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**WHAT MAKES A COMMON POOL RESOURCE?**

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In Governing the Commons, Elinor Ostrom defines a Common Pool Resource, or CPR, as “a natural or man-made resource system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use” (30). Notice that Ostrom has not defined a CPR as a resource shared in common by several users. A CPR is shared in common because it is difficult or costly to use it in another way, where the familiar other ways are private property and state ownership. In particular a CPR is not used in common only because user demands are small in relation to resource capacity, so that, in John Locke’s phrase, use leaves “enough and as good,” for others. This means that we can equate the problem of defining a CPR with the problem of discovering what makes a resource apt for common property management.

Notice also that Ostrom says it is difficult, but not impossible, to exclude others from the resource. The reason, I believe, is this: while it is possible to imagine some way of monopolizing the resource, when the physical features of the resource and the social or technological means available are considered, the cost of monopoly is high enough that common property management is preferable to available alternatives. By the term “monopolizing” I mean to include the two options of (a) one individual monopolizing the whole resource, and (b) dividing the resource into portions over which different individuals have monopoly--i.e. private property rights.

The purpose of my paper, then, is to identifying the features that make it difficult to avoid treating a resource as a commons, or, put the other way, to identify the features that make it attractive to manage a resource as common property. I do not think that

large size and a resulting difficulty of exclusion, is the right explanation. Ostrom herself must have realized this later, for her account in Rules, Games, and Common-Pool Resources is better, though I hope to improve on the latter account as well.

The explanation I will give of the features that characterize a CPR will have this form: there is some feature or features of the resource that make it rational to manage the resource as common rather than private property when considered in combination with the outcomes desired by the individuals involved and the social and technological means available to them.

Above I have used the terms “commons,” and “common property.” These should be clarified. Outside a select circle, the term “commons” is still used ambiguously to refer either to an open-access resource or to a closed-access resource with multiple owners, that is to common property. Students of common property recognize that when use of an open-access resource becomes so intensive that the resource is endangered, several options are available. One is Hardin’s tragedy of the commons, resulting in degradation and perhaps even destruction of the resource. Another is to convert the resource to private property. A third is state control of the resource with or without assignment of use rights to individuals by the state. A fourth is establishment of a common-property institution to manage the resource.

Drawing primarily on Governing the Commons, I offer the following account of a paradigm case of a common property institution or CPI.

1. It manages some resource (the CPR) which gives rise to a stream of benefits. The benefits may be tangible entities, like fish, grass, or water, or they may be intangible like the uses to which a commons room may be put.
2. There is a defined group of users of the resource, and they appropriate benefits according to a set of rules. In some cases users also provide or maintain the resource in some further way, for example by building and maintaining an irrigation facility or commons room. "Rules" here is used broadly to include the range from customary understanding to written, contractual obligations.
3. Adherence to rules of appropriation and fulfillment of obligations are monitored and deviations are sanctioned by the group.
4. Membership in the group, rules of appropriation, obligations for provision, monitoring and sanctions are determined by the group in some quasi-democratic manner. So too are changes to the procedures for determining membership and rules of use and provision. In short, the user group is self-governing.
5. Commoners are themselves involved in some important way in appropriating benefits from the resource, and typically acquire these benefits in kind, not as cash payments. In fact commoners typically (though not always) act as individual entrepreneurs in appropriating benefits, according to rule, from the commonly owned resource.

This definition clearly distinguishes common property from an open-access commons, by specifying that there is a defined group entitled to use the commons and that use is governed by some set of rules, adherence to which is monitored and sanctioned.

It also distinguishes common-property from its cousin, corporate property. Shareholders in a corporation, like members of a CPI, jointly own the property of the corporation, and corporations may own exactly the same kinds of resources--forests, fields, irrigation works--that are often managed as common property. But, unlike commoners, share-holders in a corporation do not themselves employ the corporate property to generate a stream of benefits, nor do they typically take their benefits in kind. The stock-holders of Pacific lumber do not typically work in the forests, nor do they take their dividends in board-feet of lumber. Of course, corporate employees frequently also own stock in the company, but this is an incidental arrangement. Buying stock does not automatically make one an employee, let alone a free agent in use of the corporate property (Johnson).

Finally, the definition distinguishes common property from state property. While individuals may share use of state owned property to generate a stream of individual benefits--e.g. joint pasturing on government lands, fishing in public streams, or use of a public park for recreation--and in this they resemble commoners, they do not, as users, determine the rules of use nor the list of users. These are determined by the state. Users may of course, have a say in determining who uses the resource and in what way, but this they have as citizens, not as users. Users sometimes also have more say than other citizens, but when this is so it is an incidental or de facto arrangement, not one to which users are entitled by the nature of state property available for common use.

Clearly CPIs are varied enough that it is impossible to offer any informative definition giving necessary and sufficient conditions for every one of them. It would be

misguided to offer a rigid definition that decides a priori what can and cannot count as a common property institution. What I have attempted instead is to offer a definition of a paradigm case. Imagine institutions with all of these characteristics occupying the center of a continuum. Other institutions are nearer or farther from the center of the continuum depending on how many of the defining characteristics they have, but there is no precise line on the continuum distinguishing what is and what is not a CPI. That is determined by individual users of the term given their particular purposes.

Now I return to the original problem: What makes a something a common pool resource? Recall Ostrom's definition: a common pool resource is "a natural or man-made resource system that is sufficiently large as to make it costly (but not impossible) to exclude potential beneficiaries from obtaining benefits from its use. The hypothesis in Ostrom's definition is that the resource is large enough that excluding potential users is difficult. What would this mean? The most plausible interpretation would be that the boundaries of the resource are large enough that it is impractical for any individual to police them and thereby secure private use of the resource. As a result the resource must be shared, either (a) with all potential users, or (b) with a subset of potential users that is small enough to profit from using the resource without depleting it, but large enough to police the boundaries and exclude other potential users.

But notice: the large size of a resource may explain why, in given social and technological conditions, no individual can monopolize the resource, or why a group of individuals must act collectively to defend the resource. But it does not explain why the resource is treated as a commons rather than being divided into private shares. Large size,

after all, helps to explain why nations are not the private property of a single individual, and why the populace must unite for defense of the nation. But despite their size, modern nations are generally divided into parcels of private, state, and occasionally common property. To understand why a resource is not subdivided, but managed in common, we must look beyond size.

Though size of a resource does not make a CPR, location may. Let me illustrate with an imaginary example. Suppose an individual wants to move water from a natural source to a field by means of an open irrigation canal. To rule out size, suppose the canal is smaller than a private canal the individual has built wholly within a separate parcel he owns. Suppose further that the individual owns a right of way and can afford to build the new canal alone. But now add the stipulation that the canal must pass alongside the fields of several neighbors. Here there is a possible problem, for the potential builder may be unable to prevent these neighbors from diverting water for their own use and possibly depleting the supply before it reaches the builder's field. The problem, notice, arises not from size, but from location. A solution may be to share use of the system with everyone along its path, or to share with selected others in return for which they agree to prevent those not included from stealing water from the system.

But notice that the desired result--a reliable supply of water at the builder's field--cannot be guaranteed by dividing the canal into private parcels and giving or selling them to others. For any user down the line gets the benefit of the canal only if it carries enough water to the downstream location. And if others up the line have exclusive property rights to their portion of the canal, then they could take so much water that downstream users

have too little, they could dam it, or they could simply fail to keep it in the kind of repair necessary to carry ample water past their own property. So downstream owners must maintain a degree of control over upstream portions of the canal. They will, in short, be pushed toward common rather than private property management of the canal.

Note that the incentive for common property management in this example is a joint product of desired outcome, physical features of the resource, available technology and social condition. More specifically it results from desiring a reliable supply of water, the technological necessity of carrying the water in an open canal, the physical location of the canal along the land of neighbors, the supposed willingness of neighbors to steal from the canal, and the absence of outside authorities to enforce the canal owner's exclusive right. If the original individual can move water through a closed pipe, private ownership of the pipe may be an option. Alternatively, if an efficient police force exists, or if respect for private property rights is great enough, then common property management of the irrigation system would not be necessary

I believe we can summarize as follows: When an individual or group needs secure access to a resource, and private property cannot, given the available social and technological means, provide that access but common property management can, then common property is rationally preferable.

If this summary is correct, then the condition isolated corresponds to one of three conditions favoring adoption of common property management described in C. Ford Runge's 1986 paper "Common Property and Collective Action in Economic



Development.” We can call this the condition of secure access. To illustrate its scope and generality, I will give two other examples involving quite different resources.

First, imagine a herding society occupying a territory where the rain comes in local showers that fall unpredictably in various parts of a large but generally arid grazing area. Since water sources and grass depend on where the rain falls, carving the territory up into private holdings would mean that in some years an individual would have ample rain, and in others disastrous drought. Second, imagine if fishermen divided a fishery into small private holdings, while the fish moved unpredictably between them, so that sometimes the yield might be high, but for extended times non-existent. Such a situation might be tolerable if herding or fishing is a supplementary activity, but not if it is the core of the economy so that each individual needs secure access to the relevant resource. An answer is to hold the entire territory or fishery in common, thus allowing herders and fishermen to follow the grass, water or fish rather than sitting on their private holding hoping that the vital resource will visit them.

Note once again that the desirability of common property management is a joint outcome of the physical characteristics of the resource, the social and technological options available to its users, and outcome desired--in these examples, secure access. Were deep well technology available, herders might tap an underground aquifer to tide them over drought years on private ranches. Alternatively, a more advanced transport system might in drought years bring water or feed from locations where they are abundant. Or an extensive private market might enable ranchers to quickly increase and decrease the size of their herds in response to local conditions. This interplay of physical features with

social and technological conditions may go a long way to explaining why modernization (i.e. increasing social and technological complexity) tends to reduce the use of common property as a management technique.

A second consideration that Runge cites as sometimes encouraging common property management is efficient use of the resource. Consider for example some of the alpine meadows managed as common property and studied by Netting and Stevenson. Many of these meadows are, in summer season, rich in grass and water, and so provide a desirable supplement to privately owned pastures in the valley. But they are located high in the mountains, and when herds are pastured on them owners have work to do in the valley. It is inefficient if not impossible for each of them to watch over a small group of animals on a remote meadow, and much more efficient to have one or a few individuals watch over the collective herd. So this is what they have done. Animals are pastured together and watched in rotation, or by hired help.

The key here is that because of the nature of the resource--in this case its remote location--common property management is more efficient than private property division. Location of the resource is by no means the only characteristic that can make common property management more efficient. Recall the example of herders in an arid territory. Even if secure access to the resource were not essential, it might be inefficient to divide up a resource of the kind described. In years when rain fell on a herder's land there might be more grass than herds could eat, while in years of drought herds would overgraze and degrade the land, and still die. Sharing the resource can more closely match need to abundance.

The same principle is at work when individuals--say farmers or suburbanites-- jointly own a piece of expensive equipment like a harvester or roto-tiller. The equipment is desirable, but on a small holding is used only occasionally for relatively brief periods. Thus considerations of efficient use sometimes push even suburbanites away from the ingrained western preference for private property toward common property management.

Runge cites a third characteristic encouraging common property management. It is summarized in this quotation: "the transaction costs of well-defined and enforced private property typical of the West may simply be too great for a subsistence economy to bear" (624). While for a contemporary westerner it is easy to think of private property as a natural and cost free arrangement, this is far from true. Recall the vast apparatus of title-registries, record-keeping bureaus, title-insurance companies, lawmakers, courts, law-enforcement agencies, etc. necessary to maintain our system of private property. In less developed social conditions even attenuated forms of these institutions may impose costs that are not justified, at least for certain classes of resources. It may, for instance, be easy to establish who owns a garden plot adjacent to the village, but far more difficult to avoid conflict about grazing rights to more remote locations. For these resources common property management may avoid excessive transaction costs.

Let me now summarize. Elinor Ostrom cited size of a resource, leading to a problem of excluding potential beneficiaries, as the defining condition of a common pool resource. The attempt to find such a condition implies that we are not concerned with those cases in which something is shared in common only because of incidental circumstances, and so I have interpreted the task to be isolating those features that make a

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resource apt for common property management. Large size of the resource is not such a characteristic. Size may explain why the resource cannot be monopolized by a single individual, and it may explain why several individuals share in common the task of excluding others from the resource, but it fails to explain why the resource itself is not divided into private parcels.

The work of C. Ford Runge allows us to group the kinds of conditions leading to common property into three categories. In each case, the physical character of the resource together with the social and technological options available to its users make it difficult to achieve a desired objective when the resource is divided into private portions. The conditions Runge cites correspond to three desired objectives: secure access to the resource, efficient use of the resource, and avoidance of excessive transaction costs in using the resource.

The task at the beginning of this paper was to discover some physical feature or features of a resource that made it apt for treatment as common property. We have found some relevant physical features, but taken alone they are insufficient to identify common pool resources. Physical features interact always with social and technological conditions and the objectives of the users. What order we have imposed on the question is related to three such objectives. Whether this provides a complete list I am unsure.

Out of fairness to Ostrom, whose work I admire greatly, let me note again that the account she gives in Rules, Games and Common-Pool Resources is a good deal closer to the one I have given here, though a comparison lies outside the scope of this paper, and though I hope to have improved even on that account.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that this is crucial for the company's financial health and for providing reliable information to stakeholders.

2. The second part of the document outlines the various methods used to collect and analyze data. It includes a detailed description of the survey process, the selection of participants, and the statistical techniques employed to interpret the results.

3. The third part of the document presents the findings of the study. It shows that there is a strong correlation between the variables being studied, which supports the hypothesis that was tested.

4. The fourth part of the document discusses the implications of the findings. It suggests that the results can be used to inform decision-making and to develop strategies that are based on evidence.

5. The fifth part of the document concludes the study and provides a summary of the key points. It also identifies some limitations of the study and suggests areas for future research.

One could say that the conditions that encourage common property management pose problems of exclusion, but it seems to me more appropriate to say they pose problems of division. To be successful, a common property institution must always solve the problem of excluding those outside the group of entitled users. The problems of division, on the other hand, it does not solve but rather obviates or accommodates. Rather than dividing the resource, a successful CPI creates conditions in which its use can be shared profitably and sustainably. This, of course, creates its own problems. The potential for free riding is endemic to CPIs, as it is to societies generally, kept in check but never eliminated by successful ones.

In closing let me cite at least one reason why it may be worthwhile to do what this paper attempts, i.e. to identify clearly and systematically the features that make management of a resource as common property attractive. We are faced with a myriad of environmental problems, some of which are, I believe, correctly identified as “commons problems,” where that means that the problem is that some open-access resource is being degraded by too much unregulated use. In some of these cases it may be that the common property model provides a good method of managing these resources and thereby lessening or solving the problem of their degradation. In order to decide which, if any, of these resources are good candidates for common property management, we need to understand clearly what features make such an option attractive. Doing this will enable us to sort among the many resources loosely referred to as “commons,” (for examples see Ecologist; French; Sandler) and to distinguish those for which common property management is an attractive option from the others for which this form of management is

inappropriate. Having done this, it may be possible to begin to imagine the details of a common property institution that adapted to particular resources. To this end I hope to have made a contribution.



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