



Common property regimes in the forest: just a relic from the past?

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An examination of the current and future potential of common property regimes in the conservation and sustainable use of forest resources.

[Residents of Mbazzi, Uganda, explain their forest use and management practices by preparing a map of their village and how it relates to the Namungo and Lwamunda forests](#)

Common property regimes, used by communities to manage forests and other resources for long-term benefits, were once widespread around the globe. Some may have disappeared naturally as communities opted for other arrangements, particularly in the face of technological and economic change, but in most instances common property regimes seem to have been legislated out of existence. This happened in two basic ways: where common property regimes - however elaborate and long-lasting - had never been codified, they may simply have been left out of a country's first attempt to formalize and codify property rights to the resources in question (for example, in Indonesia, Brazil and most countries of sub-Saharan Africa). Where common property regimes had legal recognition, land reforms sometimes transferred all such rights to individuals (as in the case of enclosure in the United Kingdom) or to the government itself, or to a combination of the two (as in India and Japan).

The FAO Forests, and People Programme and communal forest management

S.A. Dembner

The Forests, Trees and People Programme (FTPP) is an FAO action programme which combines resources and activities in community forestry from FAO's Regular Programme and four trust funds. The FFTP's goal is to reinforce regional national and local institutions that, in turn, strengthen local people's ability to manage and use natural resources. Another goal is to gain a deeper understanding of a vast variety of community forestry activities throughout the world.

The FFTP emphasized three complex topics in the development of new knowledge: participatory methodologies: local tree and woodland management; and extension, training and communications. From the beginning it was understood that central to local tree and woodland management was a thorough understanding of tree and land tenure (ownership, organization and governance). The FFTP developed a concept paper, a field manual and several case-studies on rapid appraisal techniques used for a better understanding and analysis of tenure at the policy and field levels.

This is also a theme on which governments, especially those in transition to market economies, are very much interested in obtaining policy advice. Many countries are considering alternatives to government ownership and management of forest land. Although there is considerable pressure for individual privatization, there is also considerable evidence that this form of tenure may not always be the most appropriate. The management of forest resources as a common pool by the people living in or near them has received increasing consideration. However, the topic is complex and information is lacking.

As a starting point, the FFTP carried out reviews and analyses of literature on communal forest management in Asia, Latin America and Sahelian Africa. The literature review indicated in many cases that common property management of forest at the local level was a longstanding and still viable approach. It also became clear that these management systems entail intricate relationships between village groups and local institutions between individuals and the laws that govern the forest and between governments and villagers.

There was no agreement on a conceptual framework for the consideration of communal forest management and there seemed to be a lack of scientific understanding about which variables are the primary causes of the success or failure of these systems. The FFTP then formed a small advisory group (including experts from FAO, the International Centre for Integrated Mountain Development, Indiana University, Duke University and the Tenure Center at Wisconsin University, The Woodlands Mountain Institute, Oxford University and Associates in Rural Development) to decide on forms of productive action.

The advisory board recommended the definition of a strategy for collecting and analysing information on local governance of forest resources, including the

creation of a database, and the concept of IFRI's research programme was born.

Research is not a primary focus of FAO, and Indiana University, a leading centre of excellence on communal management with a highly developed database on communal management of irrigation systems, therefore agreed to take the lead role in development of the forestry database. The willingness of Indiana University to take the lead and of many other organizations and agencies to collaborate intellectually and financially convinced the FTTP that initial funding and support should be provided to stimulate the establishment of IFRI. In line with FAO's goal of strengthening institutions in developing countries, the FTTP has helped establish FRI centres in Bolivia, Nepal and Uganda and is collaborating in the effort to start others.

Concurrently with the development of the database, the advisory committee recommended work on five special topics: the legal context for communal management; the impact of the market environment on communal management; the economic costs and rewards for communal management; questions of equity; and conflict management. The FTTP is pursuing these studies, in particular conflict management; a geographically balanced series of case-studies is under way to understand better how local populations manage conflicts total, the viability of traditional community institutions in dealing with disputes with external groups (e.g. government agencies, logging and other commercial interests, national and international non-governmental organizations, etc.), and the extent to which modern legal institutions are and can be used.

Among the many justifications advanced for eliminating community ownership of forests was the argument that individual or public ownership would offer enhanced efficiency in resource use and greater long term protection of the resource. But, in many instances, it is apparent that the arrangements that emerged to replace common property regimes have been ineffective in promoting sustainable resource management. In many instances, the transfer of property rights from traditional user groups to others eliminates the incentives for monitoring and restrained use, converts owner-protectors into poachers and exacerbates the resource depletion it was intended to prevent. Hence the renewed interest both in the lessons to be learnt from successful common property regimes of the past and present (see McKean, 1992a; 1992b; Netting, 1981; Berkes, 1992; Agrawal, 1994) and in the possibility of reviving community ownership or management as a practical remedy where appropriate.

This article first addresses the question of what common property is and then considers the potential advantages of using common property regimes to administer and manage forest resources. The final section examines current knowledge about successful common property regimes for forests.

What are common pool resources and common property regimes?

In this article, the term "common pool resources" is used to refer to the physical qualities of resource systems and not to the social institutions that human beings have attached to them. "Common property" or "common property regime" is used to refer to a property rights arrangement in which a group of resource users share rights and duties towards a resource. Property terms refer to social institutions and not to any inherent natural or physical qualities of the resource. The often used term "common property resources" is avoided because it risks confusing property (a social institution) with resources (a part of the physical and biological world). [*Ed. note: As the scientific examination of this field is relatively new, the question of defining terms is still unresolved. Readers will find the term "common property resources" used in some of the other articles in this issue. However, the distinction between resources and institutions can be determined from the context.*]

Common pool resources have two defining characteristics. First, it is costly to develop institutions to exclude potential beneficiaries from them, as is also the case with goods and services generally referred to as public goods. This invites people to use, even overuse, common pool goods without investing in their conservation or management. Second, the resource units harvested by one individual are not available to others - they are subtractable or rivalrous in consumption, like private goods, and can thus be depleted.

Oddly, the term "common property" seems to have entered the language to refer, not to any form of property at all, but to non-property, or to open access resources for which rights or duties have not been defined (Gordon, 1954; Scott, 1955; Demsetz, 1967; Alchian and Demsetz, 1973). The inefficiencies and resource exhaustion to which open access arrangements are prone are well known. Open access works well only when there is little need to manage a resource at all: when demand is too low to make the effort worthwhile. In a common property arrangement, on the other hand, a particular group of individuals share rights to a resource. Thus, there is property rather than non-property (there are rights rather than the absence of rights), and these are common, not to all, but to a specified group of users. Thus, common property is not access open to all but access limited to a specific group of users who hold their rights in common (Runge, 1981; 1984, 1992; Bromley and Cernea, 1989; Bromley *et al.*, 1992). Hardin's (1968) classic essay on the tragedy of the commons points out the hazards of open access, without stating clearly that the problem was the lack of a property rights or management regime (the openness of access), not the sharing of use (common use). Hardin (1994) has taken steps to rectify this oversight in a more recent work which distinguishes between the unmanaged (unowned) commons subject to tragedy and the managed (owned) commons where property rights may be able to prevent misuse of the resource.

[A woman weaving a mat from straw on a hillside near Pokhara, Nepal](#)

Economists (North, 1990; North and Thomas, 1973; Demsetz, 1967; Alchian and Demsetz, 1973; Anderson and Hill, 1977; Libecap, 1989) argue persuasively that property rights emerge in response to conflict over resource use and conflicting claims over resources, and that well-defined property rights help to promote a more efficient use of resources and more responsible long-term care of the resource base. A complete

bundle of rights would include assorted rights of use (from the right to use and change the use of a resource to the right to destroy a resource) as well as rights of alienation (e.g. transfers through bequeathing rights to heirs and/or selling rights) (Schlager and Ostrom, 1992; 1993).

Theorists (Locke, 1965; DeAlessi, 1980; 1982; Libecap, 1989) also argue that economic growth results from the creation of private property rights to the extent that these rights are:

i) clearly specified;

ii) exclusive;

iii) secure; and

iv) an intact bundle of rights, so the holder of use rights may also decide to change the way the resource is used, even to destroy it and, of course, to transfer it.

It is noteworthy that the definition of private property rights has to do with the rights, not the nature of the entity that holds them. The privateness of private property rights does not require that they be held by individual persons; they may also be vested in groups of individuals.

Scholars who have designed taxonomies to point out the difference between open access arrangements and common property have sometimes distinguished four very general "types" of property: public, private, common and open access. This classification unfortunately creates the erroneous impression that common property is not private property and thus does not share in the desirable attributes of private property. It is crucial to recognize that common property is *shared private property* and should be considered alongside business partnerships, joint-stock corporations and cooperatives. The property rights in a common property regime can be very clearly specified, they are by definition exclusive to the co-owners (members of the user group), they are secure if they receive appropriate legal support from governments and, in some settings, they are fully alienable. For example, some Swiss alpine common property regimes, some Japanese agricultural and forest common property regimes and all Japanese fishing cooperatives permit trading in shares (the individually parcelled rights to flow or income), while all have mechanisms by which the entire common property user group may actually sell its assets (the shared rights to stock or capital assets of the user group or corporation) (Netting, 1981; Glaser, 1987; McKean, 1992a).

Mechanisms for sharing private property including common property regimes do have their weaknesses: just as there can be shirking and agency problems in a firm, there can be temptations inside a common property regime to cheat on the community rules. But there are productive efficiencies to be captured through team production that may outweigh potential losses through shirking. Similarly, there may be gains from the joint

management of an intact resource that can outweigh losses from cheating (or the cost of mechanisms to deter cheating) in a common property regime (Coase, 1937; Miller, 1993).

The advantages of common property regimes

Common property regimes are a way of privatizing the rights to something without dividing it into pieces. Common property also offers a way of parcelling the flow of skimmable or harvestable "income" (the interest) from an interactive resource system without parcelling the principal itself. Such a regime would obviously be desirable when the resource system is most productively managed as an intact whole rather than in uncoordinated bits and pieces. Historically, common property regimes have evolved in places where the demand on a resource is too great to tolerate open access, so property rights in resources have to be created, but some other factor makes it impossible or undesirable to parcel the resource itself.

Factors favouring resource integrity

Indivisibility. The resource may have physical traits that make it unamenable to physical division or demarcation. Either the resource system cannot be bounded (the high seas, the stratosphere) or the resources in question may be mobile over a large territory (air, water, fish, wildlife). Such resources have to be managed in very large units. Forests may seem much more divisible at a first glance than other kinds of resources systems. However, forests need to be managed in large units, particularly where they are being managed not only for products that can be removed but also for their environmental protection value, both at micro and macro levels. Even in strictly production forests, economies of scale often argue against fragmentation, especially in terms of management costs.

Uncertainty in location of productive zones. In fragile environments nature may impose great uncertainty on the productivity of any particular section of a resource system, and the location of the unproductive sections cannot easily be predicted from year to year, even if the "average" or "total" productivity of the entire area is fairly steady over time. In this situation, the resource system is stationary and may even have obvious boundaries, but the productive portions are volatile. In such resource systems, resource users may well prefer to share the entire area and decide together where to concentrate use at a particular time, thereby sharing risks and benefits rather than parceling the area into individual tracts and thus imposing the total risk on some of their members (those whose parcels turn out to be bad ones at that particular time).

Productive efficiency through the internalization of externalities. In many resource systems, watershed catchments for instance, uses in one zone immediately affect uses and productivity in another: deforesting a hillside ruins the water supply and downhill soil quality. If different persons own the uphill forests and the downhill fields or, for that matter, small adjacent patches of forest and pasture - and make their decisions about resource use independently and separately, they may well cause harm to each other. If these externalities are substantial, the owners/users will want to negotiate mutually beneficial contracts (Coase, 1960). Either the downhill farmers would pay uphill forest

owners not to cut all the trees they might want to, or uphill forest owners would cut all the trees they want to and, instead, compensate downhill farmers for damaged fields with the extra earnings from timber sales.

An institutional alternative to this series of bilateral exchanges is to create a common property regime to make resource management decisions jointly. People who use a common property regime to manage a catchment area may all share ownership of the upland forests, manage forest harvesting to prevent soil erosion and damage to fields below, and earn more from their downhill farms than what they sacrifice by not cutting as much uphill timber. Common property regimes may become the desirable option when more intensive resource use multiplies externalities between parcels and increases collective agreement on fairly restrictive use rules, and when collective enforcement of those rules becomes easier (less time, lower transaction costs for the owners) than endless one-on-one deals.

Administrative efficiency. Even if resources are readily divisible into parcels, the administrative support to enforce property rights to individual parcels may not be available. Creating a common property regime may be a way of instituting collective management rules - which function as imaginary fences and informal courts internal to the user group - to fill this gap. It is cheaper in these circumstances and it is within the power of a group of resource users to create (even if they cannot create a nationwide system of courts and cannot afford barbed wire). Common property regimes can be particularly attractive in providing administrative efficiency when resource management rules can simply be grafted on to the functions of a pre-existing community organization.

[Demarcation of a common property forest area for analysis In Bolivia](#)

[Members of for user groups Soraghare, Nilkantha VDC, Dhading, Nepal](#)

Some resource systems appear eminently divisible, for example: where risk and uncertainty are low and uniform across the resource system; where externalities seem minor or manageable through individual contracting; and where administrative support for individually owned parcels is ample. Even in these cases, however, there may be reasons to maintain common property arrangements. Natural resource systems are fundamentally interactive forests provide watershed control, species are interdependent in ways we are often unaware of, etc. - and may well be more productive in large units than in small ones. In order to optimize the productivity of their own parcel, owners of individual parcels may want to guarantee that owners of adjacent parcels also make compatible and complementary uses of their parcels. In effect, owners of individual but contiguous parcels may have an interest in the mutual regulation of land use - the equivalent of zoning. In fact, zoning and urban planning are actually the creation of common or shared property rights in choices over land use and the vesting of those rights in the citizens of a municipality. Just as zoning in a frontier area where population density is low would be an unnecessary effort, it would be increasingly desirable to control externalities in areas with increasing or already high-density populations, so common property becomes more desirable, not less, with more intense resource use.

That is, mutual regulation through the institutional equivalent of a common property regime is more desirable as resource use intensifies and approaches the productive limits of a resource system. Further, since it is people who use resources, common property becomes more desirable - not necessarily more workable but more valuable and thus more worth trying - as population density increases on a given resource base.

If human beings depend on extracting as much out of a resource system as the system can sustainably offer, then a careful mutual fine-tuning of their resource use becomes essential. Common property regimes are essentially a way to institutionalize and orchestrate this kind of fine-tuning when resource systems are pushed to their limits.

Many observers and policy-makers throw up their hands in despair when they see population pressure and resource depletion; they condemn common property as quaint and unworkable and recommend privatization. But what they mean by privatization is either the outright award of the entire resource system to a single individual, without regard to the consequences for the former users of the resource, or parcellation. The advocacy of "privatization", therefore, tends to overlook what may in fact be the most appropriate form of privatization in some instances - that of shared private property or common property. Like individual parcellation, common property gives resource owners the incentive to husband their resources, to make investments in resource quality and to manage them sustainably and thus efficiently over the long term. However, unlike individual parcellation, common property offers a way to continue limited harvesting from a threatened or vulnerable resource system while solving the monitoring and enforcement problems posed by the need to limit that harvesting.

Common property regimes for forests-recommendations

The findings to date from many individual case-studies of successful and failed common property regimes may be synthesized into a set of broad policy recommendations (based on Ostrom, 1990; McKean, 1992b; Ostrom, Gardner and Walker, 1994).

User groups need the right to organize their activities, or at least a guarantee of no interference. There is a stark difference between forest user groups such as those in Switzerland and Japan, which have both legal standing as property-owning entities and long-documented histories of community forest management, and indigenous peoples from Kalimantan and Irian Jaya to the Amazon and from Zaire to India, who have practiced community forest management unchallenged for decades or even centuries but who have no legal protection. As soon as forest products become commercially attractive, persons outside the traditional user community become interested in acquiring legal rights to the forest. If the traditional users have those legal rights in the first place, then they essentially have the commercial opportunities that their resources create. In Papua New Guinea, for instance, where traditional community resource rights are legally valid, portable sawmills used by villagers are found to be more economically efficient overall and to bring more wealth into the village than allocating harvesting concessions to

external corporations. Where local communities' claims are unrecognized by national governments, the best they can then hope for is that the upper echelons of government will overlook them rather than oppose them. The farming villages of Andhra which use an open field system to manage planting, harvesting, grazing and irrigation, do so successfully only because and as long as the state and national governments ignore them (Wade, 1992).

[Interviewing forest users in Soraghare, Nilkantha VDC, Dhading, Nepal](#)

Establishing a research network on forestry resources and institutions IFRI

Most research on forest common property regimes has relied primarily on case-studies. The variables examined in one study are not always comparable to those examined in another. Thus, it is not possible to analyse how different institutions work in the context of a large number of ecological, cultural and politico-economic settings. Nor has it been possible to process data collected from specific localities via satellite images so that conditions observed from a distance could be related to processes and outcomes observed on the ground.

In an attempt to fill this gap, social scientists associated with the Workshop in Political Theory and Policy Analysis at Indiana University have begun the International Forestry Resources and Institutions (IFRI) research programme. The aim of IFRI is to generate systematic information over time about the capabilities and limitations of diverse institutional arrangements to cope with problems of deforestation and loss of biodiversity. The research network and database are devoted to compiling information that is amenable to comparative analysis and to establishing an international network of contributors and users who can draw on this database to guide future policy efforts.

Initial steps have been taken during the past two years to develop rigorous research protocols and a network of collaborating research centres the first three collaborating research centres are located in Bolivia, Nepal, and Uganda. It is hoped that the network will expand within the next five years to include 15 collaborating research centres located in all major regions of the world. The possibilities of establishing IFRI collaborating research centres in Norway, Sweden, Slovakia, Zimbabwe, Madagascar, Cameroon, India, the Philippines. Costa Rica, (Guatemala, Brazil and the United States are being considered.

Each participating centre will have the multidisciplinary skills and training needed to use these protocols for collecting systematic data on forest conditions and institutions and compiling a sample of geo-referenced forest sites over time. Each centre will organize multidisciplinary research teams to conduct repeated visits to a sample of forest sites and gain comparable, valid and reliable data. It will be necessary to ensure that:

- **systematic, quantitative forestry mensuration is used:**
- **species inventories include both scientific and local names and uses;**
- **researchers are fluent in local languages, enabling them to undertake in-depth discussions with users (both those with and without formal rights), including women men and children;**
- **local forest users gain confidence that researchers who return on a repeated basis ha, e respect for the capabilities of local users and use participatory methods to obtain qualitative data that is synthesized and made available immediately to local users;**
- **analysts who are keenly familiar with local differences within a country undertake sophisticated data analysis based on good scientific training as well as an in-depth knowledge of local circumstances; and**
- **advice concerning policy options is made by individuals whose own future is closer! Related to the success of these policy recommendations.**

A key aspect of the IFRI research programme is extensive training in participator!-data collection techniques, in the use of computers for archiving and analysis and in providing rapid and useful feedback to forest users and government officials. The enhancement of skills and know-ledge of national scientists will contribute to an improved knowledge base for policy dialogue in their own countries.

During each site visit, data will be collected about forest and settlement locations, boundaries and human patterns of use. In-depth discussions will be held with diverse user groups regarding their incentives to engage in enhancing, patrolling, harvesting and selling diverse forest products, as these are affected by complex bundles of property rights in use. The composition of user groups; the problems faced in controlling illegal harvesting; how users and officials view the consequences of rules in use; how multiple government agencies, NGOs, private corporations and indigenous institutions relate to one another; and what conflicts have been generated and how these are (or are not) being mediated will all be assessed in a continuing process of observation, discussion and feedback. Micro-level data will help to unravel complex processes whose effects can be monitored using satellite imagery, but the processes themselves are not yet well understood and can only be examined in the field. If preliminary analyses reveal that the institutional arrangements in particular locations are accomplishing far more (or far less) than others in similar settings, individual case-studies may be conducted.

The resulting information will be recorded in a relational database that has been especially designed to keep track of complex tree tenure regimes, indigenous harvesting technologies and the gender, ethnicity and diversity of organized and

unorganized groups of users. The database holds both quantitative and qualitative information and preserves rich contextual descriptions as well as nominal and ordinal coding. Information can be made immediately available to forest users and government officials about forest conditions and plant biodiversity in each location over time.

Analyses will focus on how different types of forest institutions, and particularly common property regimes, affect the incentives of users to increase their own welfare as well as to conserve plant diversity, prevent soil erosion and sustain long-term forest conditions. All types of forest institutions will be included in the study in order to compare the performance of common property institutions with various forms of government and individual property arrangements.

Once initial data is collected and entered in a local database maintained in a country, collaborating research centres can respond to requests from practitioners and researchers for answers to questions of direct importance for a particular location. In Nepal, for example' one use of the IFRI database is to collect baseline data for a leasehold forestry project undertaken by the Department of Forests. The project will be monitored over time to assess the effectiveness of giving long-term leases to landless peasants and training them in appropriate agroforestry techniques. Several control groups will be used in the assessment. The first will be those areas where baseline studies are conducted but a leasehold project is not initiated. The second will be areas in similar ecological zones where self-organized user groups, the Department of Forests, NGOs or other special projects are responsible for all or some of the management of the forests.

In Uganda, the IFRI database is being designed so that it can be used as an integral part of the National Environmental Action Plan. There is considerable interest in Uganda in tracing how local communities cope with managing diverse resource systems.

In Bolivia recent policies to change the formal status of different types of local communities will be examined with the IFRI database. It will also provide feedback to local users and government officials about comparative performance across types of forest institutions and over time.

After the data has been analysed locally, it will be shared among other members of the network so that a systematic cross-country analysis can be undertaken. The information obtained and utilized by this network will be used to examine conjectures derived from previous studies of common property regimes and on institutional analysis anti design more generally.

Further expansion of the network will depend on the availability of funding and arrangements whereby this research programme may provide important and timely information that is of high value to forest users, public officials and scholars in a

particular region.

Requests for additional information about the IFRI research programme and network of collaborating centres should be addressed to Dr Elinor Ostrom, Co-Director. Workshop in Political Theory and Policy Analysis, Indiana University, 513 North Park Street. Bloomington, Ind., USA, 47808-3895.

[An ant hill managed as a source of food in Uganda](#)

The boundaries of the resource must be clear. Both the natural physical boundaries of a forest as well as the legal boundaries for a particular community's forest must be clearly identified and defined. Clearly marked or even well-understood boundaries can be an inexpensive substitute for fencing. Indeed, fencing may be an effective barrier against some animals, but not against human beings who can climb over most fences and, in any case, acquire wire clippers and saws. Those who invade another person's territory know they are doing it and those who are invaded can readily prove that they have been invaded.

The criteria for membership in the group of eligible users of the resource must be clear. The user group has to be in solid agreement over who its members are, and it is probably best if eligibility criteria for membership in this group do not allow the number of eligible users to expand rapidly. Many Swiss villages limit eligibility to persons who live in the village and purchase shares in the alp, so that new residents must find shares to buy and share owners who leave the village find that it is in their interest to sell their shares because they are unable to exercise their village rights from elsewhere. Thus, the size of the eligible user group remains stable over time. Japanese villages usually confer eligibility and shares of harvest on households rather than individuals and may also limit membership to long established "main" households rather than "branch" households. These practices assure that no special advantages go to large households, households that split or new arrivals. Communities may be less strict - at their peril - about defining eligibility for membership in the user group. Vondal (1987) describes an Indonesian village whose communal resources are under stress in part because the community opens membership in the user group not only to all village residents but also to all kin in neighbouring villages. Thus, this user group has expanded rapidly, without developing a method to match its size or its aggregate demand for resources to the capacity of the resource system.

Users must have the right to modify their use rules over time. Inflexible rules are brittle, and thus fragile, and can jeopardize an otherwise well-organized common property regime. In a magnanimous but ill-considered attempt to extend legal recognition to common property regimes over forest and pasture land in the Punjab, the British authorities decided to codify all the rules of resource use in different systems. The undesirable consequence was the freezing of use rules that really needed to remain flexible. Resource users are the first to detect evidence of resource deterioration and resource recovery, so they need to be able to adjust rules to ecological changes and new economic opportunities. For example, Japanese villages that have retained full title to

their common lands are not only free to adjust regular use rules as they see fit but are also free to take advantage of attractive commercial opportunities. They may hire loggers to clear one-fiftieth of the mountain each year for 50 years. They may "manage" the forest for commercially valuable bamboo or fruit-trees. They may lease surface rights to hotels and ski resorts. They are even free to sell off the commons, by unanimous vote, if they went to reap the capital gains on appreciated land values.

Use rules must correspond to what the system can tolerate and should be environmentally conservative to allow a margin for error. Successful user groups appear to prefer environmentally conservative use, possibly to give themselves a margin for emergencies. Japanese villagers in the Mt Fuji area knowingly overused their common forests during the depression of the 1930s, removing more fodder for pack horses and more wood for charcoal than would have been harvestable on a sustainable basis, but also knew that they and the common itself - could afford this in such a temporary emergency, precisely because they had been intentionally conservative in their use during good times. The common was both an essential part of everyday living and a backup system maintained in reserve. When forestry scientists told Nepalese villagers that their forest could easily tolerate the extraction of both leaf litter and kindling, the villagers rejected this advice and opted instead to ban the cutting of fuelwood altogether because they feared that any form of woodcutting would threaten the total population of deciduous trees and could thus reduce the supply of leaf litter they valued so much as fodder and fertilizer (Arnold and Campbell, 1986).

Use rules need to be clear and easily enforceable. Common property regimes frequently establish quantitative limits on amounts of different products that an individual user may extract from various zones of the forest, but this means that a suspected infraction involves much measurement, weighing and discussion between the resource user and the guard. Sometimes other kinds of rules can be simpler to understand and enforce. Restrictions on the equipment a user takes into the forest may be just as effective in restraining harvesting and may also be simpler to enforce. Having too large a saw or a pack animal rather than a backpack might then be an infraction even before a person begins to cut. Opening and closing dates are similar: being in the forest during the off-season is simply unacceptable, whatever the excuse. Clear enforceable rules make life easier for resource users as well as for monitors representing the user group and they also reduce misunderstandings and conflicts.

Infractions of use rules must be monitored and punished. Obviously, rules only work when they are enforced. Agrawal (1992) found that communities in Rajasthan differ widely in the extent to which they devote village resources to enforcement, particularly the hiring of guards or assigning of villagers to guard duty following a rotational scheme. The communities with healthy common forests were found to be those that recycled the fines and penalties they collected into providing for their guards.

Distribution of decision-making rights and use rights to co-owners of the commons need not be egalitarian, but must be viewed as "fair". If any subgroup feels cheated - denied "adequate" access or a "fair" share vis-à-vis another subgroup, they will become

unwilling to participate in decision-making, unwilling to invest in maintaining or protecting the commons and motivated to vandalize the commons.

Inexpensive and rapid methods of resolving minor conflicts need to be devised.

Successful common property regimes assume that there will often be small disagreements among users, and provide opportunities for these disagreements to be aired and conflicts to be resolved through compromise.

Institutions for managing very large systems need to be layered, with considerable authority devolved to small components. A large forest may be used by many different communities, some of which are in frequent contact with each other and some of which are not. The need to manage a large forest as a unit would seem to contradict the need to give each of that forest's user communities some degree of independence. Nesting different user groups in a pyramidal organization appears to be one way to resolve this contradiction, allowing simultaneously for independence and coordination. The most successful models of nesting come from irrigation systems serving thousands of people at a time.

Common property database information available electronically

C. Hess

The Workshop in Political Theory and Policy Analysis has recently made available in electronic form many of its unique bibliographical databases on forestry and common pool resources. These databases contain Volumes 1 and 2 of the Common Pool Resources and Collective Action Bibliography (1989-1992) by Fenton Martin (also available in print) and Common Pool Resources and Collective Action, Volume 3 (1994) and Forestry Resources and Collective Action (1994) by Charlotte Hess. The combined databases contain over 10 500 citations. Forestry Resources is the largest of these databases, containing 2 500 citations.

These databases are now stored on the Indiana University gopher (a type of computer software) following a simple protocol and can be accessed by anyone with access to the Internet.

Gopher software may be retrieved via anonymous File Transfer Protocol (FTP) from the University of Minnesota archive at <boombox.micro.umn.edu>.

• To access these databases

- connect to: lib-gopher.lib.indiana.edu port 3080

or

- connect to: gopher.idiana.edu port 70

and follow, the menu path:

→ Οττηερ ΙΥ γοπηερσ

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Conclusion

It must be recognized that some common property regimes falter and that other institutional arrangements can also work effectively. But it would be a grave mistake to dismiss common property regimes as relics of the past, intrinsically unworkable or incompatible with contemporary society. The theoretical arguments and examples provided above indicate that there are circumstances where common property regimes may be quite suitable, and there are in fact many documented cases where forest users themselves have crafted institutions consistent with these findings. But there are still many gaps in the knowledge and information about the effects of diverse institutions on forest conditions. Instead of destroying or creating institutions willynilly, there is a need for a continued effort to enlarge the body of information at the base of attempts to reduce rates of deforestation and the loss of biodiversity around the world.

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