Siting and Designing Successful Institutions for Community Rights in Natural Resources

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ABSTRACT

This paper summarizes the best that we now know about why, when, where, and how to create community-based rights or common property regimes in natural resources, which I conceive of as a shared form of private property rather than as an alternative to private property. The paper is based on twenty years of tracking both theoretical and empirical research on property rights and environmental outcomes, particularly community management and ownership of resource systems, as well as my own primary research on the history of commons in Japan, and includes a bibliography for the landmark works in the development of that field. It begins with a summary of conventional misperceptions and recent clarifications surrounding the issues of cooperation, free riding and tragedies of the commons, and common properly arrangements that can prevent tragic depletion *of* resources and economic waste. The paper then uses the many well documented cases now available to us to (a) identify the reasons or the circumstances in which it appears to be more economically efficient to award property rights to groups rather than to individuals (the focus here is on why. when, and where to create common property, and by extension when and where not to bother): (b) review the critical internal features (design guidelines) for a successful common property regime, one that can successfully manage resources conservatively for either ecological or economic reasons or both (the focus here is on the best practice or design guidelines for common property institutions); (c) review the critical external features of a successful common property regime, or what governments and others need to do to support these regimes rather than undercutting them (though the other papers in this conference are much more specifically focused on the details of legal reform required in Indonesia). The paper then concludes by articulating the case for creating common property in natural resources for communities where these conditions can be met. rather than vesting ownership in government or individuals. It lays out the advantages, as well as risks that remain, to resources, communities, and governments. Finally, it uses the experience of the developed countries that have had the longest experience with successfully managed common property (these include Norway, Sweden, Switzerland, and Japan) — an experience that began in every instance with defining and legally protecting both individual and shared private property institutions before industrialization - to examine the role of community-based property rights in commons through different stages of economic development. Success is almost never a sure thing in social arrangements. But sometimes we know when failure is a sure thing and failing to create common property where both government and individual ownership are unsuitable virtually guarantees unsustainable resource depletion by all involved and tragic waste of a country's natural assets.

Keywords and *phrases: creating common property regimes, common property rights, common property systems, co-owners of resource rights, common property boundaries, community based resource management, common property externalities, community controls for resource management, role of common property regimes, proto-industrial Japanese society, the Tokugawa period, the Meiji period, traditional common properly rights, environmental sustainability, collective management of natural resources, sustainable development.*

WHY THE NEW ENTHUSIASM ABOUT COMMUNITY BASED RESOURCE MANAGEMENT?

Research over the last thirty years has managed to complicate our understanding of the relationship between people and environmental resources. Garrett Hardin (1968) told us that if people use resources in common, they will deplete them because of the incentive to free-ride, to cheat against their peers and make greater use of the commons than their fair share would allow. Since all involved face the same set of incentives, most would opt to cheat, and the common resource would be degraded. He concluded that the only paths out of this fate were to parcel resources to individuals who would then have incentives to exclude invaders and poachers, or to invite governments, with their monopoly of coercive power, to do this policing. However, experiments with parceling and putting governments in charge of allocating rights to resource harvesting have come under increased criticism and scrutiny - and deservedly so. Some resources cannot be divided into bits, and some that appear to be divisible turn out not to be productive when parceled, with one parcel managed in different ways from the next. Moreover, individual resource-owners are not immune to the incentive to mine their resources when they encounter rapidly rising prices or when they happen to fall into debt.

As for governments, they often lack the capacity or the political will to follow through with regulatory promises and enforcement, and they suffer from what political economists call the "principal-agent" problem: they simply cannot get their agents or officials to behave the way they want them to. Many governments are highly vulnerable to corruption and rent-seeking, in which officials uninterested in long-term earnings for the public treasury instead seize the opportunity to pocket a share of the short-term earnings that they split with concessionaires who engage in unsustainable levels of resource harvesting. These consequences are good for the recipients of resource rents, but bad for the government treasury, the economy as a whole, and other citizens. Not only does this kind of rent-seeking transfer wealth from government coffers and citizens to a few individuals in the short term, but it also shrinks the total income over time that a society earns from such resources. In essence, nobody is safeguarding the collective interests of the society, and those who supposedly have this duty (government officials, both appointed and elected) find it possible to remain in office without fear of penalty or unemployment if they ignore this responsibility. Their individual interests include only lining their own pockets, and too often do not include functioning as watchdogs of the collective interest. This is and always will be a problem, a serious risk, in every country on the planet, correctable only through close monitoring.[1] But countries vary a lot in the degree to which citizens have the information, energy, time, and impetus to collective action that they need to identify and punish misbehavior by government officials and thus create synchrony between the individual interests and the collective duties of politicians. Indonesia is known to have a severe case of this problem. It is in fact heart-warming and very promising to see political change and an increasing will to attempt reform among government officials who are concerned about the welfare of ordinary people and the state of Indonesia's natural assets.

Rent-seeking and corruption in officialdom are also very bad indeed for the local communities whose livelihoods depend on sustainable management of the resources in question, and their response to increasing evidence of resource depletion beyond their control

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[1] John Stuart Mill underestimated the problem when he said that eternal vigilance is the price of liberty, because eternal vigilance is the price of everything worthwhile — not just liberty, but also goods like clean air, safe food, sustainable resource management, honest car salesmen, and competition in the production of computer software!

also complicates the picture. If government officials share with private plunderers in the depletion of these resources, then local people have absolutely no hope of conserving the resources they depend on. If they had control over these resources, they might choose depletion too, of course (USD$1000 per tropical parrot, cash on the table right now, is hard for anybody to resist), but they might also choose sustainable extraction of income-generating products from the resource. It is control over the resource that confers the power to choose between short-term and long-term gain, between individual-only gain and a combination of individual and collective gains that are actually larger. If local communities have control over a resource, they can dare to opt for conservation, sustainable use. and greater long-term gain. If local communities have no control, and arc instead in competition with concessionaires and corrupt government officials, then there is no choice: the only sensible course of action is to race the other plunderers to resource exhaustion. They might as well get what they can before the concessionaires and the government officials do, and use what meager earnings they manage to extract to set up a new life elsewhere after their resource base is ruined. Thus parcelization to outsiders and government management, particularly management by distant units of government, may actually accelerate the process of depletion that they were ostensibly meant to halt, by inviting, even forcing, the local people to join in the pillage.

Governments have often pointed to the contribution of local resource users to the depletion of resources as a justification for taking those resources away from them, arguing, as Garrett Hardin used to, that governments will manage resources better than local people will. But the behavior of local people cannot be assumed to be a constant, indifferent to circumstance. *Resource-depleting behavior is both individually and collectively rational in circumstances of insecure tenure but NOT in other circumstances. Recently we have begun to realize that the problem is not the predilections of local resource users, nor the community sharing of resources, but the widespread insecurity of tenure over resources, both collective and individual tenure, worldwide. Where governments contribute to insecurity of tenure, they are actually a large cause of the environmental problems.* Increasing government control exacerbates the problem further because it diminishes local control over resources further and thus eliminates the very possibility of sustainable use in the long-term interest of the local community of resource users. In such cases, governments actually cause the problem that they blame local people for.

The resource depletion we have experienced worldwide is the principal reason for rethinking our relationship to resources and re-evaluating the "tragedy of the commons." Over the last twenty years, researchers have continued to unearth examples of shared resource use by communities over long periods of time that did not result in resource depletion. The crucial difference apparently is not whether use is shared or parceled, but whether the users who share resources exert themselves to manage those resources, and create rules to govern their own behavior and to exclude others. Out of these negotiations can come spontaneous contractual cooperation that is contingent on reciprocal cooperation from others, mutual assurance that others will also engage in self-restraint, and considerable monitoring, enforcement, and punishment of those problematic free-riders (Axelrod, 1984; Russell Hardin, 1982; Taylor, 1987; Ostrom, Gardner, and Walker, 1994). Whereas Garrett Hardin's shepherds all had speech impediments and apparently did not talk to each other or discuss alternatives and remedies, we have since learned that managed commons, as opposed to unmanaged open access commons, do not have to suffer (Runge. 1981. 1984a. 1984b: *Proceedings,* 1986; McCay and Acheson, 1987; Ostrom, 1990; Bromley et al., 1992; Berkes, 1989; Pinkerton, 1989; Bromley et al., 1992; Singleton and Taylor, 1992; Singh,

1994; Hanna, Folke, and Mäler, 1996; Arnold, 1998). Indeed, Garrett Hardin (1994) himself acknowledges these new findings.

This is why there is great excitement now about creating common property regimes that work to replace alternatives that have not given us sustainable outcomes. The Nepali and Indian governments are denationalizing the forests they had nationalized earlier. Nepal, which suffered faster and more obvious depletion at the hands of government than India, is more serious about this devolution, and is awarding more complete control of forest lands to villages than is India (Arnold and Campbell, 1986; Messerschmidt, 1986; Agrawal, Britt, and Keshav, 1999). In India, which has a federal system and much variety among different states, the best outcomes for Joint Forest Management are occurring where the devolution is more complete and local communities have more control, and more of the benefits go to them (Poffenberger and McKean, 1996). China is auctioning off barren wastelands (ruined during the period of people's communes in the same way that government supervision goes wrong elsewhere) to both individuals and communities (Meng, 1995; Zheng, 1996). Brazil has launched an effort to create extractive reserves in the Amazon in order to protect it while guaranteeing a livelihood to those who then have an incentive to protect the forest that is their livelihood (de Onis, 1992: Diegues, 1998). Zimbabwe's CAMPFIRE program awarding rights to income from wildlife (both ecotourism and hunting) to local communities has not only enriched these communities but it has also allowed the elephant population to recover from dangerously low levels. Instead of poaching government-owned elephants to quick exhaustion, local people now have strong incentives to protect elephants that are essentially their own. The healthy herds attract both ecotourists and hunters, producing a sustainable stream of income over the long term without endangering the herd as a whole (Barbier, 1990; Hasler, 1996).

There is considerable enthusiasm in the development community about restoring depleted resources to health, and thus improving the livelihoods of the rural poor, through devolving resource control to communities and guaranteeing streams of benefits from sound resource management to local communities. This new confidence about common property comes from studies of the robust long-lived common property arrangements that we continue to learn about all around the world (Netting, 1981; Campbell and Godoy, 1986; McKean, 1982, 1986, 1992a, 1992b; Ostrom, 1990; Freudenberger, 1993). Successful uses of common property range well beyond forests (Gibson, McKean, and Ostrom, 1999) and grazing (Agrawal, 1999) to fresh water supply (Tang, 1992; Blomquist, 1992) and the marine environment as well (McCay and Acheson, 1987; Berkes, 1989; Pinkerton, 1989; Schlager, 1990 and 1994; Singleton, 1998 and 1999b).

What Is Common Property?

The final step in outlining the new enthusiasm about common property regimes, (before I itemize the factors that are critical to their success), is to define what property rights in general and common property in particular actually are. People cannot actually own things -- what they actually have when they own something is the right to make decisions about it and control its use in contrast to other persons who do not have such rights. Properly speaking, property rights to a thing are a set of rights and duties viz a viz other persons, and thus are actually a set of relationships among people rather than a relationship between people and things. The owner has the right to extract benefit from the thing and the non-owner does not. The owner has the right to exclude the non-owner from the stream of benefits. The more people who join in mutual recognition of a claim, the more secure a right it is, particularly if there is no government in existence or no government with a local presence. But such a right

is not really very secure against challenge until there is a government around that recognizes it and assists with backup enforcement.

It is customary to classify various property rights arrangements into four types (see Berkes, Feeny, McCay, and Acheson, 1989; Bromley and Cernea, 1989; Runge, 1992; Feeny, Berkes, McCay, and Acheson, 1990): (a) *open access* (no one has any rights or duties toward the resource - anyone may use it because no one else has the right to exclude anyone else from using it); (b) *common property* (a group of people share rights to the resource and make decisions about it jointly); (c) *private property* (an individual holds exclusive rights to the resource); and (d) *state property* (an institutional abstraction, a governmental body, holds rights to the resource). In essence, this scheme implies that all four of these forms are easily distinguished, and also that common or shared property is not private properly, both of which implications I challenge.

Reality turns out to be much muddier than this. We consider business partnerships and joint stock corporations - which are clearly not individuals - to be quintessential private property-owning entities, which suggests a confusion or fusion between common and private property (Coase, 1937). We also allow governments to attenuate the prerogatives of private property owners through regulation, which suggests a blurring of the distinction between private (or private/common if we remember the last sentence!) property and state property. And finally, governments are often the formal owners of some resources that they hold in trust for the general public but either unable or unwilling to exercise close supervision over what occurs on those resources. Governments may sell harvesting concessions on state land, almost always at far below the appropriate market price for obvious political reasons, with predictably damaging consequences in the form of over-investment and bloated over-expansion of the extractive industry concerned as well as grave over-harvesting of the resource itself. The availability of under-priced and thus effectively subsidized concessions leads of course to the emergence of a highly mobilized lobby of concessionaires anxious to perpetuate this stream of benefits that is effectively a transfer of national assets into their private hands. It occurs almost everywhere, among ranchers on the public lands in the western United States who actually regard their grievously under-priced and inevitably renewed grazing permits as personal entitlements heritable over many generations, or in the industrial logging firms of the United States, Japan, Malaysia, and Indonesia, to name only a few. This situation suggests that sometimes what is formally state property can in reality be open access resources to which rights and duties are only vaguely defined, with very cheap barriers to entry that inevitably cause overuse. It also suggests a serious flaw with government ownership and management as a "remedy" for mismanagement.

Therefore, instead of using the four-fold scheme above, I regard common **property** *rights,* **if well defined and** exclusive to **the** group of commons users, as a type of private **property rights, and private property** *owners* **as** existing **in** two forms, **individuals and groups.**

Where common property rights are well defined and held by a group with mutually understood decision-making arrangements, we have in effect corporate ownership. Common property arrangements can produce the beneficial results that we see in private property (greater investment and protection of the resource in order to generate greater long-term benefit), but they offer an additional benefit very important in resource management. Whereas many individual private owners may want to protect their assets, they have no control over what others do and thus no ability to affect total use levels. Co-owners who share ownership of a resource have, by joining together, essentially created the possibility for

exercising such control, and have then awarded that control to the governance structure for that resource-owning community. Community governance constitutes a mechanism for co-owners to coordinate with each other on a total level of resource use or extraction, and therefore to limit current use to levels that are sustainable in the long run.

Pulling Apart the Bundle of Property Rights to A Resource

The confusion above indicates that different entities often have different rights over a resource - no particular owner is likely to possess the classic (and probably artificial and apocryphal) "bundle" of all imaginable rights to a resource. Thus W.R. Grace can own the right to produce insecticide and Beatrice Foods can own the right to tan leather (these two firms are the responsible parties in the Woburn, Massachusetts, class-action leukemia case), but not to dump their carcinogenic waste into nearby streams, polluting local groundwater supplies and harming human health. The United States government, in enacting anti-pollution prohibitions, has claimed that particular right (and opts to refrain from using it, to guarantee that the waste doesn't get dumped there). As a result of legal struggles in the postwar period, the Japanese government has now acknowledged that descendants of households that shared community ownership of the north slope of Mount Fuji for several hundred years still own the right to climb the slope and extract vegetation. Therefore, the government, which began conducting military exercises there in 1935, must now compensate those people for depriving them of these entry and harvesting rights during the years it used the area, and for every single tree trunk shot full of bullets. The only way to sort out complex arrangements in which different entities possess different rights to a resource is to examine, empirically, on a case by case basis, who actually possesses (uses) different strands in that bundle. Only then will we be in a position to gauge the incentives of different parties to use the resource in various ways and determine whether the resource is being used sustainably or not.

A natural resource system is composed of two elements: the productive stock, and the period increment or flow of production. Economists are comfortable with these terms, just as investors are comfortable with the notion of principal and interest. It is fine to think of the stock as the production base, and of flow as the income or increment or "offtake" that can be harvested without diminishing the stock's ability to produce a similar increment again after a predictable amount of elapsed time. Most robust common property systems turn out to be a way of sharing property rights in the productive stock, the production base, or the resource system that yields products, but apportioning rights to flow to individuals. Thus individual co-owners in a common property system have individual rights to enter, use, and extract resources, but must consult each other over long-term management of the resource. This mutual consultation or coordination is the key reason that common property arrangements offer hope in limiting the use of resources to a level that is sustainable over the long term. This will become clearer as we try to build on what Schlager and Ostrom have already done by itemizing below some of the important strands of the bundle of property rights. This exercise, summarized in Table 1, should help us work through what the practical consequences might be of vesting different rights in different rights-owning entities. Such an exercise is critical to examining the *de facto* distribution of rights in an existing situation and must precede any attempt to alter the distribution of rights.

Property rights economists argue about whether these rights should be transferable or not (De Alessi, 1980). In most circumstances we agree that people will invest more in the quality and productivity of a resource to which they hold transferable property rights - rights that they can bequeath to heirs or sell to buyers. The right of transfer means that owners can then reap

the benefits from their efforts in the form of a higher value at the time of transfer, either more value for their heirs or a higher sales price from their buyers. When co-owners of the commons cannot capture the gains from such efforts at the time of transfer, they may be less willing to invest effort in the first place. However, most traditional common property systems constrain rights of transfer, allowing bequeathal but forbidding cash sale, or restricting cash sale to certain kinds of persons, for reasons we are not entirely sure of. These systems depend to some extent on the community of co-owners having reasonably closely aligned motives for holding and protecting the resource, for purposes of resolving conflict and evaluating management options without great difficulty. It may be that transferability, particularly sale of shares in the commons, and especially to an unrestricted set of potential buyers, is seen as a threat to the likelihood of reaching agreements within the community over resource use. Swiss grazing communities allowed individual sales of alp-rights for cash, but only to residents of the village, never to outsiders. It is highly likely that in restricting such sales, these communities were forfeiting some potential earnings in return for greater ease in decision-making and conflict resolution in the meantime. It is highly likely that in net terms this was an efficiency-preserving tradeoff.

Table 1 displays six important strands in the classic bundle of property rights. Generally speaking, a community that holds only the first two rights, or that holds more rights currently but possesses no aspect of transferability, will have far less incentive to protect and invest in the resource than will a community that has at least the first four rights and some aspect of transferability. The more of the rights in the shaded areas in Table 1 that communities and their members possess, the greater their incentive to manage the resource sustainably.

(1) right to enter the resource for purposes of non-consumptive (non-subtractible) appropriation, leaving an undiminished supply for enjoyment by others.

It may seem odd to be able to use something without using it up, but there are many such goods: viewscapes can be enjoyed without being consumed, for instance. However, we need to remember that many of these non-subtractible goods are only non-subtractible up to a point. A viewscape may be enjoyed by a small number of people without diminishing in its value or in the ability of viewers to appreciate it, but as the number of consumer-viewers increases and as they begin to affect and be noticeable to each other, their very presence begins to contaminate the view and reduce its value to each viewer and thus its aggregate value. If one climbs a mountain in order to revel in solitude and feel a great sense of accomplishment at having ascended the last escarpment, the value of this accomplishment is considerably reduced by the discovery that fifty other people with flaming orange tents have also made the ascent and camped out on top of the mountain to witness the next day's sunrise. Ecotourism is often treated as a non-consumptive use of wild flora and fauna, but where ecotraffic is heavy enough, the requirements of provisioning and fuelling and housing and transporting a large number of ecotourists begins to alter the ecosystem that initially attracted these visitors in the first place. It creates points of heavy human residence and use, invades the ecosystem with roads or paths, and makes the fauna accustomed to human observers, so we have lions lounging on the tops of jeeps instead of behaving as they would in the absence of people and jeeps. Thus in many cases ecotourism essentially becomes a consumptive use of the ecosystem. We have reached the peculiar paradox today where some conservationist-preservationists who used to oppose hunting are now recommending a return to safari hunting (in modest, measured amounts) rather than ecotourism as way to reduce aggregate consumption of (negative impacts upon) the wildlife resource (Kerasote. 1999).

Table 1: Specifying who holds which Strands in the Classic Bundle of Property Rights (check-off sheet to use in diagnosing existing de facto rights arrangements)

Types of Rights to be Exercised To fully specify the ownership of a resource, identify which entity has each of the rights below, and determine the extent to which that entity is allowed to transfer that right. Most common property regimes award the lower rights (1 and 2) to individuals, and retain higher rights (3 and up) at the community level to guarantee that they will be exercised, if at all, in coordinated fashion.	**Restrictions on Transfer of Rights**			
	May owner give this right to charity?	May owner bequeath this right to heirs?	May owner sell this right to a restricted class of persons?	May owner sell this right for cash to anyone?
Lower-tier "use" rights to flow: (fill in "yes" or "no" and comments on right)				
(1) right to enter the resource for purposes of non-consumptive (non-subtractible) appropriation, leaving an undiminished supply for enjoyment by others				
(2) right to enter the resource for consumptive (subtractible) appropriation of flow				
Higher-tier "decision-making" rights that affect stock: (fill in with "yes" or "no" on right)				
(3) right to allocate appropriation of flow amongst appropriators				
(4) right to decide on the level of aggregate use of flow				
(5) right to decide on the nature of use				
(6) right to destroy/protect the stock				

(2) right to enter the resource for consumptive (subtractible.) appropriation of flow.
This is what we most often have in mind when we talk about use rights to a forest, fishery, or irrigation system: the users of such a system have the right to harvest and remove resources of value. In actual fact, these rights are usually not just vaguely defined as the right to enter and take anything, but as a specific right to take particular kinds of products. People may have rights to remove leaf litter and down wood but not green wood, or mushrooms but not ferns, or thorny bushes but not trees, and so on. They may possess this right in August but not in April, or for three days per year and not more. How these rights are delimited, defined, and distributed to appropriators is discussed below in point #3.

(3) right to allocate appropriation of flow amongst appropriators.
The right to decide who gets to take how much and under what conditions is separate from the simple unspecified right to use. In well-defined robust common-property arrangements, the people who have use rights usually also have the right to make decisions about allocating those use rights amongst themselves. In other systems, often those with poorer environmental and economic outcomes, large landlords (either private individuals or governments) choose to hang on to these decision-making rights and simply notify recipients of use rights what they have received (the right to two days of grazing, the right to one bundle of thatch, the right to all the timber they can cut, the right to one horse-load of grass, the right to all the water they can take out of the canal in a day, the right to fish on one Monday per month). Obviously, the right to decide who gets what is a very important right, and whether it is exercised by people who have access to good information about the health of the ecosystem or an interest in protecting the resource will have an enormous impact on whether use is calibrated sustainably or not. We do not yet understand the implications for sustainability or social cohesion very well, but there is significant variety among robust common property systems as to whether they allocate appropriation rights equally to all users, in proportion to pre-existing family wealth, or in relation to holdings of particular assets (e.g., livestock or cultivated fields) connected to the products harvested from the commons (fodder for animals or leaf litter for fertilizer). Some communities use different allocation rules for different products (McKean, 1992b).

(4) right to decide on the level of aggregate use of flow (use units).
This is the right to decide what the total annual harvest of a resource will be, essentially the right to mine a resource to exhaustion or to choose instead to use it sustainably by capping aggregate use. How those with this right choose to use it will obviously have an enormous impact on whether the resource is protected or depleted. The most robust common property systems vest this right in the same people who have consumptive use rights and also the right to allocate appropriation amongst themselves. Separating appropriation rights and internal allocation rights from the right to settle on a total level of harvest can introduce tremendous conflict into a resource management system, but this separation is quite common, particularly where governments have been persuaded that local people do not have the technical expertise to study the population dynamics of the living resources they use (never mind the fact that they might be in daily contact with these resources and have years of experience). Such governments often find that local people are "perversely" conservative -- refusing to cut certain species of trees, perhaps, or insisting on leaving trees in a certain sacred grove near the source of a spring uncut even though it is "excellent hardwood" — obviously the local people, mindful of their water resources and not just the cash value of cut hardwood, are sometimes smarter than the government is! Alternatively, governments may find that local people are inherently wasteful, refusing to believe forestry experts who tell them that a particular species of tree from which they remove bark is dying out as a result, or refusing to believe government experts who tell them

that the fish stock is crashing. Thus in many forests and fisheries around the world, local people are granted use rights but "experts" in government decide how much they may harvest. This is a mistake if local people have better ecological knowledge or monitoring capacity than the government does.

(5) right to decide on the nature of use.

This is the right to decide whether a piece of land is going to be turned into a grassy meadow for grazing, an agroforestry experiment, a coppice woodlot for fuel, a multispecies forest for medicinal plants and wildlife, a site for a tourist lodge, a stand of timber for cutting well into the future, a ski lift, a golf course, or a Kmart. The marine equivalent is the right to decide whether an estuary will be protected as a breeding area for small fish and shellfish that become food for larger species, or drained for luxury housing, or cemented for use as a harbor. We can easily foresee conflicts arising if one party has the right to extract wood from a forest and someone else has the right to decide that it isn't going to be a forest any more, although compromise and compensation may be possible here. In Japanese coastal communities, fishing cooperatives own the local fishery as common property. If local government wants to use a bit of coastline for a harbor or use the bay for sewage, or if Sumitomo wants to build a refinery on the shoreline, the government or the enterprise in question must buy from the cooperative the fishing rights that will thereby be extinguished. The refusal of fishing cooperatives to sell fishing rights and the high market price for community fishing rights have actually stopped some developers in Japan.

(6) right to destroy/protect the stock.

The right to decide how a resource system will be used can, at the extreme, involve tremendous transformations in the resource. A change from wetlands to cultivated field or from forest to luxury resort will obviously destroy the original resource although the physical space on which the resource was located will still generate economic value of some sort. Nonetheless, I would like to separate out for special designation the right to so transform the resource that it is effectively destroyed and *no* longer generates value at all. This is particularly important to notice if we are talking not about a multispecies resource system but a particular species or ecological niche. In economic terms, a Kmart store may produce only as much measurable material value (or a bit less or a bit more) as a wetland, but a Kmart store can be put anywhere, and a wetland cannot. Nor can the Javanese rhino, or the major estuaries that supply food for Atlantic tuna, or the mature semi-rotten trees that provide long-term housing for the red-cockaded woodpecker be moved when we suddenly feel like rearranging the world around us. We are experimenting now with creating manmade wetlands to replace natural ones that we fill and develop, but we must recognize that the right to determine the fate of a species or to invade one of the planet's last wilderness areas - that is, the right to exterminate or protect those treasures - is a right worthy of particular attention. It is important to consider who holds it. The right to protect a resource is essentially the right to destroy a resource, and to choose to refrain from exercising that right. Whoever holds the right to destroy is the entity that holds the power to protect.

INTERNAL DESIGN FEATURES THAT MAKE COMMON PROPERTY SYSTEMS ROBUST

The many studies of long-lived common property regimes allow us to compile a list of the features that confer strength and resilience on common property regimes, and that therefore protect the resources so governed. 1 itemize these below (see also Table 2).

Table 2: What Features Make Common Property Systems Robust?

Internal Features (relationships among co-owners)

(1) Co-owners of resource rights must be a self-conscious and self-governing group.

(2) The group needs a mechanism for resolving internal conflict.

(3) The rules need to provide for monitoring of behavior and enforcement of sanctions.

(4) The rules need to include arrangements to prevent abuse by guards,

(5) The rules need to be easily enforceable and ecologically conservative.

(6) The allocation of benefits from the commons needs to be roughly proportional to the effort (time, money) invested in the commons.

External Features (relationships between the body of co-owners and the outside world)

(7) The co-owning community of resource users is much better off if it has independent jurisdiction or autonomy

(8) The boundaries of common property regimes need to be set at an appropriate ecological scale and need to match ecosystem boundaries.

(9) It is important to select the right group to vest common property rights in.

(10) Finally, on large resource systems, it is important to nest new layers of governance (federalism).

We begin with features internal to the common property regime and its community of co-owning resource users, features that have been found in numerous comparative studies to be associated with long-term ecological and economic success (see Wade, 1988; Ostrom, 1990; McKean, 1992b; Baland and Platteau, 1996; and Agrawal, 2000).

(1) Co-owners of resource rights must be a self-conscious and self-governing group (clearly defined in the eyes of its own members and to outsiders).

Much variety in who joins the resource user group is possible here - dues-paying families, a list of particular people, all residents at a specific point in time, all members of families that have resided in the area for two generations etc. But whatever the membership rule is it needs to be clear and widely agreed upon. This suggests that it would be unwise to confer rights on an entity that has no self-conscious identity or has not taken the trouble first to form itself and define its membership rules. This may sound like a very demanding requirement, but even where communities are not literate or have no documentation of previous claims or usage, rapid rural appraisal techniques may be useful in ferreting out a workable definition of the group, just as they can also be used to map the territory to which groups make claims of various sorts. Above all, the group itself must arrive at its own self-definition.

(2) The group needs a mechanism for resolving internal conflict.

It is often efficient to fold this task into existing meetings (e.g.. religious services, other committees that meet anyway). The purposes of these regular meetings are to confer on rules, assess the health of the commons, evaluate monitoring and enforcement efforts, give dirty looks and issue punishments to free riders, and resolve conflict. These mechanisms need to be invented within, not imported, to assure that they are consistent with local cultural norms about conflict.

(3) The rules need to provide for monitoring of behavior and enforcement of sanctions.

The more vulnerable or threatened the common pool resource system, the more regular and substantial this must be, with graduated sanctions to suit the offense and fines collected to pay guard and/or the group treasury. Sometimes the co-owners must pay fees to their community for the products they take from the commons, as in a huge irrigation network where water-drawers pay by the hour or by the bucketful, and these proceeds go into the fund that pays for headworks and materials as well as water monitors. Most communities prefer to recruit their guards from within the community but some, particularly those that have great difficulty coping with conflict, may prefer to hire outsiders to perform this function. Either way, the community itself, not some other entity, must choose how to provide for monitoring and enforcement.

(4) The rules need to include arrangements to prevent abuse by guards.

This may require rotating guard duty, guarding in teams, and provision for control by the group in order to remove guards and leaders who misbehave. The risk of misbehavior by guards is one reason that high levels of control over the resource by the community are important, because this allows the community itself to supervise its guards.

(5) The rules need to be easily enforceable and ecologically conservative.

Some rules are inherently difficult to enforce. A rule forbidding the cutting of any tree greater than 10 cm in diameter requires measurement, either of all harvests or through random checks, whereas a rule prohibiting entry more than one day a month, without cart or horse to help bring out what one cuts, requires only patrolling the forest to apprehend anyone who is in it, no matter what they are doing (there are no excuses....). This is why some communities find it easier to restrict gear or equipment, or to restrict entry and have closed

seasons, than to have finely-tuned regulations on actual behavior inside the commons. Many communities will choose to be more ecologically conservative than necessary in order to guarantee ease of enforcement - forbidding all cutting of green wood as fuel for instance, rather than allowing some cutting and having to decide when "some" has become too much. Here the community is choosing efficiency in enforcement over productive efficiency of the resource, a trade-off which may in the end be vital to maintenance of the resource and thus to overall efficiency anyway. The community itself must choose its rules, and be allowed to adjust them on a trial and error basis. Where communities clearly want to self-organize but have no recent customs to draw upon and no idea how to begin designing rules of resource use, models and suggestions can be offered, but should not be forced on the group.

(6) *The allocation of benefits from the commons to individual co-owning users needs to be roughly proportional to the effort (time, money) that each of them has invested in the commons.*

That is, those who guard, deliberate, clean canals, conduct burnings of meadows, weed, and adjudicate conflict need some extra reward to remain content. This is not a moral principle but a politically realistic way of orchestrating incentive compatibility. It is useful in buying off the potentially disgruntled, guaranteeing a reward to cooperators who obey the rules, and assuring cooperators that cheaters will be punished. The object is to arrive at a compromise that prevents sabotage by the rich (because they don't get enough) and sabotage by the poor (because they don't get enough). Purely egalitarian (an equal absolute amount for everybody) distribution seems to be quite rare, used to enforce more restraint on a resource facing critical pressure (if extra harvesting effort goes unrewarded, it isn't worthwhile in the first place to try too hard to take more). Incidentally, we are assuming here that all of the income from the resource goes automatically to the community, and condition #6 simply refers to how the community determines internal allocation to families and individuals. Only an allocation scheme arrived at within the community and changeable by the community itself will be regarded as legitimate by the community. A group of resource users that manages to attend to all six of these internal conditions will have a robust system as long as no one from outside the system tries to interfere with it. However, outsiders can ruin everything the community has created. The more likely interaction with outsiders is, the more important it is for the group to acquire certain attributes having to do with its relationships with the outside world.

EXTERNAL DESIGN FEATURES THAT ENHANCE SUCCESS OF COMMON PROPERTY REGIMES

Any owner of resources needs to be able to protect those resources against invasion or appropriation by someone else. Rights are only claims if others do not acknowledge them. If governments are important actors (in some times and places they are so ineffectual and innocuous as to be irrelevant), recognition by government is crucial. This is tantamount to saying that tenure must be secure and expected to remain so for the foreseeable future. But we can break down the kinds of recognition, or the substance of that recognition, into components in order to identify what governments and others need to do to support common property regimes rather than undercutting them.

(7) *The co-owning community of resource users is much belter off if it has independent jurisdiction or autonomy* in its management of the commons.

This assures the co-owners that others will not interfere with their stream of benefits from the commons, and in effect that they will reap the rewards of their own efforts. Government interference and intrusion is nearly fatal to a common property system because it undermines security of tenure and reduces the *de facto* rights possessed by the community (see Table 1)

to the lowest level. Neglect by government is better than government interference, but recognition by government is best of all. because having access to police protection and the courts is vital when the group faces challengers from outsiders. This too is not a moral principle unless one wants to treat it that way — it works on practical grounds too. Recognizing that a group of co-owners needs to understand clearly who it is and that the group's identity needs a legal personality that can be recognized by others. In 1996 the South African government adopted a law [Communal Property Associations Act, Act #28, 15 May 1996] setting forth guidelines for forming groups, writing group constitutions, and making claims for restoration of community land rights to groups that held them before apartheid was instituted (Henk Smith, 1996). Others at this conference have more detailed remarks to make about how similar tasks might be accomplished in Indonesia.

(8) The boundaries of common property regimes need to be set at an appropriate ecological scale and need to match ecosystem boundaries.

This issue has not been examined much by people concerned with the property rights end of this question, although 1 am sure that many at this conference are critically interested in it. Understanding this well enough to get it right is quite important, since it is silly to use common property where parceled individual property would make more sense, and it is vital to use common property where parcelization to individuals is not a good idea. This is an area for considerable additional work, and 1 will return to this point in the next section (see also McKean, 1996). Briefly, the most important rules of thumb to use in determining boundaries is that a group using a resource needs to be able to capture at least some of the positive results of its efforts, and needs to be vulnerable to environmental damage that arises from any of its own misguided efforts. These two guidelines will cause a resource user group to be interested in the environmental health of the resource, which brings them additional benefits and protects the users themselves.

(9) It is important to select the right group to vest common property rights in.

This design guideline is closely related to the last one. Two criteria are important for identifying the appropriate community, especially when there are multiple contenders. First, the co-owning group (or at least the co-owning group with the highest rights if several groups are to share the commons in question) should be one with the greatest physical advantage in monitoring and preventing invasion of the commons, located in what I have elsewhere called the gatekeeper or bottleneck position (McKean, 1996). Usually this is the community closest to the commons or located on the most important route of access to the commons. Second, the co-owning group with the highest rights in the commons should be one whose members would suffer from mismanagement on the commons and would benefit from good management on the commons. Honoring these two criteria makes it possible to build in capacity (or comparative physical advantage) and the strongest incentive to enforce the rules and protect the resource. Thus if there arc several communities in a forested valley to which rights to the forest might be given, the highest rights should probably go to the village immediately downhill from the forest, and certainly not to one uphill from the forest. Suppose one village has the physical advantage of proximity, and another has the monitoring advantage of occupying the gatekeeper position on main routes of access to the resource, and yet another is immediately downhill or downwind from the resource and would suffer the most if damage on the resource occurred (thus it would have the highest interest in resource protection). In this situation, some arrangement dividing the highest rights among these three communities will probably be necessary. Parceling the resource into three separate commons (one for each community) will probably fail because this particular commons would need to be managed as a whole in order to serve the needs of, and win protection from, all three communities. The odds are high that over historical time an arrangement honoring these

criteria is the one that would have emerged through multi-village bargaining anyway (McKean, 1996).

(10) Finally, on large resource systems, it is important to nest new layers of governance (federalism).

Each sub-unit has autonomy over its own affairs but must negotiate with other groups and the collectivity as a whole in order to deal with issues that go beyond an individual sub-unit. The best example comes from irrigation, where each channel or major out-take point can be governed by the users who are fed by that channel, but the whole system of channels and out-takes needs to be supervised by representatives from each channel and major out-take. This happens in forested watersheds too. The design rule we see in nested arrangements is that decisions whose impact affects subgroup A and only subgroup A can be left to subgroup A, but decisions whose impact affects both subgroup A and subgroup B must be made by an assembly containing both subgroups A and B together. A large, complex, thoroughly nested and federated common property system can still be an entirely private entity (just as any huge corporation is). Nesting does not mean that government must or should sit on top of the arrangement, or that government regulators should compete with community resource regulators to determine the rules for the system.

WHEN IS COMMON PROPERTY MORE EFFICIENT AND APPROPRIATE THAN PARCELED PROPERTY RIGHTS?

We have established the ground rules for creating and designing robust common property systems in the previous sections. But researchers have paid very little attention to date to figuring out when and where we should try to create or restore common property arrangements, and when other arrangements (parceled individual private property or government ownership) are more appropriate. No design guidelines for success will bring about success if we try to put common property regimes in the wrong place or the wrong situation. In this section we will use the huge array of empirical case studies of actual commons to try to figure out when it appears to be more economically efficient to award property rights to groups rather than to individuals. The focus here is on why, when, and where to create common property, and by extension when and where not to bother doing so.

An important distinction between common property and parceled property is that in the latter all of the different rights we have itemized above are supposed to be vested in the same owner, whereas with common property, rights to flow are vested in individuals but the rights related to decision-making are vested in the collectivity of individuals. Most communities that have adopted common property arrangements in the historic past have also used parceled property rights arrangements for other resources and possessions. They do not choose between all individualized property rights or all common property rights, but a carefully calibrated mixture. They know how to do both and make conscious choices about when to do one and not the other. 1 have elsewhere (McKean, 1998 and 1999) tried to lay out a systematic analysis of what features in a natural resource system might make shared ownership, involving shared rights for purposes of coordination and consultation over the higher-level rights above, rights (3) through (6), more efficient than parceled individualized ownership of these decision-making rights (see also Singleton, 1999a, on allocative efficiency in common property arrangements). There is not space here to work out the detailed argument for each, but. here I summarize the conditions that seem to be crucial (sec also Table 3). Imagine a resource system on land, say 1000 hectares in size, with perhaps 1000 individuals laying claim to this resource system. They are free to choose whether to manage the 1000 hectares jointly as an intact system, or to parcel it into one particular hectare

per person, each of whom would then have to guard his or her own plot but would be free to make independent decisions about managing that plot. 1 would argue that these 1000 individuals will be more likely to find that sharing the resource system as common property will be more efficient for them than parceling it where **one or more** of the following conditions applies:

(1) Some resources simply cannot be physically divided, so the parceling option is unavailable.

The resource stock, the natural production system, simply has to be managed intact. These include ubiquitous resources like air and climate, water supply (groundwater basins as well as rivers), mobile resources like fish and wildlife, and intangible goods like biodiversity or landscapes.

(2) Administrative efficiency in monitoring and enforcement.

Consideration as one large parcel versus many small parcels is needed in some settings, even when resources can be physically parceled. In very poor societies, of course, the legal system to enforce individual rights may simply not exist, and individuals who hope to enforce their claims must band together as vigilante groups, offering to protect each other and to protect their rights jointly. In effect they are single-handedly creating a community police force and court (conflict resolution) system, both to deal with internal disputes and most particularly to deal with marauding outsiders. Although labor is more abundant and thus cheaper in poor societies relative to rich societies, even poor people have only 24 hours a day available to them, and they too must seek efficiency in enforcement in order to reserve energy for the effort that direct production requires. Managing resources in common can also reduce the sheer quantity of boundaries that need to be patrolled. Compare the sum of the perimeters for a single intact plot of land to the sum of the perimeters in and amongst all of the 1000 subplots if the land were parceled. Generally, the amount of monitoring required increases with the value of the resource and thus the temptations to thievery. Cultivated lands may require much more monitoring than forests or meadows, but at the same time they also require more labor anyway, so the farmer may already be on the scene to do the enforcing of his rights on his own cultivated plot. However, for resource systems that are used less frequently or that require less input of effort, it may be more efficient to delegate the monitoring and enforcement to a small band of guards who serve the community as a whole, and thus to maintain the resources those guards protect as one intact expanse. This would appear to be part of the reason that agricultural communities with classical common property systems usually assigned individualized property rights to livestock, most farm tools, and parcels of cultivated land, but very often had group rights in pasture, fuel woodlots, high forest, water supply, and fisheries (sec Netting, 1993).

3) It is clear that some common property systems are insurance devices to disperse risk due to uncertainty.

Some natural resource systems are fragile or vulnerable (arid areas, mountainous areas), and the people living on that resource system simply cannot know from year to year whether total extractable production will be high or low. Similarly, the physical location of the productive areas that can sustain extraction may move from year to year. Finally, it may simply be necessary to practice long fallowing in systems where people are trying to extract as much as they can from a natural resource system without harming it. In all such circumstances, common property regimes effectively insure that users can move their extractive activity to the particular spot that can tolerate it, and that all will have a share of total product even in bad years.

Table 3: When Might Shared Private Property be More Efficient than Parceling Property Rights among Individuals?

Sharing some or all rights to flow and stock may be efficient if any of the following conditions exist	Do these conditions exist in	
	Developing societies?	Rich industrial societies?
(1) resource is physically indivisible into parcels	Yes	Yes
(2) there are economies of scale in enforcement or administrative efficiency		
(2a) society is poor and lacks a legal system to enforce individual rights (individuals must then form vigilante groups to enforce rights that all members of the group acknowledge)	Yes	Unlikely
(2b) avoiding parceling reduces sheer quantity of boundaries that need to be patrolled	Yes	Yes
(2c) delegated monitoring of whole resource is more efficient for resources that people do not constantly work in	Yes	Yes
(3) users want to disperse risk due to uncertainty, either in location of productive zones or in aggregate productivity over time, in fragile or sensitive resource systems they are trying to make maximum use of for sheer survival.	Yes, life and death difference to society	No, society has resources of this kind but has alternatives to using them
(4) there are important economies of scale and additional increments of production available from managing a complex interactive resource system as an intact whole to internalize positive externalities	Yes	Yes
(5) users want to improve productive efficiency via internalizing "internal" negative externalities (mutual harm that co-users might do to each other)	Yes	Yes, and increasing
(6) user want to improve productive efficiency via internalizing "external" negative externalities (harm that users of the resource might impose beyond the resource) (6a) they themselves suffer from harm that spills beyond the resource system (6b) others beyond the resource system who suffer from such harm have offered an attractive bargain (side payment) to interest the resource users in refraining from harmful uses.	Yes	Yes, and increasing

(4) There may be important economies of scale and additional increments of production available from managing a complex interactive resource system as an intact whole so as to capture positive externalities and internalize them.

Even a resource system that is physically divisible such as a forest, may have higher total production if it is managed in large units, particularly because of the complex relationships among different species. For example, a valuable tree species may depend on various mobile animals for the dispersion of its seed, so the system will need to be managed at a scale that suits the requirements of its most mobile long-distance travelers. In this situation, the forest may appear to be manageable in parcels without ill effect as long as each parcel remains forest, but production (of nuts, fruits, fuel-wood, vines, rattan, timber, animals, everything) will be much higher if the forest is managed jointly as a single intact unit. Even in rich ecosystems where there is always abundant production, the species themselves may require long fallowing (rubber trees and chicle trees can only be cut so often, and like many tropical species they grow far apart, apparently as a disease-resisting tactic) and much mobility on the part of extractors. This is also the strategy used among Dayaks in Kalimantan who practice rattan gardening - selecting a patch of rich forest to cultivate over a multi-year period, using succession plantings that change as the rattan matures and the forest returns, and then moving to a new patch several years later. This system of patchwork cultivation that does not damage the integrity of the encompassing forest requires that each community of gardeners have access to a huge amount of forest over a long period of time, even though it uses only a small portion at a time. Keeping a large productive forest in a single management unit, as would be the case in a common property system rather than in parceled property, permits extraction to shift from place to place and product to product, and thus allows humans to benefit from the additional increments of production generated by an interactive resource system that remains intact.

These interactive effects between different parts of the same ecosystem (or between interlocked ecosystems) are a physical version of what economists have long referred to as externalities, or spillover effects that alter the value or the productivity of a resource, or a factory, or a person. **Positive externalities** are value-enhancing spillover effects, those that provide an unsolicited and probably unintended increase in value to other persons or resources. Managing a forest or a fishery in large units allows these value-enhancing positive spillover effects to occur, and essentially to be captured within the system (thus they are not externalities any more). A parceled forest would gradually cease to generate these benefits as individual owners of different parcels make separate independent decisions. If resource users decided to coordinate with each other in order to collaborate on management of the whole set of parcels as a unit, they are actually deciding to create a common property system to generate these positive spillover effects and then to capture them (internalize them) as enhanced production.

(5) Common property arrangements also internalize negative externalities that the co-users of separate parcels might impose upon each other, and correcting such externalities this way also enhances efficiency

Negative externalities are value-diminishing spillover effects that provide an unsolicited and not necessarily unintended reduction in value reaped by others. By agreeing to share the management of the resource stock - creating a common property system with consultation among users rather than a system of independent parcels - resource users are acknowledging the possibility of mutual harm and agreeing in advance to create a negotiating forum where they can create new rules to reduce such harm. Thus we should think of common property

regimes as negotiating forums for reducing mutual harms and generating additional benefits to be shared.

(6) Finally, common property arrangements also create the possibility of curtailing harm that all the users of the resource might impose beyond the resource.

There are two conditions in which users of a common resource will care about the impacts of their use beyond the boundaries of the resource system. Sometimes what happens on the commons can cause harm off the commons to the same people who use the commons. Consider a valley where farmers cultivate the lowlands near the river and take fish and irrigation and drinking water from the river, while they graze their animals, cut timber, harvest herbs and mushrooms, coppice fuel-wood, and gather thatch and poles from their forested commons in the upper reaches of the valley. Their own mismanagement uphill could do great harm to their production downhill. When such farmers band together to make management decisions on the uphill resources jointly, and thereby prevent deforestation, soil erosion, flooding, and overuse of those resources, they are creating a common property system to prevent activity on that resource system from damaging other activities they care about. They are intentionally creating a joint property system uphill to take care of their mutual interests in protecting their individual parcels downhill.

Of course, people appear to have no incentive to refrain from causing harm to others if there is no boomerang effect that brings that harm back to themselves. But in fact, those "others" who are so harmed may mobilize and attempt to negotiate with the community of harmers. Suppose our uphill resource users and our downhill sufferers constitute two different communities of people. If these two communities can strike a Coascian bargain (see Coase, 1960), then the uphill community may agree to restrict its collective use of the resource system in order not to cause negative spillovers for the downhill community, in exchange for a payoff. (Of course, Coase would also remind us of the possibility that the downhill community would accept both damage and compensation from the uphill community, if the benefit the latter receive from high use exceeds the cost to them of the payoff that the downhiliers would find acceptable.) Thus, whether in their own direct interest or because others make it interesting to them, users of a resource may want to coordinate and cap their use of the resource in order to prevent harms that spill entirely beyond the boundaries of the resource and beyond their own concerns.

If we look carefully at these six conditions in Table 3. we see that the only condition that we are more likely to see in poor countries than in rich ones are (2a), the reliance on common property arrangements to provide conflict resolution and justice where the larger society does not provide these, and (3), the need to disperse risk in fragile environments where production is likely to be quite low and people are nonetheless dependent on such a system, and have no possibility of moving elsewhere or of being subsidized by richer members of society in very bad times. Two of the other conditions - those relating to negative externalities, (5) and (6) - are of course increasing rapidly in rich societies. As a rule, industrialized countries have denser populations and more intensive resource use by each person than in agricultural countries, so industrialized countries are actually creating and encountering environmental externalities more often than they used to. Although using common property to resolve environmental externalities is certainly not unknown in traditional systems (look at mountainous environments), externalities loom as the principal reason we become interested in altering the scale at which we manage resource systems in industrialized countries. Our levels and patterns of resource use in industrialized countries are creating externalities that didn't happen before. (See Freyfogle, 1995, on American law concerning new harms and externalities.) Thus there is really no reason to think that we can afford to have common

property systems disappear from our institutional repertoire. If anything, we will have to devise new ones of ever-greater complexity as time goes on. And in fact, we are having to devise them at the international level also. International treaties among governments and pacts among other transnational actors convert global resource systems into shared property that we regulate through mutual self-restraint and Coaseian bargains as above.

This exercise in identifying when it is wiser to use common property than individual parcelled property has two implications. First. as we have just mentioned, there is absolutely no reason to think that common property arrangements are "primitive" or "prior" to "individual private property" in some evolutionary sense, since the circumstances in which we need common property are not disappearing but are actually increasing, in rich countries as well as in poor ones. Indeed, they may be more important to use in today's developing countries than in the developing countries of the past, since today development is occurring with denser populations and more complex mixtures of resource use and productive activities than it did a century or two ago. Thus in developing countries today we find both resource degradation and industrial waste, both biodegradable refuse and heavy metals, both fuel-wood shortages and leaded gasoline. Having more externalities suggests a need for more mechanisms to foster coordination over externalities, and common property regimes are such a mechanism.

Second, amidst the world wide wave of enthusiasm for "privatization," it is truly sad that so many advocates of privatization think only of an outright award of the entire resource system to a single company, without regard to the political consequences of enraging all other former users of the resource, or parcelization of the resource to many individuals. They forget that they themselves would call any business enterprise or joint stock corporation to be elements of the "private sector" and thus already acknowledge that abstract entities and collectivities of individuals can be private too. **Because they imagine only individual parceled ownership to be private, they overlook the shared private property or common property that should be encompassed in the notion of "privatization." Some advocates of "privatization," then, ignore what may in fact be the most appropriate form of privatization in some instances!** Fortunately, I know that those here at this conference are considering community ownership of resources seriously and will not make this mistake.

THE ROLE OF COMMON PROPERTY REGIMES IN ECONOMIC DEVELOPMENT

I will conclude with a story. Imagine a farming district with fields alongside a river. The river is handy for irrigation, but deforestation upstream is causing the river to bring enormous quantities of soil downstream. As the river reaches flatter land it widens, slows down, **and** deposits that soil. The soil raises the river bottom, the river widens further and floods its banks and destroys the crops. This problem continues to occur periodically over the years, worsening each time. Eventually the government, concerned both about farm production and tax revenue from the farmers, launches public works projects to build levees along the riverbanks to protect the farms. As this process continues we eventually end up with rivers higher than the surrounding farmland - in a sense, the public works projects increase the risk of catastrophic damage in an attempt to protect the farms from the river. To make matters worse, the government officials who manage these projects and hire the locals to do the heavy labor are lazy, arrogant, and offensive. Worse, they're not paying attention to the real problem, which is deforestation upriver. One of the local residents - **a** man who had been born and raised in the community, went to a large commercial center as an adult to work, but upon retirement

returned to his home town. He then writes a series *of* letters to the government outlining his own diagnosis of the problem and offering a few propositions to correct it.

> *"First of all, although it will involve temporary sacrifice, we need to reforest our devastated hillsides. We can do this ourselves, without government help, because it's in our interest to do it. We'll have to come up with a way to provide for the poorest members of the community to subsist so they don't need to take trees and grasses from the hills during this period of re-growth, but we can even do that. They will be much better off in a few years' time when the hillsides are luxuriant again and provide more than they do now. And we can stop wasting money on these silly river projects. Finally, we're too poor to cope with these arrogant officials who want bribes and gifts and run around asking questions while we try to get our work done. We're the ones who are worried about the long-term consequences, and they're not. We would really be better off if these officials and their projects just stayed away and let us solve our problems ourselves* ".

Both the situation and the courageous and innovative local response could be taken from any of the developing countries around the world today, particularly those that have received multilateral aid to build large irrigation networks. This letter could easily have been written by a member of the Chipko or Uttarak hand movements in Uttar Pradesh, or just as likely by an opponent of the Sardar Sarovar dams in Madhya Pradesh or the Arun dam in Nepal (both now considerably reduced in size due to protests of this kind), or of a waterworks project along the banks of the Gambia river or the Senegal river in West Africa. But it wasn't. The author was Yoshidaya Tôshichi, writing in 1788, to the Tokugawa shogunate (the military dictatorship that governed Japan from 1600 until 1867), from his home village of Hoshida, outside of Osaka where he had spent his adult life (Chiba, 1973, 34-58).

This example brings home the fact that today's developed countries used to be developing countries, and some of them have been through some of the same troubles that developing countries experience today. I will use the Japanese example in two ways. First, to show that even an oppressive non-democratic government had reasons to grant full property ownership in natural resources to communities and to provide courts to enforce those claims, and second, to illustrate that Japan's legacy of common property ownership was perfectly consistent with economic progress and that the owners of these rights considered them to be vital assets as they coped with change.

The Commons in Proto-lndustrial Japanese Society

Table 4 presents a reduced and simplified history of the commons in Japan across three time periods, but I will discuss the crucial elements of this process here in the text as well. Common property arrangements developed in Japan from the medieval period (1190-1467) onward. After more than a century of civil war that left villages and citizens to fend for themselves (and taught leaders that they had to provide benefits to their followers if they wanted a following!), Japan finally arrived at national unification and peace in 1600 under the Tokugawa shogunate or military dictatorship. This government ruled until 1867, but experienced a national wave of deforestation on a huge scale during its first century, in connection with the arrival of peace, population doubling, economic growth, and the building of castles and great cities, all of wood. Deforestation occurred on all types of land, leading to the world's first development of scientific silviculture as well as rapid clarification and specification of rights and rules in the common property regimes by which villages controlled most of Japan's 25 million hectares of upland forest and meadow (owning much of it outright and having legally protected access to the rest).

Table 4: Common Property as an Economic Foundation through Different Stages of Development: A Hypothetical but Realistic Example from the Central Alps of Japan (descriptions are accurate; numbers with question marks are guesses only)

	The commons as a source of subsistence (circa 1600)	The commons as a basis for proto-industrialization (circa 1700 - 1850)	The commons in modern post-industrial life (circa 1960-present)
Japan's population	About 12-15 million in 1600, doubling by 1721 (Hayami). Foreign trade banned in 1639 except for Dutch and Chinese traders, so Japan lives within its environmental means thereafter (an early "Biosphere" experiment useful for us all!).	Estimated at 30 million including warrior class, indentured servants, and transients. At least 22% urban. Annual census indicates zero population growth from 1721 to 1846. Japan remains closed to foreign trade until 1856.	127 million (1997). Population now dropping, expected to reach 110 million by 2050.
Village/ Community population	Typical mountain village (with commons largely in forest) might have 30-50 families in the 1600s, or 150-250 people. Typical valley village (with commons containing both forest and meadow) might have 200-900 families or 1000-4500 people.	Due to population stability in Japan, typical village did not change in population during this time. When rural Japan began growing in population again, additional increments of rural population due to natural population increase moved into the cities, leaving villages with about the same population to support as before.	Same community today today may be the same size as in the past (if we disregard legal amalgamation with other villages that created larger municipalities after 1871). Japan's increase in population lives in the cities.
Per capita income/ Standard of living in rural communities	Very low standard of living. Malnutrition and starvation a routine possibility. But peace in 1600 brings economic growth even to rural areas	Nutrition and health improving considerably; vaccinations against smallpox widespread; water supply abundant and permits good sanitation; housing stock improving; peace and improved standard of living permits children to spend more time in school so literacy rises and accounting practicies on farms improve; emergence of entrepreneurial farmers (*gônô*) (see Dore, Thomas Smith, Hanley and Yamamura, and Hanley).	Farmers in rural Japan as wealthy as urban citizens and therefore as rich as anyone else in the world; quality of living in terms of housing stock and local environment better than in urban Japan; rural residents continue to own and cultivate their croplands but derive majority of income from factory and service jobs located in rural Japan and rural city centers. Excellent access to health care and education Diffusion of television, telephone, automobile, cellphones complete.
Size & condition of commons (Japan is 36 million hectares; 25 million hectares of this land is uncultivated forest and upland.)	Each village had huge commons but boundaries still fuzzy in many places, to be defined through protest and negotiation with feudal overlords. Conflicts between villages over boundaries and multiple uses of shared commons are handled in courts, whose verdicts over time also increase definition and clarity of common property rights. Deforestation crisis throughout Japan during 1600s due to building of castles and cities affects government, individual, and common forests. Response on government and individual land is the development of scientific forestry (see Totman). Response on the commons is the development of careful community regulation in many places (see Chiba, Harada, Hirasawa, Hôjô, Furushima, Fukushima-Ushiomi-Watanabe, etc). If we include areas used in common but owned by lords or individuals who had to grant common access rights to nearby villagers in order to gain their help as protector-monitors of resources, then the size of the area used or formally owned in common between 1600 and 1750 could have approached the entire 25 million hectares of forest and meadow in the main four islands of Japan.	Commons are large, well-defined, well-protected in the courts. Villages own their commons, pay taxes on them, and determine how they will be used. They have additional well-specified rights on lands owned by lords and rich individuals, whom they serve as guards in return for access to sustainably extractable resources of specified types. To capture additional income from their commons, villages rent out unused portions to other villages and make regular contractual arrangements with timber brokers. Improved community management of commons has restored many commonses to environmental health after 1670, and communities are adjusting the use of the commons toward commercial activity. Ratios of pasture to forest, thatch reserve to fuelwood coppice, timber production to mulberry and mushroom production, etc, all change with market demand for different products, as a reflection of flexible livelihood strategies used by increasingly entrepreneurial farmers. Commons surveyed in 1870s totalled over 12 million hectares. Shrinkage of commons during this time is largely due to (1) parcellization (conversion to individual property) of lowland meadows (not needed as sources of fertilizer with the increase in fish meal substitutes) where cultivation will not cause environmental damage, and (2) some parcellization of upland forests where individual ownership increases incentives to guard, but markets	Meiji land grab began in 1873 when new government began nationalizing all commons whose owners lacked adequate documentation or could not mobilize to pursue defense of their claims in court. As a result, commons of 1850 were greatly reduced in size (by legal and illegal means, often over tremendous protests of villagers) and by 1950 only 3 million hectares survived as commons in some legally defensible formal sense. Some communities therefore have none left because what used to be theirs is now owned by government or individuals. Others either continue to own their commons outright or have legally protected access to land now owned by government or individuals. After wartime deforestation (massive conversion from 1938 to 1940 of all vehicles to charcoal fuel!) -- so desperate that it occurred on all forms of property -- Japanese uplands are considerably recovered now and forests finally ready for harvesting.

		(high, stable timber prices) provide guarantees that forests will remain intact, harvested only in sustainable increments, thus reducing the likelihood that parcelled individual ownership will result in environmental damage.	
Literacy level in rural Japan	10% literate? only biggest landlord families arranged tutoring for their children at first. Slowly a system of temple schools emerged in which not only warriors but also farmers and artisans paid tuition to send their children to school, but diffusion of literacy very slow in rural areas	Nationally, 50% of males, 15% of females literate (see Dore) and can regularly read government edicts & instructions. Several in each village are able to write village bylaws and petitions to local magistrates in formal legal language in the Chinese style [*kambun*]. Many can do basic bookkeeping for their farms and enterprises and take advantage of farm manuals that disseminate advice on new agricultural tools and practices as well as new seeds and crops.	100% literacy
Contribution of commons to per capita income and to livelihood strategies in the communities with common property	Commons are an absolutely vital source of subsistence & agricultural inputs and environmental protection for water supply and fields. Agriculture and forestry probably contribute 90% (?) of per capita income for communities with common property.	Commons remain an absolutely vital source of subsistence, agricultural inputs, and environmental protection. Increasingly, the commons offers flexible increments of additional income as farmers diversify, specialize, and add non-agricultural by-employments to their livelihood strategies. Agriculture and forestry are probably contributing only about 60% (?) of per capita income to communities that have common property.	Since Japan now meets its timber needs courtesy of dirt-cheap lumber available from Canada, US, and Southeast Asia (why cut Japanese timber when others are giving it away from their own mis-managed government forests?), Japanese villages with commons have not been using them as a source of agricultural inputs since about 1960. Agriculture and forestry themselves are probably contributing only 15% (?) of per capita income to "agricultural" communities today.
Portion of rural labor force in non-agricultural pursuits	10% (?) operating shops that provide non-agricultural goods and agricultural inputs to the village and handle sales of agricultural products to outsiders	40% (?) pursuing new protoindustrial activities during agricultural off-season, much of it using materials from the commons. Village also sends excess labor into the cities and receives cash income from remittances sent home by these workers.	95% (1997) working in industrial or service sector of the economy. Proportion almost that high in rural areas too
Strategies for using the commons	Limited to subsistence uses. Villages forbid members to sell products of the commons for cash to outsiders. -- source of fuelwood -- source of green manure for fertilizing crops in cultivated fields (this continued after introduction of commercial fishmeal fertilizer and human nightsoil as amendments) -- timber for house construction -- construction materials for furnishings and agricultural implements -- thatch for rooves -- vegetables, mushrooms, and wild game for consumption	In addition to all the subsistence uses mentioned to the left, in this period the commons also provide new commercial uses. But all cash sales (whether of products of the commons or of physical chunks of commons) are by the community as a whole to preserve the community's ability to cap aggregate use to sustainable levels of extraction -- charcoal production -- afforestation to produce timber for commercial sale (wooden Japanese cities burn down regularly during this time, guaranteeing a reliable timber market into the long-term future for forest-owning villages) -- pasture for horses used for domestic transport -- plantings of mulberry trees for paper and silk production -- plantings of hardwoods used for lacquer production and furniture -- orchards for fruit production as the Japanese diet improves -- gathering of "mountain vegetables" [*sansai*], greatly appreciated and valuable supplements to both traditional diet and haute cuisine in the cities. -- collection of stupendously valuable mushrooms that cannot be cultivated and must grow in natural forest	Villages continue to own their commons if they still possess them after nationalization (the Meiji land grab that began in 1873) or if the government restored their rights of access (not full ownership) in response to lawsuits and protests by the villages. In the postwar period, many converted their commons to orchards, cattle pastures, subcontracted timber production (at sustainable levels), and other primary-sector forms of production that generate supplementary cash income from lands no longer needed for fertilizer or wood. In places with tourism potential, villages rent out surface rights to hotels and ski lifts, sell off chunks for conversion to ill-planned golf courses, many with environmental regrets afterward. Some simply forego income from the commons because they no longer need the money but maintain common ownership (where they still have it) as a hedge against the future, as an investment strategy as Japan's tourism/leisure industry develops, and for local environmental protection.

These arrangements were a mainstay of agricultural life, and therefore of the whole economy, in Tokugawa Japan. They constitute one of the important cases in the human repertoire of common property institutions because they encompassed considerable variety, lasted so long, and arc relatively well documented (along with surprisingly similar arrangements in Switzerland. Norway, Sweden. England, Scotland, and India). Because the Tokugawa regime also banned foreign trade in fear of religious and political imperialism, Japan unintentionally embarked on the world's first biosphere experiment, living within its environmental means and pushing resource use to the limits within existing technologies and energy sources. The Japanese of this period had a very acute sense of "limits" appropriate to an environmentally conscious society. The Japanese experience during this period is of course a very important one for us all, now that we seem to be reaching planetary limits.

During the Tokugawa period, the national government was interested principally in maximizing agricultural production and the tax revenue therefrom, and considered it perfectly normal for villages to be juridical entities with their own collective property and taxpaying obligations. Although all of Japan's non-urban land was contained in the feudal fiefs granted by the regime to one lord or another, and the regime was free to move fiefs and fiefholders around to suit its political and economic goals, fiefs consisted largely of the right to collect taxes. Within each fief, individuals and villages arrived at bargains with their feudal lord that awarded them very secure ownership over much of the land and use or access rights to much of the lord's land as well. The lords wanted to retain ownership of particularly valuable timber trees on all of this land, both their own land on which they granted access rights and expected protection in return, and on land otherwise owned by others. A lord who needed guards for his forest, or for his trees on others' forests, could grant various rights to resources on land to local villages in order to obtain the village's services as guards. The courts could be counted on to enforce the resulting contractual arrangements. It is important to point out that these villages forced the lords into these contracts. If the lord did not grant them formal rights, these villages had the physical advantage in invading the resource and exploiting it to depletion, so the lord needed to make a deal that the villages found satisfactory. Individuals and villages were supposedly forbidden to sell land (they were permitted to bequeath land to heirs), but because land could be used as collateral in loans it was easy for individuals and villages to sell land - and have these transfers registered and legally protected by the courts.

In this system, villages were juridical entities that owned property, paid taxes, and participated in contracts, and the Tokugawa government and its national network of courts and magistrates recognized contracts that these land-owning entities might make with each other. Thus a village and a person, or two persons, could arrive at a long-term contract with each other for planting and eventual harvesting of timber. Fifty-year contracts were normal, binding not only those who initially signed the contract but also their successors, who inherited the rights and duties in these contracts - and Tokugawa courts would enforce these contracts if a problem with default arose later. It is also worth noting that the usual division of harvest income in these contracts was for the village who planted and nurtured the trees for 50 years to get two thirds of the eventual income form the harvest, a much higher proportion than most governments offer today in social forestry programs on public land. Villages that weren't paid could go to the courts to demand enforcement of these contracts (see Totman, 1989). Similarly, in Tokugawa Japan, whoever owned a forest was in a position to contract with timber harvesters. So if villages owned the land and wanted timber cut, villages could grant/sell the timber concessions - these did not come from some ministry of forests or other government officials. A proto-industrial forest industry most certainly existed, but it was limited in size by the amount of cutting that timber-owners (who had learned about deforestation the hard way) would tolerate (Totman, 1995).

The story at the beginning of this section comes from 1788, by which time the Tokugawa administration and legal arrangements were comfortably established and the major deforestation crisis of the 1600s was well over. But spots of serious pressure on the forests, particularly near the great cities, continued. The letter writer Yoshidaya was trying to point out to the government that its own moneys on flood works and the like were ill-spent, that this problem's solution lay simply in seeing to it that villages in the area tightened up their rules on the commons much as many other villages had already done by this time. The models were readily available, the consequences in the form of environmental improvement were well understood, and in Yoshidaya's view there was no need for the government to get involved at all, much less waste money. Obviously Tokugawa arrangements did not work perfectly (if they did, Yoshidaya would have had nothing to complain about), but the conflict in this story between solutions based on local community control and top-down solutions that waste resources and miss the mark is intriguingly similar to what we see all the time today.

When Japan was forced to open its doors to trade in 1856, the internal political rumblings that resulted produced a new Meiji government in 1867, one no longer able to use isolation as a way of protecting Japan from foreign incursions and therefore determined to use industrialization and modernization to provide national security. This new government - stunned to learn of the technological innovations abroad that Japan had missed out on during the ban on trade - routinely assumed that the traditional or existing Japanese way of doing things was usually backward and inappropriate for the transitions it wanted to promote. It therefore nationalized as much of the commons as it could. Nationalization was motivated partly by the belief that "backward" villagers could not manage Japan's natural resources intelligently, but mainly because the government wanted the wood for itself, for buildings and ships. Thus one hundred years ago, many Japanese villages witnessed the loss of their community resources to a hungry central government that was relatively indifferent to the common property rights that the Tokugawa government - supposedly a less modern and more oppressive military dictatorship - had honored for two and a half centuries. In this too, Japanese communities have undergone an experience similar to that of resource-dependent communities in today's developing world.

Predictably, after 1873 when the Japanese government tried to nationalize these common lands, villages rose in protest at this taking of their property, and often burned the forests down. Once again, they forced the government to restore their rights, though not nearly as successfully as they had been able to do 300 years earlier. Because of the resilience and legal standing of the common property tradition and the vehemence of the protest by people on whom the new government depended both for taxes and for military conscription, capture of the commons by the Japanese government after 1873 was never complete. In this, Japan's experience contrasts with the nationalization of lands in developing countries during or at the conclusion of colonialism, and instead more closely parallels the reversals and devolutions that are occurring today along with increasing democratization around the world. In Japan, Meiji leaders were persuaded to write traditional common property rights *(iriaiken)* into the new civil code of 1890 rather than ignore them entirely. Where farmers had the energy to protest sufficiently, had good documentary records, registered their land after 1873 in appropriate ways, and fought where necessary in the courts, they were able to retain their common property rights into the present day. Throughout the history of the commons in Japan, when farmers protested intrusions onto their commons, they forced the government (whether Tokugawa, Meiji, or 20th century) to acknowledge their traditional property rights, and they retained control over their assets. Thus in spite of the Meiji nationalization, 2.5 million hectares out of the 12 million that were identified by the Meiji land reforms as commons are still legally identifiable as lands to which common access rights remain attached.

In this checkered history, Japan stands out both as a success and failure. It provides an example of the maintenance of common property and at the same time is an example of an attempted assault by the central government on common property. What does all this mean for Indonesia today? Tokugawa Japan, both a developing country and an oppressive military dictatorship, did not find it philosophically or physically impossible to honor the land rights of community groups, or to create courts that enforced and protected these rights. On the contrary, it found these arrangements to be preferable for generating economic wealth and therefore tax revenue, and for producing public peace and tranquillity on which its rule depended. Tokugawa Japan did this without being a rich country, without being a civil libertarian democracy, without having heard of Adam Smith, John Stuart Mill, or Thomas Jefferson, and without any international donor agencies or legal models from abroad. These results were driven simply by internal political forces - recognizing the tremendous collective economic and political gains in the form of peace from doing this, and the tremendous political cost and risk of prolonged civil war from NOT doing this. Tokugawa leaders were not weak - having fought a century-long war to acquire power they were masters at the use of force. They did not surrender lightly any prerogatives for control over the land, exploitation of resources, or capture of rents that they might have retained. They surrendered these things because they were made to, by the fact that having won this war they now wanted peace and the still-greater revenues that could bring.

The similarity to today's developing countries is quite intriguing. Many of these countries still have a long way to go before they come up to the standards of the Tokugawa regime with respect to legal rights and stability of land tenure. However, the Tokugawa example also means that devolving real control, real management power, over resources, and possibly ownership (with right of resale) onto individuals and communities is not just important but quite do-able. It also means that basic literacy, local knowledge, and good common sense are enough for rural communities to exercise adequate responsibility in the care of their resources. Fancy education and outside technical expertise may be helpful but are not absolutely necessary. Indonesia is now going through tremendous political change. Many of the separatist movements throughout the country are driven by a desperate effort to stabilize control over the land, to get out from centralized government retention of power over the land. State control is essentially whimsical and dissipates rents by gobbling up and vaporizing the economic value of the land and its resources.

Today's developed countries were yesterday's developing countries, and without a single exception they are countries that are rich today because the powerful elites within those countries learned to share with the rest of the nation's population. They accepted constraints on themselves in the form of arrangements that required them to protect not just their own property claims but those of others as well. Political economists make great use of the Robin Hood story from England to illustrate this point. In this story of medieval England, probably true many times over, the Sheriff of Nottingham was a local leader who was trying to ingratiate himself with England's new king, and who taxed his local people heavily and capriciously in order to collect income for himself and the king, in exchange for his official position as Sheriff. The local people suffered in disabled silence until Robin Hood came along and mobilized them to arm themselves, hide in the forest of Nottingham, and ambush government officials and tax collectors, retrieve the money taken from local people, and redistribute it back to the population, particularly to the poor. This behavior guaranteed not only the popularity of Robin Hood's band of merry men, but also their protection as political guerrillas.

Throughout, the Sheriff of Nottingham attempted to enforce his preferred property rights rules:

> *"What's mine is mine, what's yours is mine if I can take it, and I will rely on my friends, the courts I create, and coercive force to enforce my property rights. You of course have no property rights and the courts are unavailable to you (or will always ride against you) ".*

Therefore property rights existed in Nottingham, but only for the elite. A tremendous change occurs when the authorities decide (probably at swordpoint or gunpoint, a few centuries later....) to extend the benefits of courts and property to classes beneath their own, and eventually to all citizens. It is at this moment that government changes its role from banditry to policing, protecting people both from each other and from itself (Olson, 1993). Until that point, natural resources are not safe against predation, because those who own them cannot protect them against local resource residents and resource neighbors. Similarly, local resource residents and neighbors have no incentive to protect the resources themselves or add value to them, since any value-added they generate will be confiscated by rapacious tax collectors. The unavoidable conclusion is that until government extends property rights to everyone and enforces these rights impartially and effectively, we will have reckless resource overuse and the tragic dissipation of national assets and economic rent.

The Commons in Japan's Industrial Development

In addition to outlining the history of the commons in Japan, Table 4 also illustrates the role that common property can play during economic development if government honors and enforces common property rights. The goal of good common property resource management is not to keep resource-dependent people in the forest so they can live at subsistence forever. Common property is not a device that operates to keep people poor, to keep them non-industrial, to deprive them of technological advance, or to treat them as aboriginals in natural zoos. Instead, common property gives people some control over their livelihood strategies and the opportunity to maintain the economic and environmental foundation of their lives as they go through economic change. Keeping common property can be consistent with improving economic well being of rural communities and does not restrain communities or prevent them from taking advantage of other economic opportunities, if the decision-making power over their resources stays in their hands. We need to recognize that the resources they depend on must be sustainably managed for as long as they are dependent on those resources, and that when these people become richer, they will be much better off if they still have healthy and productive ecosystems than if they or others have destroyed them. The transition we should hope for in developing countries is to do the developing without destroying the resource base.

In Japan, industrialization and economic growth affected rural areas with common property in two ways. First, it gave excess population in rural areas a place to go and a non-agricultural source of livelihood. The people who moved out abandoned their claim to the commons, and the commons remained sufficient for supporting the population that still used it. Second, industrialization came to rural areas as well, bringing non-agricultural by-employments and occupational flexibility to users of the commons, so that they could then contemplate new uses, and eventually much less use, of the commons, as their standard of living improved. Gradually, as the remaining (stable or shrinking) rural population diversify their income strategies so that they supplement their livelihoods with incomes drawn from sources other than the commons, the commons begins to contribute a declining monetary portion to these people's incomes. Nonetheless, the commons continues to be crucial as the

environmental resource base for safety and health, for clean water and air, for flood control, for microclimatic stability, and also for whatever biodiversity survives (much greater, one hopes, in Indonesia than in Japan).

The Japanese communities that 1 have studied used the commons before and during rapid change as a backup system in crises. The commons had always provided a welfare system for destitute families inside the community and continued to do so. During industrialization, when daily pressure on the resource was declining because most families were finding new sources of income, the commons remained very useful for emergencies. The commons could provide a source of new roofing material after a typhoon damaged most of the homes in the village or be a source of extra materials and cash income (earned and divided at the community level of course) during depressions and hard times, etc. Commons-owners still have this foundation as one of their community and personal assets when the transition is "over." As economic growth provides increasing non-agricultural opportunities to increasing increments of the population, the number of people relying on the commons actually shrinks (as has happened in the countries that are now rich), then income from the commons may be subdividable into fewer individual portions and actually generate rising absolute income per claimant, even as claimants simultaneously become richer because of other forms of income as well. Thus keeping common property is consistent with increasing per capita income of individuals in rural communities. The commons can actually contribute more income per person as the number of claimants to the commons decreases.

Thus there exists the possibility for a commons that can support the basic subsistence of, say, 1000 people, to provide over time a useful supplement to 1000 richer people in the future, and eventually to provide a less important income contribution and a much more important environmental contribution to, say, 500 people in an affluent future. In this way, one can envision moving from a subsistence economy filled with resource-dependent people whose only livelihood comes from living in the forest to a richer economy in which people do not have to live inside of national parks (and don't even want to). It would be wonderful for today's developing countries to use their natural assets sustainably rather than in one irreversible and permanently damaging conversion to make this transition. Far better to lose less than the United States or Japan did in the process, and therefore to end up with more of their original resource base left after this economic transition is completed. Indonesia has presumably seen enough unsustainable resource rape already, selling off its resources for economic returns that arc small in quantity and very limited in duration (Gillis, 1988). Presumably the reason for this conference is that Indonesia is now prepared to consider alternatives that generate not only larger economic returns but also more equitably distributed economic returns from its magnificent resource base before any more of it gets cut down or burned up.

As Mancur Olson wrote in his foreward to Baland and Platteau's massive study (1996), it is time to take community resource management very seriously. We have disappointing experience with parceled individual private property and appalling performance when governments try to sequester and concession off the natural resources that communities depend on. We know a lot about how to design the internal workings of these regimes so that they fight the ever-present free rider problem and promote cooperation instead. We also know what kinds of external factors are needed to support common property arrangements. Nevertheless, how to persuade markets not to produce wild price fluctuations and how to enable governments to provide public goods like price stability, high quality information, and predictability about the future in addition to secure tenure remain problematic. We are also making progress at figuring out where and when sharing rights to resources are wiser than

dividing such rights and thus where and when we should try to locate common property regimes.

I limited my examination above to ecological and physical criteria for siting common property and did not mention social and cultural attributes of the communities themselves. Communities do obviously vary in their historical experience with cooperation and the social capital that such experience generates. The extent to which they suffer from internal stratification based on class and caste that might foster mutual suspicion and impede cooperation needs further analysis. But if we think for a moment in quasi-functionalist evolutionary terms, is it not probable that in places where the physical circumstances create tremendous potential gains from cooperation, we will probably be more likely to find experience with cooperation? And even if there is no such experience, surely the promise of mutual gains from cooperation will be a critical (necessary) factor in motivating a community that lacks such experience. As for places where the physical circumstances offer very little potential gain from cooperative solutions, we should not be trying to establish common property regimes anyway, and the local experience with cooperation versus conflict in such places becomes irrelevant. Thus my suggestion is to look first for the appropriate physical setting that makes cooperation worthwhile, to make sure there really are gains from cooperation that community-based resource management can generate and capture, and then examine the social and cultural predisposition to cooperate in the candidate communities.

Creating common property, even in the most appropriate circumstances, does not guarantee success. In addition to internal flaws that a given community may have (inability to cope with conflict, the losses of social capital and so on referred to above), market prices for some products of the commons may fluctuate so wildly as to create great uncertainty about the future value of the resource, shortening time horizons and eliminating the willingness to forego in the present for long term gains that may be illusory. We also have many instances (India abounds in these for instance) where the community itself is so stratified by caste or economic differences or recent experience with ethnic conflict and the like, that cooperative arrangements involving the entire community are very difficult to orchestrate. Finally, we are certain to have cases where the circumstances are right, the community is right, but government officials do not honor the pact to respect community based resource management. Only nationwide mechanisms by which citizens are enabled and expected to police government behavior can begin to address this problem. In conclusion, we must understand this - creating common property where we should create it does not guarantee a successful outcome. **But failing to create common property where it makes sense, does guarantee that the ecological and economic failures we have already witnessed will continue.** This we surely find unacceptable.

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The single most useful internet web site *on* common property is the International Association for the Study of Common Property (IASCP)'s site, at www.indiana.edu/~iascp The IASCP is an interdisciplinary organization designed to serve as a forum for the sharing of information about resources (both natural and man-made) that are used or held in common, and is meant to be useful to scholars, resource managers, community members, government officials, and anyone else with these concerns. At the IASCP web site one can find information about the history of this organization, formed in 1989, the schedule of panels and papers presented at every international meeting the group has held, abstracts for the papers, and back issues of the Common Property Resource Digest, the organization's newsletter. Those who pay membership dues to the association also have access to the full text of papers that have been

presented at these meetings and submitted in electronic form for mounting on the site. Most importantly, all users of the site have access to the magnificent bibliographies on common property that have been developed by Fenton Marton and the IASCP's Information Officer, Charlotte Hess. These bibliographies are searchable by author, title, subject, and other keywords. The web-based bibliography is constantly updated, but for those with limited access to the web, copies of the bibliographic information as of summer 1999 are available on a CD that can be used on a computer without internet connections. Those without the internet connection to search the site for information may want to contact the organization by regular mail: Michelle Curtain, Secretary-Treasurer, IASCP, Woodburn Hall 220, Indiana University, Bloomington, Indiana, 47405 USA (Email: iascp@indiana.edu).

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