THE MANAGEMENT OF COMMON PROPERTY RESOURCES: *Finding a Cooperative Solution*

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When will villagers come together to produce goods and services that they all need but cannot provide individually? In what circumstances will those who face a potential "tragedy of the commons" be able to formulate rules by which the tragedy is averted?

Many writers on collective action are inclined to think that the circumstances are very limited. They argue that people in a situation in which all could benefit from cooperation will be unlikely to cooperate without an external agent to enforce agreements. Likewise, many theorists on property rights argue that common property resources will be overexploited as demand rises, so only private enclosure or state regulation stands a chance of preventing such a result.[1] This article offers a critique of some of the analytical arguments used to reach these conclusions and argues that they have been inappropriately applied to certain types of village resources. It then discusses how to judge whether villagers will be able to sustain local rules of restrained access to common property resources and interprets the evidence from a study of forty-one villages in South India.

Clearly there can be no general presumption that collective action rather than privatization or state regulation will work: witness the frequency of degraded grazing commons, despoiled forests, overexploited groundwater, and depleted fisheries. But there are many examples of villagers collectively managing property for long periods. Privatization or state regulation is therefore not always essential. A third option—local collective action—needs to be taken seriously. Because

less public money is likely to be needed for local collective action than for either privatization or state regulation, it makes financial sense to establish local rules where circumstances permit.

Common Property and Common-Pool Resources

On a continuum of property rights, exclusive possession (freehold) is at one end. At the other is no property, as in ocean fisheries or the atmosphere. In between lies common property, where the rights to exploit a resource are held by people in conjunction with each other. These rights may take several forms: they may allow unlimited exploitation for those within a specified group (as happened in commercial fisheries under national jurisdiction) or they may stipulate limits for each user (as in most commercial fisheries today or as in "stinting" of a grazing commons).

Of course, the same type of resource may be exploited under a variety of property rights. This article deals with those resources that might be called "common-pool" resources—a subset of public goods, as that term is used in economics. All public goods have the property that many people can use them at once, because exclusion is difficult. But some public goods yield infinite benefits, in the sense that if A uses more there is not less available for others (lighthouses and weather forecasts, for example). Common-pool resources, by contrast, are public goods with finite, or subtractive, benefits: if A uses more, less remains for others. Common-pool resources are therefore potentially subject to congestion, depletion, or degradation (Blomquist and Ostrom 1985; Randall 1983).

Groundwater is an obvious example of a common-pool resource. It can be used jointly, but use is subtractive. So when water is scarce, the groundwater table is likely to be depleted. Canal irrigation water, unfenced grazing land, and unfenced forest all meet the same criteria. These three resources—water, grazing, and trees—are vital to the livelihoods of millions of people in developing countries; the question of how to prevent their overexploitation as population grows is important for development policy.

The prevailing answer runs as follows: when people are in a situation where they could mutually benefit if all of them restrained their use of a common-pool resource, they will not do so unless an external agency enforces a suitable rule. Each individual has an incentive to ignore the social costs of his behavior for fear that others will exploit the resource before he does. As a result, the rate of aggregate use exceeds the physical or biological rate at which the resource renews itself (Ostrom 1985b).

This argument has been used to justify far-reaching proposals for changing the way that common-pool resources are managed (Ostrom 1985a; Runge 1986). According to one school, full private property

rights over the commons are a necessary condition for avoiding overexploitation (Demsetz 1967; North and Thomas 1977; Johnson 1972; Picardi and Siefert 1976). According to another, it is essential to give an external agency—usually the state—full authority to regulate the commons (Carruthers and Stoner 1981; Hardin 1968). For both schools, the policy issue is simply how to achieve the desired change with the least opposition from those involved.

Theories of Collective Action

Defining the conditions under which users of common-pool resources may voluntarily restrain their use can be considered as a subproblem of the theory of collective action, also known as the theory of public goods. Collective action is action by more than one person intended to achieve a common goal or satisfy a common interest (that is, a goal or interest that cannot be obtained by an individual alone). Achievement means that a public or collective good has been provided. The collective action might be setting and observing a rule of restrained access to a common-pool resource, and the public good might be the sustainable exploitation that results.

One of the theories that has generated pessimism about the viability of collective action is Mancur Olson's "logic of collective action" (which might better be called the illogic of collective action, or the logic of collective inaction). His core proposition is this: "unless there is coercion or some other special device to make individuals act in their common interest, *rational, self-interested individuals will not act to achieve their common or group interests*" (Olson 1971, emphasis added). In other words, the theorem says that (a) voluntary collective action will not produce public goods, and (b) collective action based on selective (that is, excludable) penalties or rewards may produce public goods. Existing cases of common interest groups are thus to be explained by selective punishments or inducements.

My findings question this argument.

Indian Villages

The conventional view of Indian villages is that they lack any real public realm. A number of men are regarded as "big men," in some sense first in the village. But there is no clearly defined social domain or institution separate from state authority where activities of a public nature are carried out, no center of community management other than the lowest levels of the state apparatus itself, and no machinery for raising resources for public (village) purposes other than through state-sanctioned taxation.

I analyzed forty-one villages in South India (Kurnool district, Andhra Pradesh), thirty-one of which are irrigated from one or another of two large canal systems, while the other ten are dry. Despite the

conventional view to the contrary, a significant number of these villages *do* provide public goods and services through local arrangements that have nothing to do with outside bodies, whether government or voluntary agencies.

The Public Realm

Kurnool district is semiarid; rainfall averages 620 millimeters a year in a unimodal distribution. Population density averages 105 people a square kilometer (1971), up from 53 in 1870. Seventy percent of the cultivated area is under foodcrops; only 12 percent is irrigated. Thirty-four percent of villages are supplied with electricity (1971). There is one tractor for every one or two irrigated villages, and many fewer in rainfed villages (1980). Most variation in real wage rates is contained within the range of 1.5 to 4.5 kilograms of foodgrain a day.

In those villages that have a public realm, it consists of four main institutions: a village council (distinct from the statutory *Panchayat*, which is moribund in all the forty-one villages); a village standing fund (distinct from local government moneys); a group of village guards, employed by the council to protect crops from livestock and thieves; and a group of "common irrigators," employed by the council to distribute water to the rice fields and to help get more water to the village through the government-run canal. The council, and through it the field guards and common irrigators, are loosely accountable to an annual meeting of all the village's farmers.

The council also organizes the supply of many other public goods and services, such as repairing wells, ridding the village of monkeys, and making donations for a new primary school or a building where sick animals can be treated, and so on. All these services except water distribution are financed from the village standing fund, for which the council raises money in a variety of ways.

Take K village as an example. Its population is just over 3,000. The council has about nine members (the number is fixed for any one year, but varies slightly from year to year). It has authority to make decisions affecting all the village. The village's standing fund spends about Rs 10,000 a year (in an economy where a male agricultural laborer gets Rs 4 a day outside of seasonal peaks). The standing fund pays the salaries of the field guards. Four are employed full-time for most of the year, and another two to four are added as the harvest approaches. About twelve common irrigators are employed for up to two and a half months, for about 1,200 acres of first-season rice. At harvest the common irrigators supplement the field guards in protecting the crops.

In the sample of thirty-one canal-irrigated villages, eight have all four of the main corporate institutions—council, fund, field guards, and common irrigators; eleven have some but not all; and twelve have

none. These proportions are not necessarily typical of the whole area, since the sample was drawn not randomly but with an eye to ease of access and a representative range of water arrangements. Among the ten dry villages, eight have field guards; six have a village council; and six have a village fund.

The Management of Grazing

The impetus for central (village) control comes primarily from two distinct sources of social conflict and production loss. Trespassing animals and thieves are one. Unrestrained use of irrigation water is the other. These are discussed in turn, using K village as an example.

K has a population density of 159 people a square kilometer. With this density goes a farming system of annual cropping (at least one crop on each plot each year) and multiple cropping where irrigation permits. Little waste or yearly fallow land is left; the village has no common, in the sense of a large area available for common grazing for a year or more. But oxen and buffalo are needed for traction, and they must be fed. During the growing season they graze close to the crops, on the verges or on small areas of fallow, which are treated as commons. Because fields are not fenced, the animals must be tethered or shepherded. But the incentives for careful shepherding or tethering are asymmetrical—I may not be unhappy to see my animals get fat on your grain. The rationale of the field guards is to make the incentives less asymmetrical. During the medieval and early modern period in Europe, the open-field system solved the problem primarily by regulating the cropping; these Indian villagers solve it mainly by regulating the livestock.

If the field guards catch an animal grazing a standing crop, they take it to the village pound, where it remains until its owner pays a fine. If just a few animals are involved, the fine is a flat rate—Rs 2 per animal during the day, Rs 4 at night. The rate is set by the council; the field guards collect and keep the fine, dividing it equally among themselves. If many animals are involved, the council uses its discretion. The fine may run into hundreds of rupees. The field guards collect it, keep 25 percent, and hand the rest over to the standing fund. (In most villages the owner of the damaged crop is not compensated.) The field guards do not enforce a stinting. The decision about how many animals to own and graze is left to each individual.

After the harvest of most of the rainfed crops in February, large areas of stubble become available for grazing. (Even in irrigated villages, the area under rainfed crops is generally greater than the irrigated area.) Each landowner could reserve his stubble for his own animals or those he chose to allow. He could do so by posting guards around each field or by fencing. But the cost of either method—the cost of privatizing the stubble—is very high; all the more so as each

landowner tends to have his holding divided into several scattered plots (McCloskey 1975). So, as in the open-field system of Europe, the stubble is put in common; private rights to the product of the land extend only to the crop, not to the crop residues.

How, in the "corporate" villages, is this commons managed? Since the village's own stock of animals is adjusted to the availability of year-round grazing, after the harvest it has some surplus grazing, which it could rent out to herdsmen from drier parts of the district.

The market for grazing and manure is organized in two ways. In one system, a small group of herders bargains with the council for exclusive access to the village's grazing. The bargain states how many sheep and goats they will bring, when they will come, how long they will stay, and how much they will pay for the franchise. Once the bargain is made, those herders have exclusive claim to the village's grazing, and others can enter only as some leave. Their flocks graze over the stubble by day. By night, when the animals drop most of their manure, they are put on the plots of particular landowners, who pay them an agreed nightly rate per animal. So the herders as a group pay the village a lump sum for access to the commons; and they individually get back part of what they pay through the sale of manure.

The second method (used in K, among others) is more complex. Again, a group of herders obtains exclusive access. But instead of a group rent, an auction is held regularly (every four days in K) to decide who will have each flock on his land at night up to the next auction. The auction is arranged by the village council. Half the winning bid (for each flock) is then paid to the herder, and half goes to the village fund. In K, some 9,000 to 13,000 animals commonly enter the village for about six weeks, and the village fund gets about Rs 5,000 in return.

Such a large number of animals entering the village when some crops (mainly the irrigated ones) are still standing poses a serious risk of loss for those crop owners. The response is to tighten the regulation of the livestock in two ways. One is to stipulate rules for both herder and landowner. These rules are read out at the first auction of the year and may be read out again if infringed. They are worth repeating here because they do not fit easily with the view that Indian villagers cannot, so to speak, get their act together (although they may seem unremarkable compared with the elaborate by-laws of open-field villages in medieval England cited in Ault 1973).

For the herder:

- He must take the flock to the designated field by 6:30 p.m. and keep it there until 8:00 a.m.
- He must not allow the flock to graze standing crops.

- He must deposit with the council half the money paid to him for the first "turn" (four nights); if he leaves before completing four turns (sixteen nights), he forfeits his deposit to the village fund. (This is to discourage herders from leaving before the farmers have had their fields manured and cleared of stubble.)
- He must stay within the village boundary; if the farmer asks him to go to a field outside he must refuse.

For the farmer:

- He must keep the flock within the village boundary.
- If he prefers to pay the fund or the herder in kind rather than cash, he must make the conversion at the rate (in early 1980) of Rs 1.25 per measure of hybrid sorghum or Rs 1.50 of "local" sorghum.
- To help the herder guard the flock at night, he must provide two men for each 2,000 head. Hired guards must be paid Rs 3 a night, or the equivalent in grain. (This is to prevent the farmer from sending nonablebodied men, who could be paid less.)

Such rules are not self-enforcing. Any one farmer would have an incentive to cheat, by not providing the stipulated number of guards or by bringing the flock to a field outside the village boundary. So joint regulation is carried further by means of *village*-appointed guards.

To pay the guards, it would be possible for the council to set a flat rate—so much per cultivated acre—which each landowner had to pay. But such an arrangement would be vulnerable to free riding: a farmer could delay payment indefinitely, expecting that others would not similarly delay. In most villages this free rider problem is avoided by raising the money for the guards' salaries from a collective source. The chief source is the money received from the sale of the grazing franchise, which is generally enough to pay for a semipermanent team of field guards.

The "corporate" irrigated villages tend to have several other sources of revenue for the standing fund, based mostly on the sale of council-sanctioned franchises. In addition to the grazing franchise, a franchise to sell liquor is a valuable source of revenue. By law the franchise is sold in a government-run auction. However, the corporate villages usually send just one person from their village, thus acquiring the franchise at the lowest price. They then auction it within the village which, with competition, produces a higher price. The difference between the two prices goes to the village fund. Or again, one village in the sample has an irrigation tank (a small reservoir). Each year the council stocks it with fingerlings, and later in the year auctions the franchise to catch the fish, the money going to the fund. Some villages auction the right to collect a commission on all their grain sales.

The Management of Irrigation

Any irrigation system that experiences water shortages poses an inherent conflict between farmers upstream and those downstream. Those upstream have first access, and their supply is relatively abundant; how much they take determines how much the downstreamers will get. Without some rules about access, continual conflicts are likely.

The villages in the sample are irrigated from large, government-run canals and grow rice in the first (wet) season. The rice is transplanted in late July or early August and harvested in December and January. By the end of September the heavy rains have normally stopped, so the crop depends on canal water. Common irrigators are then appointed to allocate the scarce and fluctuating supply of canal water over the village's land and also to procure, by various means, more water from the government-run supply (which may include surreptitiously blocking the outlets of upstream villages).

This arrangement is notable in two respects. First, the common irrigators do not decide how much land will make a claim to the irrigation water; that is left to individual farmers (as are decisions about how many animals to graze). Second, however, once the common irrigators are appointed, they take important decisions out of the hands of individual farmers, in the name of a villagewide authority.

The criterion used by the common irrigators is "adequately wetted." Each field is entitled to be adequately wetted, but it cannot get more water until the other fields downstream from that outlet (most villages have several outlets) have also been adequately wetted. This criterion is quite different from the open access, first-come-first-served rule that prevails before the common irrigators are appointed. The criterion is also quite different from the approach in northwest India, where canal water is always scarce; there during a fixed period of the week each field is entitled to draw whatever water is flowing in the watercourse, but cannot draw more until the same time the following week.

The difference in approach presumably derives from the difference between rice (in Andhra Pradesh) and other crops (in the Northwest). Rice is more adversely affected than other crops if the water available is less than potential evapotranspiration; however, rice does not suffer from excessive irrigation. As a result, one farmer's overgenerous irrigation of a rice crop can cause drastic yield reductions for others. Therefore, whereas the Northwest's "fixed time per acre" method is self-policing—the next farmer in line knows exactly when his turn should start—the judgment of adequate wetting cannot be left to each irrigator and must be made by people answerable to a villagewide authority.

Farmers who steal water—who try to influence how much water

they get once the common irrigators have been appointed—are liable to be fined by the council. During a drought, the fines may be Rs 20 to 50 each time, but the main penalty is the stigma of being dressed-down in front of the council.

The common irrigators are paid at harvest time, not from the village fund but by means of a levy—so much per irrigated acre—on each irrigator. The rate is set by the council. Is this not vulnerable to free riding? The short answer is no, because the levy is in kind rather than cash and is made at the harvest—the one time of the year when every farmer has no excuse to delay payment in kind. More important, common irrigators who are not paid one year can damage the nonpayer the next year. The withdrawal of common irrigator services from one individual's land has graver implications than does the withdrawal of field-guarding services.

The Ecological Basis of Common Property Rules

This article has so far discussed how things are done in the corporate villages, those with all or most of the four corporate institutions. Although most of the detailed information comes from K village, the organization of the four key institutions varies little from village to village, even though they were not imposed from above.

Many villages, however, have no corporate organization: no village council, no standing fund, no common irrigators, and no village-appointed guards (though private landowners may hire their own, sometimes forming small groups to do so). In these villages the rule of open access to canal water applies, although informal turn-sharing may develop along some watercourses. And uncoordinated groups of herders may enter a village's land at will, or with the permission of the headman, and will negotiate with individual farmers about where they fold their flocks at night.

Why the difference between the corporate and uncorporate villages? The first point is that the corporate irrigated villages are located toward the tail-end of an irrigation distributary (roughly, the bottom one-third of its length; typical distributaries are ten miles long). The second point is that the corporate dry villages tend to be located in areas with black, rather than red, soil. The third point is that, in the semiarid tropics generally, black soil areas tend to be lower down a watershed than red soil areas. So irrigated villages toward the tail-end of a distributary also tend to have a higher proportion of black soils.

Black soils are more water-retentive than red soils, allowing a wider range of rainfed crops and a higher yield—and hence a more abundant and varied supply of stubble. With unrestrained access, too many animals might come in, damaging the soil. Moreover, the risks of crop loss are higher: with the more varied cropping pattern of black soils, large areas of stubble from the early-harvested crops will become

available when other crops are still standing. This provides the impetus to arrange for the fields to be guarded, which can be financed by the herders' willingness to pay for the better grazing on black soil.

In theory, the power structure of the village might be such that collective action was impossible because it was not supported by a few key households with land close to the canal. In practice, however, holdings are typically scattered in small parcels, partly because landowners want to diversify risk. A family with land close to one irrigation outlet may have another plot close to the tail-end of a block fed from another outlet. This greatly helps the consensus on the need for rules and joint regulation.

Areas of rainfed cultivation higher up a distributory have more red soil, which dries out sooner after the rains stop. They therefore have less stubble, so herders are less interested in grazing there. The higher irrigated areas tend to be under rice in both seasons, but sheep and goat manure is wanted mainly for other crops. So both the demand and supply of animals and grazing is less in the higher villages—and canal water there is more plentiful and reliable. It is in villages lower down a watershed that the potential for conflict is greatest. The evidence of my sample suggests that these lower villages are very likely to have an organized public domain, with rules on the use of water and grazing and the provision of other public goods.

How effective are the rules of restrained access in changing the way that resources are used? This question is difficult to answer, because it is hard to find a pair of similar villages, one with corporate institutions, one without. All one can say with confidence is that both production and equity are greater where rules and institutions apply than they would have been had the same villages been unorganized. Where individual benefits from joint action are high, joint action is likely to be forthcoming.

This is not to say that the temptation for self-interested individuals to go for immediate gain is minor. The need to respond to the free rider problem affects a village's organization. The typical council has developed formidable arrangements for enforcing the rules, precisely to convince each individual that his fellow villagers will probably abide by the rules, so that if he too does so he will not be the sucker (Runge 1984). These expectations are reinforced by the social composition of the council, an elite body with no pretense at representation. Councils have increased their authority with the passage of time: in all these villages, they have been operating for several decades at least.

Lessons for Theory

What of Olson's argument? One of its main weaknesses is a lack of attention to the size and nature of the *collective* benefit.[2] It concentrates instead on the size of the *selective* benefits and costs, those that

can discriminate between people according to whether or not they help to provide the public good. It simply assumes the net collective benefit to be high, since free riders must by definition be among those who value the public good highly. So the argument is geared to interpret noncooperation as evidence for the free rider hypothesis, rather than for the hypothesis of low collective benefit. In these Indian villages, however, cooperation and noncooperation are explained in terms of high and low collective benefit, as indicated by downstream or upstream location on a water supply channel and by black or red soils. The presence or absence of selective punishments has little bearing on the variation among villages.

Another qualification to Olson concerns the source of control and punishment. Olson's key proposition—that examples of collective action groups can be explained as the response to selective punishments or rewards—differs from the more conventional notion that joint behavior is related to the presence of an external enforcer of agreements. Olson is not entirely clear on whether the source of selective punishment or reward is inside the group or outside. But he can be read to mean that the penalties must be organized from outside the group.

This notion is contradicted by my findings and those of many others. There are many examples where villagers have established rules, monitored the conditions of the commons, checked for cheating, and assigned punishment.[3] There are also, of course, many more examples where attempts to do so have failed; in the absence of state regulation or private property, the commons has then degenerated. But the successful examples of local rules show that regulation of the commons does not have to be imposed from outside (McKean 1984; Ostrom 1986).

Where Olson and other pessimists about collective action are surely right is in the need for coercion to back up agreements. Their emphasis on the difficulties of voluntary collective action is a useful counter to the simple optimism of those who believe that community development projects, people's participation, water users' associations, and the like are mainly a matter of teaching people about their real common interests or promoting values that are less individualistic. On the contrary, rules that make people do what they may not immediately want to do are a necessary ingredient of managing common resources, so that while free riding tendencies may remain, they need not destroy the organization.

The voluntariness of collective action, therefore, has to be considered as a constitutional issue and as a matter of action. Constitutionally, people can agree on a set of rules of restrained access or financial contributions, their incentive to do so being prospective net collective benefit. In action, compliance with the rules must also be mainly voluntary, not the result of a calculus of evasion and punishment. But

the rules must be backed by a system of punishment, which helps to assure each individual that if he follows the rules he will not be cheated, and which at times of crisis can directly deter violations.[4]

Lessons for Organizational Design

If an outside authority wanted to encourage the establishment of some cooperative bodies, how would it choose to design them? One lesson is that, in the South Indian context at least, villagers are likely to follow joint rules and arrangements only to achieve intensely felt needs that could not be met by individual action (Johnston and Clark 1982). These are likely to involve primarily the defense of production (avoidance of crop or animal loss), secondarily the enhancement of income, and last by a long way, education, nutrition, health, and civic consciousness. The opportunities for avoiding losses or boosting income by collective action will be taken only if the losses or gains are large. In my irrigated villages, corporate organization to manage common property is found, with barely an exception, only toward the tail-ends of distributaries.

The second lesson is that corporate organizations, to be effective, should be based on existing structures of authority. In practice, this means that the council will be dominated by the local elite, which is a disturbing conclusion for democrats and egalitarians. But rules made by the majority of villagers would carry little legitimacy in the eyes of the powerful. More important, the effectiveness of a council depends on its councillors all having a substantial private interest in seeing that it works, and that interest is greater the larger a person's landholding (provided holdings are in scattered parcels). Moreover, the tendency of the nonelite to cheat can be checked by the sanctions of the village's power structure. Without these wider sanctions, the council's formal penalties would probably be ineffectual. This point tends to be overlooked in the public choice literature because it assumes a context of free and equal individuals.

If the elite runs the council, will it not become another instrument of exploitation? That is not so in these Indian villages, which reflects the third design lesson: the council is concerned only with nonprivatizable benefits. It is not involved in supplying inputs other than water. It is not involved in settling disputes unrelated to husbandry or water. It does not try to compensate the owners of animal-damaged crops, for that would create conflict about privatizable value. In K village, the council once tried to intervene in the allocation of a privatizable good (rationed sugar): the conflicts over who got it became so strong that the council almost ceased to function.

The fourth lesson is that a council should take on less vital functions (well repairing, monkey catching, and so on) only when it is very good at the core (income-defending or income-enhancing) activi-

ties. Not all those councils that are organized to do the essentials also do much less-essential work.

The fifth lesson is to keep the techniques of calculation and control simple. Some record keeping and accountability are needed, so as to "institutionalize suspicion," in Ronald Dore's phrase (1971). But the accountability procedures are straightforward in these Indian villages. There is an annual general meeting of all farmers to discuss the forthcoming season, ratify the new council, and receive nominations for guards. The records on standing fund income and expenditure are simple and are read out at the general meeting. Meetings of the council are held in the open, and anyone who passes can listen on the fringes.

One specific lesson is that, where water users' associations are deliberately fostered, the right unit of organization is usually the whole village. Attempts to form a water users' association around each canal outlet are likely to be futile if such a group of farmers does not already do other things together. The group will simply not contain enough authority. Yet many programs for irrigation improvement in India assume that the natural unit of organization is the outlet or some other hydrologically defined unit.

More generally, what can be said about the conditions on which successful collective action depends? In the extreme case—many users, unclear boundaries of the common resources, people scattered over a large area, rules easy to break—degradation of the commons can confidently be expected as demand increases, and privatization or state regulation may be the only options. The likelihood of successful collective action therefore depends on the following:[5]

- *Resources*. The smaller and more clearly defined the boundaries of the common resources, the greater the chances of success.
- *Technology*. The higher the costs of exclusion technology (such as fencing), the better the chances of success.
- *Relation between resources and users*

  Location: The greater the overlap between the location of the common-pool resources and the residence of the users, the greater the chances of success.

  Users' demands: The greater the demands (up to a limit) and the more vital the resource for survival, the greater the chances of success.

  Users' knowledge: The more users know about sustainable yields, the greater the chances of success.
- *Characteristics of users*

  Size: The smaller the number of users, the better the chances of success. However, there is a minimum number below which the tasks able to be performed by such a small group cease to be meaningful.

Boundaries: The more clearly defined the boundaries of the group, the better the chances of success.

Relative power of subgroups: The more powerful are those who benefit from retaining the commons and the weaker are those who favor enclosing private property, the better the chances of success.

Existing arrangements for discussion of common problems: The more developed such arrangements are, the greater the chances of success.

Extent to which users are bound by mutual obligation: The more concerned people are about their social reputations, the better the chances of success.

- *Noticeability.* The more noticeable is cheating on agreements, the better the chances of success. Noticeability is a function partly of how clearly defined are the resource boundaries, how near they are to users' residences, and how large is the group of users.
- *Relation between users and the state.* The less the state can or wishes to undermine locally based authorities and the less it can enforce private property rights effectively, the better the chances of success.

As the list implies, there can be no presumption that collective action will generally work—any more than there can be a presumption that private property or state regulation will generally work. My argument is only that (a) the propensity to descend into anarchy or destruction is neither as strong nor as general as mainstream collective action theory implies and (b) that where circumstances look promising for collective action government officials should treat this option as seriously as the other two.

The government can help these local systems by providing a legal framework and perhaps technical assistance. The legal framework should enable village organizations to obtain legally enforceable recognition of their identity and rights and to call upon the state as an enforcer of last resort (Korten, forthcoming). Obvious though it may sound, few governments in Asia have given much attention to this task, at least with respect to rural (as distinct from modern urban) organizations. If governments did more, their efforts would widen the range of situations in which locally based common property regimes could be expected to work.

Abstract

When will villagers come together to supply themselves with goods and services that they all need but could not provide for themselves individually? Can locally based collective action be a viable way to manage common property resources? Many writers on collective action and common property are pessimistic about the ability of people who face problems with common property resources to organize sustainable patterns of use for themselves. Some writers favor privatization of the commons as the only viable solution; others, the imposition of state regulation. This article shows, with reference

to Mancur Olson's "logic of collective action," that the analytical basis for this pessimism is weak for the village-based use of common property resources. There can thus be no general presumption that collective action will fail in the management of common property resources, any more than there can be a general presumption that it will work. The article suggests that the chances of success through collective action depend on the characteristics of the resources, the user group, and group-state relations.

Notes

This article is based on a forthcoming book, *Village Republics: Economic Conditions for Collective Action in South India*, Cambridge University Press. I am grateful to Hans Binswanger, Richard Kimber, Ford Runge, and especially Elinor Ostrom for discussions on various points of the argument.

1. For references, see citations later in text.

2. It is not that Olson says or implies that the size of the collective net benefit is irrelevant; he simply does not give it much attention.

3. For example, McKean (1984) on Japan; Gilles and Jamtgaard (1981) on Peru; Campbell and Godoy (1985) on the Andes; Hitchcock (1980), Peters (1983), and Thomsen (1980) on Africa; and Netting (1978) on Switzerland. See also Runge (1987) and Ostrom (1985b).

4. This argument is in line with some of the early writings in public choice theory, notably Buchanan and Tullock (1962) and Ostrom (1968). Later work in the public choice tradition has tended to focus too much on the issue of financial contributions.

I have not discussed here the issue of group size. Olson's celebrated theorem, stated without qualification early in his book, is later restricted to large groups in a taxonomy of small, intermediate, and large. He says little about how to distinguish the three types of groups in practice, but he might argue that the groups under discussion here are intermediate groups and therefore outside the scope of his argument.

5. See also Ostrom (1985b), the starting point of my own formulation.

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