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Publications

Timothy Swanson and Sam Johnston, *Global Environmental Problems and International Environmental Agreements: The Economics of International Institution Building*, Edward Elgar Publishing, 1999. ISBN 1–85898–751–2

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Global warming, deforestation of tropical forests, and the thinning of the ozone layer are examples of some of the more salient problems confronting the world today. These and other similar problems have two common attributes. First, they affect the *environment* and, second, they are *international* in nature. Consequently, if we are to deal with such international environmental problems efficaciously, then it is essential that we first comprehend the many and varied intricacies of these problems. The purpose of this book is to aid this process of comprehension. Specifically, the book, published in association with the United Nations Conference on Trade and Development (UNCTAD), is intended to serve as an introductory guide on 'resource management problems that exist at the interstices between the various governance units that we know as sovereign states' (p. xi). This book consists of ten chapters. Rather than provide a tedious chapter by chapter review, in what follows, I shall evaluate the contents of five of the book's ten chapters. This should provide the reader with a good idea of the intellectual contributions of this book.

Chapter 1 begins the proceedings by examining issues at the interface of economic growth, global development, and the environment. The chapter points out that the 'role of international environmental agreements in the global development process is to provide for the regulation that is deemed necessary to channel this [growth] process effectively' (p. 3). It then rightly goes on to note that when studying the nexuses between global growth and development, it is particularly important to pay attention to two issues. First, when utilizing resources, it is necessary to generate investments that are 'forward-looking in the sense that they prepare … society

for impending natural resource scarcities' (p. 21). Second, it is particularly essential to give serious thought to the question of the substitutability between different forms of capital.

This is a good introductory chapter but there are a few loose ends. Here is an example. On p. 3, environmental problems are described as instances of inefficient *resource exploitation*. Surely, this is a rather narrow view of such problems. For instance, the Exxon Valdez generated oil spill in Alaska in 1989 created a significant environmental problem. However, this problem did *not* have anything to do with inefficient resource exploitation.

Chapter 3 discusses the need to regulate the decline in biodiversity in the context of the process of development. The chapter notes that countries that have low (high) material wealth often have high (low) biodiversity wealth. As such, it is important to create institutions that generate incentives for proper land use management in countries where the process of development has not yet generated these institutions. This chapter rightly comments on the link between the conversion of natural habitats and the attendant diminution in biodiversity. As the chapter suggests, it would be useful to determine a global stopping rule that will tell us 'when the marginal conversion by an individual country is not globally beneficial, and then alter the decision-making of that state so that the conversion will not occur' (p. 65).

These are all salient points and they deserve to have been made. A distracting feature of this chapter is its occasionally sloppy prose. For instance, although it is obvious that the problem being discussed here pertains not to biodiversity *per se* but to the *diminution* in biodiversity, there are many sentences in this chapter (see p. 52 and p. 57) that suggest that biodiversity is the problem!

The foundations of international environmental law and its relationship to international environmental agreements constitute the subject matter of chapter 5. This chapter makes three salient points. First, it points out that there a number of circumstances in which international environmental agreements (hereafter IEAs) are absolutely essential. Second, it is noted that despite 'the need for these agreements there are no prevailing incentives for their adoption' (p. 105). Finally, the chapter rightly notes that the truth of this second point does not mean that 'all states should be encouraged to adopt globally uniform environmental legislation …' (p. 105).

So far so good but there are two problems with this chapter. The first concerns the description of the Coase theorem. On p. 96, it is noted that in 'the absence of such [transaction costs], cooperation between members of a society can successfully eliminate all significant externalities …' Although this is not wrong, to give the reader a *complete* sense for the significance of this theorem, it should have been pointed out that this quoted sentence is true *independent* of the initial assignment of the *property rights*. The second problem is more serious. On p. 102, with regard to the regulation of carbon emissions, the chapter says that a tax approach and an emission permits approach are equivalent. This is *incorrect*. What the chapter should have said is that price and quantity control instruments are equivalent only in deterministic settings. In more realistic stochastic settings, they are *not* equivalent.

Chapter 7 analyzes problems that arise in the negotiation of IEAs. It is correctly noted that differing development statuses, investment choices, and physical locations are important sources of heterogeneity and hence friction between nations. Consequently, if a meaningful IEA for a set of parties is to be effected, then the various parties to the agreement, particularly the richer parties, must recognize that 'there is no reason why a poorer country should perceive the need to invest in [environmental and health-related] commodities to the same extent as a rich country …' (p. 159). From the standpoint of the design of IEAs, what this means is that it must be possible to translate the heterogeneity between the various parties into a common baseline that is 'an underlying relationship between human development status, physical location and [the party's] valuation of the environmental resource' (p. 159).

In general, the discussion in this chapter is both cogent and thought-provoking. However, the treatment of adverse selection is puzzling. First, instead of clearly stating that the problem of adverse selection arises when one party to a transaction knows things about the transaction that are relevant but unknown to a second party, this chapter says that adverse selection is 'the rational reaction of diversely situated parties to a proposed uniform standard' (p. 141). This sentence doesn't really explain the *meaning* of adverse selection; moreover, it also doesn't tell the reader *why* adverse selection is a problem. Second, the discussion on p. 137 leaves the distinct impression that adverse selection is commonly associated with the provision of insurance. The authors should have been more careful here. Adverse selection is typically associated with the provision of *some kinds* of insurance; an example is life insurance. For other kinds of insurance such as automobile or fire insurance, moral hazard is generally the more important problem.

Chapter 10 contains an account of the principles of international law. The discussion of international organizations helpfully explains that such organizations are salient because they contribute to 'the development of international legal obligations …' (p. 208) and because they 'provide an independent forum, or mechanism, for the settlement of disputes, usually between states' (p. 208). The chapter then rightly points out that environmental issues have increasingly come to form a significant part of regional and global trade and economic cooperation agreements. A noteworthy point made in this chapter is that 'environmental requirements can, in certain circumstances, justify limitations on free trade' (p. 244). In sum, this chapter contains a detailed and simple to comprehend account of the many nuances of international environmental law. As such, it should appeal to readers interested in a general overview of this subject.

As I have explained in this review, the presentation in some parts of this book would have profited from greater authorial care. Even so, this book does contain a frank and useful account of global environmental problems. Moreover, the book rightly argues that the way to solve such problems is by designing and implementing effective IEAs. As such, this book should be of interest to readers who are interested in learning more about the properties of and the solutions to some important contemporary problems.

Clóvis Cavalcanti (ed.), *The Environment, Sustainable Development and Public Policies: Building Sustainability in Brazil*, Cheltenham, UK, Edward Elgar Publishing, 2000. ISBN 1 84064 018 9.

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The book consists of a set of papers on topics related to sustainable development, with some emphasis on Brazil. It is the outcome of a workshop held in 1996, in Olinda, Brazil, co-ordinated by the organiser, sponsored by the Brazilian Ministry of the Environment, and by the Fundação Joaquim Nabuco of which Dr. Cavalcanti is a director. The book's 12 chapters are not structured in any particular fashion; they reproduce the papers from the workshop which, at the time of publication, were in publishable form.

Many of the chapters are by well known authors. In fact, some are summaries of the authors' thought, amply discussed elsewhere; but some also explore aspects of sustainability in Brazil. Other chapters are by less well known authors—mostly Brazilians; as a rule they present more material on that country. Reflecting the multidisciplinary nature of the workshop, the chapters' authors are from various fields. Economists, ecological and otherwise, prevail (8 of the authors), but there are also papers by an ecologist, a biologist, a political scientist, a philosopher, an anthropologist, a physicist-mathematician, and a by a chemical engineer.

What did impress me regarding the book's workshop was the limited effort made to influence the non initiated—policy-makers in Brazil, but also economists and experts of viewpoints other than those of most of the participants. Examining the papers and the list of participants, it becomes clear that the workshop consisted of an exchange among experts that did not have to be persuaded about the central message: that the world faces critical sustainability problems stemming from the incompatibility between a growing economy and an expanding human population and a finite global ecosystem; that we need to rely on a view of the economic process which emphasises the ecological limitations imposed by nature; and that in its effort to grow, Brazil is failing to heed to the principles of adequate husbandry of natural resources (see Chapter 1, by the editor). In wider circles there is far from a consensus on this; therefore, it would have been worth the effort to broaden the circle of 'converted'.

Another feature of the book that struck me is that, in spite of the workshop's multidisciplinary character, the 'political economy' of sustainability

in Brazil was almost absent. Most of the papers containing policy discussion treat the state, the government, as a unitary entity; it is as if policymaking were an intellectual exercise in rationality, undertaken by a central entity perfectly informed about all policy issues and alternatives, endowed with the capacity and with the time to establish the 'best' solution for each problem it faces. And this would occur in a social milieu free from pressures of interest groups and in which the prevailing vision of 'good society' highlights sustainability. If this is the standard, the lack of action or the adoption of 'wrong' policies is an indication of a negligent policy entity; it is implied that it should know better but instead it stubbornly refuses to follow the right track.

A problem with this approach is that it centers only on the rational dimension of policy-making, leaving aside the important dimension of power—which has to do with the inter-relation between policy making entities and social groups with influence, groups that stand to gain or to lose from policy decisions. Policy-makers do not operate in an ivory tower, exempt from the pressures of interest groups.

Moreover, issues of sustainability tend to be extremely complex, and some of them are controversial even among the initiated. In countries such as Brazil, public opinion is still largely uninformed on these issues; it is unaware of the extent and the exact nature of many of the country's main environmental problems. There is still no consolidated view of a 'good society' that includes sustainability. Other problems tend to be considered more crucial and there is not, even remotely, a consensus on what the country's environmental policies should the be.

This is reflected in the institutional organisation of government; the Brazilian government is far from an unitary entity, and although there are segments of the state which tend to hold sound views on the environment—one even provided resources for the book's workshop—they do not have the necessary power and resources to fully implement 'right' measures. This will only change when the Brazilian society arrives at a view of 'good society' in which sustainability issues are prominent.

To be fair, the book has two chapters focusing on political aspects of sustainability: Chapter 8, by Héctor Ricardo Leis, for instance, calls for radical change in the process of environmental negotiations in Brazil, one characterised by a growing participation and influence by stakeholders. In Brazil those directly affected by projects with environmental impacts have only a marginal participation in environmental negotiations, and this leads to distorted, unsustainable decisions. And Chapter 9, by Sérgio Trindade calls for a larger stakeholder participation in the elaboration of national Agenda 21 by countries, with emphasis in Brazil. But these two chapters are more in the nature of an afterthought; they are placed almost at the end of the book, and the issues they discuss are not an element in most of the other contributions.

As a result of this lack of political realism, we tend to find in papers the usual recriminations of the government, together with exhortations for changes in behaviour in the direction indicated by the authors. This is particularly evident in sections 3 and 4 of Chapter 1; in the latter section, for instance, the book's editor issues a 10 point list of radical changes in

Brazil's life style, which presumably are the only way to achieve sustainability. These changes are treated as self evident, and one almost feels the longing for an enlightened and benevolent absolute ruler to enforce them. Even agreeing with many of the suggestions, I find unrealistic the idea that the Brazilian society—and the country's government—could just wake up, embrace the 'truth' and mend its ways.

There are other examples in other chapters, such as Biswanger's call for changes in society's patterns of consumption, and for a re-arrangement of institutional order for sustainable development (ch. 2, p.26). Such as the reproach of governments for their tendency of bending to the pressures of interest groups, and for their lack of wisdom and ethics to act for sustainability, by Proops *et al*. (ch. 5, p. 53). And such as Daly's (ch. 6) four basic policies for salvation. These and other instances reflect a simplistic view of the policy decision process, one that ignores the dimension of power. They seem to assume a unitary entity in charge of making the decisions, one that consistently commits mistakes or acts in bad faith. They also fail to overlook the fact that sustainability is still far from ingrained in the view of 'good society' of countries such as Brasil.

Following, we present a brief outline of the book's chapters (except for chapters 8 and 9, already considered). Chapter 1, by the book's editor, goes far beyond the material covered in the workshop. It portrays the author's view on sustainable development, his uneasiness about the unsustainable pattern of development in Brazil; and it comprises his policy recommendations regarding sustainability. It is a condensation of the thoughts of someone who has innovatively contemplated the basic issues of sustainable development. Chapter 2, by Hans C. Binswanger is an imaginative piece, in which some basic concepts of economic analysis are adapted to the analysis of sustainable development. This is done by (re)introducing nature as a factor of production and as a constraint on growth. The purpose is to reconcile economic growth with the preservation of natural capital. Chapter 3, by Alpina Begossi, examines the concept of scale for ecology and for economics; the concept is applied in the discussion of sustainability in Brazil. It is well researched but contains some economic inaccuracies.

Chapter 4, by Richard B. Norgaard, summarises some of the author's contributions, alone or with Richard Howard. In it, he criticises the environmental valuation techniques developed by neo-classical economics, on the grounds that they are rooted in *status quo* and that they leave aside intergenerational and intragenerational distributional goals. Chapter 5, by John Proops, Malte Faber, Reiner Manstetten and Frank Jöst is also a (short) summary of work by the authors. They present a diagnosis of sustainability in Western societies, criticise measures currently undertaken to achieve sustainability and indicate the necessary corrections, with emphasis on the role of the state. Chapter 6, by Herman Daly, also outlines the author's thought. In addition it presents and discusses four basic policies for sustainable development, which the author recommends for application in Brazil.

Chapter 7, by Salah El Serafy, on green accounting, is a summary of the author's invaluable contributions in the field. It is quite comprehensive,

including a discussion of controversies and incorrect interpretations of the author's previous work. It contains a review of an attempt at measuring sustainable income from the extraction of mineral resources in Brazil. Chapter 10, by Peter May, discusses the transformation in the origin of foreign capital for development in Brazil, from public multilateral and commercial credit to private financial capital, and examines the extent to which this pattern of capital flows is an appropriate substitute for public commitment toward sustainable development.

Chapter 11, by Philip Fearnside, is another piece in the author's crusade for sustainable development in the Amazon. It contains a wealth of information on the path of destruction in that region and suggests steps towards sustainability. We find that the author became fascinated with the determination of monetary values of the benefits of preserving the region's ecosystems. Apparently, when he was working on this he was unaware of Norgaard's criticism (ch. 4) of the available techniques of environmental valuation.

Finally, in chapter 12 Darrel Posey discusses the exploitation of biodiversity and of indigenous knowledge in Latin America. He reproaches the negligence of governments in curbing the exploitation by Northern economic interests of the region's biodiversity, and suggests intellectual property rights regimes to protect the interests of indigenous, traditional and local communities.

Lakshman D. Guruswamy and Jeffrey A. McNeely (eds.), *Protection of Global Biodiversity: Converging Strategies*, Duke University Press, 1998. ISBN 0–8223–2188–2.

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In an age when, increasingly, several disciplines are converging to provide solutions for complex environmental problems such as conservation of the earth's remaining biological resources, it is heartening to find a book that not only celebrates the importance of this cross sectoral problem-solving approach, but show cases its usage to find real life solutions. Loss of biodiversity is not merely a biological problem, but a political, social and economic one, hence a diverse range of approaches that challenge the

conventional bounds of human and academic wisdom are needed to meaningfully address its resolution. In this book, ably edited by Lakshman Guruswamy and the ever-prolific Jeffrey McNeely, the authors cover a vast canvas of opportunities, techniques and solutions that attempt not only to show why biodiversity should be conserved but how it should be done.

This book has been structured cogently and follows a tight logical framework that reflects a progression of ideas and solutions starting from an identification of the nature and scale of the problem to its various responses, scientific, economic, institutional, moral and legal. Distinguishing this from any other similar publication seeking solutions, is the space and unabashed importance given to moral and ethical reasons for biodiversity preservation, an oft neglected issue in a climate where the utilitarian approach is believed to carry more weight to justify conserving nature.

The first essay, an alarming list of figures underscoring how species extinction rates today far exceed those of the past 65 million years sets an appropriate backdrop of concern for the rest of the book. Despite prevailing uncertainty of the existing number of species and of the validity of extinction projections, Raven and McNeely argue that future extinction rates can be reliably calculated on the basis of the species-area relationship. They dismiss dissenting studies on extinction rates in Puerto-Rico and the eastern United States as an attempt to, ' pick at the general pattern in an attempt to argue to a conclusion that defies the substantial body of information that exists in the area.' This is followed by an impassioned explanation of why these figures should matter to an average individual, that is the ecological, economic, ethical and aesthetic values of biodiversity as the pivot for continued human survival.

Taking a broader perspective is Lugo in the next essay. He argues that the rate of species extinction may be irrelevant as a driver for biodiversity conservation not only because the science of biodiversity is still inexact but because biodiversity has to be viewed in a larger context as being more than mere species loss. Biodiversity is intertwined with the ecosystem flows and cycles and hence its management has to be at a broader level-that of the landscape. Further, Lugo argues human existence is not incompatible with biodiversity maintenance, provided we are flexible enough to accept the emergence of different ecosystems containing new biotic assemblages that continue to perform valuable ecological functions or what he calls the self-design of landscapes. The sooner we manage for human-induced biodiversity change, using the methods of natural succession, multiple seeding and self-design the better we may be able to, 'conserve the whole earth.'

The pros and cons of biotechnology as a panacea for conservation are explored in the next two essays in the scientific responses section. Horsch and Fraley, representatives of Monsanto, emphasize the biotechnology can create food security for burgeoning global populations by increasing production on smaller pieces of land, reducing the need for energy intensive fertilizers and pesticides and encouraging sustainable practices like IPM and conservation tillage. This in turn will reduce land

degradation and prevent conversion of rainforests and other areas for industrialized agriculture, currently one of the important reasons for biodiversity loss.

Jackson, however, argues that biotechnology is very much part of the destructive industrial agriculture regime, and that frequently what appear to be solutions come from the same source that created the problem in the first place. The application of herbicides for soyabean advocated by Monsanto as a way to reduce soil erosion inducing crop tillage, she argues, has only become necessary because the practice of crop rotations that reduced erosion was abandoned. Similarly, industrial agriculture has destroyed many natural refugia in croplands that helped conserve wild biodiversity apart from being destructive of traditional social and cultural practices. Gregory Benford then explores crypto-preservation as another hi-tech scientific response to preserve nature for the future.

Options explored in the economic instrument section are limited. Chichilnisky believes that a trade environment in which export of labour and resource intensive products has greatly intensified resource degradation in the developing world as exemplified by Africa and Latin America. Shifting instead to export of knowledge driven products such as the software industry by India, will prevent developing nations from taking the destructive path of the West. The next two essays strike a negative note regarding market mechanisms for biodiversity conservation. While Heal shows that markets cannot capture the full value of biodiversity though in some cases they can provide incentives for its conservation, Simpson et al. point out that genetic prospecting may be economically a poor incentive for conservation given the size of the resource pool and the low value of each additional species.

The section on institutional designs fluctuates between micro and macro institutional structures that could regulate biodiversity in several distinct fashions. Elinor Ostrom opens the series of essays with a call for the development of institutional complexity to meet the demands of regulating biodiversity in all its inherent complexity and variety. Citing eight design principles for community based institutions she makes a case for allowing local, complex and resource specific institutions to evolve that can address issues of maintaining local biodiversity while indirectly preserving the global pool. Allowing for such flexibility in institutions is important, however, not only to capture diversity in genes, species and ecosystems but cultural diversity as well. Thus Ostrom rightly argues for polycentric, multi-layered arrangements for biodiversity management. This diversity of institutions would allow for the healthy co-existence of institutions that span the gamut of those owned by the State to quasi-participatory approaches such as Joint Forest Management in India to communally managed resources and finally private ownership. This would depend on what is economically, politically, culturally and ecologically appropriate at the local level. Ostrom, however, fails to provide an idea of how such institutions should be structured, restored, or created in areas where such community managed initiatives have either been eroded or do not appear to have existed in the first place.

The next essay focuses on an international institutional structure, the

Convention on Biological Diversity and incorporates broad recommendations for its effective implementation through both international and national action. An important point the author makes is that the focus on incremental costs that support international benefits should be replaced in favor of mechanisms supporting national agendas for biodiversity conservation that will act as more powerful incentives for preserving the local biota.

Anil Gupta argues that documenting and valuing the knowledge of local communities on biodiversity is as essential as the conservation and valuation of biodiversity itself. Citing the close connection between biodiverse areas and impoverished communities, he argues; a) for the documentation of local indigenous knowledge through networks such as the Honey Bee initiative that disseminates information while establishing the individuals' or communities' legal right to its knowledge and b) through intellectual property resources that provide economic benefits in lieu of such knowledge

In China, the usage of hybrid rice seeds hyped production by 22% while simultaneously reducing the area under production by 6%. Using this and other examples to illustrate biotechnology's crucial role in providing food security for developing economies, Toenniessen makes a case for the development of mechanisms that will allow the flow of biotechnology from the profit driven corporate sector to help boost developing countries agricultural sector. While citing examples such as the International Service for the Acquisition of Agri-biotech Applications (ISAAA) that plays a role in acquiring and transferring proprietary agricultural biotechnologies for the benefit of the developing world, he however, points out that such mechanisms in the absence of a public-sector agricultural research system would fail to meet the needs of the most deserving.

In the section on moral responses, Bryan Norton briefly traces the history of biodiversity protection from the single species approach to the current paradigm of ecosystem health. While acknowledging that the single species approach and its concomitant the Endangered Species Act, stem from the first phase of biodiversity evolutionary thought, given the lack of understanding of ecosystem processes and how they should be maintained, it continues to remain a practical solution to stem biodiversity erosion.

In the next essay Mark Sagoff attempts to show that moral or ethical grounds may provide a more holistic reason for preserving biodiversity than prudential or instrumental ones. Arguments that justify preserving millions of species just because some may become important at some unknown point in the future are hardly convincing. After all, Sagoff argues, should we produce every child possible just in the hope that one of them may grow up to earn millions? He then revisits the debate on biotechnology to show that by allowing human beings to preserve genetic material in vitro, this science may eliminate the necessity of preserving natural environments and species in-situ. What biotechnology does is to simplify and domesticate nature. When food, fodder, fibres and all human needs can be manufactured in factories, when wild fisheries are replaced by aquaculture, when crops that can do well on rainforest soils are devel-

oped, then what will be the value of utilitarian arguments for preservation of wild nature?

The legal section of the book deals largely with various policy instruments for protecting biodiversity especially patents and Intellectual Property Rights. In the first essay, Stone explores the range of policy instruments for protecting our biological assets and concludes that because of the public good dimension of biodiversity, markets will fail to ensure the capture of full social benefits. The author then goes on to make a case for the international subsidization of important biological resources. Following this Cripps examines European developments vis a vis patenting and IPRs. The theme is carried further by Sagoff. As in his previous chapter, Sagoff explores the prudential argument for patenting along with the moral argument (people have the right to own the fruits of their labour). The conclusion is, however, reversed in this case as Sagoff believes that whatever the economic justification for IPRs, the moral right premise is a false and untenable one.

The editors have successfully carried out an immense task of mapping the dimensions of the whole picture by drawing together information from diverse sources and placing them together in one place. The book lacks a comprehensive treatment of each of the possible solutions, but then a thorough analysis of each issue is not its objective. By drawing together disparate and diverse threads, the book illustrates the broad contours of the problem and the realms in which solutions are available and is therefore mainly directed at the layperson or perhaps the scholar seeking inspiration from other fields of knowledge.

One aspect of the book that tends to detract from its overall readability is that the argument of the value of biotechnology and genetic resources for preserving biodiversity versus its potential for undermining nature has been addressed repeatedly throughout the book, albeit from legal, moral or economic perspectives. This at times gives the impression that the underlying theme of this book is centred at the level of the gene. However, this could signify the importance of this debate in ecological circles. Additionally, arguments both in favor and against a point of view do provide for a balanced representation of diverse perspectives.

This book could have been greatly enriched with more case studies. Natural resource managers are always seeking ways in which complexities are resolved and solutions implemented on the ground. Therefore, while the Mayan case study made interesting reading, the InBIO bioprospecting experience has been worn threadbare and the use of more recent and innovative material could have been of more relevance to the reader.