

Protected areas and traditional commons: Values and institutions

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The modern, largely academic and urban-initiated concern with the environmental protection of landscapes, species, watersheds, biodiversity, ecosystem services, etc. is framed by a language suggesting that the main concern is the protection and preservation of precarious resources of common interest for mankind. Thus the values deserving the attention of environmental protection seem to be very different from the concerns shaping the evolution of traditional commons: the control of, access to and extraction of resources seen as limited but essential for the survival of local communities. This article explores the theoretical differences and similarities of the two types of interests driving the concern for preserving values. It will be suggested that a basic difference lies in the distinction between values where there is rivalry in appropriation and values where there is non-rivalry. Further, it will be argued that in designing new institutions for managing protected areas, an understanding of traditional commons and how the new values to be protected are different from and interact with the old values will be important in order to achieve sustainability of resource use within the protected areas. Instituting regulations of environmental protection can be seen as creating new types of commons.

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Introduction

The modern, largely academic and urban-initiated concern with the environmental protection of landscapes, species, watersheds, biodiversity, ecosystem-services, etc. is framed by a language suggesting that the main concern is the protection and preservation of precarious resources of common interest for mankind. The values deserving the attention of environmental protection seem to be very different from the concerns shaping historical land use associated with the evolution of traditional commons. The collective regulation of the values of the landscape in traditional commons concerned access to and extraction of resources seen as limited but essential for the survival of local communities.

This article explores the theoretical differences and similarities between two types of interests in preserving values: those driving the creation of protected areas and those driving the management of traditional commons. It will be suggested that a basic difference lies in the distinction between values where there is rivalry in appropriation and values where there is non-rivalry.

It is further argued that an understanding of traditional commons, and of how the new values to be protected are different from and interact with the old values, will be important in designing new institutions for managing protected areas in order to achieve sustainability of resource use within them.

Instituting regulations of environmental protection to govern values of common interest for a group, small or large, can be seen as creating new types of commons. It can be conjectured that some of the practical day-to-day problems in managing the protected areas might have been easier and less costly to solve if the experiences of traditional management systems had been properly utilized.

Protected areas

The IUCN (International Union for the Conservation of Nature) defines Protected Areas as: 'Areas of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means' (1994). The IUCN promotes six management categories for protected areas (Box 1). The description indicates that the values of concern are science, wilderness, ecosystems, species, habitats, natural monuments, recreation, and landscapes. Only science and recreation imply human activities. Landscapes regarded as human creations are often called cultural landscapes. The link between landscapes or seascapes and recreation will be interpreted readily to include cultural landscapes or seascapes, however. It is interesting to note the absence of items such as historical monuments or the symbolic significance of landscapes or elements associated with landscapes. Presumably this is taken care of by the World Heritage Committee.

Geiranger-Herdal protected landscape area

Some aspects of the more general problem of the meeting of 'old and new' values within a protected area can be outlined by looking at the creation of a particular protected area. Norway's most recent protected area is the Geiranger-Herdalen Protected Landscape Area as of October 2004.

The proposal to protect the mountains around Geiranger-Herdalen in the county of Møre og Romsdal was first made in 1986 (NOU 1986: 13; Miljøverndepartementet 1992), alarming the local population. In October 2004 this particular area was designated a Protected Landscape Area by government decision. More interesting from our perspective is that the area was included as part of Norway's 'West

Box 1

IUCN Protected Area Categories:

1. *Strict Nature Reserve/Wilderness Area:*
 - a. *Strict Nature Reserve:* protected area managed mainly for science
 - b. *Wilderness Area:* protected area managed mainly for wilderness protection
2. *National Park:* protected area managed mainly for ecosystem protection and recreation
3. *Natural Monument:* protected area managed mainly for conservation of specific natural features
4. *Habitat/Species Management Area:* protected area managed mainly for conservation through management intervention
5. *Protected Landscape/Seascape:* protected area managed mainly for landscape/seascape conservation and recreation
6. *Managed Resource Protected Area:* protected area managed mainly for the sustainable use of natural ecosystems

Source: IUCN (1994).

World Heritage:

The Convention Concerning the Protection of the World Cultural and Natural Heritage was adopted by the General Conference of UNESCO in 1972. The goal of the Convention is to identify and protect the world's natural and cultural heritage considered to be of 'outstanding universal value'. The Convention creates a list of sites, the World Heritage List, made up of natural, cultural and mixed sites, and cultural landscapes.

Source: <http://www.iucn.org/themes/wcpa/wheritage/wheritageindex.htm> (Website of the International Union for Conservation of Nature (The World Conservation Union), World Commission on Protected Areas; accessed 2004).

Norwegian Fjords' nomination to the World Heritage List (Miljøverndepartementet 2004), accepted by UNESCO (United Nations Educational, Scientific and Cultural Organization) in July 2005. The fjords nominated were Geirangerfjord and Nærøyfjord. The values seen in the mountains defining these fjords should be assumed to be as ranking among the highest in the world. According to the 'West Norwegian Fjords' proposal: 'The purpose of setting aside the Geiranger-Herdalen Protected Landscape Area is to:

- *safeguard a distinctive, beautiful landscape of fjords and mountains containing a rich and varied plant and animal life*
- *safeguard valuable cultural landscapes where fjord farms, transhumance dairy farm settings and historic and pre-historic monuments and sites form important elements in the distinctive character of the landscape*
- *safeguard geological features and landscape forms* (Miljøverndepartementet 2004, 107; emphasis in original).

The selection was motivated by the attraction of the area to tourists:

The two fjords represent one of the cradles of scenic tourism in Europe and have been able to cope with great influxes of tourists without losing any of their qualities. They have played an important role ever since in encouraging the public to understand and enjoy the natural wonders of Europe's environment. ... Each of the two areas stands on safe ground in a World Heritage perspective, but seen together they complement each other as regards geomorphology and display values which, collectively, are even greater than when seen individually. These values stem from the spectacular scenery and the pristine and unspoiled character of the areas. Collectively, they are a unique representation of fjord landforms' (Miljøverndepartementet 2004, 11).

The values presented can be said to be those perceived by the urban academic communities of the world. The only IUCN

value not mentioned is science, yet historic and prehistoric monuments and sites are added.

What does the local population that has carved a living out of the inhospitable landscape find of value? The mountains are the common property of the farms in the valley. They are not the common property of the farmers as individuals, but of the farms as such. The resources found in the mountains, basically pasture for sheep and goats, and wildlife for hunting, were an integral part of what made farming possible here near the margins of agriculture. However, farming has been changing rapidly for more than a generation. The mountain resources are now of much less significance for farming, even though still used extensively.

More important than the slow changes in agricultural activities is the impact of the activities of the central authorities. Their efforts to 'protect' the mountains are both an enigma and an inspiration for the local population. It is an enigma because most of the local population are unable to see how the mountain landscape can be threatened in any way. It is an inspiration in that it enables them to see possibilities for providing tourist services as a supplement to their traditional agriculture. They also recognize that the rules made for protecting the landscape put severe restrictions on any new activities. To exploit the recreational and scenic values they have to be creative within a restrictive conservationist regime.

The need to protect and the need for income for the local population

Except for being used less by the farmers, neither the local farmers nor the local authorities (*kommuner*) have any plans that are likely to alter the mountains in any significant way. The need to protect the landscape can hardly be seen to concern anything that is actually happening or about to

happen in the area. The question is all about possible futures.

The original desire to protect is clearly induced by certain possibilities that large-scale modern capitalism affords. In Norway the central environmental authorities see these forces at work in the increasing use of motorized access to the wilderness, and also in the widespread local desire to develop hydroelectric power and large-scale tourism. These three indicators of the destructive possibilities of modern society can alternatively be seen as examples of the local desire to create activities that may generate income for the local population and the local community. The desire of a local population and community to adapt their activities to new opportunities and their goal of long-term survival are easily recognized across the globe.

How does one go about protecting against possibilities afforded by modern technology and the wishes entertained by a (local) population? To do so means to create institutions structuring the incentives that people perceive and act upon. The way this is done currently implies that, compared to areas without protection, the rules of protected areas will, if nothing else, increase the transaction costs of those that have land within the area. In the long run this may reduce the human-made component of the landscape and thus will also alter the values currently being emphasized as a reason for protecting the area. However, this outcome is just one possible future.

So far the main achievement is to force Norwegians to think differently about such areas. Designation as Protected Landscape Areas imbues areas with values that were not seen to be there before. They are given a common value for all Norwegians. This will make it harder to make changes to the landscape, not only for the local stakeholders but also for actors with more resources and more power to intervene. Thus, indeed, the area is better protected against the forces of development in a modern capitalist society. However, this increased protection probably comes at a cost not yet considered.

It should also be noted that the creation of a protected area, at a minimum, will transfer power from local to central stakeholders. This has worried the local population since the protection was first proposed. Most of their activities have been directed at minimizing this transfer of power. How the creation of a protected area may affect the people's perception of values and alter the way they think about possible future opportunities have not been an issue either for central authorities or the local community. The link between social and economic institutions and the way people think about what they do is probably a dimension in need of attention in institutional design. However, in order to talk about such links we need to understand better both the values embedded in a landscape and what people can do to or with such values.

In the Geiranger-Herdalen area we find values tied to scenic beauty and recreational activities, and we find opportunities for providing services for mass tourism and the generation of hydroelectric power. The traditional farming activities utilizing pastures are declining, but hunting has been increasing following a rapid increase in the population of red deer since c.1970, and (recreational) fishing in the

fjord has also increased. It does not seem possible to realize all of the different values. Analytical concepts to aid the discussion can be found in the theory of the commons.

Theory of the commons

It is a moot point whether there is *one* theory of the commons. The situation seems best described as several general theories applied to the problem of governing the use of resources that are or could have been held in common (meaning resources that are, or ought to be, enjoyed by several people rather than only one). It will not be possible to go into these theories in depth here. A starting point for theoretical development was the interdisciplinary reaction to the article by Garret Hardin (1968) discussing the mechanism generating 'the tragedy of the commons'. By 1990 Elinor Ostrom was able to sum up the debate and conclude that in certain circumstances a commons was not only possible but a management system superior to both individual ownership and state ownership. This is now widely accepted (Sandmo 2000, 142) (for some recent surveys of various aspects of the field see e.g. Baland & Platteau 1996, Hannesson 1996, Baden & Noonan 1998, Berge & Stenseth 1998, Buck 1998, Hardin 1998, Jentoft 1998, Ostrom 1998; 1999, Ostrom et al. 1999; 2002, Gibson et al. 2000, and Dolsak & Ostrom 2003).

Here, only a brief discussion of the following elements will be presented:

- elements describing aspects of nature in terms of their capability of motivating human action: their value or values (a typology of goods)
- elements describing the modes of human action (theory of collective action, degree of interdependence (cooperation-conflict), characteristic social dilemmas)
- elements describing the outcomes of the actions in terms of feedback to the motivational system and the system of action (unintended consequences, externalities), including a moral and ethical evaluation of the outcomes.

To some extent these elements are interlinked and need to be discussed together.

Types of goods

At the core of the motivational system are the values and goals seen in nature. These can be reinterpreted in terms of the kinds of goods perceived to inhere in land and renewable resources. These goods can usefully be described as being of four types: private goods, common pool goods, club goods, and public goods (Table 1).

Table 1. A typology of goods.

Resource	Appropriators/users	
	Excludable	Non-excludable
Subtractable	PRIVATE	COMMON POOL
Non-subtractable	CLUB	PUBLIC

Source: adapted from Ostrom & Ostrom (1977).

A resource is subtractable if harvesting or appropriating from the resource by one owner or stakeholder diminishes the amount available for another. Thus there will be rivalry for scarce supplies of subtractable goods. The rivalry will apply both among appropriators with interests in further processing and sale, and among (subsistence) consumers. Where exclusion of any particular appropriator or consumer can occur, the goods are called private goods. The common pool goods are so labelled because it is costly or technically difficult to exclude any particular stakeholder from appropriating resource units or utility from the pool. This situation has led to various institutional constructions for governing the appropriation from the pool by a suitably bounded group of people. Any particular institution is defined in relation to a group of people and a particular resource with common pool characteristics. The bundle is usually called a commons.

Where goods are non-subtractable and exclusion is impossible (or not allowed), goods are called public goods. The use of 'private' and 'public' as labels of goods should not be confounded with the same labels used about stakeholders. Used about goods they are labels denoting an analytic characteristic of a good important for the collective action problems experienced by stakeholders wanting to coordinate their goals.

Similarly the label 'club' good is used here with such analytical meaning. In a study of clubs by Cornes & Sandler (1986, 24), a club is defined as 'a voluntary group deriving mutual benefit from sharing one or more of the following: production costs, the members' characteristics (e.g. members' scholarly activities in learned societies), or a good characterized by excludable benefits'. In the present context the last item needs the following qualification: 'excludable, but non-rival benefits'. While as a general case all clubs need not be based on club goods as defined here, all club goods can give occasion for the creation of a self-governed club just as common pool goods can give occasion for a self-governed commons. Assuming open access to a common pool resource or free entry or exit from a club, one important implication following from the typology is a distinction between two types of appropriator-generated externalities affecting other stakeholders.

An activity generates an externality if there is a material consequence for stakeholders not taking part in the activities generating the consequence. Externalities generated in the appropriation of common pool resources and club resources are most clearly seen in common pool resources with open access where they appear as queuing problems, and in club resources with unrestricted entry and exit where they are experienced as crowding or thinning problems.

In common pool resources the externality is of the queuing type (first come, first served). Queuing causes competition among appropriators and distribution problems between those first in the queue and those last, but does not affect the utility of the good appropriated. Management has to consider the equity in the assignment of slots in the queue in relation to the finite volume of the flow of resource units.

In club goods the externality is cumulatively affected by the last stakeholder to enter or exit the club and through a crowding (or thinning) process will affect the utility of the

good for all members of the club (the last drop causing the overflow or the last tread to break causing the collapse). This type of externality produces distribution problems in relation to non-members and causes threshold effects in the utility of the good. Management can preserve the utility of the good by setting the number of club members to something under the threshold (if overuse is the problem) or over the threshold (if the service level depends on a certain minimum number). However, equity problems between members and non-members also have to be addressed. Positive externalities from the preservation of some club good, such as watershed protection or preservation of biodiversity, are often considered public goods. Distributional and management challenges arise from the discrepancy between costs borne by resource managers and the benefits enjoyed by others ('free riders').

In the theory of the commons the discussions of the problems surrounding various resource systems and their management have basically focused on common pool resources and commons. However, modern protected areas are not created or visited primarily because of their common pool type resources. Other types of values more appropriately described as club goods or public goods predominate. With regard to the Geiranger-Herdalen area, the traditional values – pasture and game – are common pool goods. None of the values associated with the protected area are of this type. However, it is worth noting that recreation within specific areas may be affected by crowding. In so far as the protected landscape area is used for recreation, a club is created. Its characteristics should be investigated.

Environmental goods and services in the theory of the commons

With a few notable exceptions (e.g. Bromley 1991, Yandle 1997, Cole 2002), environmental protection and management of common pool resources have not been discussed together. The economic theory of environmental problems and policies is usually discussed as a problem of allocating responsibility for externalities (Baumol & Oates 1988, Devlin & Grafton 1998, Sandmo 2000). The environmental problem is described as consisting of the misuse of a resource currently being in the public domain with open access. The solution is seen to be either imposition of appropriate taxes for matching the use of the resource to its capacity, or it is seen as a problem of privatization, to allocate private property rights to the resource in order to achieve the internalization of externalities. However, in recent treatments of environmental economics and policy (Kolstad 2000, Tietenberg 2001) the discussion of property rights is expanded to comprise common property, and property rights have become a central concept in discussions of the design of management institutions.

Property rights give rules of behaviour, rules of how non-owners shall behave relative to owners, and how owners shall behave relative to non-owners. Property rights can be distinguished from other rights in that they give the holder the maximum security of tenure and legitimacy of possession

a society can afford. In many societies this maximum protection is rather small scale and local, based on customary rules and practice and not enforced by state authorities (de Soto 2000). Individuals and collectives as well as the state can legitimately hold property rights to valuable goods and services. Thus the protection of environmental goods and services could easily be framed as a problem of allocating property rights to them. Usually, this is not done.

The legal discussions of environmental protection are concerned with balancing rights and duties, but have a very noticeable emphasis on the manufacturing of products. Breen (1993, 70) concludes: ‘The cycle of resources from extraction to recovery is a natural one, but the law’s approach to it is curious. Law generally uses a light hand as resources are taken out of the environment. It uses a heavy hand as resources are manufactured into products’.

In its modern form, environmental protection originated with the need to control toxic and hazardous waste, but has come to encompass all sorts of public interventions to protect parts of the natural environment, including the much older tradition of protecting particular wilderness areas (Buck 1996, Weale et al. 2000). Other approaches to environment-society relations, including studies of the cultural and material processes involved (Beck 1986, Murphy 1994, Smith 1999), would seem to be even further from the theory of the commons.

The problems of interactions and interdependencies among resources of traditional commons (basically the management of common pool resources) and the goals of the environmental protection interests are only obliquely being addressed in the literature (e.g. in discussions of poverty and environmental degradation following the Brundtland report: WCED 1987). The problem is most directly addressed by Partha Dasgupta (2001, 126), who notes:

Some of the products of watersheds are necessities for local inhabitants (forest dwellers, downstream farmers, fishermen), some are sources of revenue for commercial firms (timber companies), while others are luxuries for outsiders (eco-tourists). Some of the benefits accrue to nationals (from agricultural goods), while others spill over as transboundary externalities (from carbon sequestration). Watersheds offer joint products (protection of biodiversity, flood control, household goods), but they also offer services that compete against one another (commercial timber, agricultural land, biodiversity). Competition among rival services has been a prime force behind the transformations of watersheds. Politically, commercial demand can easily outrank local needs, especially under non-democratic regimes. If local biodiversity is lost, eco-tourists can go where it still exists. International public opinion, not to mention pressure

from the country’s elite, is often at best tepid. Local needs are frequently trumped by outsiders’ demands.

The discussion of the interactions and interdependencies between the resources of the traditional commons (timber, pasture, fuelwood, water, non-timber forest products, etc.) and the goods and services that are the goal of environmental protection (biodiversity, clean water, landscapes, etc.) can be facilitated by extending the theory of commons to comprise more than common pool resources. As environmental protection expands into the preservation of values perceived to inhere in human-made landscapes, the interactions between particular usages of wilderness resources and particular landscape values become critical. Looking at both kinds of values in a common theoretical framework may facilitate both kinds of resource management. The institutional outcome may reasonably be called a new type of commons.

Types of goods in landscapes

The concepts of subtractable/non-subtractable benefits and exclusion or non-exclusion of beneficiary may be applied to landscapes to suggest four types of goods generated by the landscape (Table 2). It will be assumed that if human efforts are necessary either for production of the good or for its appropriation then exclusion is possible. This may not be economically or technically feasible, but for the moment this problem will be set aside.

Based on the discussion above it would seem reasonable to stipulate that there ought to be systematic differences among the four types of land-use areas. The core of the differences may be captured by the following labels:

1. *Agricultural area*. The main deliverables from the landscape are private goods such as agricultural products, forest products, or other extractive activities requiring human efforts.
2. *Recreation area*. The main deliverables are club goods for all types of recreation, or the landscape is used for the production of scientific information or supply of experiences such as a natural history museum, a heritage site, or aspects of biodiversity.
3. *Protected areas type I* (‘*Ecosystem service area*’). The main deliverables here are forest for ecosystem services, water, fish and game for hunting, or the landscape used as a sink for pollution.
4. *Protected areas type II* (‘*Wilderness Area*’). The main deliverables here are public goods such as elements of

Table 2. A typology of goods linked to landscapes.

	Appropriator or producer within the area necessary (beneficiary excludable)	Appropriator or producer not necessary (beneficiary non-excludable)
Rivalry for benefits (subtractable)	1) Landscape produces goods or services that may be enjoyed outside the landscape. Sustained human activity within the area is required for production.	3) Landscape produces goods or services that may be enjoyed outside the landscape. Human activity within the area is not required for production.
Non-rivalry for benefits (non-subtractable)	2) Landscape produces goods or services that can be enjoyed only within the landscape. Sustained human activity within the area is required for production.	4) Landscape produces goods or services that can be enjoyed everywhere. Human activity within the area is not required for production.

nature with existence value (e.g. wilderness, ecosystems, or biodiversity), or information value (data for scientific knowledge).

It is significant that we do not have ready labels that are able to capture the differences between land use areas 3 and 4. Tentatively, it is suggested that they are called 'Ecosystem service areas' and 'Wilderness areas' respectively.

The resources of traditional commons all fall within the group where the landscape requires sustained human activity and in principle products can be exported. The new environmental goods and services are of three different types.

Applying the theory of the commons to environmental goods and services

Looking closer at the resources of agricultural areas and ecosystem service areas (where the products of the landscape can be exported) the following characteristics can be noted:

- In general the goods derived from these resources are subtractable (private or CPR (common property resource) goods).
- In a commons the right to enjoy the traditional goods are independent of ownership of the ground. This does not preclude that the commoners may own the ground themselves. However, the right to enjoy ecosystem services (or suffer environmental pollution) is independent of the property rights to the ecosystem.
- The problems of equitable distribution of the goods and of ecological sustainability of the resources are the main management problems.

If we take a look at recreation areas and wilderness areas, there is one important difference. The club aspect of a good tells us that the utility of the good cannot be exported. To enjoy the good a person has to be within the landscape area – a member of the club. From club goods will also flow derived or secondary products such as pictures, films, or oral or written descriptions; these are made for export. Such goods are not covered by the discussion here. Their institutional governance is treated in copyright rules. In contrast to this, the wilderness character of an area is meant to capture the existence values of nature and ecosystems. This value is a public good. Anywhere in the world the certainty can be enjoyed that the mountains and ecosystems of Geiranger-Herdalen exist in their pristine form. Pictures may assure the doubtful. However, their recreational utility requires the presence of the consumer. Other important differences in characteristics are:

- The environmental goods and services of these types are non-subtractable (public or club goods).
- Rights to enjoy these goods are independent of ownership of ground. This does not preclude that the state (or other public bodies) may own the ground over which policy is instituted. If private bodies own the ground, environmental policy will introduce outside interests into the management of private lands where such interests

have not existed previously. The multiplicity of particular stakeholder interests in the management of lands is reintroduced.

- The main management problem is compliance with regulations, including the compliance of the stakeholders in the traditional commons.

Real world goods such as pasture, wildlife, timber, water, landscapes providing recreation, environmental services, or biodiversity will usually be a mixture of the various types of analytical goods identified above, and thus the property rights to the resources need to solve the particular mix of externality problems found in each case. The reason for privatization of a commons is often argued to be a unification of management powers and benefits derived from the management ('internalization of externalities'). The creation of a protected area will reintroduce a discrepancy between management powers and the distribution of costs and benefits.

Problems of exclusion and subtractability, as well as the characteristics of externalities, are shaped in profound ways by the technology used in the appropriation of the good. For example, video cameras have profoundly transformed the monitoring of space, and made exclusion much more feasible for some types of resources. More efficient harvesting technology in fisheries has made exclusion that much more necessary. Damming rivers for irrigation or production of electricity affects the way downstream stakeholders may use the river. The particular consequences of using a resource depend not only on the institutions but also on the available technology, including knowledge about how to transform resources into something more desirable.

Knowledge as a resource is non-subtractable and there is no rivalry in its consumption unless patent legislation introduces such rivalry. By awarding patent rights to some piece of information about the genetic diversity, the public goods character of the information is transformed into a private good. The character of the good is thus determined by the institutional allocation of property rights. Awarding private individual property rights assumes that there are feasible solutions to the problems of monitoring and exclusion. Thus there is an element of political choice in the way we treat any particular good. Institutions may determine how we want the good to be treated. In the choice between different institutional solutions the political problem is often seen as a technical one: to determine the most 'efficient' institution, or to find the 'optimal' allocation of rights and duties. Only later as consequences propagate throughout the system are questions about justice and equity raised. However, when property rights have been instituted they are not – and should not be – easily redefined. Hence it may be worthwhile to think carefully about the consequences of changing property rights.

Public goods: ecosystem services of the public good type

Ecosystem services such as air purification, carbon sequestration, and storage of genetic diversity are public goods. As long as ecosystems are allowed to function nobody can be

excluded from enjoying such goods and the goods are non-subtractable. Similarly landscapes or landscape elements giving symbolic values (heritage sites) or scientific information values (nature reserves and other protected areas) are basically public goods as long as their existence values are emphasized. If one has to visit a particular locality to enjoy the information or symbolic value vested in the landscape it becomes a club good similar to recreation.

Stopping or limiting toxic emissions from point sources

While a clean environment can be considered a public good, toxic emissions to the environment from a point source can be considered a common pool resource (of negative value: a bad). It is difficult or impossible to exclude 'consumers' individually from suffering the bad. The bad is also cumulative (analogue to subtractable) in the sense that it becomes worse with increasing deposits of pollution. This is so whether there is only one actor polluting or uncoordinated actions by several individuals (e.g. at a waste dump). Usually it is assumed that there is a threshold for how much pollution the environment can handle alone (variable by substance and ecosystem). If too many stakeholders put too much pollution into the environment the negative impact (the externality) will escalate and propagate down the queue from the point of emission. Those closest to the head of the queue will be worst hit by the pollution.

Club goods and common pool goods: enhancing ecosystem services and recreation resources

Ecosystem services such as water purification or protection against floods, soil erosion, avalanches, and landslides can be considered club resources (of positive value). In the relevant local setting it may be difficult but not impossible to exclude consumers individually from enjoying the benefits of such services. The benefits themselves are non-subtractable. Often such benefits are maintained by one or more individuals refraining from removing material benefits such as forest cover or water. If the maintenance of the environmental capacity to provide services is jeopardized, the bad that follows will be a common pool bad similar to toxic emission. Usually it is assumed that there are thresholds for forest cover and water tables, below which there is a rapidly increasing probability of catastrophic reorganization of the environment with repercussions propagating along the queue from the point of reorganization. Thus, lack of maintenance of the club good transforms it into a common pool bad. Landscapes providing recreation are also club resources. For recreation, one has to enter the landscape in order to enjoy it, hence exclusion is possible even if difficult. The enjoyment is not subtractable. However, it is subject to crowding. With increasing crowding above some thresholds the enjoyment tends to become increasingly diminished. The discomfort is experienced uniformly throughout the club (except for individual variations in tolerance of crowding).

Comment

At the outset it was assumed that there was a basic difference between values where there is rivalry in appropriation and values where there is non-rivalry. The discussion has basically confirmed this. Perhaps more importantly, the discussion has shown that the characteristic of rivalry is not static. It changes with how the context is defined or interpreted. Genetic information may be a public good or it may be a private good, depending on the institutional setting. Thresholds in use or enjoyment may also trigger shifts in the character of a good. At a certain level of pollution the club good of a clean environment may become a common pool bad.

This means that the theory of commons will be relevant for pollution management. Cleaning up an environment entails the kinds of collective action problems studied in the theory of commons. Maintaining the desired level of non-pollution of an environment entails the problems encountered in maintaining a club. For ecosystem services depending on the non-usage or stunted usage of traditional resources such as forests or water, the collective action problems of common pool resources are present in the 'production' of the goods and services. The specific persons or groups holding rights to these resources bear the cost. It would seem reasonable that their forgone income should be compensated. However, since the benefits of the resulting ecosystem goods and services have the character of a club good this entails the problem of free riding. The costs of production have to be covered in ways avoiding the possibilities for free riding.

The link between traditional resources (water, forest) and ecosystem services is of general interest. Recreation and biodiversity, for example, will depend heavily on how traditional resources are utilized. The interdependence of many of the goods and services of different types is obvious in one sense, yet is it acknowledged by legislation? Furthermore, where it is acknowledged, how is it dealt with? A preliminary impression is that little attention is devoted to this interdependence.

One important fact needs to be emphasized: there is every reason to suppose that a particular landscape (seen as a culturally and socially delimited area) may hold several and possibly all of the mentioned goods and services, traditional as well as modern. There is nothing remarkable in this except that it means many special interest groups (usually referred to as 'stakeholders') have to find ways of accommodating their interests, and that every stakeholder group wants its special interests safeguarded. Those with interests in the old resources are protected by property rights as defined in both statutory law and customary law. Those concerned with the new resources have turned to the state to secure regulations protecting their interests. The remarkable thing is that they often have obtained – at least partly – such special regulations without much consideration of the possible interactions and interdependencies there might be among the various resources of the regulated area. A greater attention to how customary law also protects environmental goods and services and a basic understanding of the

traditional commons would probably improve on the designs of environmental regulations.

From traditional commons to dominium plenum and new problems

The traditional commons of North-West Europe, whether conceived of as lands or rights, are remnants of the pre-medieval land use systems where significant use rights were held jointly by the local population and managed by their customs. In English jurisprudence rights of common were said to be rights to remove something of material value from lands owned by somebody else. These rights were called 'profits-à-prendre'. Some of these rights are of ancient origin and said to be inalienable (appendant) from the commoner's land (the dominant tenement). Others, usually of more recent origin, were seen as alienable (appurtenant) from the commoner's land. Some could be attached to a particular person, in which case it always was alienable (called a right held 'in gross') (Lawson & Rudden 1982, 127–136, Simpson 1986, 111–113, Black 1990). Exactly the same definition will cover what in Norway is called 'commons' (*almanning*). However, for the theoretical discussion and for the empirical realities around the world this definition is too restricted. For the present purpose a commons is any area where a suitably delimited group of people, the commoners, have legitimate joint rights or rights in common to harvest resources or goods within the area. How ownership to the ground itself is allocated is not part of the definition, but will affect the particular organization of the commons.

Access to and use of the commons were significant additions to the outcome of privately held lands, often yielding goods that it would be difficult or unprofitable to provide on privately held lands. The landscapes that grew out of this system by way of privatization, particular usages, and diversification of control are highly valued today and considered both precarious and in need of protection. Today, we can see the old commons as highly sophisticated forms of property rights with a social and political dynamic very different from that generated by a system of ordinary individual private property (Dahlman 1980, Berge 2002, Moor et al. 2002).

The ultimate form of individual property rights is the 'dominium plenum', defined as the full ownership of both tenant rights and landlord rights (Black 1990). In practice this meant that within any particular area there was one and only one owner of all kinds of resources.

In traditional commons the reasons for keeping some resource as common property are many:

- If there is enough of a resource for all with access to the resource there is no reason to incur the costs of enforcing property rights.
- If access to a particular resource is essential for the survival of a family it would be seen as unjust to deny anyone access to a minimum level of the resources.
- If traditional societies see that there is safety in numbers, maximizing the number of people implies resource access for every member of the community.

- If there are technical difficulties of excluding particular persons from access to a resource, keeping it in common may be the only feasible way of managing it.

Thus, both in European history and in contemporary traditional societies, commons abound. In Europe since the medieval period and until the dominium plenum tradition of property rights became dominant (in the 18th century in England; Gordon 1996) a situation with multiple stakeholders within a common area has been handled as if the person or group of persons with the highest interest in a particular resource had been awarded property rights to just that resource. This implied access to legal remedies to sort out the points of conflict with other groups with interests in other resources. The fact that different resources within an area had different owners, sometimes with conflicting interests, required a common organization. The feudal system gave the territorial aspect an advantage in the organization that translated into ownership of the ground for the lord of the manor in the early modern state. The advantage of the ownership of the ground was extended to its ultimate end in the privatization of the commons, the enclosure process. Unifying the property rights to the resources within fixed boundaries internalized many conflicts, leaving only the externalities suffered by neighbours and the questions of justice in relation to those excluded from the land.

However, the simplified situation – the dominium plenum regime – was of course 'too good' to last. As discussed above, the concern for environmental goods and services has reintroduced the multiplicity of stakeholder relations with different sources of legal rights.

Changing property rights by means of environmental regulations

A core element of the theory of commons are the links between the common pool resources and the problems of collective action encountered in finding institutional arrangements that overcome the problems inherent in the ungoverned usage of such resources. The usage of club resources also entails problems of collective action, as well as conflicts caused by interactions and interdependence between environmental protection and traditional usage of nature.

One interesting case where such collective action problems must be expected is the enactment of protected landscapes on private lands. The Geiranger-Herdalen Protected Landscape Area is such a case. The purpose here, as in most places, is to protect a characteristic or beautiful natural or cultural landscape. The means is prohibiting any activity or enterprise that may change the character of the landscape. The stipulation is that ordinary ongoing activities at the time of enactment can continue undisturbed, but that any new activity, constructions or resource harvesting needs permission.

In technical terms, it can be said that in this way the state has taken away the right to the remainder of the landowner's property. The right to the remainder is the right to decide on

utilization of resources not yet discovered or not yet capable of being exploited. The owner now needs the permission of the state to do anything that is not a direct continuation of previous activities. In many cases, it might be observed that this right is already vested in the local authority through the powers of the Planning and Building Act (Act of 14 June 1985, No. 77) (<http://www.lovdata.no/info/ueng.html>). The designation of a protected landscape transfers the local authority's decision-making power to a central agency of the state together with a lot of smaller decisions that formerly made by the landowner. The total value of this transfer from the landowner to the state may not amount to much, and in any case will be almost impossible to estimate. However, the feelings of lost freedoms induced are real and may have long-range dynamic consequences. This may be seen more easily if we consider the altered transaction cost for those using the land. Having to obtain permission for all changes relating to carrying out an activity increases the costs of adapting to a changing environment. It does not make adaptation impossible, just more costly. This alters the relative price of using the land compared to finding another way of gaining a livelihood. The likely consequence is a decreasing number of people using the resources of the protected landscape in customary ways.

However, simultaneously, the creation of a protected landscape will also open up economic niches for people to invent new ways of exploiting the club values of the landscape in order to create incomes for themselves. Ideally, it might be desirable to ensure that those that find fewer opportunities in the traditional land usages will be able to see new opportunities in the changes introduced, but this is hardly likely.

The critical question that has not been adequately addressed by the processes of protecting landscapes is to what degree the values seen in the protected landscapes actually depend on the activities of the traditional users. Usually it is acknowledged that cultural landscapes are created by the people using them. However, the assumption in the process of protection seems to be that people, even with higher transaction costs, will continue doing what they have done in previous years as if nothing has changed.

Another case of changing property rights by means of environmental legislation can be seen in the Act of 1977 relating to Motor Traffic on Uncultivated Land and in Watercourses that prohibits the use of motorized vehicles on watercourses and on non-arable lands. The Act allows for many exceptions to this, though for recreational activities in particular, it is difficult to obtain permission. In some instances this is felt to decrease the value of properties. In other cases of legislation, such as the successful pursuit of polluters, the values of adjacent properties increase. In Norway during the last decade the most notable case of such external effects transforming property rights is the re-emergence of large predators. In the areas where bears and wolves have been able to establish themselves and where the prohibition of hunting them is enforced, the value of sheep farming as an industry has declined noticeably.

Property rights to environmental goods and services

As noted above, while an acceptable level of environmental goods and services are maintained they can be classified as club goods. This means that since all members of the club will enjoy the benefits, the problem of crowding has to be monitored and controlled by membership. A club good differs from a purely public good only by being local in relation to the relevant social system. Alternatively, they might be called local public goods. Local public goods may be produced and managed by either private or public actors. Public actors will usually be able to cover the cost of production by taxing every member of the club. For private producers of club goods a diversity of mechanisms has been identified (Olson 1965, Cornes & Sandler 1986), usually combinations of membership fees bundled with suitable private goods. In the Geiranger-Herdalen area *Storfjordens Venner* (Friends of Storfjord) is a private organization producing public values locally by their efforts to restore and preserve the buildings on abandoned mountain farms. At the outset the activity was sustained by membership fees and volunteer work. As the value of their effort became apparent, they were able to expand their activity with the help of public funds allocated to their activity.

For environmental goods and services the efforts or expenditures required to maintain the level of service in most cases will appear as income foregone by not exploiting goods such as forest or water. These costs are not evenly distributed. Depending on the distribution of property rights to the traditional resources, the level of conflict around the institution of new public regulations will vary. If the club is to be a private undertaking (e.g. a private recreation area) the organization must either include landowners and other stakeholders or in other ways accommodate their interests in order to give incentives for maintenance and enjoyment. It is to be expected that environmental goods and services could be handled most easily by local public actors with powers to tax their constituency.

The modern Norwegian legislation on environmental protection and services has largely been created since 1970. The legislation on outdoor recreation can be seen as a precursor to the more recent concerns. With hindsight, by this legislation it can be seen that the urban interests in recreation landscapes used an old customary right of access (*allemannsretten*) to formalize and protect their interests. However, the conflict between the recreational interests and the traditional property rights interests is not an urban-rural conflict per se. It is a conflict that runs right through society. This is easily seen in the long struggle over the use rights to the Norwegian littoral. As a case of conflict between legitimate stakeholder groups created by single issue legislation, it may prove interesting to take a closer look at this.

Public access to the Norwegian littoral

Since 1965 we have had an open political and cultural struggle between two powerful groups, both interested in

using the seashore for recreational purposes: the landowners and the rest of the population interested in access to the shore areas. Every summer there is a new chapter in the saga of the struggle for control of access to the coastal areas of Norway. People valuing the coastal landscape want to walk along the shore, picnic, bathe, and land their boats.

Landowners that hold title to a parcel of the coast and value the coastal landscape want to build cabins close to the sea, quays for their boats, and in general to be left alone. The number of owners relative to non-owners is low. Yet in certain densely populated parts of Norway the owners occupy most of the coast. Many of the non-owning people experience access to the coastal landscape as difficult, hence making it of less value for recreation than might have been the case if there were fewer owners using the shore. The owners experiencing the non-owning stakeholders feel invaded. In some areas – notably in the Oslofjord littoral – these two groups of stakeholders have clashed. The fight is framed as a political struggle around the coastal planning legislation.

The historical basis of the conflict

The two groups of stakeholders in the littoral, the landowners and those exercising their right of access, see their rights as legitimized in different but long-standing traditions. The customary rights in both cases are formalized in statutory law.

Private property reaches into the water to the shelf of the shore or as far out under water as to a depth of 2 m measured at ebb tide. For private properties there are many laws defining their rights and duties, but the strongest defence of private rights in the littoral may be custom and habit.

The tradition of open access to non-arable lands (*alle-mannsretten*) gives the public access to the coast where such access is seen as unproblematic for the landowner. The customary rights were made statutory law in 1957 in the Act on Outdoor Recreation (28 June 1957, No. 16) (<http://www.lovdata.no/info/ueng.html>). In 1965 an interim Act on building along the coast was passed. This was replaced in 1971 by the Act on Planning in Coastal and Mountain Areas (Act of 10 December 1971 No. 103). Current regulations are included in the 1985 Planning and Building Act (14 June 1985, No. 77, §17-2), which prohibits building along the shore up to 100 m measured horizontally from the high water mark, except where approved land use plans exist. In theory, this rule will remove the individual owner's possibility to build anything along the shore. However, all legislation needs the possibility for reasonable exceptions and the exact wording of the paragraph needs interpretation. In practice we can in the littoral of Norway observe two old and well-entrenched institutions in direct conflict.

The current situation

Much of the Norwegian coastline is not accessible at all except by sailing along it in a boat. Only a fraction of the coastline is well suited as a recreational landscape. Where

Table 3. Hindrances to public access to the shore recorded by local authorities in Østfold, August 2002.

• Annexes to cabins	11	• Flagpole	280
• Trailer cabins	40	• Shed/boathouse	306
• Jetty	50	• Lawn	333
• Lighting/lamps	65	• Patio	409
• Signs	85	• Fence	631
• Roads	94	• Movable objects	815
• Portals	114	• Stairs/walkway	818
• Cabins	188	• Quay/diving board	943
• Railings	238	• Others	535
		Sum	5955

Source: *Dagbladet* (2002).

entry is possible either by boat or on foot, both public regulations and cultural mechanisms take effect.

The general rules governing the usage of the littoral are the same everywhere. However, the rules are interpreted and applied according to the precepts of the bureaucrat working in the local authority. One might reasonably guess that most apply the cultural standards of private property in judging what is reasonable in each case.

Public regulations are always founded upon a system of behavioural norms and informal institutions. For the seashore we can conceive of these mechanisms as gatekeepers whose task it is to protect the utility derived from access to the shore. Since the public regulations evidently do not work, the control is left to the informal institutions, and we may ask who has the power to create gates and how do those arriving at the gates react to their presence.

In so far as a gate controlling a recreational area needs some kind of physical presence, the power resides with the landowner. In theory, the landowner may need permission from public authorities but this requirement does not have a strong cultural foundation or a strong public enforcement. Few landowners seem to feel bad about putting up the kind of physical implements that most people will interpret as a gate.

Thus the control of access has two aspects to it, the construction of the gate and the perception and interpretation of the gate. Landowners put up physical implements that they know other people will see as barriers, discouraging access. Against these barriers stand our feelings about the right to access to the littoral both by boat and on foot. Which type of reaction, then, is most important: knowledge of rights or interpretations of physical implement? Table 3 lists what local authorities saw as physical barriers along the coast of Østfold in 2002. The categories are suggestive.

Why do owners put up devices like these? Why are items such as quays or flagpoles interpreted as barriers? Why do people feel uncomfortable crossing private roads, lawns or jetties? Not all of the constructions are barriers in the literal meaning of making passage difficult in any physical sense. Only fences and railings will physically be seen as barriers, and some of these may be easy to pass. The rest can be termed signs of private property and personal space. They are barriers because they tell the would-be visitor: 'Do not disturb this space!' The landowner and the visitor share an understanding about whose personal space this is and what appropriate behaviour consists of. Yet the desire to access

the seashore is strong, and people know their theoretical rights. Some call for the police to fine cabin owners who in such ways try to discourage non-owners from exercising their rights. However, in general, both ordinary people and the police are reluctant to enforce the legislation. The reaction by both police and other people to these kinds of barriers is a testimony to the strength of our cultural precepts about private property rights, and the legitimacy of ownership.

How can we interpret this conflict?

The problems of the use of the littoral can be described as being a result of crowding. On the most crowded stretches of seashore, landowners have filled up the locality to a threshold where their combined activity generates persistent problems for other stakeholders. This threshold was felt early on in Oslofjord. Collective action in the form of legislation banning any kind of building along the shore was intended to solve the problem. However, the effect of this seems to be minor or non-existent. Why should it be so difficult to stop building close to the shore?

The following can be noted:

1. Private property rights to the shore area have a long history, and unlike in the Anglo-Saxon world they reach out into the sea. Some landowners erect physical barriers making access difficult.
2. Non-owners acknowledge the status of private property also along the shore and can overcome the signals of private property to enjoy access to the shore only with difficulty. Often the difficulty lies in the perception and interpretation of physical implements as signals of private property and a concomitant unease of trespassing – at least trespassing personal cultural boundaries of appropriate behaviour. In any case, the customary rights of open access do not apply close to houses.
3. Along most of the Norwegian coast crowding is negligible and the local authority practice of allowing buildings has no great consequences locally. The local social pressure towards other uses of the littoral is low. Thus the political understanding of the problem is very unevenly distributed across the electorate. The group representing the general public in the crowded parts of the littoral may not have the strength to institute a stricter enforcement since, according to current legislation, such enforcement applies across the whole country.

Applying the concepts introduced earlier, the implications of what has been said are:

- Recreation in the littoral is a club good.
- Utility is excludable and non-rival but subject to crowding effects. In relation to the number of stakeholders, there are very low thresholds for the crowding effects.
- Maintaining a club with thresholds requires gatekeepers. The gatekeepers in the coastal zone are landowners supported by cultural norms.

If one can determine specific values for the thresholds, one might use them to improve on planning and regulation of

local governance by making decisions dependent on the value of the degree of crowding relative to the thresholds for suitable sections of the coast.

Conclusion

The effort to institute that *allemannsretten* – the right of access of the general public – is more important than the landowner's rights cannot be seen as a success. In the long struggle between the non-owners' interest in open access to the littoral and the traditional property rights of landowners it would seem that the landowners are winning. If the occasional visitor to the shore can win only by opposing the cultural norms defining civilized behaviour in relation to private property, the repercussions in other fields may be too high a price. This may create an occasion for rethinking the problem. To overcome the cultural precepts about private property one might think of creating special rules for the littoral. Rules adapted to the existing rules of property rights are needed, rather than rules that largely ignore them. One way of doing this might be to redefine the littoral, or rather the parts of the littoral that are well suited for recreation, into a type of commons. Even if we do not change policy but still manage to protect the coastal zone, a type of commons may be the final outcome, in fact.

However, a coastal commons encompassing recreational interests is not quite comparable to the old style commons comprising timber, pasture and wild game. We need to explore further differences and similarities, and how the theory of the commons may aid in the management of the new urban interests in nature.

The core elements of the theory of the commons are the links between the common pool resources and the problems of collective action encountered in finding institutional arrangements that overcome the problems inherent in the ungoverned usage of such resources. The usage of club resources also entails problems of collective action, as do the conflicts resulting from interactions and interdependence between environmental protection and traditional usage of nature. It would seem worthwhile to explore an approach to such problems framed as the design of a commons where different stakeholders and different bundles of rights are embedded in an institution or system for (local) collective action to accommodate conflicts and interdependencies in order to secure long-term benefits for all.

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References

- Baumol, W.J. & Oates, W.E. 1988. *The Theory of Environmental Policy*. Cambridge University Press, Cambridge.
- Baden, J.A. & Noonan, D.S. 1998. *Managing the Commons*. Indiana University Press, Bloomington.
- Baland, J.-M. & Platteau, J.-P. 1996. *Halting the Degradation of Natural Resources. Is there a Role for Rural Communities?* Clarendon Press, Oxford.
- Beck, U. 1986. *Risk Society. Towards a New Modernity*. Sage, London.
- Berge, E. & Stenseth, N.C. (eds.) 1998. *Law and the Governance of Renewable Resources*. ICS Press, Oakland.
- Berge, E. 2002. Varieties of property rights to nature. Some observations on landholding and resource ownership in Norway and England. Schmithüsen, F., Iselin, G. & Herbst, P. (eds.) *Forest Law and Environmental Legislation. Contributions of the IUFRO Research Group 6.13 Proceedings VII Forstwissenschaftliche Beiträge* 27, 14–33. ETHZ, Zürich.
- Black, H.C. 1990. *Black's Law Dictionary*. West Publishing, St. Paul, MN.
- Breen, B. 1993. Environmental law from resources to recovery. Campbell-Mohn, C. (ed.) *Environmental Law. From Resources to Recovery*, 51–70, West Publishing, St. Paul, MN.
- Bromley, D.W. 1991. *Environment and Economy. Property Rights & Public Policy*. Blackwell, New York.
- Buck, S. 1996. *Understanding Environmental Administration and Law*. Island Press, Washington.
- Buck, S. 1998. *The Global Commons. An Introduction*. Island Press, Washington.
- Cole, D.H. 2002. *Pollution and Property Comparing Ownership Institutions for Environmental Protection*. Cambridge University Press, Cambridge.
- Cornes, R. & Sandler, T. 1986. *The Theory of Externalities, Public Goods, and Club Goods*. Cambridge University Press, Cambridge.
- Dahlman C.J. 1980. *The Open Field System and Beyond*. Cambridge University Press, Cambridge.
- Dagbladet. 12 August 2002. Kystens hinderløype: 6000 private stengsler hindrer fri ferdsel i Østfolds strandsone (Kristoffer Egeberg), 16–17.
- Dasgupta, P. 2001. *Human Well-Being and the Natural Environment*. Oxford University Press, Oxford.
- de Soto, H. 2000. *The Mystery of Capital. Why Capitalism Triumphs in the West and Fails Everywhere Else*. Basic Books, New York.
- Devlin, R.A. & Grafton, R.Q. 1998. *Economic Rights and Environmental Wrongs. Property Rights for the Common Good*. Edward Elgar, Northampton.
- Dolsak, N. & Ostrom, E. (eds.) 2003. *The Commons in the New Millennium. Challenges and Adaptations*. MIT Press, Cambridge, MA.
- Gibson, C., McKean, M.A. & Ostrom, E. (eds.) 2000. *People and Forests. Communities, Institutions, and Governance*. MIT Press, Cambridge, MA.
- Gordon R.W. 1996. Paradoxical property. Brewer J. & Staves, S. (eds.) *Early Modern Conceptions of Property*, 95–110. Routledge, London.
- Hannesson, R. 1996. *Fisheries Mismanagement. The Case of the North Atlantic Cod*. Fishing News Books, Oxford.
- Hardin, G. 1968. The tragedy of the commons. *Science* 162 (3859), 1243–1248.
- Hardin, G. 1998. Extensions of 'The tragedy of the commons'. *Science* 280 (5364), 682–683.
- IUCN [International Union for Conservation of Nature and Natural Resources]. 1994. *Guidelines for Protected Area Management Categories*. IUCN Publications, Cambridge.
- Jentoft, S. (ed.) 1998. *Commons in Cold Climate*. Parthenon, New York.
- Kolstad, C.D. 2000. *Environmental Economics*. Oxford University Press, New York.
- Lawson, F.H. & Rudden, B. 1982. *The Law of Property*. Clarendon Press, Oxford.
- Miljøverndepartementet. 1992. St.meld.nr. 62 (1991–1992). Ny landsplan for nasjonalparker og andre større verneområder i Norge. Oslo.
- Miljøverndepartementet. 2004. *The West Norwegian Fjords, Norwegian Nomination 2004 UNESCO World Heritage List*. Oslo.
- Moor M.D., Shaw-Taylor, L. & Warde, P. 2002. *The Management of Common Land in the North West Europe, ca. 1500–1850*. Brepols, Turnhout.
- Murphy, R. 1994. *Rationality & Nature. A Sociological Inquiry into a Changing Relationship*. Westview Press, Boulder, CO.
- NOU. 1986: 13. *Ny landsplan for nasjonalparker*. Statens naturvernråd, Oslo.
- Olson, M. 1965. *The Logic of Collective Action. Public Goods and the Theory of Groups*. Harvard University Press, Cambridge, MA.
- Ostrom, E. 1990. *Governing the Commons. The Evolution of Institutions for Collective Action*. Cambridge University Press, Cambridge.
- Ostrom, E. 1998. A behavioral approach to the rational choice theory of collective action. Presidential address to the American Political Science Association 1997. *American Political Science Review* 92:1, 1–22.
- Ostrom, E. 1999. Coping with the tragedies of the commons. *Annual Review of Political Science* 2, 493–535.
- Ostrom, E., Burger, J., Field, C.B., Norgaard, R.B. & Policansky, D. 1999. Revisiting the commons: Local lessons, global challenges. *Science* 284 (5412), 278–282.
- Ostrom, E., Dietz, T., Dolsak, N., Stern, P.C., Stonich, S. & Weber, E.U. (eds.) 2002. *The Drama of the Commons*. National Academy Press, Washington DC.
- Ostrom V. & Ostrom, E. 1977. Public goods and public choices. Savas, E.S. (ed.) *Alternatives for Delivering Public Services: Toward Improved Performance*, 7–49. Westview, Boulder, CO.
- Sandmo, A. 2000. *The Public Economics of the Environment. The Lindahl Lectures*. Oxford University Press, Oxford.
- Simpson, A.W.B. 1986. *A History of the Land Law*. Clarendon Press, Oxford.
- Smith, M.J. (ed.) 1999. *Thinking through the Environment. A Reader*. Routledge, London.
- Tietenberg, T. 2001. *Environmental Economics and Policy*. Addison-Wesley, New York.
- WCED [World Commission on Environment and Development]. 1987. *Our Common Future*. Oxford University Press, Oxford.
- Weale, A., Pridham, G., Cini, M., Konstadakopoulos, D., Porter, M. & Flynn, B. 2000. *Environmental Governance in Europe. An Ever Closer Ecological Union?* Oxford University Press, Oxford.
- Yandle, B. 1997. *Common Sense and Common Law for the Environment. Creating Wealth in Hummingbird Economies*. Rowman & Littlefield, New York.