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March 6, 1987

TO: David Feeny  
Jere Gilles  
Margaret McKean  
Ronald Oakerson  
Elinor Ostrom ✓  
Pauline Peters  
Ford Runge  
James Thomson

FROM: Dan Bromley *DB*

RE: Draft of Chapter 14 for the Book

I enclose a draft of a chapter for the common property book. This is a slight variation on a paper that I presented in Pakistan last April, though it draws on the material from the Annapolis Conference.

I would be grateful for your earliest possible reactions regarding its suitability as a chapter 14 in the book. Although I am in England please convey your comments to my secretary in Madison and she will forward them to me.

The editors at Cambridge University Press have asked me for names of possible reviewers and I provided them with 6-7 names. We have been promised expeditious treatment and I shall keep after them in this regard.

mj  
Enclosure

To: CPR Project Colleagues

From: Lin Ostrom 10 March 1987

I just received this draft chapter from Dan Bromley who was the chair of the National Academy of Sciences Panel on Common Property Management. There is obviously some level of overlap between Bromley's view and the own we have been developing. On the other hand there are some distinct differences. Thought you would want to see this. Lin

DRAFT

## CHAPTER 14

### COMMON PROPERTY REGIMES IN INTERNATIONAL DEVELOPMENT

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The original purpose for which the chapters in this volume arose have to do, primarily, with intellectual imperialism. That is, the extent to which orthodoxy has come to view the "development problem" through a particular lens that obtains its character from the very cultural milieu of mainstream economics, and—to a lesser extent—sociology and anthropology. This orthodoxy, at least among development economists and administrators, is generally without reservation when it comes to prescriptions about how natural resources ought to be owned and managed. So absorbing and universal is the wisdom of the market and atomistic choice among economic agents that there simply is no possibility that collective management of natural resources might be efficient and in the long-run interest of resource integrity. The "tragedy of the commons" allegory is final proof—as if any were needed—that joint responsibility is a license to destruction.

The irony of the situation calls out for comment. When resource destruction is observed in settings of joint ownership and control of course it is the institutional arrangement (joint responsibility) that is obviously to blame. When resource

destruction is observed in settings of private ownership and control—and there are many examples indeed—it is not the institutional arrangement (private property) that is to blame but the excessively high rate of time preference of the owner, or imperfect capital markets, or incomplete contingent claims markets, or some other imperfection in the larger economic system. Since everyone knows, as a matter of faith, that private owners take care of their assets in the best interest of society at large, it goes without saying that the fault must be seen to lie elsewhere.

The chapters here, then, address both the conceptual issues inherent, in joint ownership and control, and the empirical issues of those regimes. We propose to show that conceptually there remains much confusion about common property, and empirically there is much that we can learn about the successful administration of common property regimes.

In my comments here I will focus on the conceptual issues inherent in common property regimes, for it is here that the greatest mischief has been perpetrated by the conventional wisdom. My central motivation here is that the discussion of resource ownership and control in the developing world is much hampered by serious conceptual errors and misunderstanding. Few commentators show much hesitation in discussing such highly technical terms as ownership, rights, property, the commons (and the presumed "tragedy" therein), the free-rider problem, and private property. And yet the meaning of these concepts varies

across both time and space. In what follows I provide a rudimentary picture of the necessary concepts for meaningful discourse about natural resource control in the developing world. It is, at once, both broad and narrow; broad to encompass the diversity of settings we encounter in the developing world, and narrow to offer theoretical specificity where required.

#### ON RESOURCES AND REGIMES

A range, or a forest are renewable resources capable of yielding a sustainable offtake over an indefinite time horizon. The sustainability of that use-regime is directly related to the annual harvest vis-a-vis the stock that is left behind. Humans enter these systems and take particular products that have value to them, and leave the rest. We know that grazing may not only change the biomass that is available for the future, but the composition of that biomass is altered as well. Indeed the very intent of human interaction with the ecosystem is to alter the composition of that natural system to more closely conform to the products considered useful or valuable by humans.

We worry about resource degradation when the remaining biomass is inadequate to maintain the basic integrity of the system, or when the composition of what remains is altered in ways that are judged potentially serious. Logging in steep terrain would be an example of the former, while overgrazing that changes a perennial range to one of annuals would be an example of the latter. These aspects are well understood. What is more

difficult is to understand: (1) the social relations that define the role of individuals within a group of resource users vis-a-vis others in that same group; (2) the social relations that define one group vis-a-vis other groups; and (3) the social relations that define individuals or groups with respect to the natural resources on which they depend.

We start with the recognition that land and related resources in the rural sector are characterized by a whole complex of institutional arrangements that will vary across resources, and through seasons of the year. In some locations, or at certain times of the year, these resources may be under the control of only one individual, or one household. When this is the case their management resembles that which is pertinent to a variety of individual (or "private") resources. However, in other locations, or at other times of the year, the management of some of these resources may transcend the nominal individual or household and involve instead a number of individuals or households. Western observers, unfamiliar with local institutional arrangements, will often confuse this situation with an absence of property rights, and will then suggest that the solution is to be found in the establishment of such rights. In point of fact, as will be elaborated below, successful common property regimes are characterized precisely by the existence of individual rights. What changes as between different types of property regimes is the scope of the primary decision-making unit.

<sup>1</sup> This variation in resource decision units across resources or seasons introduces important complexities into natural resource management. Because the vertical ecosystem gradients are the most pronounced in mountain agricultural systems, we will usually observe the greatest institutional variability in such settings. It is in mountain agricultural systems—as epitomized by Nepal—that the greatest alarm about resource destruction is raised, and hence we here find the greatest scope for the imposition of inappropriate institutional arrangements.

The essence of control over resources is that there exist socially recognized and sanctioned rules and conventions that make it clear who is the "owner" of the resource in question. In private property regimes the individual's interest in a resource has been recognized as a claim, and then has been given the more formal identification as an entitlement. Though the specifics of a particular entitlement may require elaboration, there is little doubt about what individual rights or entitlements mean in the abstract. These entitlements are not so easily discerned with collective management and control of resources. The economics literature has been most uneven in its understanding of group resource regimes, even confusing situations of common property with the complete absence of entitlements [Gordon; Scott]. More will be said on this momentarily.

For now we will want to view the group management and control of a resource as a collective good as that term is understood by economists. By a collective good we mean something

that is provided by a group for its own benefit, and its enjoyment by one does not diminish that which is available for others in the group to enjoy. Law and order is a collective good, just as is the orderly management of a group pasture. In the language of game theory, the collective good is the binding agreement that distinguishes a cooperative game from a non-cooperative game [Friedman, Schotter, Shubik, Sugden].

Successful common property regimes are modelled as cooperative games [Dasgupta and Heal, Runge].

Collective goods will, of course, have transaction costs, by which we mean the costs of: (1) gaining information about the resource and what other users are doing with it; (2) reaching agreements with others in the group with respect to use; and (3) enforcing those agreements that have been reached. In private property settings these costs are part of regular cash transactions, or they are handled by the legal system. In group property settings these costs are part of the collective decision making.

Transaction costs in group settings will often concern the likely actions of others, and their tendency to adhere (or fail to adhere) to the arrangements that have been made. That adherence to a set of agreed-upon rules constitutes the collective good of the group; if there is full compliance the goals of the group as a management entity will be met, while if there is anarchy the goals are confounded.

We can think of the behavior of members of the group with respect to a particular resource being managed and can postulate four possible situations. That is, consider the likely actions of a member of the group (individual  $i$ ) against the expected actions of all others in the group ( $n-1$ ). Positive reciprocity is defined as that situation where individual  $i$  will contribute to the collective good (the "orderly" management of the common resource), and expects that all others will likewise. Beneficiaries is defined as that situation in which individual  $i$  will contribute to the collective good on the expectation that all others will not so contribute. Negative reciprocity is that situation in which individual  $i$  will not contribute to the collective good because it is expected that others will not, while free riding is that situation in which individual  $i$  will not contribute to the collective good because all others are expected to do so. These four possible situations for the group management of a shared resource are depicted in Table 1.

TABLE 1. EXPECTATIONS AND COMPLIANCE IN COLLECTIVE GOODS

	$i$ Expects Others to Contribute	$i$ Expects Others Not to Contribute
$i$ Will Contribute	Positive Reciprocity	Beneficence
$i$ Will Not Contribute	<i>FREE</i> Riding	Negative Reciprocity

The two colls exhibiting reciprocity depict behavior that is interdependent or matching in nature; individual  $i$  does what he/she expects others to do with respect to contributions to the collective good. Beneficence and free-riding behaviors are independent in that the individual refuses to "go along." The preferred situation for the success of collective goods (such as the group management of a shared resource) is clearly to create a situation of positive reciprocity. Similarly, negative reciprocity is to be avoided since it signals the disintegration of the group into anarchy and the dominance of individual strategies with respect to the resource under study.

The relative merits of beneficence and free riding fall somewhere between these two poles. While we normally laud beneficence, and denounce free riding, these quick judgements are not always correct. In a static sense free riding is *preferred* to beneficence since it (free riding) implies that only individual  $i$  will not contribute while all others are expected to. And it is surely much easier to deal with only one "trouble maker" than with a large number. Under a situation here defined as beneficence all other  $n-1$  members of the group are expected to do nothing and so the full burden falls on individual  $i$ .

In a dynamic setting however, free riding may become "catching", just as beneficence may shame others into doing their part. It is not essential here to worry about these differences. The concern is that successful management regimes for shared agricultural resources can only persist if positive reciprocity characterizes the nature of group interaction and compliance.

Note that we are here talking of the likely actions of one individual, given the expected actions of others. Again, the analogue in game theory is to that of strategies. We have said nothing about outcomes, which are the stuff of payoff matrices. Our interest at the moment is in the likely actions of members of an n-person group with respect to the binding agreement that defines the cooperative game among independent decision units. When these units are bound together by an agreement regarding the management and control of a valuable natural resource—a group pasture, a village forest—then they become part of a resource management group and their individual and independent identity is, for the moment, subsumed into the resource management group.

These resource management groups imply, as explained earlier, overlapping decision units across time or space. Each decision unit will have certain interests in the management of the resource, and those interests will find expression in claims made by the decision unit. When various claims are adjudicated and given formal protection we say that rules and conventions are established that bestow entitlements on each decision unit. Entitlements entail a socially recognized structure of institutional arrangements that both constrain and liberate individuals in their behaviors with respect to other individuals; as such, institutions are at the core of group management regimes over agricultural resources. It is the institutional arrangements that comprise the "binding agreement" that transforms the isolation problem of a prisoner's dilemma into a

cooperative game.<sup>2</sup> because property represents a secure claim or expectation over a future stream of benefits arising from a thing or a situation (a resource, if you will), we can regard such collective management systems as common property regimes.

A common property regime will consist of a well-defined group of authorized users, a well-defined resource that the group will manage and use, and a set of institutional arrangements that define each of the above, as well as the rules of use for the resource in question. In addition to the rules of use there will be rules for changing the rules of use. While it is common to refer to "common property resources", I do not much like this terminology for the simple reason that it evokes the notion that there are certain resources that are always managed as common property. There are no "common property resources" just as there are no "private property resources". There are, instead, resources that are managed as private property in one place, and as common property in another.

#### ON RIGHTS AND REGIMES

A resource regime derives its meaning from the structure of rights that characterizes the relationship of individuals (or, as suggested earlier, primary decision units such as households or kin groups) to one another, and to the object(s) of value. It is the nature of these institutional arrangements that defines the extant property regime over land and related resources—whether that regime be one we would call private property, or one of

common property. That is, the institutional arrangements define one individual vis-a-vis others—either within the group or outside of the group. We can characterize these relations between two (or more) individuals (or groups) by stating that one party has an interest that is protected by a right only when all others have a duty. Property is a right to a benefit stream that is only as secure as the duty of all others to respect the conditions that protect that stream. When one has a right one has the expectation in both the law and in practice that your claims will be respected by those with duty.

There are other situations in which an individual does not have a right to undertake certain actions but instead has only privilege. With a right I am protected against the claim of another by their duty. With privilege I am *free* to do as I wish since the other party has no rights. Put differently, an individual with privilege is free to ignore the interests or claims of those with no rights.

The difference between a common property regime and an open access regime can now be made clear. In a situation of *open* access I have privilege with respect to use of the resource since no one else has the legal ability to keep me out—they have no rights. But since I have no ability to prevent them from using the resource I have no rights, and they have privilege. It follows, therefore, that an open-access situation is one of mutual privilege and no rights. Contrast this with a common property regime in which there are rules defining who is in the

resource management group and who is out. That is, some have a right to be in, while others have a duty to stay out. Of those recognized as being in, each has a duty to obey the rules of the group (compliance) and each has the right to expect others also to obey the rules. Here there is mutual duty and rights. It is the rights of the members limiting group size (and hence total use), along with the rights of the members 'proscribing the use that each will make (the stint), that together constitute "property". Hence the term common property regime:

Invoking the concepts of entitlements and property, it should be clear that those who confuse open access regimes with common property regimes, or who write of the "tragedy of the commons", know nothing of property, nor of entitlements, nor of claims given effective protection through rights and duties. If that were understood much mischief in the literature 'would never have occurred.

Before elaborating the various types of regimes for the management of agricultural resources we should pause and mention the dynamic aspect of these legal relations. Rights and duties, as well as privilege and no rights, define individuals and groups at a particular moment in time. When an individual or a group has the legal ability to alter the status-quo structure of legal entitlements then we say that individual (or group) has power, while the party who is put in a new legally binding situation has exposure. If a party is not able to change the legal entitlements that define it with respect to others then that party has no power and the other party has immunity.

When economic conditions change, or when tastes and preferences change, or when a new technique *appears* on the horizon, then it becomes necessary to reevaluate existing structures of entitlements (institutions) to make sure that they are not counter productive; if these entitlements change by mutual consent we assume that both parties have been made better off, or at least one of the parties is no worse off. If, however, one party was excluded in the deliberations, or if that party was ignored or overridden, then power has been exercised.

With an understanding of right and duty, privilege and no right, it is now possible to provide a general classification of possible resource regimes, and to thereby place the common property regime into context. I propose that, for most purposes, it is sufficient to consider four possible resource regimes: (1) state property regimes; (2) private property regimes; (3) common property regimes; and (4) non-property regimes (or open access). Let us consider each in turn.

In a state property regime the control over use rests in the hands of the state. Individuals and groups may be able to make use of the resources, but only at the forbearance of the state. National forests, national parks, and military reservations are examples of state property regimes. The nationalization of Nepal's village forests by the government in 1957 converted a common property regime into a state property regime (although, as indicated previously, in the absence of consistent administration and enforcement the forests are now virtually open-access resources).

The most familiar property regime is that of private property. While most think of private property as individual property, we must remember that all corporate property is private property, yet it is administered by a group. It is also essential that we be reminded of the pervasive duties that attend the private control of land and related resources; few "owners" are entirely free to do as they wish with such assets.

The third regime is the common property regime. Notice that common property represents private property for the group (since all others are excluded from use and decision making), and that individuals have rights (and duties) in a common property regime [Ciriacy-Wantrup and Bishop].

Finally we have the open access situation in which there is no property. While the aphorism "everybody's property is nobody's property" has gained wide acclaim in the confused literature on the tragedy of the commons, this is logically inconsistent. It can only be said that "everybody's access is nobody's property." The fallacy of the "tragedy of the commons" allegory is that by failing to understand property, and thus to see the world as dichotomous between open access (which is bad) and private property (which is good), the commentators could leap from the presumption of destruction to the presumption of "wise management" with one quick sleight of hand. The four different regimes can be summarized as in Table 2.

TABLE 2. FOUR TYPES OF PROPERTY REGIMES

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STATE PROPERTY	Individuals have <u>duty</u> to observe use/access rules determined by controlling/managing agency. Agencies have right to determine, use/access rules.
	* * * * *
PRIVATE PROPERTY	Individuals have right to undertake socially acceptable uses, and have duty to refrain from socially unacceptable uses. Others (called "non-owners") have <u>duty</u> to refrain from preventing socially acceptable- uses, and have a <u>right</u> to expect only socially acceptable uses will occur.
	* * * * *
COMMON PROPERTY	The management group (the "owners") has right to exclude non-members, and non-members have <u>duty</u> to abide by exclusion. Individual members of the management group (the "co-owners") have both <u>rights</u> and <u>duties</u> with respect to use rates and maintenance of the thing owned.
NON- PROPERTY	No defined group of users or "owners" and so the benefit stream is available to anyone. Individuals have both privilege and no right with respect to use rates and maintenance of the asset. The asset is an "open-access resource."

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## ON THE PERFORMANCE OF REGIMES

The serious literature on the performance of different types of regimes is notable for its paucity.<sup>3</sup> Of course the literature abounds with stories of how so-called "common property resources" are driven to extinction but it should now be obvious that such anecdotes, regardless of their empirical voracity, are conceptually flawed for their failure to understand the central difference between open access and common property.

Moving from abstract discussions of entitlement structures to practical matters of performance, we must recognize that resource management regimes exist to link human associations with ecological associations. In mountain ecosystems, where ecological gradients are the most pronounced, we are likely to find the greatest variation in resource management regimes. It is here that we can most easily study regimes for their adaptation to vertically differentiated ecological conditions, on their innovation of rules to meet new situations, and on the conditions for judging their ultimate success as viable institutional options.

Human associations fit into ecological niches and develop social rules and conventions with the presumption of optimal concordance between those conditions and their collective goals—of which survivability must be given *prima facie* dominance. Those social rules and conventions have here been called institutions in accord with classical social science literature. From this nexus of ecosystem and social system one finds certain behaviors resulting, both with respect to other individuals and groups in the social sphere (patterns of interaction), but also with respect to elements of the ecosystem that we here consider resources— The patterns of interaction and the eventual nature and level of resource use will generate certain outcomes that, over time, will be regarded as either "suitable" or "antisocial" (that is, not conducive to long-run success for the association). The idea of "coevolutionary" development captures the notion that human and ecological associations are mutually adapted over time, each to the other's needs [Norgaard].

This assessment or evaluation of outcomes can be seen as an enquiry into the suitability of realized behaviors, *and* thus ultimately as a concern for the accepted rules *and* conventions that we refer to as institutions. These institutions constitute the incentives and sanctions that both liberate and constrain individual and group behavior; they define opportunity sets for members of the human association.

The result of assessment (which is, after all, a continual process) will be a constant effort to "fine tune" the social system as well as the ecosystem to provide the desired outcomes at the least possible commitment of scarce "labor" and "capital", broadly defined. Some of this fine tuning will be directed at the ecosystem and will be called "investment." Examples would be the construction of irrigation channels to bring glacier run off to arable land, or the manuring of these fields to improve their fertility. The second dimension of this fine tuning involves institutional change that will be directed at the rules and conventions that define patterns of interaction.

It is appropriate at this time to mention "technology" as an innovation into the human associations under consideration. I have earlier talked of an irrigation channel which fits the classical notion of technology. Fertilizers, tractors, and new seed varieties also fit. It is important, I suggest, to draw a distinction between a particular tool/device and the way in which that device fits into the social milieu. That is, a tractor can be accompanied by a variety of institutional arrangements regarding its purchase, its amortization, its control, its use, and the socioeconomic impacts of its introduction. The same can

be said for any other device that is introduced into a social system. The device itself does not change, but the identical device introduced into two different ecological *and* socio-economic settings will have different institutional arrangements that determine the nature of its introduction, and that grow up around it as it becomes incorporated into the going concern.

When one talks of irrigation technology, or machine technology in harvesting, one is talking about a constellation of social rules and conventions that accompany, respectively, a ditch or a combine. This is the conventional meaning of "technology" though it is often implicit, and even though the institutional arrangements are certainly different across different applications and settings. But the tool or device—be it a ditch, or a tiller, or IR 66, or a particular formula of fertilizer—is the same physical entity. It is a technique that can be used in a variety of ways, and the ways in which the same technique is used in a particular setting is technology [Bromley and Verma]. This distinction helps us to keep on prominent display the various ways in which social rules and conventions accompany identical techniques across social and ecological settings. It also helps us to understand that the recent development fad for "appropriate technology" is best thought of as appropriate techniques for the ecological and social realities into which they are introduced, and from which will arise the institutional arrangements that will define the socioeconomic (as well as ecological) impacts of their use.

## CONCLUSIONS

A fuller understanding of the institutional arrangements that define property seems necessary to a more careful assessment of the resource regimes in the developing countries. A large proportion of the peoples in these countries obtain a substantial fraction of their daily sustenance from lands that are not held in fee simple (free hold). The history of development assistance has been one of almost exclusive focus on "private property"—either in the form of more scientific agricultural practices for these lands, or in the form of land reform programs to redistribute large private estates to the landless. Few comparable efforts exist to understand the nature of economic activity on other types of lands (that is, lands under other property regimes).

Of course there is a substantial literature on ways to prevent the degradation of non-private land. I have talked earlier of the fundamental asymmetry that seems to persist regarding resource destruction on private lands and that which occurs on jointly owned land. There is ample evidence, and it is growing, of the destructive land-use practices undertaken by private (freehold) owners of many land and related natural resources. Soil erosion and deforestation are but two prominent examples.<sup>4</sup> In the face of this evidence few observers challenge the ultimate social wisdom of free-hold land. We are told, rather, that there must be economic incentives (bribes, tax breaks) to induce the private owner to behave in socially acceptable ways; such bribes often justified on the ground that the public is, somehow, "interfering" with the owners "right" to

do as he/she desires. But when evidence of resource degradation on non-private land is observed the fault is immediately said to lie with a "quaint" property regime that fails to assign clear ownership and, by implication, stewardship. Indeed there is almost universal agreement that the solution is to create private *property* for individuals, or to create state property so that the destructive users might be displaced or *properly* controlled by some remote government agency. We see few serious recommendations that the resource regime be studied carefully to understand the structure of rights, duties, privileges, and no rights. We see little recognition that resource regimes in the developing countries might be revitalized by efforts to understand their systemic problems, as opposed to expropriation of the resource by the state. In short, there seems little recognition of the rich array of institutional alternatives whereby land and related resources might be managed.

This continuum of choice and control--ranging between complete individualization and total collectivization--is the subject of great intellectual and popular debate. Indeed, the debate goes back to the Greek philosophers [Schlatter], The essence of contemporary economics is to celebrate the individual as the proper decision maker, and from that it follows that the Individual must have full control over the necessary productive inputs (of which land and related natural resources are central).

The mischief to arise from the term "common property" is that many social scientists do not understand the critical distinction between "open-access resources" (*res nullius*) and "common-property resources" (*res communis*). Open access is a

free-for-all, common property represents a well-defined set of institutional arrangements concerning who may make use of a resource, who may not make use of a resource, and the rules for how the accepted users shall conduct themselves. By failing to understand this essential difference, many then commit an equally serious mistake. That is, institutional arrangements over natural resources (property arrangements) are thought to be at two polar extremes; one either has individual (or private) property, or one has a free-for-all. And the obvious next step is to point out what seems all too apparent—that a free-for-all will almost certainly result in resource degradation. Thus, the presumed salvation is to create individual (private) *property* over scarce and valuable natural resources in the developing world.

By failing to understand that property arrangements are not bimodal but in fact are to be found along a continuum, observers are led to embrace one pole on the evidence of eminent disaster at the other. Moreover, such reasoning ignores centuries of wise use of commonly controlled resources in the Swiss Alps [Netting], in the Andes [Rhoades and Thompson], and in other locations where exogenous technology and market processes have not disrupted the human-ecosystem interaction. Third, such reasoning invites incredulity in the developing world when various cultures are told that their salvation lies in the extreme individualization of all resource decisions. Finally, and possibly most damaging, the record of resource use in countries where individualization is present and *revered* would lead the neutral observer to ponder the ultimate wisdom of unconstrained atomization of control.

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## NOTES

1. See the work on coevolutionary development by Norgaard.
2. The prisoners' dilemma is a situation in which each of the participants has a consistent tendency to defect from an agreement and to seek to better his own situation at the ultimate expense of the others in the group. This tendency to defect means that the aggregate of all participants is less well off than if the individuals had stuck together. See Friedman, Guttman, Schotter, Shubik, or Sugden.
3. Netting offers one of the few careful assessments of a particular common-property regime, while Ciriacy-Wantrup and Bishop explore the general historical record of the commons. Dahlman investigates the performance of the English common-field system and does not find it to be a destructive system at all.
4. It is common in the U.S. for state laws to require the reforestation of private lands following the harvest of timber; laws which would presumably not be necessary if private owners had not been prone to clear-cut lands and then leave them to erode.