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Book Review: Protection of Global Biodiversity: Converging Strategies, by Lakshman D. Guruswamy and Jeffrey McNeely (eds.)

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Book Review

PROTECTION OF GLOBAL BIODIVERSITY: CONVERGING STRATEGIES. Edited by Lakshman D. Guruswamy & Jeffrey A. McNeely. Durham, N.C.; Duke University Press, 1998. Pp. 425. US$69.95 (Hardcover), US$23.95 (Paperback).

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Legal thinkers—and people in general—approach the world from differing perspectives. Some posit a model of humans as rational maximizers, looking to further economic efficiency in a quest for Pareto-superior solutions.[1] Others champion more fairness-seeking souls, persons who will only enforce rules against others that they would consent to having enforced against themselves.[2] What would be the reaction to followers of either model, or of those who embrace other decisional frameworks,[3] to the problems of preserving global biodiversity? In the United States, the paradigm law for protecting biodiversity has been the Endangered Species Act (ESA).[4] Depending upon whether one favored economic maximizing or not, the ESA became either infamous or famous when it was interpreted as preventing completion of the Tellico Dam to preserve the habitat of the snail darter.[5] *Protection of Global*

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1. *See, e.g.*, Richard Posner, *Utilitarianism, Economics, and Legal Theory*, 8 J. LEGAL STUD. 103 (1979). A solution is "Pareto-superior" when it makes at least one person believe him or herself better off, while no one believes him or herself worse off.

2. *See, e.g.*, JOHN RAWLS, A THEORY OF JUSTICE (1971).

3. For a thought-provoking early work on the potential for deriving decisional frameworks from various disciplines in the social and physical sciences, see William H. Rodgers Jr., *Building Theories of Judicial Review in Natural Resources Law*, 53 U. COLO. L. REV. 213 (1981). In this work, Professor Rodgers examines whether there might be useful disciplines with insights other than economics and philosophy, the disciplines that more traditionally have been employed as guideposts to legal thinking. For example, he cites the biological concept of territoriality as providing a rationale for protection against trespassers, even if a utilitarian argument could be made on behalf of granting rights to the invader. *See id.* at 214–15.

4. 16 U.S.C. §§ 1531–1544 (1998).

5. *See* Tennessee Valley Authority v. Hill, 437 U.S. 153 (1978). More recent newsmaking imbroglios concerned the spotted owl, preservation of which conflicted with logging in old-growth forests in the Pacific Northwest.

Biodiversity: Converging Strategies (Duke University Press: 1998), edited by Lakshman D. Guruswamy and Jeffrey A. McNeely, goes beyond the borders of the United States and the species-protection paradigm of the ESA to provide an intriguing interdisciplinary examination of the problem of global biodiversity.

Protection of Global Biodiversity: Converging Strategies defines global biodiversity as "a portfolio of diverse life-forms, including all species whose survival is currently threatened."[6] The book is a collection of essays in which the ideas concerning how and why to protect biodiversity from the physical and social sciences are interwoven with ideas based in law and philosophy. The synthesis is ultimately and effectively used to suggest practicable policies and effective laws. The editors are well-versed to succeed at such a fusion. Jeffrey A. McNeely is the chief scientist and director of the Biodiversity Programme at the World Conservation Union, with training in anthropology and zoology. Lakshman D. Guruswamy was born in Sri Lanka, with his first law degree and legal work in his homeland followed by a doctorate in England and law teaching in the United States.[7]

The editors warn readers not to turn to their particular specialty seeking groundbreaking work; the purpose of the book is to find collective wisdom, making the book less significant for those "who fail to see the forest for the trees or only recognize a particular species but not an intricate ecosystem."[8] Collective wisdom comes not only from the editors' attempts at synthesis, but from the authors as well because authors of the essays respond to the thoughts of others "outside" their "box," despite the placement of essays within the various categories.[9] Therefore, the greatest value of this book for those versed in the law are the essays discussing science, economics, social theory, and philosophy underlying the methods and reasons for protecting biodiversity. The book's usefulness is in expanding horizons: effective preservation strategies must not run contrary to the principles discoverable by the differing fields. Nevertheless, even reading the book in its entirety, most readers will bring to their exploration the vantage point of their most familiar "tree."

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6. Lakshman D. Guruswamy & Jeffrey A. McNeely, *Introduction, in* PROTECTION OF GLOBAL BIODIVERSITY: CONVERGING STRATEGIES 1 (Lakshman D. Guruswamy & Jeffrey A. McNeely eds., 1998).

7. Professor Guruswamy has taught at the University of Iowa and University of Arizona and currently teaches at the University of Tulsa, where he also serves as director of the National Energy-Environment Law and Policy Institute.

8. Guruswamy & McNeely, *supra* note 6, at 2.

9. Chapters include "Identifying the Problem: An Overview," "Scientific Responses," "Economic Responses," "Institutional Responses," "Moral Responses," and "Legal Implementation."

This reviewer is most cognizant of the legal world, with an expertise primarily in domestic environmental and public land law. Therefore, preexisting knowledge of the debates on the efficacy of the ESA, emanating from science, pragmatism, and philosophy, provide the most specific backdrop for this reader's examination of the book's debate, a debate that travels beyond the snail darter's protection. The paradigm employed in the ESA is primarily protection of specific species, with some concern to protect the habitat of the protected species. The book's overview section immediately challenges the act's basic thrust, therefore underscoring that we have not even achieved a domestic solution.

In addition to their immediacy to the ESA debate, the two essays that provide an overview of the problem of biodiversity protection set the stage for the efforts that follow on global matters. For Peter H. Raven and Jeffrey A. McNeely, the authors of *Biological Extinction: Its Scope and Meaning for Us*, the problem is the high rates of extinction of species that many believe the earth is currently experiencing. In addition to posing ethical arguments on behalf of species preservation, they detail the potential losses to humanity from species extinction, which include economic losses as well as ecological and aesthetic damages. A contrary focus is expounded by Ariel E. Lugo in *Biodiversity and Public Policy: The Middle of the Road.* Lugo argues that focus on extinction rates of species might be misguided because extinction rates are unknown and possibly unknowable; thus, the better emphasis would be on preserving biodiversity itself (from genes to life zones), so as to provide a buffer for, or stabilizer in, a world that is changing.

Other authors in this volume also question whether individual species protection is the best way to preserve biodiversity and what are the moral, philosophical, scientific, and economic rationales for preserving biodiversity at all. The one essay directly addressing US law is Bryan G. Norton's *Biological Resources and Endangered Species: History, Values, and Policy.* Norton concludes that, while the ESA is "anachronistic," it remains the most valuable tool in the United States for biodiversity protection given the state of scientific knowledge and resource managerial ability. The reason the ESA is considered anachronistic is because general protection goals have progressed from seeking individual species protection through a desire for overall biodiversity, toward a goal of seeking sustainable ecosystem health.

Another issue particularly relevant to both the domestic and global debate is whether biodiversity can be valued in such a way as to provide a strong rationale for its preservation. Geoffrey M. Heal's succinct summary in *Markets and Biodiversity* includes the value of biodiversity as a source of knowledge, as a factor in life-support systems (e.g., oxygen production from green plants and the cleansing of water and soil by

bacteria), as a cultural or aesthetic symbol (e.g., elephants for Hinduism), and, finally, as having an intrinsic value independent of usefulness to humankind. These discussions of value are as relevant to the domestic debate as they are to the global debate. Ultimately, the book's focus takes those conversant with the domestic debates into less familiar ground because the book is concerned with a truly "global" problem. When one moves beyond biodiversity protection in the United States, other issues become increasingly important.

For example, the United States has its share of exploitation versus preservation conflicts (such as completion of the Tellico Dam versus preserving the snail darter and logging old-growth forest versus preserving the northern spotted owl), but when the debate focuses on the developing world, curbing exploitation of natural resources in order to preserve biodiversity could mean a community will not move beyond basic subsistence levels to enjoy the material benefits common in the developed world, or, in some instances, may prevent a community from even reaching subsistence level. This point is vividly made in the essay by Graciela Chichilnisky, *Sustainable Development and North-South Trade*, which argues that in order to meet the conflicting demands of economic growth and biodiversity protection, developing countries must move from resource exports and exports of labor-intensive products to knowledge-intensive products. She believes other responses to the global environmental problem, such as green accounting and property rights in biological resources, are politically unattainable. Other authors in the book, however, have differing perspectives on the problems of development, which is one of the more international aspects of the biodiversity debate.

Biotechnology may also have an important role in preserving biodiversity at the international level. Whether biotechnology can effectively be used to preserve biodiversity is a multifaceted question. Part of the question is whether genetic engineering of plants will hinder or help the cause of biodiversity protection. In an essay appropriately titled *Biotechnology Can Help Reduce the Loss of Biodiversity*, Robert Horsch and Robert Fraley[10] argue that increased productivity of agricultural land would prevent marginal lands being put to crops, and therefore, protect biodiversity where marginal lands are rainforests or other biodiversity-rich terrain. Moreover, growing crops that are genetically resistant to herbicides, pests, or viruses may lower the need for expensive inputs. Gary H. Toennisessen, in *International Research on Crop Plants: Strategies for Utilizing Biotechnology and Proprietary Products*, looks

10. The authors are scientists for the Monsanto Company, which is active in bioengineering seeds.

at institutional structures that could assist in transferring technology that can increase sustainable crop yields from the corporate sector to parts of the world in need.

In *Agricultural Industrialization and the Loss of Biodiversity*, Laura L. Jackson disputes the ability of biotechnology to preserve biodiversity by enhancing production from agricultural lands. She argues that biotechnology is simply another form of agricultural industrialization, which has historically destroyed biodiversity by leading to monocultures divorced from "nature" and which often has unintended consequences such as soil erosion. Moreover, she argues that the US model of "increased productivity" would not necessarily feed the multitudes in less-developed countries if exported; industrialized agriculture is dependent on expensive inputs and often ends up growing food for export. The availability of biotechnology as a "scientific fix" for food production that would temper demands to put lands to agricultural use is therefore debatable.[11]

In addition, a debate exists over whether biotechnology could increase the value of biodiversity directly and consequently remove some incentives for economic development that destroys biodiversity. Biodiversity is sometimes likened to an undiscovered "mine" of knowledge, because many pharmaceutical discoveries hark back to plant life. An oft-cited example is taxol from the western yew, which is useful in fighting breast and ovarian cancer. In addition, the twenty top pharmaceutical products sold in the United States all had natural products research in their development.[12] The possibility of tapping into this biodiversity mine leads to robust debate on two interrelated issues: bio-prospecting and intellectual property rights in biotechnology.

Bio-prospecting, along with other attempts to exploit existing traditional knowledge of the medicinal uses of plants, has been one method touted as giving an incentive to developing nations to preserve their biodiversity. Developing nations would receive payments for access to their biological resources and some return from sales of products derived from study of the resources. *Biodiversity Prospecting Frameworks: The INBio Experience in Costa Rica*, by Ana M. Sittenfeld and Annie Love-

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11. The final essay in the "Scientific Responses" chapter, *An Ex Situ "Library of Life,"* by Gregory Benford, examines the possibility of a "library" to preserve biodiversity for future use by scientists who may have greater skills at decoding the uses of genetic material.

12. Guruswamy & McNeely, *supra* note 6, at 23 (of the top twenty pharmaceutical products, two are derived directly from natural sources, three are semi-synthetics, eight are modeled on previously used natural compounds, and seven had their pharmacological activity defined by natural products research).

joy, describes the efforts of Costa Rica and the pharmaceutical company Merck under their bio-prospecting agreement.[13] According to Costa Rica and Merck, the bio-prospecting agreement has some utility as one method to conserve biodiversity.

However, others challenge this conclusion. One specific challenge is made in *The Commercialization of Indigenous Genetic Resources as Conservation and Development Policy*, by R. David Simpson, Roger A. Sedjo, and John W. Reid. The authors argue that the value of property rights placed on indigenous genetic resources may not be as high as others have suggested. Despite the probability that a valuable discovery might be made, they conclude the marginal value of any individual species will be low in light of the huge number of species to be sampled. Therefore, the strategy of bio-prospecting as a protective scheme should not divert attention from other conservation methods.

In *Markets and Biodiversity*, Geoffrey M. Heal critiques the use of bio-prospecting as a preservation tool in the broader context of whether markets could foster biodiversity protection. He notes four impediments to the use of markets in this regard:

1. Even if resources could be owned, "diversity" per se is not a tradeable commodity and is thus difficult to value
2. Biodiversity is a public good,[14] but one that may be privately provided, and therefore is hard to value
3. The impacts of the loss of biodiversity will not be felt until the future, leading to problems of valuation because of discount rates
4. Biodiversity has an "option value," a value arising out of the fact that the future is uncertain; therefore, biodiversity may be more valuable in the future[15]

The difficulties in valuing biodiversity create a market failure, which means the market will not make the proper allocation of a resource. Nevertheless, the author does suggest that markets could play some role in biodiversity protection, suggesting "tradeable depletion permits" similar to the tradeable emission permits used in fighting air pollution.[16] A similar conclusion is reached by Christopher D. Stone in

13. Both authors are associated with INBio.

14. A "public good" is a good "that if provided for one, then is provided for all. Classic examples of public goods are law and order as well as defense." Geoffrey M. Heal, *Markets and Biodiversity*, *in* PROTECTION OF GLOBAL BIODIVERSITY: CONVERGING STRATEGIES, *supra* note 6, at 121.

15. *See id.* at 118–28.

16. *See id.* at 122–24.

his detailed analysis of the problem in *What to Do About Biodiversity: The Earth's Biological Riches in Law and Economics*. Stone concludes that while privatization of some aspects of biodiversity, such as using prospecting contracts and granting intellectual property rights, would enhance the ability of markets to allocate biological assets, ultimately the "public good" aspect of biodiversity would lead it to be underpriced and hence not protected by markets. Moreover, the international community generally only uses punitive measures such as trade sanctions and lawsuits in reaction to the most egregious incidents. Therefore, the case for international subsidization of certain conservation areas is strong.

The Stone essay also raises a second issue crucial to an understanding of biotechnology's potential for influencing biodiversity protection: whether property rights should be given in altered genetic material. This question is sometimes phrased, "Can you patent a cow?" The authors in this book respond variously. The essay by Yvonne Cripps, *Aspects of Intellectual Property Rights in Biotechnology: Some European Perspectives*, is primarily descriptive of the intellectual property systems of the United States and Europe, which are designed to foster innovation through economic rewards. Cripps also notes that the law should not be blind to the moral, social, and environmental implications of patenting. These latter issues are foremost to Mark Sagoff in *Animals as Inventions: Biotechnology and Intellectual Property Rights*. Sagoff argues that biotechnology advances do not meet the two justifications for patenting. The first is to reward innovation, which is an instrumental justification. The second justification is to "respect the natural right of a person to own the result of his or her labor," which is a moral right. Sagoff concedes that there might be some argument for patenting based on the first justification, but argues that the second justification breaks down because engineered organisms remain part of nature and are not invented. Recognizing a property right in a process, rather than a result, might be more defensible.

In preparing the reader for the conclusion, the book moves from intellectual property systems to international law directed at preserving global diversity. Throughout the essays, the authors refer to various laws of individual nations and also to international treaties. Not surprisingly, the treaty most discussed is the Convention on Biological Diversity (CBD), which is included in the volume as an appendix. Two essays directly comment on the CBD: one finds it flawed and the other sees a glimmer of hope in it. In *The Convention on Biological Diversity: A Polemic*, Guruswamy argues the CBD does not institutionalize common human responsibility for biological resources or state responsibility for damage to such resources and, despite lip service, turns its back on sus-

tainable development. Brent Hendricks, in *Transformative Possibilities: Reinventing the Convention on Biological Diversity*, concurs that the CBD lacks the substance anticipated by the environmental community, which wanted an "umbrella" treaty to coordinate the many treaties and conventions affecting the field. Nevertheless, he finds that the open political process and institutions set up by the CBD could enable it to be "reinvented" through increased access by nongovernmental organizations and a strengthened secretariat. Another author enthusiastic about using the CBD as a vehicle for change is Walter R. Reid in *Halting the Loss of Biodiversity: International Institutional Measures.*

Coming full circle, the question posed initially remains: why should one care about the problem of biodiversity protection? How would the person in search of economic maximization or fairness respond? The readings do show the economic value of biodiversity, but they also show the difficulty of computing that value, thwarting those who seek balance sheet answers. In the elegant language of Mark Sagoff, who perhaps provides the best essay on this issue in *On the Uses of Biodiversity*, basing protective decisions on the economic value to man is to make prudential or instrumental arguments. He argues that the most important reasons to preserve biodiversity are moral ones, drawn from ethical, aesthetic, cultural, and religious arguments. For example, fish farming more than supplies sufficient salmon to eat, so providing food will not suffice as a reason for preserving the wild salmon fishery. Moreover, keeping wild stock "in reserve" to assist the farmed stock genetically if needed does not seem to be an answer to the preservation game; domesticated cattle do not seem endangered because of the lack of wild cousins. The true reason to preserve the wild salmon, beyond all the prudential reasons, Sagoff argues, is its intrinsic worth. Nature deserves reverence.

In the final analysis, however, all concerns with environmental protection, which include biodiversity preservation, are anthropocentric. This is not to say that prudential or economic concerns drive our need to protect these resources. The moral and ethical dimension exists. Nature inspires awe, whether it is the simplest single-celled creature or the soaring bald eagle. No one species should have the hubris to think its interests alone are paramount. However, having a moral and ethical awareness is one of the hallmarks of being human. Therefore, in acting to forward morality, we are acting in a manner that enhances our humanity. Believing ourselves to be fair enhances our self-esteem. It is a false dichotomy to separate the prudential and moral spheres or to isolate the maximizer from the fairness-seeker. Interdisciplinary works such as *Protection of Global Biodiversity: Converging Strategies* help to underscore this truism.

The essays in the book, including those that have not been directly noted,[17] provide a wealth of information and insights. In and of themselves, they would be valuable. However, in the conclusion, the editors go further than summarizing the points made by the authors; they synthesize the conclusions and present suggestions for actions. They propose activities in six areas: (1) education leading to knowledge and awareness, (2) coordination of international resource management, (3) market-based remedial actions, (4) international financial and trade mechanisms, (5) international cooperation in science, and (6) implementation of the CBD. The practical suggestions on how to remedy the problem of preserving biodiversity draw upon the multiple disciplines of the authors. They include ensuring that human cultural diversity is considered in attempting to conserve biological diversity as well as experimenting with tradeable depletion allowances and making conservation "pay" its way through prospecting agreements tied to conservation activities. Recognizing the limits of market mechanisms to value conserving biological resources properly, they also consider transfer payments or generalized taxes on the seed, biotechnology, and pharmaceutical industries. Anyone interested in the problem of biodiversity preservation should read these comments and the others contained in the conclusion with care. Politicians, biologists, lawyers, and social scientists have much to learn from the book.

17. The essays not mentioned primarily are those within the chapter on "Institutional Responses." They include the thought-provoking work of Elinor Ostrom (*Polycentricity, Complexity, and Incentives: Designing Complexity to Govern Complexity*), arguing in favor of local controls; Anil K. Gupta (*Rewarding Local Communities for Conserving Biodiversity: "The Case of the Honey Bee"*), arguing to give intellectual property rights in local biodiversity to those in local communities and sharing knowledge gained through local trial and error; and S. James Anaya and S. Todd Criter (*The Mayagna Indigenous Community of Nicaragua: Moving from Conflict to Convergence of Interest*), detailing a community's attempt to negotiate for development of a forest.