

The International Yearbook of Environmental and Resource Economics 1997/1998

A SURVEY OF CURRENT ISSUES

Edited by **HENK FOLMER
and TOM TIETENBERG**

NEW HORIZONS IN
ENVIRONMENTAL
ECONOMICS

General Editor
WALLACE E. OATES

The International Yearbook of Environmental and Resource Economics 1997/1998

A Survey of Current Issues

Edited by

Henk Folmer

*Professor of Economics, Wageningen Agricultural University,
The Netherlands*

Tom Tietenberg

Mitchell Family Professor of Economics, Colby College, US

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NEW HORIZONS IN ENVIRONMENTAL ECONOMICS

General Editor: Wallace E. Oates, *Professor of Economics,
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This important series is designed to make a significant contribution to the development of the principles and practices of environmental economics. It includes both theoretical and empirical work. International in scope, it addresses issues of current and future concern in both East and West and in developed and developing countries.

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Contributors

David G. Abler is an Associate Professor of Agricultural Economics at the Pennsylvania State University. He holds a PhD in economics from the University of Chicago. His research interests include environmental policy design for agriculture, interactions between population growth and the environment, and environmental impacts of economic policies in developing countries.

Daniel W. Bromley is Anderson-Bascom Professor of applied economics at the University of Wisconsin-Madison, US. He has served as editor of the journal *Land Economics* since 1974. He is the author of: *Economic Interests and Institutions: The Conceptual Foundations of Public Policy* (1989) and *Environment and Economy: Property Rights and Public Policy* (1991). He has also edited *Making the Commons Work: Theory, Practice, and Policy* (1992); and *The Handbook of Environmental Economics* (1995). He is currently writing *Rousseau's Revenge: An Economic History of Private Property*.

Lawrence H. Goulder is Associate Professor of Economics and a Senior Fellow at the Institute for International Studies at Stanford University, US. His research examines the economic impacts of environmentally motivated tax reforms and other environmental regulations, often in a general equilibrium framework that accounts for interactions between environmental policies and other, pre-existing regulations or taxes. He has written numerous theoretical and empirical papers on these subjects and has developed applied environment–economy models for several US government agencies and international organizations.

John M. Hartwick has taught economics at Queen's University (Ontario) since 1969. His contributions to the economics of natural resources have been on 'green' national accounting and stock change valuation in the analysis of sustainable development. The second edition of his textbook with Nancy Olewiler (*The Economics of Natural Resource Use*) is in press.

Dominic Moran is currently Environmental Economic Advisor in the Economic Planning Unit, Kuala Lumpur, Malaysia and previously a Research Associate at the Centre for Social and Economic Research on the Global Environment at

University College London, UK. His main interests include the economics of nature conservation and biodiversity and the application of valuation methods. He holds MA and PhD degrees in economics from Manchester University and University College London respectively.

David Pearce is Professor of Environmental Economics at University College London, UK and Associate Director of the Centre for Social and Economic Research on the Global Environment. He is the author or editor of more than forty books mainly on environmental economics, holds the United Nations Global 500 award for services to the World Environment and was awarded the Gambrinus Prize for literature for *Blueprint for the Green Economy*.

James S. Shortle is Professor of Environmental and Natural Resource Economics in the Department of Agricultural Economics and Rural Sociology, Pennsylvania State University, US. He has conducted research on a range of environmental issues including nonpoint pollution control policy, environmental policies for agriculture, trade and the environment, agricultural productivity impacts of air pollution, and water resource impacts of climate change.

V. Kerry Smith is the Arts and Sciences Professor of Environmental Economics at Duke University, US and a University Fellow for the Quality of the Environment Division at Resources for the Future. He is a past President of the Southern Economic Association and the Association of Environmental and Resource Economists. His current research focuses on modelling how individuals deal with risks, investigating the development of recreation values for reducing marine pollution, measuring the trade consequences of environmental policy, incorporating nonmarket services into measures of GDP and calibrating nonmarket valuation methods. Dr Smith has served as editor of *Advances in Applied Microeconomics* and is associate editor for the *Journal of Risk and Uncertainty*, *Risk Analysis* and the *Review of Economics and Statistics*. His most recent book is a collection of new and published essays on non-market valuation entitled *Estimating Economic Values for Nature* (1996). He is currently completing work on another book, *The Economics of Environmental Risk*.

Alistair Ulph is Professor of Economics at the University of Southampton. He has published widely on a range of economic topics, but with an emphasis on resource and environmental economics, and labour economics. He served as economic assessor for a public enquiry into the Hinkley Point 'C' Nuclear Power Station, and has been a consultant on a range of projects for UK Government Departments, the European Commission, and ILO. His current research interests are trade and the environment, and the impact of environmental liabilities on financial markets.

Preface

As a discipline Environmental and Resource Economics has undergone a rapid evolution over the past three decades. Originally the literature focused on valuing environmental resources, designing policy instruments to correct externalities and providing for the optimal exploitation of resources. The relatively narrow focus of the field and the limited number of contributors made the task of keeping up with the literature relatively simple.

More recently, environmental and resource economics has broadened its focus by making connections with many other subdisciplines in economics as well as the natural and physical sciences. It has also attracted a much larger group of contributors. Thus the literature is exploding in terms of the number of topics addressed, the number of methodological approaches being applied and the sheer number of articles being written. Coupled with the high degree of specialization which characterizes modern academic life, this proliferation of topics and methodologies makes it impossible for anyone, even those who specialize in environmental and resource economics, to keep up with the developments in the field as a whole.

The editors have initiated *The International Yearbook of Environmental and Resource Economics: A Survey of Current Issues* to fill this niche. The *Yearbook* publishes state of the art papers by top specialists in their fields who have made substantial contributions to the area which they are surveying. Authors are invited by the editors, in consultation with members of the editorial board. Each paper is critically reviewed by the editors and by several members of the editorial board.

The editors would like to thank Wallace Oates for his help in getting the project started. We also owe a special debt of gratitude to Scott Barrett, Carlo Carraro, Per-Olov Johansson, Karl Gustav Löfgren, Wallace Oates, Steve Polasky, Alan Randall, Bob Solow and Olli Tahvonen for their assistance in editing this first collection of papers.

Henk Folmer
Tom Tietenberg

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1. Property regimes in environmental economics

Daniel W. Bromley

PROPERTY ISSUES IN ENVIRONMENTAL ECONOMICS

The Early Interest in Environmental Property Rights

It would not be overstating things to assert that environmental problems are property rights problems. Pollution is simply the transmission beyond the recognized legal ‘boundary’ of the firm or the household of some quantity of matter (chemical compound, heat, smoke, garbage, noise, dust) that gives rise to costs for others. We call these effects ‘externalities’ precisely because the impacts on others are external to the unit that makes the decisions about resource allocation. By being external we understand that these economic effects transcend the domain over which the firm has socially sanctioned control. That is, pollutants transcend the property regime pertinent to the firm (or household), thus giving rise to the external costs at the core of externalities. The nominal boundary of the firm or the household – which is a legal notion – does not match the real boundary – which is a physical notion reflecting the space over which the physical effects (pollutants) travel.

But the importance of property regimes transcends pollution. Problems in fishery management, groundwater management, African grazing regimes, forestry, or the extraction of exhaustible resources, all arise because of the contentious nature of the property regimes pertinent to those environmental resources. Indeed, global climate change represents a property regime problem in a contemporary sense as well as in an intertemporal sense. That is, greenhouse gases represent pollution today, but allegedly alter global climate such that future generations may bear important costs not of their choosing. This is an intertemporal externality that may require a restructuring of the property regimes such that those living in the future acquire protection through altered rights structures (Bromley, 1989b).

One of the early illustrations of the importance of property regimes in environmental economics is found in the work of A.C. Pigou (1920). Pigou used the illustration of factory smoke harming clean laundry hung out to dry as an

example of a 'social cost'. That is, the factory did not take into account the costs imposed on the owner of the laundry who must, following the increased prevalence of smoke with the Industrial Revolution, take extraordinary measures to keep clean linens from becoming dirty again. Pigou suggested a tax on the generator of smoke to reflect the 'external' costs borne by the laundry. While this account has been a valuable heuristic to explore the issue of pollution, there are several unexplored property issues in this famous example.

First, notice that the externality can be 'solved' immediately if one firm would but buy out the other. For instance, let the factory purchase the laundry – or the laundry purchase the factory – and suddenly the externality will have been internalized.¹ Once these two firms fall under a single owner then the 'efficient' solution will arise because one decision maker is balancing the two enterprises and making the correct decisions in the best interest of the joint enterprise. We see immediately that the 'externality' problem disappears once the property regime changes to combine two firms into one. The externality has been internalized to the new joint firm. The internalization occurs because the nominal boundary of the firm has now become coincidental with the real boundary of the firm. This solution is one possible outcome of the bargaining recommended by Coase (1960).

Second, note that there is another property rights lesson in the standard Pigovian story. Pigou assumed that the owner of the laundry had a right to clean air in which to dry linens. The other side of this presumed right to clean air for the laundry is the duty on the part of the factory not to emit smoke that would foul clean laundry. While it may be easy now to argue that the laundry should not have dirty air to contend with, it is not always obvious that this is so. For instance, what if the laundry moved into the immediate vicinity long after the factory had been in operation?² What if the factory was the source of most of the employment in the town, without which the laundry might not survive? We see that externality problems entail perceptions of 'rights' in a moral sense as well as in a legal sense. The Coasean response to Pigou was to argue that the rights should go to the most valuable use. In essence, while Pigou erred by regarding the smoke as the problem (rather than the unfortunate proximity of the two incompatible activities), Coase erred by stripping externality policy of any chance to consider that one use – even if of lower 'value' – may have some compelling moral claim (perhaps by being there first).³

Third, there is the important matter of so-called 'third-party' effects. We know that there are a large number of individuals who have an interest in factories and laundries, even if they have no immediate contact or involvement with either one. Some individuals want the air to be relatively free of smoke, while others might well see smoke as signs of 'progress'. The social costs of concern to Pigou did not encompass these third-party interests. Nor was Coase particularly concerned with those beyond the immediate parties to the externality. With

Coase's interest in bargaining, and his emphasis on low transaction costs, he saw most externality situations as fairly narrowly circumscribed. But it is essential to see that air quality is of concern to those beyond factories and laundries. Hence there are larger 'ownership' issues even in what may appear to be rather simple externality situations.

To address these issues, let us now turn our attention to the matter of property rights and property regimes.

Property Rights and Property Regimes

Before we can give clarity to the idea of property regimes in environmental policy, it is first necessary to understand the related ideas of rights and property rights.

To have a right is to have the capacity to call upon the collective power – some authority system – to stand behind one's interests. This authority system could be the government of a local village, or it could be a national government. Notice that rights can only have effect when there is some authority system that agrees to defend a right-holder's interest in a particular outcome. If I have a right, then it means that I can turn to the pertinent authority system to see that my interest is protected. *The effective protection I gain from this authority is nothing other than a correlated duty or obligation for all others interested in my claim.* A right is a triadic relationship that encompasses my interest, the outcome or object of my interest (whether a physical object or a stream of benefits), plus all others with conflicting interests, yet with a duty to respect my right. Rights are not relationships between me and an object, but are rather relationships between me and others with respect to that object. Rights only have empirical content when there is a social mechanism that gives duties to those interested in the particular outcome guaranteed to the right-holder.

When one has a right in something it means that the benefit stream arising from that situation is explicitly protected by some authority system. The authority system gives and takes away rights by its willingness – or unwillingness – to agree to protect one's claims in something. To have a property right, therefore, is to have secure control over a future benefit stream. And it is to know that the authority system will come to your defence when that control is threatened. The thing of value to you is the benefit stream and this benefit stream is the property interest that individuals seek to have protected with property rights.

The degree of protection afforded by a particular structure of property rights is always relative to other social concerns and priorities. I will discuss this in more detail later in this chapter, but for now we must recall that protection of the benefit stream associated with any particular asset is always relative to its social usefulness. Property rights in land are usually more secure than property rights in other assets, but this is not universally so across different cultures.

So 'property' is the stream of benefits, and rights to property offer varying degrees of security over that benefit stream. When I purchase a piece of land its price is a reflection of the present discounted value of all of its future benefit streams. By purchasing the land I am really purchasing the benefit stream. While land is sometimes called 'property', the property is, in fact, the benefit stream that I now own, and that I believe will be protected with the authority of some governance structure. If it would not be protected then my willingness to pay for it would be reduced in reflection of its less-secure status.

Before leaving this discussion of rights, it seems important to say a word about the rhetorical – as opposed to legal – aspect of the term 'right'. There are two dimensions to this rhetorical idea of a right, and they both get invoked at various times. For instance, individuals will assert that they have a 'right' to smoke in some location – say in an airplane. When used in this sense, the term 'right' is being used as a persuasive device to buttress a self-serving argument. Those who use this language know that this phrasing is much stronger than merely claiming that they wish to smoke. In addition, they confuse the traditional practice of smoking in public places with the legal right to do so. The owners of factories, with a long tradition of disposing of their waste in nearby rivers, have been known to assert that they have a 'right' to continue to do so. In this instance, the long use of a particular practice – smoking in public places, disposing of industrial wastes in rivers – is taken as proof of its propriety. There is, or so some would like to argue, a compelling moral authority in tradition.

This argument is particularly prominent in environmental disputes. The human and ecological ramifications of many traditional industrial practices are of rather recent origin. When efforts are made to modify such practices, those who will be thereby disadvantaged will invoke that long tradition to suggest that they have a 'right' to do those things now discovered to be harmful. Farmers will insist they have a right to spray poisonous chemicals on their crops. Industrial managers will insist they have a right to dispose of their waste products as they have been doing for the past 75 years. Suburban residents will claim they have a right to burn the leaves from their ample yards. While the confusion of tradition for a right certainly has no grounding in law, it can often be used in the political arena to put on the defensive those who desire a change in the status quo. 'Rights talk' has some heft in such debates (Glendon, 1991).

The idea of a right can also be used to suggest something much more compelling than mere tradition. In fundamental terms, a right is often associated with some moral position. We see this in the area of so-called human rights. Here the term 'right' is used to suggest some inherent virtues and capacities associated with being human that transcend legal and political strictures that are the creation of some government. The related domain of discourse about the 'rights of nature' appeals to this moral element. This line of attack is then used, in a rhetorical sense, to persuade others that nature should be protected. As with the

previous category of rights talk, it is much more compelling to couch one's interests in terms of rights. Given the alternatives of fighting to have nature protected because we prefer that outcome, or arguing that nature should be protected because nature has 'rights', the choice is quite obvious.

We see, therefore, that the idea of rights has both a rhetorical element and a legal element; rights are both prescriptive (normative) and descriptive. These two domains are clearly interdependent. After all, the law is simply a manifestation of the normative realm of human associations. What at one time is expressed as an 'ought' or a 'should' becomes, through the legislative process, a 'must' in a subsequent time. Rights are simply the socially sanctioned and enforced normative elements of civil society. Property rights extend that legal force to the realm of objects and benefit streams.

It is now time to explore alternative property rights arrangements. In what follows I will use the term resource-management regime to denote these possible property rights structures. A resource-management regime is a constellation of legal correlates that defines the relationship of individuals to one another with respect to that particular environmental resource. Property relations between two or more individuals (or groups) are defined by recognizing that one party has an interest that is protected by a right if and only if all others have a duty. When one has a right one has the expectation that their claims will be respected by those with duty. And, when necessary, the state is available to compel compliance.

There are four broad types of management regimes worthy of attention by environmental economists: (1) state-property regimes; (2) private-property regimes; (3) common-property regimes; and (4) non-property regimes (open access).

State-property regimes

These are when ownership and control over natural resource use and management rests in the hands of the state through various government agencies. Individuals and groups may use the natural resources, but only with the approval of the administrative agency responsible for carrying out the wishes of the larger political community. National forests, national parks and military reservations are examples of state-property regimes. The state may either directly manage and control the use of state-owned natural resources through government agencies, or it may lease the natural resource to groups or individuals – for example, timber companies, livestock producers – who are thus given usufruct rights for a specified period of time. That is, state-property regimes remove most discretion from the user, and generally do not convey long-term expectations to the immediate users. However, state-property regimes, by their very nature, convey secure expectations for many others. That is, national parks and forest preserves ensure that the resources under such management regimes will be conserved for future generations. To be successful, such regimes require

governmental structures and functions that can match policy pronouncements with meaningful administrative capacity.

Resource degradation in state-property regimes will arise when the administrative reach of the management agency is insufficient to control the behaviours of those authorized to use the resource. This can happen because of an absence of knowledge about proper use, or it can arise because of inadequate funding to make timely enforcement decisions. Resource degradation also occurs in such property regimes when political processes are not sufficiently robust to resist pressures from those allowed to use natural resources.

Where governments are weak, and their legitimacy is easily undermined, there is a tendency for resource degradation to arise from the inability of the government to confront powerful commercial interests which exploit natural resources under state property regimes. Timber concessions in the developing countries represent a typical form of this practice. It takes a secure government to stand up to those who are making large economic gains from the use of those natural resources the government has said it owns. Unfortunately, such governments are also likely to be ineffective in regulating the use of privately held natural resources.

Private-property regimes

The most familiar property regime is that of private property. Here the range of discretion open to the owner(s) is fairly extensive and will include the right to control, the right to transfer, the right to use, and several other aspects signifying relative autonomy for the owner. Note that private property does not necessarily mean individual property; corporate property is private property administered by a group. Similarly, marital property is often the joint property of the spouses. Nor does private property imply absolute control for the owner. An owner is always faced with a number of strictures and obligations in the use of private land and its related natural resources (Christman, 1994). But given the ubiquity of private property, and given the presumptions that accompany this particular property regime, it is necessary to elaborate on some aspects of private property.

As with any property regime, the case for private-property regimes ultimately rests on judgements concerning social utility. Becker (1977) notes that any property regime must be understood at three levels: (1) the general level; (2) the particular level; and (3) the specific level. A general argument for private property in the abstract is difficult to refute. Even at a particular level, one can argue that land is often best suited to a regime of private property. However, at the specific level, the issue may not be so clear. To argue that pasture land in the valleys of Switzerland is best managed as private property is not to say that the Swiss summer pastures at 3000 meters elevation are best managed as private property. Indeed, the Swiss have answered this institutional question by