water Dist.Soc	lift	Warana River	1985	240
Phulewadi	Mahatma Jyotirao Phule Coop Society	lift	Panchganga River	1958	1380
Tamil Nadu					
LBP	U10 Farmers' Council ^c	canal	Lower Bhavani Project	1989	2399
PAP	16th Farmers' Council	canal	Parambikulam-Aliyar Project	1992	1557
PK Tank	Pilaryarkulam Tank WUA	canal	Periyar-Vaigai Project	1992	35
PVP	11th Branch Canal Farmers' Council	canal	Periyar-Vaigai Project	1990	1572
Salipperri	Mahilancheri Ch. Salipperri Vill. WUA	canal	Cauvery-Valappar System	1989	120
Vagaikulam	N Kodaimelalagian Land Holders' Assn	canal	Tambraparani System	1960	188
Dusi-Mamandur	Dusi-Mamandur Tank WUA	tank	Dusi-Mamandur Tank	1980	4118
Kedar	Kedar Tank WUA	tank	Kedar Tank	1989	117
PP Tank	Panchanthatgapatti Tank WUA	tank	Panchanthatgapatti Tank	1992	19

Notes:

^a Brief names are names used in the subsequent tables and in the text. Brief names have been derived from system names (e.g. LBP), channel names (e.g. Anklav), or village names (e.g. Phulewadi, Vagaikulam). Some brief names (e.g. Anklav, Salipperri) are well-known in the literature.

^b There are three WUAs based in Ozar Village. We treat them together because they cooperate very closely, to the extent of sharing an office and meeting together. The names are: Banganga Cooperative Society, Mahatma Phule Cooperative Society, and Jai Yogeshwar Cooperative Society.

^c Our study concentrated on the 28L Sluice Association within the U10 Farmers' Council.

We have made some assumptions. First is that the benefit and cost conditions which encourage initial participation also are essential for continued participation of individuals in group effort. We have tried to build a historical account of what transpired, and examined the present conditions noting any changes in conditions. The second is that an assessment of the benefits and costs faced by the majority of members gives an indication of whether the benefits and costs were attractive to a critical number of individuals. These two assumptions enable us to test some of the hypothesis without information on individual participants.

The information used in this study was primarily collected through process documentation throughout a season by research assistants. This information was augmented with visits to these sites by the primary researchers.

2. Common Property

The facilities managed by groups of irrigation users are common pool resources the primary characteristic of which is that it is costly to develop institutions to exclude beneficiaries from them (Ostrom, 1994:2). The reasons for individual inclination to free ride or not contribute could be several. Whatever the motives may be, individuals will hesitate to participate in collective efforts when they do not have assurances about what others will do. Individuals are likely to work collectively when they expect significant benefits and they also have assurances that others will also contribute (Runge, 1986:629). Therefore, the challenge for members of groups wishing to build and maintain common properties is to offer themselves assurances about the behavior of each other.

Common properties are those in which a number of individuals are coequal in their rights (Ciriacy-Wantrup and Bishop, 1975:714). The definition of a property as common is based on institutions; that is common properties are associated with customs and rules for behavior that provide a set of incentives and disincentives for individuals (North, 1986:5&281). Institutions are constraints that individuals place on themselves; they facilitate coordination between people by making it possible for individuals to reasonably predict how others will behave. The basis for building and maintaining common properties is the development and enforcement of these rules.

Collective effort frequently results in creation or redistribution of rights (White and Runge, 1966:1685). Converting open access resources into common properties may result in reallocation of de facto rights as efforts to reorganize rights do not bring uniform benefits to participants (Libecap, 1989:6). Individuals will work to establish new rights or reallocate existing rights only if the benefits from doing so exceed costs (Libecap, 1989:2). How the benefits will be redistributed has bearing on whether there will be a significant coalition which is interested in collective action.

Farmers may be able to expect significant benefits from working together to improve irrigation supplies or to establish new sources of supply. They suffer considerable losses from unreliable irrigation and unnecessary efforts devoted to capture water in public irrigation systems. Potential users can benefit from converting such "open access" water flows into, and developing new sources of irrigation as, common properties. Though farmers in public irrigation systems have de jure rights, the agency which supplies the water is usually not in a position to protect the rights. They can expect to protect their rights by developing common property institutions. Members of common properties honor the rights of each other or the rights of members are "protected collectively". Under some circumstances, it may be that

working together to distribute irrigation water more effectively can also provide benefits, at least for a substantial number of farmers within an irrigation system (Ray, 1997).

Most situations which potentially offer benefits from collective action do not result in collective action. Working together can potentially offer benefits, but it also entails organizational costs (Olson, 1973:47). Therefore, the prospects of benefits alone are not adequate to motivate individuals to work together. The potential benefits must exceed the costs by a significant amount. Even consensus among potential members of the desirability of a particular group effort and of the means of achieving is not adequate to result in group effort (Olson, 1973:60; Wade, 1988a:188).

Organizational costs - mostly transactional - are incurred in group effort to build consensus among potential members, to develop an organization and to maintain it. These can be termed as consensus building, organizing and maintaining costs (Kolavalli, 1996). Consensus building is necessary to make potential members agree that an improvement in the current situation is possible and desirable, and that the means proposed to achieve it are appropriate. This is akin to White and Runge's challenge to status quo (1996:1685). Organizing involves developing rules for working together and obtaining the required recognition to function as an organization. Maintaining involves all the day-to-day activities of an organization. Consensus building and organizing are largely one-time activities. Maintaining is a recurrent activity involving consensus building and organizing to a limited extent.

Individuals make decisions on the basis of their subjective assessment of the benefits they are likely to receive and the costs they are likely to bear over a reasonable period of time. These subjective assessments are likely to vary considerably among potential members. In addition to differences among individuals in their expectations of benefits and costs, the benefits and costs are also likely to change over time. Individuals may lower their cost expectations with increasing willingness of others to join group effort. Situations in which the expected organizational costs are likely to be low or one or two individuals are likely to absorb much of the costs, thereby reducing the expected costs for others, have a higher chance of resulting in group effort. The presence of leaders or assistance from external agents is one such situation. A strong culture with elements, such as reciprocity, favorable to group effort also can facilitate group effort.

Though leadership is a complicated phenomenon, its role in promoting group effort can be understood, if it can be reduced to a few critical dimensions that explain why followers behave differently in the presence of leaders without having to explain why leaders lead. First, leaders supply vision. By sharing their vision, leaders can make followers aspire for things that they would not have sought otherwise. Ideas offer new possibilities for action (Uphoff, 1992:376&386). In "transforming leadership, leaders and followers raise one another to higher levels of motivation and morality" (Burns, 1979:20). The leaders are thus able to influence and guide the expectations of followers. Second, individuals believe that leaders have the kind of influence on others that they themselves experience. Therefore, in the presence of leaders, individuals expect greater congruence in interest among potential members and greater possibility of mutual assurances. Consensus is likely to be achieved more rapidly. Also, leaders reduce transaction costs and absorb a disproportionate share of the costs thereby making participation more attractive for others.

There are two sources of leadership: external agents and leaders who are also group members. External agents include all those promoting group effort such as the staff of non governmental organizations and parastatal organizations.

3. Capability of Common Property Management Organizations

As successful common property institutions share certain features (Ostrom, 1990 & 1992), a common framework can be adopted to compare disparate organizations engaged in developing and maintaining common properties. The success organizations have in achieving their objectives is a good indicator of the performance of organizations, but outcome based assessments are feasible only after the organizations have been working for sufficiently long periods. For organizations engaged in the management of natural resources, performance should be judged both on whether organizational objectives are met and on the impact on the resource as the two objectives may not be always consistent. These impacts can only be assessed after the organizations have functioned for some time. As many of the features of successful collective organizations are related to management processes, an examination of these processes is a useful way to assess organizational effectiveness.

The key to effectiveness of collective organizations is to have institutions or rules-in-use which encourage members to contribute to group effort and discourage abuses. Rules are statements that define situations and determine the terms of interaction in those situations. They also determine the domain or boundary of coordinated interactions as they separate group activities from the individual. In other words, they define the space over which individuals choose to constrain themselves with group norms. They guide the interactions of interdependent individuals because they provide a basis for predicting how others will behave. Therefore, the capability of collective organizations to develop appropriate rules and to enforce them while keeping the level of conflict low is the core of organizational effectiveness.

In a general sense, rules can be judged for their appropriateness considering the needs, opportunities and circumstances of different groups. The extent to which the rules facilitate effective provision of collective goods while keeping transaction costs low is one aspect of appropriateness. The care with which a boundary has been set for group effort to meet the needs of the members or to take advantage of the opportunities while maintaining group cohesiveness is another. Community organizations carefully determine the scope of their collective effort to maintain cohesiveness (Wade,1988a). The domain or scope is relevant for “enterprise” reasons too; including certain related activities may make the primary enterprise more viable.

In our analysis of collective action with regard to irrigation, we judged the capability of the WUAs on the basis of the effectiveness of key rules, the manner in which problems are dealt with on a day-to-day basis, and the long term response of groups to problems and opportunities faced by them. Overall capability is evaluated on a combination of their performance in rule making, rule enforcement, and conflict resolution. Our judgements are shown in Table 2.

We examined rules for water distribution, maintenance and fee collection. The aspects of rule enforcement examined were: monitoring mechanisms used, the means used to enforce rules, and the effectiveness of rule enforcement. We also examined resolution of conflicts among members. The performance of groups in terms of rule making, rule enforcement and conflict resolution were rated by a group of researchers on the basis of information collected on the

organizations through process documentation. These ratings were then combined for a single rating for WUA capability.

Table 2: **Water User Association Capability**

WUA	Type	Devising Rules	Rule Enforcement			Conflict Resolution	Overall Capability
			Water Distribution	Maintenance	Fee Collection		
Gujarat							
Anklav	canal	low	low	low	low	low	low
Baldeva	canal	medium	low	low	medium	medium	medium
Mohini	canal	high	low	low	low	low	low
Pingot	canal	medium	high	low	medium	medium	medium
Bhima	lift	high	high	high	high	high	high
Maharashtra							
Datta	canal	high	high	high	medium	high	high
Ozar	canal	high	medium	medium	high	high	high
Shevare	canal	high	high	high	high	high	high
Hadshi	tank	low	low	low	low	low	low
Parunde	tank	medium	medium	high	medium	medium	medium
Kadoli	lift	high	high	high	high	high	high
Phulewadi	lift	high	high	high	high	high	high
Tamil Nadu							
LBP	canal	low	high	low	low	medium	low
PAP	canal	low	medium	low	low	medium	low
PK Tank	canal	medium	high	medium	high	low	medium
PVP	canal	low	medium	low	low	medium	low
Salipperri	canal	high	medium	high	high	high	high
Vagaikulam	canal	high	high	medium	high	high	high
Dusi-Mamandur	tank	high	high	low	medium	high	high
Kedar	tank	high	high	low	low	medium	medium
PP Tank	tank	high	high	high	high	medium	high

The rules for water distribution adopted by the associations varied considerably. Water distribution rules adopted by various associations are, to use Ostrom's expression, cleverly crafted to suit their conditions. Although most of them, at least those in the large surface irrigation systems began with similar rules recommended to them by the agency, they modified their water distribution rules to find those most suited to their conditions. The rules chosen reduced the potential for conflicts, and most importantly, entailed low administrative costs. Another interesting aspect of rules was that they were designed to take care of special needs. When water is scarce for example, irrigation is given only to those members who do not have alternative sources. However, none of them were committed to enforcing rules which would make up for the location disadvantage of some members. The rules observed by farmers deviated considerably from rigid rotation rules recommended to them by the irrigation agency.

Nearly all the WUAs demonstrated capability to devise appropriate water distribution rules (Table 2). Beyond water distribution rules, there appeared to be large differences in rule devising capability. Some had demonstrated greater capacity to think through the problems to find appropriate solutions. While many associations routinely include ambitious plans in their

by-laws, only some have thought them through, carefully selected what they would like to do and made specific efforts to raise the required resources to implement them.

The effectiveness of rule enforcement is difficult to judge as rules are not usually observed under all conditions. Abundant supply of irrigation water is a clear case in which there is little reason to adhere to rules in the absence of conflicting demands for water. The presence of large number of rules is not in itself an indicator of effectiveness nor is the absence of conflicts if alternative supplies are available. Some groups may permit rule breaking in the short run as an adjustment to specific problems that may be taken care of through rule modifications in the long-run (Vermillion, 1986).

Judged on the basis of extent of conflicts arising from rule breaking, the number of complaints to management committees and information collected on water distribution, enforcement of water distribution rules appeared to be effective in the majority of the associations, but they are weaker in those which have been initiated recently (Table 2). The evidence suggests that even the best associations would have difficulty enforcing rules when water is scarce. The record of fee collection in the associations varied with effort made by staff to collect the charges and the ability of the users to pay (Table 2).

Rule enforcement requires credible threat of punishment if the rules are not complied with or the offer of positive incentives for complying with rules. Punishment essentially consists of denying something valued by an individual. It could be done by withdrawing water rights, imposing a fine or causing a loss of face. Some sort of authority is required to punish, the type of authority depending on the choice of punishment. The source of authority could be legal recognition by the state in which case the punishment could be imposed through a state institution. It could be moral in which case whoever punishes appeals to the moral sensibilities of the offenders. In India, authority can be based on socio-economic status: a combination of traditional leadership and economic power resulting from landholding and position in the caste hierarchy. Finally, the source of authority could be the collective resolve of the group to enforce norms among themselves. In this case, the authority or the legitimacy of an individual or a group of individuals imposing the punishment comes from the collective organization itself.

We observed very few cases in which the authority emanated from the group itself, not even in groups which had been in existence for a long time. Rule enforcement is possible in most associations because of leaders who already wield considerable influence in their communities. Leaders who have been instrumental in establishing and managing the society also play an important role in enforcing rules. Their source of authority is either moral or power to cause harm in their communities. Without them the associations would not be able to enforce rules.

Most associations have not made specific efforts to resolve conflicts. Farmers resolve them among themselves often involving third parties. Influential village leaders, who may not hold any formal position in the society, may also assist in resolving conflicts. In only one association did they set up committees of respected elderly individuals to resolve serious conflicts.

Overall management capability of the water user associations determined on the basis of rule devising, rule enforcement and conflict resolution suggests that 10 of the 21 associations studied have high organizational capability (Table 2). This overall judgement is the level achieved in 3 of the 5 categories or a level lower than the level achieved in 2 of the 5

categories. Performance in all categories have been given equal weights although rule devising can be argued to be more important than other categories. It turns out that overall management capability corresponds closely to rule devising capability.

4. Factors Contributing to Organizational Effectiveness

Individual decisions on participation in group effort are based on expected benefits and costs. Two factors which influence benefits are the nature of rights transferred and incremental benefits from belonging to the WUA. The two are closely related. Our hypothesis is that the more complete the bundle of rights, the greater the incentives for users to participate in collective management of water. A more complete bundle of rights is likely to offer more certain and potentially higher returns. They also bring about a sense of ownership among the users thereby attracting long term investments in the upkeep of the resource. The incremental returns depend directly with the extent to which water control was improved, extent of their dependence on the source and potential increase in income as a result. Costs are less observable, but we have information on the extent to which these groups were assisted by external agents and leaders within. We use the extent of leadership support received as a proxy for lower costs.

4.1 Rights

The status of resource users can be arrayed along a scale ranging from authorized user to owner depending on the bundle of rights held by them (Schlager and Ostrom, 1992:249). The bundles may contain the following:

- water withdrawal rights;
- management control which includes the freedom to use water in any season for any crop, adopt appropriate distribution criteria, make maintenance decisions, set charges and deny withdrawal rights to those who fail to meet group norms;
- exclusion - being able to decide who belongs to the group;
- alienation of property;
- rights to complementary resources which augment revenues and subsidize irrigation where required.

The third column in Table 3 summarizes the degree of completeness of the bundles of rights held by the WUAs.

All the WUAs have withdrawal rights to water, the least that a bundle could contain. Management of water use rights varies. Some associations have management rights which give them the flexibility to adopt appropriate use patterns. Exclusion and alienation rights remain with the irrigation agencies wherever there has been a transfer of management rights; i.e. in canal and tank WUAs. Even in the case of lift systems, alienation rights held by the association pertain only to lift mechanisms and not to water. The members of most water user associations are claimants, not owners, at the most as they only have withdrawal and management rights. There are large differences in status of members of WUAs because of diversity in withdrawal and management rights. Some transfers may involve no change in rights as such but a change in the expectation of being able to exercise those rights.

There are differences in the withdrawal rights because of the way in which they are specified and the prospects of being able to exercise rights. Some of the associations have rights to specific quantities. For others, the rights are ambiguous. Their rights are defined in terms of

number of rotations or criteria by which the main system is operated. In all these cases, the rights are subject to availability of water. Lift associations are given rights in terms of area which can be irrigated or the capacity of the pump used.

Physical aspects of irrigation systems, the nature of agreement with the agency and the ability to influence the working of the agencies determine the prospects of being able to exercise withdrawal rights. A society receiving water from a large surface system may have smaller prospects of exercising rights than a society that receives water from a smaller system in which the users are closer to the source. In the former case, greater competition for available water and the difficulty of transporting water over longer distances may limit a society's ability to capture its share. Users situated closer to the source often feel more secure about access to water (Wade, 1988b).

Management rights comprise a number of rights which enable users to put water to its best use and also to run their enterprise more effectively. Whether the users can save water they are entitled to in one season for use in another, whether they are free to raise the crops of their choice, whether they are free to set charges for water all have a bearing on the returns they can get from irrigation and their ability to manage irrigation water as a resource. Groups which are free to determine the charges, or deny withdrawal rights to those who break rules have greater possibility of being able to create incentives for proper use of water.

Management rights held by associations vary across the sample. All are free to use irrigation water for crops of their choice. The right to save water in one season for use in another is more restricted. Canal associations in Maharashtra and Gujarat can save water in the cool season for use in the hot season. Tank associations also can decide when they would like to use water.

Rights to determine charges for irrigation water are not universal. Gujarat and Maharashtra canal associations retail water to users and have the freedom to set their charges. They are also permitted to charge up to 30 per cent more to non-members. Tamil Nadu canal WUAs do not collect irrigation charges - these are collected through the land tax system - so they have no power to set rates or benefit directly from the charges. Lift associations are free to determine the charges. The ability to deny withdrawal rights to those who do not conform to group rules is an important factor that enables groups to work together. Tamil Nadu canal associations do not collect irrigation charges and do not have the right to deny access to irrigation from public irrigation sources.

Maintenance responsibilities also give the associations an additional stake in the system (Ray, 1997). Maintenance rights may appear to be burdensome. However, users can potentially benefit from more effective maintenance which they can supply if it is under their control. They can organize more timely and effective repair; they are in a better position to rationally decide where limited funds should be used and also to respond to emergencies more effectively.

Powers to decide rules for water distribution within the WUA, powers to regulate or choose crops, and powers to make other decisions concerning the use of irrigation water are fairly uniform across the associations. However, because of differences in the power to control finances and deny benefits to rule-breakers, recently initiated associations which retail water have higher levels of controls over water than do associations in public irrigation systems in Tamil Nadu.

Resource users who have ownership status have full rights including exclusion and alienation. Exclusion and alienation rights enable owners to benefit from investments thus encouraging long-term investments. But it is not only full owners who have incentives to invest in resources (Schlager & Ostrom, 1992). In irrigation systems, a sense of ownership can develop among the users without exclusion and alienation rights. In general, even if the farmers are only claimants they develop a sense of ownership which encourages them to make investments in the resources they manage. Granting of adequate management rights over use of water seems to be critical. Vesting associations or communities with management rights to resources encourages them to make long-term investments in their upkeep.

Overall the bundle of rights possessed by water user associations is most complete in lift associations, which are full owners of infrastructure they have developed, and in the newer canal associations in Maharashtra and Gujarat (Table 3). The rights are least complete in Tamil Nadu canal associations.

4.2 Potential Benefits

The incremental returns that members expect from WUAs may be the most important factor that influences individual decisions on participation in group effort (Meinzen-Dick et al, 1995:14; White & Runge, 1996). Benefits potentially arise from increased and more timely supply of water or decreased costs of irrigation including decreased hassles. The size of expected benefits also depends on opportunities to commercialize production. Comparable improvements in water supplies at two locations may not yield comparable benefits. If there are alternative sources of irrigation water, such as private wells, the potential incremental benefits from organizing a WUA may be small, even if it can increase the supply of canal water. Potential incremental benefits, therefore, depend on availability of alternative sources of irrigation, the extent of improvements in water control, and the opportunities to convert improved water control into higher production or incomes. Levels of benefits are summarized in the fourth column of Table 3.

Improvements in water control are obviously large where WUAs - such as the lift associations - have resulted in irrigation where there was none before. There are considerable differences among associations in the access they have to alternative sources of water particularly groundwater. Opportunities to commercialize agriculture also vary.

Incremental benefits are high or medium in all associations except Anklav, Mohini, Hadshi, LBP, and PAP (Table 3). Farmers in Anklav have easy access to ground water while farmers in PAP have to depend on ground water; farmers in Mohini and Hadshi have physical problems in distributing water; and in LBP organization of the WUA has not resulted in any change in water supply or distribution. Benefits have declined over the years in some associations, due to increased access to groundwater or to deterioration of the physical system.

External agents working with the associations offered additional benefits to many of the associations to keep them working together (see next section).

4.3 Support from External Agents

Most of the associations would not have come into existence without the involvement of the external agents. External agents who have worked with water user associations belong to a diverse group of organizations:

- The most prominent of these are non governmental organizations (NGOs). Most of these organizations place emphasis on making use of local knowledge systems, cooperative approaches to solving problems, empowering communities and ensuring that the poor receive development benefits that they are entitled to from the bureaucracy.
- The second group comprises of quasi-state organizations involved in research or training in irrigation related activities. All these organizations are involved in research and training directed at improving the performance of irrigation systems. Many have been engaged in action research in recent years and tend to be receptive to new ideas.
- The third group of external agents are the staff of the irrigation agencies themselves. They are mid level officials who were keen on increasing user participation. Organizing farmers is not a part of their official duties; many do it out of personal interest with support from a few high level officials.

Levels of assistance from external agents are shown in the fifth column of Table 3.

External agents give organizational, technical and political support to associations. These agents put considerable effort into building consensus and organizing the associations. The organizational support they provide includes everything from introducing new ideas to helping members draft bylaws, make rules and run meetings. They supply the vision that something can be done differently and better. They provide assurances that interests opposed to change can be overcome. They balance power vis-a-vis various groups within the communities and between the state and the villagers. They bargain on behalf of the communities with government agencies. Where the change involves working with the agencies of the government, the external agents provide assurances that it will be feasible. Such assurances are most credible when they come from the staff of agencies themselves.

The major contribution of external agents has been to convince users that there is the possibility of doing something differently and better. The idea of communities managing their resources may not have been new to users. But doing it with the agencies of the state, and doing what they always thought was the business of the government was new, particularly where the agencies do not appear to be enthusiastic partners. Another useful function external agents perform is to bring together different factions within the communities. Wide wealth disparities and unequal power relations often make change seem impossible. External agents also allay the anxieties of potential members that the association may be an effort to defraud them.

External agents often work with potential leaders among the weaker sections of the community. Their role as independent arbitrators in building consensus is crucial. Change which would otherwise be opposed by existing power bases, remain unopposed as they see external agents as being powerful in their own right. There is always the threat of external agents pressuring government agencies into acting on behalf of the weaker sections of the community.

External agents continue to provide support to many associations. They help in enforcing rules, resolving conflicts and taking care of the day-to-day affairs including maintaining accounts. Some associations receive technical support from external agents.

External agents support associations politically by helping them in their claims from government agencies. Much of this support was provided in the formative stages of the WUA and has been continued in several cases. In one case, when the agency refused to supply water

at the farmers' convenience, the NGO working with the WUA threatened to write about it in newspapers.

Only in three associations - Dusi-Mamandur, Vagaikulam, and Phulewadi - did farmers not have external help in organizing themselves. Dusi-Mamandur society was formed to lobby the agency and politicians for more water for their tank. Vagaikulam association is a land owners association initially started to protect rights to land and water. Phulewadi society was initiated by a Member of the Legislative Assembly. Support from external agents has been high in most recently organized associations in canal and tank systems (Table 3).

4.4 Leadership Support

Management and leadership are issues of particular concern in many associations. In the WUAs, the quality of leadership varies as shown in the sixth column of Table 3.^{^^}

Members of WUAs often expect those managing the WUAs to devote considerable time to their tasks without financial compensation. They would like the leaders to be around when the fields are being irrigated to ensure that water is distributed as it should be and conflicts are resolved as they arise. As noted earlier, rule enforcement depends heavily on leaders. In many associations, office bearers spend as much as two hours daily on society affairs. Managing the society becomes a major preoccupation for those who assume leadership.

Individuals have strong incentives to offer leadership. For those who are already leaders, providing leadership for water user associations is a natural extension of their power base. They would not like to lose control over important activities in the village. Such leaders tend to provide strong leadership when they also benefit directly from the services of the association. When it is only to maintain their power base, they may not put in adequate effort so the associations may suffer. They also often try to prevent others from assuming leadership.

In many cases, leaders directly benefit from associations. A large landowner, for example, may benefit more than anybody else from lobbying for more water for the village. The fact that others may also benefit does not seem to be of consequence to these leaders as their efforts also strengthen their political base; leadership of irrigation organizations blends nicely with political leadership. These are cases where something beneficial to a large number is provided for unilaterally by one or more as the benefit to them far exceeds the cost (Olson, 1973). Leaders in several Tamil Nadu associations meet travel and other expenses of lobbying. Some leaders are driven by ideology of community service and they take pride in serving their communities. There is great deal of respect for leaders (Wade, 1988a).

There is generally an abundant supply of people wanting to be leaders. But helping communities meet their expectations is not an easy task. It requires skills and clout and often the courage to challenge the existing power bases.

In most WUAs, leadership is assumed by those who already wield considerable influence in their communities. That is, leadership is in the hands of socio-economically powerful: those with large land holdings or from families that traditionally have had significant influence in their communities. Many of these leaders have links with outside power bases such as government agencies and politicians.

Table 3: **Factors and Overall Performance**

WUA	Type	Factors				Performance
		Rights	Benefits	External Support	Leadership	
Gujarat						
Anklav	canal	most	low	high	low	low
Baldeva	canal	less	high	high	medium	medium
Mohini	canal	less	low	low	medium	low
Pingot	canal	less	high	high	medium	medium
Bhima	lift	most	high	low	high	high
Maharashtra						
Datta	canal	most	high	high	high	high
Ozar	canal	most	high	high	high	high
Shevare	canal	most	high	high	high	high
Hadshi	tank	most	low	high	low	low
Parunde	tank	most	high	high	high	medium
Kadoli	lift	most	high	high	high	high
Phulewadi	lift	most	high	low	high	high
Tamil Nadu						
LBP	canal	least	low	low	low	low
PAP	canal	least	low	low	low	medium
PK Tank	canal	least	high	high	high	medium
PVP	canal	least	medium	medium	low	medium
Salipperri	canal	least	medium	high	high	high
Vagaikulam	canal	least	high	medium	high	high
Dusi-Mamandur	tank	less	medium	low	high	high
Kedar	tank	most	medium	high	high	medium
PP Tank	tank	most	high	high	high	high

An important aspect of providing leadership is providing assurance. The chairman of one WUA purchased shares in the association for a number of farmers to generate sufficient support. He personally supervised water distribution in the first year and interacted with farmers frequently regarding the association just to assure them that the association will respond to their needs. The decline in some of the societies can be attributed withdrawal of individuals who were instrumental in initiating the society.

Associations which have established structures and processes to enable a number of individuals to assume leadership roles appear to get more leadership support. In some societies, sub-committees are set up to take on different responsibilities. The members of associations receive leadership support from various sources, chairpersons, committee members, other persons in the communities and from staff. External agents sometimes provide leadership.

The overall level of leadership support received was low in four societies and medium in another two (Table 3). The remaining WUAs received high levels of support.

4.5 The Factors and Organizational Performance

The relationships between the four factors and organizational performance were found to be organic. They are not relationships which can be quantified even if we could measure them more objectively. The effect of some of the factors on performance is complementary and

others are substitutable to some extent. When considered together they offer useful insights. Table 3 shows our ratings of the overall performance of the WUAs together with our ratings for the four factors. Note that the overall performance rating was made independently from the ratings for the four factors; this table is meant to provide data to explore the relationship among the factors and performance.

As expected, the presence of significant benefits from belonging to associations is associated with high levels of performance. Performance is medium or high in all the associations in which the incremental benefits are high. The poor performance of four associations -Anklav, Mohini, Hadshi, and LBP - can be attributed to low benefits in addition to other factors. Anklav in fact would have never come into existence without the extraordinary efforts made by external agents.

Water user associations which have more complete rights to water resources appear to have higher prospects of performing at higher levels. The most complete bundles or rights have resulted in high or medium levels of performance in all associations except Anklav and Hadshi where other factors have resulted in small incremental benefits. In other cases, they have added to incentives by bringing in a sense of ownership. Two associations in which incomplete rights have not impeded performance are Salipperri and Vagaikulam. In Salipperri, though they have not gained any control over water deliveries, they have overcome the problem of lack of maintenance and poor drainage in years of abundant water. Their establishment of a maintenance fund has encouraged collective maintenance and gaining control over the village pond seems to have galvanized them into a community more confident of being able to solve some of their collective problems. Vagaikulam association is a village level institution whose main aim is to lobby for water; water brings them high returns. Individuals who wield considerable influence in the communities provide leadership in both associations. The associations also benefit from younger farmers' interest in community activities. The WUAs which have the most complete sets of rights and in which the expected benefits to members are also substantial are the best performers.

The freedom to set their own charges some of these associations have (lift and selected canal associations) has enabled them to set charges high enough to generate adequate resources and in some cases encourage effective water use. These are the associations which are also financially more viable than others.

Although external agents have been instrumental in the initiation of most of the WUAs, their assistance may not be required under all conditions. Lift associations (Bhima and Phulewadi), Dusi-Mamandur and Vagaikulam have done well without external help. Vagaikulam and Dusi-Mamandur were established to influence the agency through political means, although Vagaikulam received some external help later. In both, association membership corresponded with that of the communities. Leadership provided by individuals wielding considerable influence in the two communities was adequate to organize the users. In the other two high-performing associations which received little external support (Bhima, Phulewadi), members had strong incentives as lift systems offer complete control and proprietary status. In addition, these associations were also facilitated by the fact that there were clear models for them to emulate. There is proliferation of lift irrigation associations in Maharashtra. How these organizations work is fairly clear to farmers. Group effort is also somewhat easier in lift societies as groups are free to determine who belong to them although they may be required to

enlist the support of everyone holding land in a contiguous area. The technology of water distribution in lift systems also makes rule enforcement relatively easy.

It is also clear from the cases that associations have been able to establish themselves without assistance from outside persons where the irrigation agencies have enthusiastically supported them. Examples are Mohini, Shevare, Parunde, and Hadshi. Mohini was organized by a well respected village leader with the support of the agency. In Shevare, Parunde, and Hadshi, irrigation agency staff were involved in organizing the users. Assurances that group effort will have benefits are most credible when they come from the agency staff. Agency staff are considered sources of authority, so they can also serve effectively as independent arbitrators.

Where leadership is weak (Anklav, Hadshi, LBP, PAP, and PVP) performance tends to be poor although other factors, particularly benefits, are also low in these cases. This makes it appear that leadership is not a determinant factor, particularly if external assistance is available.

In sum, the benefits from belonging to the society need to be significant to provide incentives for individuals to participate in WUAs. These incentives will be stronger where substantial a bundle of rights is transferred since the rights give farmers the power to create benefits. Where perceived benefits from participation in group effort have eroded, members of even successful organizations are likely to lose interest in group effort. The prospect of benefits is a necessary condition for individuals to act collectively. But it is not sufficient. Expected organizational costs need to be low. The prospect of costs being low or being absorbed by one or more individuals - either external agents or internal leaders - provides an encouraging environment. External support is generally essential for initiating WUAs. Dependence on external agents can be reduced if the agencies themselves become more supportive of water user associations.

5. Environment, Socio-Economic Characteristics and Organizational Performance

Where there is government regulation or control of natural resources, as in most irrigation systems in India, the performance of user organizations is a response to the prevailing institutional environment; particularly to user expectations of agency actions. Performance of user organizations is likely to be qualitatively different when agency actions are changed. In some cases, even where substantial bundles or rights are granted to users, government agencies retain legal powers to interfere and may use these powers in ways that reduce the users ability to benefit from their own management. In other cases, government agency failure to carry out necessary supporting actions, either willful or unplanned, can make it impossible for user associations to realize their rights or achieve the expected benefits. For example, in large-scale canal systems, if the irrigation agency fails to deliver water to a WUA, the power to distribute water is of little benefit. On the other hand, if irrigation agency personnel show themselves willing to help users develop local management capabilities and willing to work with the resulting organizations, this increases the probability of achieving benefits and makes collective action more likely.

In our irrigation cases, political support from external agents has been necessary in canal irrigation system where agencies resist their loss of power through transfer. A need for external agents other than the agencies was absent where the agencies themselves promoted WUAs. Given that non-agency external agents devoted much of their effort in supporting the claims of users against the agencies, any reforms which make the establishment of user

associations to be in the interest of the agencies will considerably reduce the need for third party external agents.

In our Indian cases, the ability to create and manage WUAs does not appear to be constrained by the socio-economic characteristics of users. That is, enough wealth exists among the farmers to take on the needed activities, although some help is often demanded to repair irrigation systems before taking over management. Of greater importance is the existence of skills needed to create and manage organizations. Communities which have lower “formal organizational skills” in terms of being able to deal with agencies of the state, maintain records, prepare reports and so on will be slower to develop than others. But their ability to reach the desired levels is likely to be unlimited if they are given opportunities to learn.

In order to elicit more enthusiastic response from resource users, there is need to revise their expectations of choices available to them. Encouraging user participation has to be part of a broader strategy of changing user expectations as to how natural resources will be managed in the future. In irrigation, management transfers offer the potential to decrease government operation and management costs. Farmers, however, remain reluctant to participate as it often results in them having bear a greater share of the costs. External support is often needed to provide understanding of the potential for and the means of group effort.

6. Assessing Common Property Institutions

In this paper, we have suggested that the suitability and performance of water user associations can be assessed through a process that involves assessing

- the rules devised by the users for managing the resources and the organizations,
- the means for enforcing the rules and success in doing so,
- the ability to resolve conflicts over use of the resource.

This is not a complete basis for assessing community capability to manage common property resources. The best basis would, of course, be the results. The approach we have taken, however, allows a preliminary assessment in the early years of the development of common property management institutions.

In addition, through our study of water user associations created for irrigation management, we found four factors that seem to explain much of the variation in success of users and outside programs to create user organizations to manage resources. These four factors are:

- the bundle of rights given to or held by the users,
- the magnitude of the potential benefits from collective management,
- help given by external agents,
- internal leadership.

Our data indicates that the magnitude of the benefits is the most important factor, while internal leadership may be least important factor. These factors are important primarily in situations in which the resource users have to deal with government agencies. External agents are particularly necessary when the government agency personnel are reluctant to support user management efforts, although they often also provide the vision necessary to bring about change and serve other functions as well.

We believe that not only is our approach useful to those dealing with irrigation management transfer programs - a strategy currently popular among governments as a way to reduce government costs for irrigation - but may be useful in planning and assessing other programs for developing or assisting local resource management.

7. References

- Brewer, J.D., S. Kolavalli, A. H. Kalro, G. Naik, S. Ramnarayan, K. V. Raju, and R. Sakthivadivel. 1998. *Irrigation Management Transfer in India: Policies, Processes and Performance*, Indian Institute of Management, Ahmedabad, and International Irrigation Management Institute, Colombo.
- Buchanan, James M. and Gordon Tullock. 1967. *The Calculus of Consent*, Ann Arbor: The University of Michigan Press.
- Burns, James MacGregor. 1979. *Leadership*, New York: Harper Torchbooks.
- Ciriacy-Wantrup and Richard C. Bishop. 1975. "Common Property" as a concept in Natural Resources Policy, *Natural Resources Journal* 15(4):713-728.
- Kolavalli, Shashi. 1996. *User participation and incentives to perform in Indian irrigation systems*. Ahmedabad, India: Centre for Management in Agriculture, Indian Institute of Management.
- Libecap, Gary. D. 1989. *Contracting for Property Rights*, Cambridge: Cambridge University Press.
- Meinzen-Dick, Ruth. Et al 1995. Sustainable water user associations: Lessons from a Literature review. In A. Subramanian, N.V. Jagannathan and R. Meinzen-Dick (eds.) *User Organizations for Sustainable Water Services*. World Bank Water Resources seminar. December 11-13.
- Mosse, David. 1994. *Local Institutions and Power: The History and Practice of Community Management in the Development of Tank Irrigation Systems in South India*. In S. Wright and N. Nelson (eds.) *Power and participatory Development: Theory and Practice*. London: Intermediate Technologies Publications.
- North, Douglass. 1986. The new institutional economics. *Journal of Institutional and Theoretical Economics*. 142: 230-237
- North, Douglass. 1990. *Institutions, institutional change and economic performance*. Cambridge: Cambridge University Press.
- Olson, Mancur. 1973. *The Logic of Collective Action*. Cambridge, Massachusetts: Harvard University Press.
- Ostrom, Elinor. 1990. *Governing the Commons: The evolution of institutions for collective action*. Cambridge: Cambridge University Press.
- Ostrom, Elinor. 1992. *Crafting Institutions: Self-Governing Irrigation Systems*. San Francisco, California: Institute for Contemporary Studies.

Ostrom, Elinor. 1994. Neither Market Nor State: Governance of Common-Pool Resources in the Twenty-first Century. Lecture presented June 2, Washington, D.C.: International Food Policy Research Institute.

Ray, Isha. 1997. A Farming Systems Analysis of Irrigation Institutions, unpublished PhD dissertation, Stanford University, Palo Alto, CA.

Runge, Carlisle Ford. 1986. Common Property and Collective Action in Economic Development. *World Development*, Vol. 14, No. 5, pp. 623-635.

Schlager, Edella and Elinor Ostrom. 1992. Property-Rights Regimes and Natural Resources: A Conceptual Analysis. *Land Economics*. 68(31): 249-62.

Shah, Tushaar (1993). Leadership in Collective Action: Conceptual Framework and Empirical Evidence, A paper presented at National Consultation on Cooperative Leadership for Agriculture, November 28-30, 1993, Indian Institute of Management, Ahmedabad.

Uphoff, Norman. 1992. Learning from Gal Oya: Possibilities for Participatory Development and Post-newtonian Social Science. Ithaca: Cornell University Press.

Wade, Robert (1988a). *Village Republics: Economic Conditions for Collective Action in South India*, Cambridge, Cambridge: Cambridge University Press.

Wade, Robert (1988b). The Management of Irrigation Systems: How to Evoke Trust and Avoid Prisoners' Dilemma, *World Development*, Vol. 16, No. 4, pp. 489-500.

White, T. and C. Runge. 1995. The Emergence and evolution of collective action: Lessons from watershed management in Haiti. *World Development*, 23(10): 1683-1698.