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CLIMATE CHANGE AND INTERGENERATIONAL JUSTICE: FOUNDATIONAL REFLECTIONS

Burns H. Weston*

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INTRODUCTION

This much we know with certainty: climate change exists, global warming included; it is today caused largely by human activity; and, with each passing day, it looms ever larger as a major threat to the worldwide human and natural environment. We also know with certainty that its worst effects will be severe if left unabated and that these will be felt primarily by today's children and the generations that follow them, especially if they are poor or otherwise without capacity to protect themselves.[1]

* Visiting Distinguished Professor of International Law and Policy and Director, Climate Legacy Initiative, Vermont Law School; Bessie Dutton Murray Distinguished Professor of Law Emeritus and Senior Scholar, Center for Human Rights, The University of Iowa. I acknowledge with gratitude Tracy Bach, Richard Brooks, Steven Burton, Jonathan Carlson, Bruce Duthu, Richard Falk, Eleanora Masini, Marc Mihaly, Nancy Myers, Craig Pease, and Carolyn Raffensperger for their generous help with drafts of this Article. I wish also to acknowledge with thanks the gracious help of my Vermont Law School research assistants, Jonathan DeCarlo and Katherine Moll, and my University of Iowa research assistants, Jacob Larson and Suzan Pritchett.

1. U.N. Env't Programme & World Meteorological Org., Intergovernmental Panel on Climate Change [IPCC], *IPCC Second Assessment, Climate Change 1995: A Report of the Intergovernmental*

Ask almost anyone about this perilous state of affairs and they will agree: each of us living today has a responsibility to prevent the looming catastrophe. At a minimum, each of us has a moral responsibility to ensure that today's children and future generations inherit a global environment at least no worse than the one we received from our predecessors. It is true, of course, that we cannot fulfill this obligation completely. It is in fact beyond our capacity to do so. According to the U.N.'s authoritative Intergovernmental Panel on Climate Change (IPCC), the best we can do is to minimize the predicted harms.[2] It also is true that some individuals, groups, and institutions will not help to mitigate these harms. Not everyone is moved to action by the plight of others. But it is the rare person who will deny this intergenerational responsibility in principle. What parent, grandparent, or great-grandparent would disavow a climate legacy beneficial to their descendants? What child, grandchild, or great-grandchild will not feel at least a little resentful if such a legacy is denied them? Somewhere deep inside, all of us know that life is an energetic concurrence of the past, present, and future; that we are a temporary part of it; and that, whatever our past failings, we must reach beyond our egoistic selves to ensure its continuity with fairness to today's children and communities of the future. It is axiomatic—a "no-brainer," as we say.

When this responsibility-towards-future-generations axiom is considered from a legal perspective, however, it emerges less obvious. Asked if future generations (children aside) have a *legal* right to protection

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Panel on Climate Change, ¶ 6.7 (Dec. 1995), *available at* http://www.ipcc.ch/pdf/climate-changes-1995/ipcc-2nd-assessment/2nd-assessment-en.pdf [hereinafter *IPCC Second Assessment*]. The IPCC prepares regular Assessment Reports combining comprehensive information on "human induced climate change, potential impacts of climate change and options for mitigation and adaptation." Intergovernmental Panel on Climate Change, IPCC Reports http://www.ipcc.ch/ipccreports/index.htm (last visited Apr. 30, 2008). For the most recent Assessment Report, see U.N. Env't Programme & World Meteorological Org., IPCC, *IPCC Fourth Assessment Report, Climate Change 2007: Synthesis Report* (2007), available at http://www.ipcc.ch/ipccreports/ar4-syr.htm [hereinafter *IPCC Fourth Assessment*]. The *Summary for Policymakers* and *Technical Summary* of each report may be obtained free of charge from the IPCC Secretariat. The complete reports in English may be ordered from Cambridge University Press, at http://www.cambridge.cambridge.org/us/promotion.climatechange2007/default.html. For a rousing account of the climate change threat based largely on the IPCC reports, authored by a popular science writer, see MARK LYNAS, SIX DEGREES: OUR FUTURE ON A HOTTER PLANET (2007). For confirmation of the large degree to which the world's poor will suffer greatly from climate change, especially in developing countries, see U.N. Dev. Programme, *Human Development Report 2007/2008, Fighting Climate Change: Human Solidarity in a Divided World*, 2 (2007), available at http://hdr.undp.org/en/reports/global/hdr2007-2008. "How the world deals with climate change today will have a direct bearing on the human development prospects of a large section of humanity. Failure will consign the poorest 40 percent of the world's population—some 2.6 billion people—to a future diminished opportunity." *Id.*

2. *See IPCC Fourth Assessment*, *supra* note 1, at 1 (discussing adaptation and mitigation strategies).

from climate change harms and if present generations have corresponding *legal* obligations relative to them, some legal and moral theorists demur.[3] Often of libertarian persuasion, they are concerned about the nature of the legal obligations that might be imposed upon present generations and how these obligations would play out on their public and private institutions were the question to be answered in the affirmative. But their theoretical arguments, ontologically driven, are intrinsically sobering all the same. Future persons, they tell us, cannot have rights because they do not yet exist and, therefore, cannot *have* anything, including rights.[4] Future human beings are indeterminate and contingent, not actual, without identity. We cannot know their number or their needs, desires, or tastes. Indeed, we cannot even be sure that "they" will exist. As Derek Parfit and Thomas Schwartz have pointed out, our reproductive decisions will "repopulate" the future with persons different from those who otherwise might have existed; our decisions can determine even their composition and size.[5] Therefore, mindful of the truism that legal rights do not exist absent corresponding

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3. *See, e.g.*, DAVID GAUTIER, MORALS BY AGREEMENT (1986); ROBERT NOZICK, ANARCHY, STATE, AND UTOPIA, at ix (1974) (proposing that any governmental interference beyond a minimal state is unjustified and that a "state may not use its coercive apparatus for the purpose of getting some citizens to aid others"); Wilfred Beckerman, *Sustainable Development and Our Obligations to Future Generations*, *in* FAIRNESS AND FUTURITY: ESSAYS ON ENVIRONMENTAL SUSTAINABILITY AND SOCIAL JUSTICE 71, 85–92 (Andrew Dobson ed., 1999) [hereinafter Beckerman, *Obligations*] ("[P]riority should be given to the relatively simple humanitarian objective of moving towards just institutions and a 'decent' society. This objective should replace egalitarianism or 'sustainable development' as our major obligation to future generations . . . ."); Wilfred Beckerman, *The Impossibility of a Theory of Intergenerational Justice*, *in* HANDBOOK OF INTERGENERATIONAL JUSTICE 53, 53 (Joerg Chet Tremmel ed., 2006) [hereinafter Beckerman, *Intergenerational Justice*] ("[A]ny attempt to establish our moral obligations to future generations on the basis of their rights is a futile enterprise. . . . This is because future generations cannot be said to have any rights."); Robert L. Heilbroner, *What Has Posterity Ever Done for Me?*, N.Y. TIMES MAG., Jan. 19, 1975; Richard T. DeGeorge, *The Environment, Rights, and Future Generations*, *in* RESPONSIBILITIES TO FUTURE GENERATIONS: ENVIRONMENTAL ETHICS 157, 159 (Ernest Partridge ed., 1980) ("[Future generations] cannot be said to have rights in the same sense that presently existing entities can be said to have them."); Ruth Macklin, *Can Future Generations Correctly Be Said to Have Rights?*, *in* RESPONSIBILITIES TO FUTURE GENERATIONS, *supra* ("[T]he ascription of rights is properly to be made to actual persons—not possible persons."); Thomas H. Thompson, *Are We Obligated to Future Others?*, 1 ALTERNATIVE FUTURES 1 (1978); *see also* references cited *infra* note 13.

4. *See* DeGeorge, *supra* note 3, at 159 ("Future generations by definition do not now exist. They cannot now, therefore, be the present bearer or subject of anything, including rights."); *see also* Macklin, *supra* note 3, at 153 ("Sentience is not only a sufficient condition for ascribing rights to persons; it is also a necessary condition.").

5. *See* DEREK PARFIT, REASONS AND PERSONS pt. 4 (1984) [hereinafter PARFIT, REASONS AND PERSONS]; Derek Parfit, *Energy Policy and the Further Future*, *in* ENERGY AND THE FURTHER FUTURE: THE SOCIAL DISCOUNT RATE (D. MacLean & P.G. Brown eds., 1983) [hereinafter Parfit, *Energy Policy*]; Thomas Schwartz, *Obligations to Posterity*, *in* OBLIGATIONS TO FUTURE GENERATIONS 3–13 (R.I. Sikora & Brian Barry eds., 1978) (discussing how population control policies may affect the composition of future generations); Thomas Schwartz, *Welfare Judgments and Future Generations*, 11 THEORY AND DECISION 181 (1979).

legal duties and, vice versa, that legal duties do not exist absent corresponding legal rights, it follows, the skeptics say, that presently living persons cannot have *legal* obligations to future generations.[6]

Yet we can find abundant counterevidence to this way of thinking in the workings of domestic law systems, most or all of which make protective provision for future—commonly unborn—interests of one sort or another. Take the institution of the long-term ground lease, for example. An alternative to a land sale, a taxable event, it allows a lessor (landowner) to retain ownership of a property to capture its appreciation in value over time. Additionally, the lessor secures from a lessee (a user and improver of the property who commonly subleases) a long-term rental cash flow and a promise of reversion of the property and all its improvements at the lease's end—an incentive to the lessee to renew the lease well in advance of its expiration and for an additional long term. Increasingly central to economic development and commercial enterprise in the United States, the ground lease typically binds the lessor, the lessee, and all potential lessee tenants for up to ninety-nine years, a term beyond the probable lifetimes of most lessors and lessees and well in advance of the birth of many, if not most, of the lessee's potential tenants.[7]

Indeed, because most ground leases provide for the right of assignment to third parties, the lessors and lessees at the beginning of the lease often are not the same persons bound by the lease many years—decades—later. Surely it is possible, we may conclude, to establish a realistic theory and implementing strategy that makes present generations, as lessees of Planet Earth, legally accountable to the entire human family (including future generations), as lessor of the global commons (owned by no one but belonging to everyone), so as to ensure its continued vitality, diversity, and sustainability for eons to come. We are temporary lessees on a planetary ground lease whose worth is at least as great as a secure annual cash flow and appreciated value.

The ground lease is not, of course, the only instance where domestic law systems demonstrate concern for future interests. Short-term leasehold contracts require the return of property in good condition for use by future (possibly unborn) tenants; private and public trusts impose fiduciary duties on trustees to protect the trust corpus for future (possibly unborn) beneficiaries; legislation directs visitors of public parks and monuments not to despoil them for future (possibly unborn) users; and so forth. Indeed,

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6. For further discussion of libertarian theorizing, see *infra* Part III.

7. Commercial entities, to be sure, are often the lessors and lessees in long-term ground lease contracts. However, individual human beings also act in these capacities and, in any event, the choices and decisions of commercial entities are always the choices and decisions of sentient beings.

one need look no further than U.S. federal environmental statutes to prove the point. Several express concern for the ecological well-being of future generations, explicitly and some implicitly, even if none of them make it easy for that concern to be effectual.[8] For that matter, in all legal systems where custom, predictability, stability, and coherence are valued—in the common law system especially, where the doctrine of precedent (*stare decisis*) is controlling—it can be safely said that most if not all judicial decisions are as much about the future as they are about the past. In these and other intertemporal ways, domestic law systems embrace the idea that the law can, sometimes must, and often does safeguard the interests of future persons.[9]

Nevertheless, the idea that, in the context of global climate change, future generations can have legal rights and that present generations can have legal duties in relation to them has its detractors. Why? One reason, as we have seen, has to do with ideological persuasions and legal philosophy. Another has to do with the other-worldly remoteness of the

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8. *See* National Forest Management Act (NFMA), 16 U.S.C. §§ 1600(1), (3), 1601(a)(1) (2000) (stating that the Nation's renewable resources are "subject to change over time" and must be analyzed in terms of "present and anticipated uses"); National Environmental Policy Act (NEPA), 42 U.S.C. § 4331(a) (2000) ("[I]t is the continuing policy of the Federal Government . . . to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans."); Federal Land Policy and Management Act of 1976 (FLPMA), 43 U.S.C. § 1702(c) (2000) (defining "multiple use").

Other federal environmental statutes that do not contain express language protecting future generations are nonetheless susceptible of interpretation to this end. *See* Surface Mining Control and Reclamation Act (SMCRA), 30 U.S.C. §§ 1251–1279 (2000) (regulating the environmental impacts of surface coal mining); Federal Water Pollution Control Act (CWA) § 101(b), 33 U.S.C. § 1251(b) (2000) ("It is . . . the policy of the Congress to support and aid research relating to the prevention, reduction, and elimination of pollution . . . ."); Resource Conservation and Recovery Act (RCRA) of 1976, 42 U.S.C. § 6902 (2000) ("The objectives . . . are to promote the protection of health and the environment and to conserve valuable material and energy resources . . . . [and] to be the national policy of the United States that, wherever feasible, the generation of hazardous waste is to be reduced or eliminated as expeditiously as possible. Waste that is nevertheless generated should be treated, stored, or disposed of so as to minimize the present and future threat to human health and the environment."); Clean Air Act (CAA), 42 U.S.C. § 7403 (2000) (calling for a national research and development program to study "the short-term and long-term effects of air pollutants" on human health and ecosystems); Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 U.S.C. § 9601(24) (2000) (defining "remedy" as any action taken "to prevent or minimize the release of hazardous substances so that they do not migrate to cause substantial danger to present or future public health or welfare or the environment").

9. Domestic law systems can, must, and sometimes do protect, at least, the interests of future unborn *citizens*. But what about future non-citizens? As Edith Brown Weiss asks, "Does one country have an obligation to the future nationals of another country?" EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY, AND INTERGENERATIONAL EQUITY 26 (1989). The question is inescapable. In a world of separately sovereign states, climate change, a global—indeed galactic—phenomenon, commands that we think *interspatially* as well as *intertemporally*, across political boundaries as well as across time.

majority of future generations, ergo perplexity over the meaning of intergenerational justice across large spans of time.

In this Article, motivated by the conviction that the law cannot be timid in the face of threats to life as we know it, I probe each of these domains to uncover the legal theory or theories upon which intergenerational justice already is or may be convincingly founded.[10] This is a necessary task. To be intellectually persuasive and have popular support, legal rights and duties must be anchored in coherent theories of justice.

My project, thus, is to establish *in theory* that future generations can have a legal right to protection from climate change harms, both abrupt and normal, and that the ecological rights of future generations can define the ecological duties of present generations. Concluding this to be possible, I also argue that the ecological rights and duties of future and present generations, respectively, are best fulfilled by focusing public and private policy on an ecological legacy that is informed by the ecological values that future generations are meant to inherit and that present generations must bequeath if we do not want climate change to choose our destiny for us. Central to my project is, of course, the previously cited truism that legal rights do not exist absent corresponding legal duties and, vice versa, that legal duties do not exist absent corresponding legal rights. This is key. If future generations cannot be said to have a legal basis for asserting ecological rights vis-à-vis present generations, then neither can it be said that present generations can have corresponding legal duties relative to future generations. I, of course, recognize the possibility and power of moral rights absent corresponding moral duties.[11] My focus, however, is the law.

I therefore take issue with the skeptics who contend that theoretical discourse of this sort is unnecessary either because (1) identity-determining choices we make today (for example, opting to postpone having a child or committing genocide) can do no harm to people who may never exist as a consequence;[12] or (2) future generations will inherit the capacity to adapt to

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10. In the literature, the terms "intergenerational justice" and "intergenerational equity" are interchangeable. I prefer "intergenerational justice," however, because, in addition to the fact that "equity" has lost some of its resonance since equity was combined with law into one cause of action, it evokes the fundamentally relevant notion of "social justice."

11. Lawyers are not, of course, the only ones to worry about the normative implications of climate change harms relative to future generations. Philosophers (especially ethicists), scientists, and policy-makers, among others, do so also, albeit more from a moral than a legal perspective. The IPCC, for example, widely considered the most authoritative source on climate change science, has taken pains to point out that climate change raises "particular questions of equity among generations." *IPCC Second Assessment*, *supra* note 1, at 48.

12. *See supra* notes 4 & 5 and accompanying text.

climate change and, thus, not necessarily be worse off than persons living today.[13] While there is validity to the first argument insofar as unborn individual persons or possibly even groups are concerned, it has no merit when it comes to whole generations of people save for some wildly improbable chain of cataclysmic events. As for the second argument, the empirical evidence is shaky at best. Consider alone the economic and political resistance that until recently generally greeted "alternative energy" since NASA's James Hansen warned of global warming in the early 1980s[14]—a form of psychological denial that makes itself felt still to the present day despite even the latest reports of the authoritative IPCC.[15] These arguments, I submit, should not be taken seriously, particularly when the stakes are high. Climate change raises the specter of global ecological catastrophe. What is more, it is by no means assured that technological innovation will rescue us from it.[16]

Before proceeding to make the case for a theory upon which intergenerational ecological rights and duties may be grounded, however, I wish to be clear about what my project is not. Two issues merit brief comment.

First, it is not about whether unborn generations have a right to come into existence—"the right to be born," as philosopher Joel Feinberg puts it.[17] Regrettably, it is within the realm of possibility that this issue could arise in the context of a nuclear war or meltdown that, after a "nuclear winter" of long darkness and extreme cold, leaves all or part of our fragile planet so radioactively contaminated as to prevent life far into the future or

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13. *See, e.g.*, BJØRN LOMBORG, THE SKEPTICAL ENVIRONMENTALIST: MEASURING THE REAL STATE OF THE WORLD 259 (Hugh Matthews trans., Cambridge Univ. Press 2001) (1998) (introducing author's argument that unlikely "assumptions . . . about future technological change" has skewed global warming models); Beckerman, *Obligations*, *supra* note 3, at 71, 85; *see also* Beckerman, *Intergenerational Justice*, *supra* note 3 (arguing the "impossibility" of future unborn persons to have rights as a primary reason to dispense with intergenerational justice discourse).

14. *See* James Hansen et al., *Climate Impacts of Increasing Carbon Dioxide*, 213 SCIENCE 957 (1981) (describing the rise in global temperature between 1960s and 1990s); *cf.* Sharon Begley, *The Truth About Denial*, NEWSWEEK, Aug. 13, 2007, at 23 ("Since the late 1980s . . . . [a] well-funded campaign by contrarian scientists . . . has created a paralyzing fog of doubt around climate change.").

15. *See, e.g.*, *IPCC Second Assessment*, *supra* note 1 (concluding that over the past century the global climate has changed and various factors including human influence have contributed to the change).

16. Writes Mark Lynas, "[U]nless we decide to reduce greenhouse gas emissions within just a few years from now, our destinies will already be chosen and our path toward hell perhaps unalterable as the carbon cycle feedbacks . . . kick in one after another." LYNAS, *supra* note 1, at 263. Lynas continues: "Like the tormented souls Dante meets at the Sixth Circle of Hell, once the 'portals of the future close'—in Amazonia, Siberia, or the Arctic—we will find ourselves powerless to affect the outcome of this dreadful tale." *Id.* at 263–64.

17. JOEL FEINBERG, *The Rights of Animals and Unborn Generations*, *in* RIGHTS, JUSTICE, AND THE BOUNDS OF LIBERTY: ESSAYS IN SOCIAL PHILOSOPHY 159, 182 (1980).

even forever. Nevil Shute's *On the Beach*[18] and Cormac McCarthy's more recent *The Road* come to mind.[19] Apart from this possibility, however, and brain-teasing exercises in logic when philosophers imagine the end of our species,[20] it is not unreasonable to assume that future generations will exist with 100% certainty. My project is about the ecological conditions that future generations will face when they arrive.

Second, my project is not to be confused with the debate over reproductive rights that currently stalks U.S. law and policy. While successful "right to life" advocates have reconfirmed that the American legal system is capable of honoring claims of rights on behalf of unborn plaintiffs,[21] this debate is otherwise irrelevant to the question of intergenerational rights relative to climate change. In the climate change context, where the underlying legal (and moral) question is whether or not it is permissible to damage severely or even possibly destroy Planet Earth, the issue is not when life begins for an individual but, as indicated above, under what conditions it begins for a class of many. Writes environmental law scholar Edith Brown Weiss: "[I]ntergenerational rights are not in the first instance rights possessed by individuals. They are, instead, generational rights, which are held in relation to other generations—past, present and future."[22]

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18. NEVIL SHUTE, ON THE BEACH (1957), later adapted for the screenplay of a 1959 film of the same name featuring Gregory Peck, Ava Gardner, and Fred Astaire, and a 2000 television film also of the same name starring Armand Assante and Rachel Ward.

19. CORMAC MCCARTHY, THE ROAD (2006). The novel was awarded the Pulitzer prize for fiction in 2007.

20. *See, e.g.*, FEINBERG, *supra* note 17; Heilbroner, *supra* note 3, at 222. See also ALAN WEISMAN, THE WORLD WITHOUT US (2007), described by environmentalist Bill McKibben as "one of the grandest thought experiments of our time." For this review and others, see The World Without Us, http://www.worldwithoutus.com/news.html (last visited Apr. 30, 2008).

21. *See* Gonzales v. Carhart, 127 S. Ct. 1610, 1632–34, 1639 (2007) (upholding a ban of a partial birth abortion method Congress found too similar to infanticide); 18 U.S.C. §§ 1531(14)(G), (L) (Supp. 2003) (providing congressional findings in support of the ban of a partial birth abortion).

22. Edith Brown Weiss, *Intergenerational Fairness and Rights of Future Generations*, INTERGENERATIONAL JUSTICE REV. 1, 6 (2002) [hereinafter Brown Weiss, *Intergenerational Fairness*]; *see also* BROWN WEISS, *supra* note 9 ("The difficult issue is to define justice between countries in the context of generations."); Edith Brown Weiss, *The Planetary Trust: Conservation and Intergenerational Equity*, 11 ECOLOGY L.Q. 495, 498 (1984) ("[T]he human species holds the natural and cultural resources of the planet in trust for all generations of the human species."); Edith Brown Weiss, *Our Rights and Obligations to Future Generations for the Environment in Angora: What Obligation Does Our Generation Owe to the Next? An Approach to Global Environmental Responsibility*, 84 AM. J. INT'L L. 190, 198–207 (1990) [hereinafter Brown Weiss, *Our Rights and Obligations*]. In the literature generally, the adjectives "intergenerational" and "generational" are used interchangeably. Thus, *"intergenerational* fairness [or equity or justice]" and "intergenerational rights [or duties]" are sometimes labeled "generational fairness [or equity or justice]" and "generational rights [or duties]."

With these caveats, I turn to the challenge at hand. It is my argument that, in the context of climate change at least, future generations can have legal rights in theory and that, as a consequence, they can claim legal entitlement to intergenerational ecological justice (or "ecojustice" as it is sometimes called) in practice. But what is meant by "future generations"? And how is "intergenerational ecological justice" to be defined? I begin with these two rudimentary questions.

I. FUTURE GENERATIONS AND INTERGENERATIONAL ECOLOGICAL JUSTICE DEFINED

Not a little ink has been spilled on the meaning of "future generations" and "intergenerational ecological justice," the latter especially. I strive here to be brief.

A. "Future Generations"

Given the "continuum of human existence," writes a student of intergenerational relationships, "it seems problematic to define the future generation as the people who are not-yet-born because 'future people' are born into the present generation every minute."[23] He concludes: "Thus, it appears natural to include future generations in our moral community."[24] Except arguably in the case of children aborning,[25] this viewpoint appears to have won no adherents.

The meaning of "future generations" ranges from today's children[26] to unborn persons distant in the future without limitation—so-called "remote future persons," defined by one intergenerational theorist as "those that

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23. Huey-li Li, *Environmental Education: Rethinking Intergenerational Relationship*, PHIL. OF EDUC. Y.B. (1994), *available at* http://www.ed.uiuc.edu/eps/pes-yearbook/94_docs/Li.htm.

24. *Id.*

25. *See* Convention on the Rights of the Child, G.A. Res. 44/25, art. 1, U.N. Doc. A/RES/44/25 (Nov. 20, 1989), *reprinted in* 28 I.L.M. 1456, 1459 (1989), *available at* http://www.un.org/documents/ga/res/44/a44r025.htm ("[A] child means every human being below the age of eighteen years unless under the law applicable to the child, majority is attained earlier."). It should be noted that 193 states had ratified the Convention as of January 30, 2008, two more than are party to the U.N. Charter and lacking only Somalia and the United States among them. Press Release, General Assembly, States Parties to Rights of Child Convention Elect Nine Members to Monitoring Body, U.N. Doc. HR/4912 (Feb. 21, 2007). From this statistical standpoint, it can be credibly argued that the Convention has entered into customary international law, which is widely understood to be legally binding on all states.

26. *See, e.g.*, LAURA WESTRA, ENVIRONMENTAL JUSTICE AND THE RIGHTS OF UNBORN AND FUTURE GENERATIONS: LAW, ENVIRONMENTAL HARM, AND THE RIGHT TO HEALTH, at xv–xvii (2006) (referring to presently living children—denominated "the first generation"). Others refer to children as an "overlapping generation."

[sic] will come into existence after all those now living have ceased to exist."[27] Indeed, a definition unrestricted in time appears to be the dominant view. The Earth Charter of March 2002,[28] for example, created through, reputedly, the most open and participatory process ever associated with the drafting of an international declaration,[29] affirms the need to "[s]ecure Earth's bounty and beauty for present and future generations"[30] without temporal qualification of any kind.

I am sympathetic to treating "future generations" from this distant or remote future persons perspective. In the ecological context (climate change of course included), there is no theoretically plausible reason why remote unborn persons should not be accorded deference in roughly the same manner as persons living today or soon to follow. In the case of *Nuclear Energy Institute, Inc. v. Environmental Protection Agency*, for example, decided by the U.S. Court of Appeals for the District of Columbia Circuit in July 2004,[31] it is this long view that, for good reason, was presupposed both by the court and by all sides to the litigation. The case concerned the temporal standard to be applied to activate safely a federal repository for spent nuclear fuel and high-level radioactive waste at Yucca Mountain, Nevada. The time frame contested ranged from between "tens to hundreds of thousands of years after disposal, 'or even farther into the future.'"[32]

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27. *Id.*; EDWARD A. PAGE, CLIMATE CHANGE, JUSTICE AND FUTURE GENERATIONS 53 (2006).

28. The Earth Charter, http://www.earthcharterinaction.org/assets/pdf/EC.English.pdf (last visited Apr. 30, 2008) [hereinafter Earth Charter]. For a history of the Earth Charter, see Earth Charter in Action, http://earthcharterinaction.org/about_charter.html (last visited Apr. 30, 2008) [hereinafter Earth Charter History].

29. According to the Earth Charter International Council:

> [T]he Earth Charter is a widely recognized, global consensus statement on ethics and values for a sustainable future. Developed over a period of ten years, in what has been called the most extensive global consultation process ever associated with an international declaration, the Earth Charter has been formally endorsed by over 2,500 organizations, including global institutions such as UNESCO and the World Conservation Union (IUCN).

Earth Charter History, *supra* note 28.

30. *Id.* princ. 4.

31. Nuclear Energy Inst., Inc. v. Envtl. Prot. Agency, 373 F.3d 1251 (D.C. Cir. 2004).

32. *Id.* at 1267 (quoting NAT'L ACAD. OF SCIS. [NAS], TECHNICAL BASES FOR YUCCA MOUNTAIN STANDARDS 2 (1995)). In this case, the three-judge panel unanimously voided a 10,000-year nuclear radiation safety guideline the EPA had written for the repository because it found the EPA, in violation of federal law, had "unabashedly rejected" the findings of the National Academy of Sciences (the federal government's scientific adviser). *Id.* at 1270. These findings indicated that there is "no scientific basis for limiting the time period of the individual-risk standard to 10,000 years or any other value." *Id.* at 1267 (quoting NAS, *supra*, at 55). They also indicated that "compliance assessment is feasible for most physical and geologic aspects of repository performance on the time scale of the long-term stability of the fundamental geologic regime—a time scale that is on the order of 10^6 [one million]

Immanuel Kant put it this way: "[H]uman nature is such that it cannot be indifferent even to the most remote epoch which may eventually affect our species, so long as this epoch can be expected with certainty."[33] Such distant horizons, however, are hard for the average person to grasp, let alone clasp empathetically. They also are not required for the pressing emergencies that current climate change trends portend. Unless rapidly and decisively addressed within the next decade (possibly sooner), many serious—potentially cataclysmic—ecological and socioeconomic harms are believed likely to occur within 100 years or less.[34] Simply put, we do not have the luxury of delay. Indeed, as is well known to, for example, the Inuit of the Arctic, the Maasai of Kenya's Rift Valley, and the citizens of Kiribati, the Marshall Islands, Tuvalu, Vanuatu, and other South Pacific nations, we already are experiencing the initial impacts of climate change,[35]

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years at Yucca Mountain." *Id.* (quoting NAS, *supra*, at 6). "NAS also explained that humans may not face peak radiation risks until tens to hundreds of thousands of years after disposal, 'or even farther into the future[.]'" *Id.* at 1267 (quoting NAS, *supra*, at 2). Given these findings, the court observed, the Academy "recommend[ed] that compliance assessment be conducted for the time when the greatest risk occurs, within the limits imposed by the long-term stability of the geologic environment." *Id*. at 1270–71 (quoting NAS, *supra*, at 6–7). In passing the Energy Policy Act of 1992, Congress required the EPA to set standards for Yucca Mountain consistent with the time frame for radiation risks *as determined by the NAS*. *Id.* at 1282–83 (emphasis added). For thoughtful insight, see John S. Applegate & Stephen Dycus, *Institutional Controls or Emperor's Clothes? Long-Term Stewardship of the Nuclear Weapons Complex*, [1998] 28 Envtl. L. Rep. (Envtl. L. Inst.) 10,631, 10,631–34 (discussing "the challenges that [the U.S. Department of Energy] faces in developing an effective long-term stewardship program"); Richard Routley & Val Routley, *Nuclear Energy and Obligations to the Future*, *in* RESPONSIBILITIES TO FUTURE GENERATIONS, *supra* note 3, at 277, 298 ("[O]n the basis of its effects on the future *alone*, the nuclear option is morally unacceptable.").

33. IMMANUEL KANT, *Idea for a Universal History with a Cosmopolitan Purpose*, *in* KANT'S POLITICAL WRITINGS 41, 50 (Hans Reiss ed., H. B. Nisbet trans., Cambridge Univ. Press 1970) (1784) (discussing Kant's "Eighth Proposition").

34. *IPCC Fourth Assessment Report*, *supra* note 1, at 6–7.

35. *See* Ana Nunez, The Inuit Case Study, http://www.ciel.org/Publications/Climate/CaseStudy_Inuit_Sep07.pdf (last visited Apr. 30, 2008) (unpublished study prepared for CIEL) ("Inuit hunters are now navigating new travel routes, trying to avoid areas of decreasing ice stability and changing their hunting practices to coincide with shifts in the migration times and routes of caribou, geese, and new species that are moving northwards."); *Human Rights and Global Warming*, 127 Period of Sessions Before the IACHR (Mar. 1, 2007) (testimony of Sheila Watt-Cloutier to the Inter-American Commission on Human Rights) (transcript available at http://www.earthjustice.org/library/legal_docs/testimony-before-iachr-on-global-warming-human-rights-by-sheila-watt-cloutier.pdf) (discussing "how global warming and climate change are affecting the basic survival in many vulnerable regions and, in particular, of indigenous cultures throughout the Americas"); *Kenya's Maasai Plead for Help Against Global Warming*, TERRA.WIRE, Nov. 10, 2006, http://www.terradaily.com/2006/061110110020.4tgsq2gp.html ("The Maasai are feeling the first and worst of climate change."); Stephen Leahy, *Tiny Tuvalu Fights for Its Literal Survival*, INTER PRESS SERVICE, July 27, 2007, http://ipsnews.net/news.asp?idnews=38695 (reporting that the South Pacific island nation of Tuvalu may only have fifty years or less before rising sea levels from climate change entirely engulfs and floods the tiny island nation); Jonathan Adams, *Rising Sea Levels Threaten Small Pacific Island Nations*, INT'L HERALD

and its effects are likely to become much more pronounced within the next few decades.

It seems wise, therefore, not to try to make any single time horizon fit all circumstances, but, rather, to allow the circumstances to determine the time horizon most useful to the circumstantial need. "It seems reasonable," writes environmentalist philosopher Bryan Norton, "to use shorter time scales for consideration of some risks and longer time scales for other issues (such as storage of nuclear wastes)."[36]

Accordingly, given the closeness of the climate change threat and therefore the urgent need to mobilize against it, I favor conceiving of "future generations" in more or less proximate terms in this context: embracing persons potentially within one's personal awareness if not actual knowledge, possibly but not necessarily involving overlapping generations. In Native American parlance, they are "the coming faces"[37]—constituents of the seven generations referenced in the Iroquois Nation maxim: "In our every deliberation, we must consider the impact of our decisions on the next seven generations."[38]

To energize the rapid response needed to meet the climate change challenge, however, a deliberative time frame shorter than even seven generations seems required. For this reason, I draw upon the strategic outlook that renown sociologist and futurist Elise Boulding recommended for policy makers and others contemplating the future:

TRIB., May 3, 2007, http://www.iht.com/articles/2007/05/03/asia/pacific.php (discussing the effects of global warming on low-lying atolls).

36. BRYAN G. NORTON, SUSTAINABILITY: A PHILOSOPHY OF ADAPTIVE ECOSYSTEM MANAGEMENT 326 (2005).

37. Carol Jacobs (Cayuga Bear Clan Mother), Presentation to the United Nations (July 18, 1995), *in* 1 AKWESASNE NOTES 116, 116–17 (1995), *available at* http://www.ratical.org/many_worlds/6Nations/PresentToUN.html.

38. *See* Oren R. Lyons, *The American Indian in the Past*, *in* EXILED IN THE LAND OF THE FREE: DEMOCRACY, INDIAN NATIONS AND THE U.S. CONSTITUTION 33 (Oren Lyons & John Mohawk eds., 1992).

> The Gayaneshakgowa, the Iroquois Great Law of Peace, is . . . important in human history. It is the earliest surviving governmental tradition in the world that we know of based on the principle of peace; it was a system that provided for peaceful succession of leadership; it served as a kind of early United Nations; and it installed in government the idea of accountability to future life and responsibility to the seventh generation to come. All these ideas were prevalent among the Haudenosaunee before the arrival of the white man, according to the oral history of the elders of that society.

Id.; *see also* N. BRUCE DUTHU, AMERICAN INDIANS AND THE LAW ch. 5 (2008) ("Stewards of the Natural World").

> I propose . . . thinking in a time-span which I call the "two-hundred year present." . . . [It] begins one hundred years ago today, on the day of the birth of those among us who are centenarians, celebrating their one hundredth birthday today. The other boundary of this present moment is the hundredth birthday of the babies being born today. It is a continuously moving moment, always reaching out one hundred years in either direction from the day we are in. We are linked with both boundaries of this moment by the people among us whose lives began or will end at one of those boundaries, *three and a half generations each way in time*. It is our space, one we can move around in directly in our lives, and indirectly by touching the lives of the linkage people, young and old, around us.[39]

Conceiving our temporal space in this way, I believe, demystifies the meaning of "past" and "future" generations. It signals not some far off abstracted beings, but—assuming good health for all—our parents, grandparents, and great-grandparents, on the one hand, and our children, grandchildren, and great-grandchildren on the other. As such, it has at least three distinct advantages:

> (1) it helps to remove vagueness of generational identity, thereby strengthens the conviction that future generations can and should have rights, and consequently facilitates our seeing how theories of social justice can be transferred from the intragenerational to the intergenerational setting in a chain of consecutively beneficial concern from generation A to generation B and so on through and beyond generations Z and AA;
>
> (2) it stirs us to personalize our understanding of what we have inherited from the past; and, thus reminds us that all futures have pasts that influence, it simultaneously moves us to an active interest in a future past—our present—that we pass on to adjacent next generations; and
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> (3) it in no way prejudices remote future persons because the outer boundary of the present (roughly 100 years) is a continuously moving moment that, with the passing of each generation, makes proximate what previously was remote,

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39. Elise Boulding, *The Dynamics of Imaging Futures*, 12 WORLD FUTURE SOC'Y BULL., No. 5, Sept.-Oct. 1978, at 7.

> potentially benefiting remote unborn persons as they become proximate unborn persons and so on ad infinitum.

Thinking in this temporal frame, in sum, the odds are greater that we will strive for a legacy as good or better than the one we have inherited. In the context of climate change, this could make all the difference, particularly if we succeed at equitably distributing the burdens of adjustment that are associated with uneven capabilities and conditions in the developed and developing worlds. But we dare not tarry. The theory that technological innovation will conquer all and bring material happiness to future generations, a theory of progress with us since the Enlightenment, is now in doubt.

In the remainder of this Article, therefore, I adopt, for strategic reasons only, a proximate definition of "future generations" that reflects our personal linkage, both direct and indirect, with the future—three and a half generations of persons yet to be born from this day forward at a minimum.

I do so, however, with qualification: I include children in my definition (persons under age eighteen).[40] With rare exception, children are little better positioned than unborn persons to determine their future. Like unborn generations, though they be "lives in being," they require conservators, guardians, trustees, or other proxies or surrogates to represent their interests before the bar of legal—and oftentimes public—opinion.[41] They are, it has been said, "[the] representatives of future generations living today."[42] It also has been said that, in our presently endangered ecological moment, they are the new "canaries."[43] For these reasons, they are as much deserving of protective justice, though administered *intra*generationally, as unborn persons are deserving of protective justice administered *inter*generationally. The distinction between them is one without significant difference except in time.

I recognize, of course, the potential for confusion here (especially when referencing others who intend "future generations" to mean future *unborn* persons only). The terms "future generations" and "future unborn

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40. *See* Convention of the Rights of the Child, *supra* note 25 (defining the term "child" for the purpose of the Convention).

41. WESTRA, *supra* note 26, at 147 ("[F]or a long time, children cannot speak on their own behalf or represent themselves, and cannot always guess exactly what their future choices and preferences might be. These are also the characteristics of future generations.").

42. Aleg Cherp, *Background Paper of Working Group 5: Intergenerational Justice and Environmental Sustainability*, presented to Berlin Intergovernmental Conference for Children in Europe and Central Asia, at 2 (2001), *available at* http://web.ceu.hu/envsci/aleg/projects/Children.pdf. For judicial endorsement of this view, see the Philippine case of *Oposa et al. v. Factoran*, G.R. No. 101083 (S.C., July 30, 1993), *reprinted in* 33 I.L.M. 173 (1994).

43. WESTRA, *supra* note 26, at 3.

generations" do not necessarily embrace the same range of people. To avoid confusion, therefore, I use the term "future unborn generations" or "unborn generations" whenever fact or logic dictate reference to future generations exclusive of living children.

B. "Intergenerational Ecological Justice"

The concept of intergenerational ecological justice appears to have first emerged in modern environmental times in preparatory meetings for the 1972 Stockholm Conference on the Human Environment which adopted, in June of that year, the much celebrated Stockholm Declaration on the Human Environment.[44] The preamble of the Stockholm Declaration several times proclaims the "goal" of defending and improving the human environment "for present and future generations," and its Principle 1 expresses "the common conviction" that humanity "bears a solemn responsibility to protect and improve the environment for present and future generations."[45] Around the same time, in the 1972 London Ocean Dumping Convention, the 1972 World Cultural and Natural Heritage Convention, the 1973 Endangered Species Convention, and the 1974 Charter of Economic Rights and Duties of States,[46] in several regional seas conventions such as

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44. Conference on the Human Environment, Stockholm, Swed., June 5–16, 1972, *Report of the United Nations Conference on the Human Environment*, 3, U.N. Doc. A/CONF.48/14/REV.1 (June 16, 1972) [hereinafter Stockholm Declaration], *reprinted in* 5 INTERNATIONAL LAW AND WORLD ORDER: BASIC DOCUMENTS V.B.3 (Burns H. Weston & Jonathan C. Carlson eds., 12th ed. 2006). For an earlier known formal recognition of the concept of intergenerational ecological justice, preceding the first global Earth Day on April 22, 1970, as well as the March 1970 equinoctial Earth Day celebrated by the U.N., see International Convention for the Regulation of Whaling, pmbl. Dec. 2, 1946, 161 U.N.T.S. 72 ("Recognizing the interest of the nations of the world in safeguarding for the future generations the great natural resources represented by the whale stocks . . . ."), *reprinted in* 5 INTERNATIONAL LAW AND WORLD ORDER, *supra*, at V.H.2; *see also* Argument of the United States, Fur Seal Arbitration (U.S. v. Gr. Brit.), *reprinted in* 9 FUR SEAL ARBITRATION: PROCEEDINGS OF THE TRIBUNAL OF ARBITRATION (Gov't Printing Office 1895).

45. Stockholm Declaration, *supra* note 44, princ. 1. Additionally, Principle 2 of the Stockholm Declaration which declares that "[t]he natural resources of the earth, including the air, water, land, flora and fauna, and especially representative samples of natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate." *Id.* princ. 2.

46. *See* Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft, Feb. 15, 1972, 26 U.S.T. 2403, 932 U.N.T.S. 3 ("Recognizing that the marine environment and the living resources which it supports are of vital importance to all nations . . . ."); Convention Concerning the Protection of the World Cultural and Natural Heritage pmbl., Nov. 16, 1972, 27 U.S.T. 37, 1037 U.N.T.S 151 ("Considering that parts of the cultural or natural heritage are of outstanding interest and therefore need to be preserved as part of the world heritage of mankind as a whole . . . ."), *reprinted in* 5 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, at V.B.4; Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) pmbl., *opened for signature* Mar. 3, 1973, 27 U.S.T. 1087, 1037 U.N.T.S. 151 ("Recognizing that wild fauna and flora . . .

the 1976 Barcelona Mediterranean Sea Convention,[47] in the 1982 U.N. World Charter for Nature,[48] and in the 1997 UNESCO Declaration on Responsibilities Towards Future Generations,[49] identical concern for the ecological legacy we leave to future generations was formally expressed.

It was, however, for the 1987 report of the U.N. World Commission on Environment and Development (WCED)[50]—popularly known as the "Bruntland Commission Report on Our Common Future," to give the concept of intergenerational justice its first concrete meaning. Seeking to recapture the spirit of the 1972 Stockholm Conference by joining the environment and development as a holistic issue, it famously stated that socioeconomic development, to be sustainable, must ensure that "it meets the needs of the present without compromising the ability of future generations to meet their own needs."[51] This statement, aided by the publication of *Our Common Future*[52] and the subsequent work of the WCED, helped to lay the groundwork for the 1992 Earth Summit which produced the Rio Declaration on Environment and Development and its companion Agenda 21, each of which made the well-being of "present and future generations" a high priority.[53] The Vienna Declaration and

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are an irreplaceable part of the natural systems of the earth which must be protected for this and generations to come . . . ."), *reprinted in* 4 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, at V.H.10; Charter of Economic Rights and Duties of States, G.A. Res. 3281, pmbl., U.N. GAOR, 29th Sess, Supp. (No. 31), at 50, U.N. Doc. A/9631 (Dec, 12, 1975) ("Stressing the importance of . . . strengthening instruments of international economic co-operation as a means for the consolidation of peace for the benefit of all . . . ."), *reprinted in* 4 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, at IV.F.5.

47. Convention for the Protection of the Mediterranean Sea Against Pollution, Feb. 16, 1976, 1102 U.N.T.S. 27 (1976), *reprinted in* 5 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, at V.F.18a. The preamble to this convention states that "[t]he Contracting Parties are fully aware of their responsibility to preserve this common heritage for the benefit and enjoyment of present and future generations."

48. World Charter for Nature, G.A. Res. 37/7, Annex, U.N. GAOR, 37th Sess., Supp. (No. 51), at 17, U.N. Doc. A/RES/37/51 (Oct. 28, 1983), *reprinted in* 5 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, at V.B.11.

49. Declaration on the Responsibilities of the Present Generations Towards Future Generations, G.C. Res. 31, art. 4, U.N.E.S.C.O., 29th Sess., U.N.E.S.C.O Doc. 29 C/Res. 31 (Nov. 12, 1997), *available at* http://www.unesco.org/cpp/uk/declarations/generations.pdf ("Resolv[ing] to strive to insure that the present generations are fully aware of their responsibilities towards future generations . . . .").

50. GRO HARLEM BRUNDTLAND ET AL., OUR COMMON FUTURE: THE WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT, OUR COMMON FUTURE (1987).

51. *Id.* at 8.

52. *See generally id.* (publishing the WCED report as an annex to U.N. G.A. Res. 42/427).

53. Conference on Environment and Development, Rio de Janeiro, Braz., June 13, 1992, *Report of the United Nations Conference on Environment and Development*, U.N. Doc. A/CONF.151/26 (vol. I) (Aug. 12, 1992), *reprinted in* 5 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, at V.B.16; U.N. Dep't of Int'l Econ. & Soc. Affairs, Div. for Sustainable Dev., *Agenda 21, Report of the*

Programme of Action adopted by the U.N. Conference on Human Rights in June 1993[54] and U.N. General Assembly resolutions relating to protection of our global climate have likewise given future generations high priority.[55]

The concept of intergenerational justice has been much cited also in both official and scholarly circles. Which doubtless is why political economist and future generations scholar Jörg Tremmel, founder of the German-based Foundation for the Rights of Future Generations (FRFG),[56] was recently led to write that "[t]he concept of intergenerational justice may very well become an intellectual *leitmoif* of the new century."[57] Dr. Tremmel continues:

> Since the earliest days of the environmental movement, the rights and interests of future generations have been invoked in argumentative discourse. These days, however, barely a budget debate passes in a parliament anywhere in the world without the Minister of Finance justifying his planned cuts on the grounds of generational or "financial sustainability." In many European countries, youth movements for intergenerational justice have formed and members of the younger generation use moral issues on talk-shows to put their opponents from the older generation under intense pressure.[58]

United Nations Conference on Environment and Development, vols. I–III, U.N. Doc. A/CONF.151/26 (June 3–14, 1992) [hereinafter *Agenda 21*], *as reprinted in* 5 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, at V.B.17.

54. World Conference on Human Rights, June 14–25, *Vienna Declaration and Programme of Action*, ¶ 37, U.N. Doc. A/CONF.157/23 (July 12, 1993), *reprinted in* 32 I.L.M. 1661, 1663–87 (1993), *available at* http://www.un.org/children/conflict/keydocuments/english/viennadeclaratio21.html.

55. *See, e.g.*, Protection of Global Climate for Present and Future Generations of Mankind, G.A. Res. 46/169, U.N. Doc. A/RES/46/169 (Dec. 19, 1991) ("Recalling its resolutions 45/53 of 6 December 1988, 44/207 of 22 December 1989 . . . and resolution 45/212 of 21 December 1990 . . . .").

56. Established in 1997, the FRFG is a think tank founded by a group of European students who worried about the future and wanted to promote intergenerational justice in terms of both ecology and economy. Accredited by the German state of Hessen, it has supporting members throughout the world. FRFG-International Justice-Who We Are, http://www.intergenerationaljustice.org (follow "Who We Are" hyperlink at left) (last visited Apr. 30, 2008) [hereinafter FRFG Website].

57. Joerg Chet Tremmel, *Introduction* to HANDBOOK OF INTERGENERATIONAL JUSTICE 1 (Joerg Chet Tremmel ed., 2006) [hereinafter Tremmel, *Introduction*]. Elsewhere Tremmel writes: "The concept of Generational Justice is a leading contender in the race to become the intellectual leitmotif of the dawning century. The demand for a new system of ethics, one that takes into consideration the rights of coming generations, is becoming increasingly urgent." Joerg Tremmel, *Generational Justice—A Leading Concept for the New Century*, INTERGENERATIONAL JUSTICE REV. 3–4 (2002), http://www.intergenerationaljustice.org/images/stories/publications/gg7_20021106.pdf [hereinafter Tremmel, *Generational Justice*].

58. Tremmel, *Introduction*, *supra* note 57.

Tremmel cites such issues as the high rate of youth unemployment, the insecurity of state pension or retirement systems, the public debt, and environmental degradation as primary among the concerns of intergenerational justice. Each, he observes, are examples of present-day discrimination against future generations, reflecting "a complete political programme—from environmental and financial to educational policy."[59]

It is this "complete political programme" that informs Tremmel's definition of "intergenerational justice." Such justice exists, he writes, "when the accumulated capital, which the next generation inherits, is at least as high as what the present generation inherited."[60] By "the accumulated capital" that shapes each generation's legacy to the next, Tremmel has in mind: "*natural capital*" ("[t]he stock of environmental assets important for supporting human life, for the generation of well-being, and for amenity and beauty"); "[*human*]-*made capital*" ("[m]achinery, infrastructure, and institutions as well as financial assets");[61] "*cultural capital*" (institutions such as democracy and market economy, constitutions and legal codes); "*social capital*" (existing solidarity within society, stable relationships between individuals and groups, values); and "*human capital*" ("health, education, skills, knowledge").[62] His list corresponds, more or less, with what in recent years economic, political, and legal theorists have come to call "global public goods,"[63] urgently to be safeguarded, even expanded, if the world is to avoid catastrophe or conflict or both.

There are some who would modify Tremmel's definition of "intergenerational justice." Moral and political philosopher Brian Barry, for example, believes that it would be unfair to leave all non-renewable resources undiminished for the sake of future generations and thus favors leaving future generations "no worse off (in terms of productive capacity)

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59. *Id.* at 2.

60. Jörg Chet Tremmel, *Is a Theory of Intergenerational Justice Possible? A Response to Beckerman*, INTERGENERATIONAL JUSTICE REV. 6, 7 (2004) [hereinafter Tremmel, *A Response to Beckerman*]; *accord* NORTON, *supra* note 36, at 305.

61. Tremmel uses the term "man-made." Tremmel, *Generational Justice*, *supra* note 57, at 4. I prefer "human-made" to avoid a use of gendered language that is historically distortive in this instance.

62. Tremmel, *A Response to Beckerman*, *supra* note 60, at 6; *see also* Tremmel, *Generational Justice*, *supra* note 57, at 4.

63. *See generally* GLOBAL PUBLIC GOODS: INTERNATIONAL COOPERATION IN THE 21ST CENTURY (Inge Kaul et al. eds., 1999) ("[A] globalizing world requires a theory of global public goods to achieve crucial goals such as . . . the reduction of environmental pollution."). American economist Paul A. Samuelson is credited as the first economist to develop the theory of public goods. In his classic 1954 paper *The Pure Theory of Public Expenditure*, 36 REV. ECON. & STATS. 387–89 (1954), he defined public goods (what in his paper he called a "collective consumption goods") as "[goods] which all enjoy in common in the sense that each individual's consumption of such a good leads to no subtractions from any other individual's consumption of that good." Public goods are thus understood to be *non-rivalrous* and *non-excludable* in character.

than they would have been without the depletion."[64] For another, the late John Rawls would have argued that present generations should not just maintain but also improve the legacy they receive before it devolves to the next generation.[65]

Yet, though the concept of intergenerational justice did not emerge until after the first Earth Day but a few decades ago,[66] there is general agreement on its core meaning today. This is perhaps best evidenced in the six regional meetings leading up to and including the landmark May 2002 U.N. Special Session on Children.[67] Particularly noteworthy was the work of the Berlin Intergovernmental Conference for Children in Europe and Central Asia in May 2001.[68] Its final report stressed a major theme of the Conference:

> [It] broke new ground in linking the three concepts of justice between generations, environmental sustainability and the rights of children. Efforts towards linking children issues with Agenda 21 of the Rio Conference[69] have been underway for some time. But the idea of looking at the environment from the perspective of intergenerational justice—the obligation to leave behind a world that is better or at least as good as the one we inherit and understanding what this means in terms of protecting the rights of future, as yet unborn, children opened a number of new horizons. The need to ensure that options are kept open for future generations and transmitting social values and institutions that are non-discriminatory and protective of the rights of children, was found to have profound implications.[70]

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64. BRIAN BARRY, DEMOCRACY, POWER AND JUSTICE 519 (1989).

65. JOHN RAWLS, A THEORY OF JUSTICE 293 (1971).

66. The first global Earth Day was April 22, 1970. The first U.N. Earth Day was the day of the March 2007 equinox, a month earlier.

67. *See* United Nations Children's Fund [UNICEF], Special Session on Children, http://www.unicef.org/specialsession (providing details on the U.N. Special Session) (last visited Apr. 30, 2008).

68. The Governments of the Federal Republic of Germany, Bosnia, and Herzegovina, with the support of UNICEF, *Conference on Children in Europe and Central Asia: Setting an Agenda for Children in Europe and Central Asia, Preparing for the United Nations General Assembly Special Sessions on Children* 8 (May 16–18, 2001) [hereinafter *Berlin Conference on Children*], *available at* http://www.unicef.org/ceecis/Final_Berlin_Report.pdf.

69. *Agenda 21*, *supra* note 53, *as reprinted in* 5 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, at V.B.17.

70. *Berlin Conference on Children*, *supra* note 68, at 8. The major theme, one of four singled out for special notice in the report, emerged from one of the Conference's six working groups. The working group on Intergenerational Justice and the Environment had to

The main outcome of the Conference was its *Berlin Commitment for Children in Europe and Central Asia*, adopted by consensus and invoking the term "intergenerational justice" for the first time, it is believed, in official U.N. pronouncements.[71] It is important to acknowledge, however, the earlier contribution of the above-cited 1998 Aarhus Convention,[72] which, though regional in scope,[73] has been characterized by former U.N. Secretary-General Kofi Annan as "the most ambitious venture in the area of environmental democracy so far undertaken under the auspices of the United Nations."[74] Stressing the need for citizen participation in environmental issues and for access to environmental information held by public authorities, the Convention also links environmental values and human rights by "[r]ecognizing . . . that every person has the right to live in an environment adequate to his or her health and well-being, and the duty, both individually and in association with others, to protect and improve the environment for the benefit of present and future generations."[75]

The concept of intergenerational justice appears also to rest comfortably with all disciplines. The FRFG, embracing multiple disciplines, sums it up thusly: "[I]ntergenerational justice means that today's children and future generations must be capable to [sic] meet their own needs and fulfill their rights and aspirations to at least the same extent as the generation governing today."[76] For its formulation, the FRFG

> take into account the need to respect and protect the rights of future, unborn, generations of children . . . [to encourage] greater complementarity in applying the principles of Agenda 21, the Aarhus Convention, and the CRC, promot[e] a more child-centred and multi-disciplinary approach to environmental and intergenerational issues, [conduct] long term impact studies on developments that threaten the well-being and rights of future children . . . and extend the liability period for environmental damage in international conventions.

Id. at 3–4; *see also* Convention on the Rights of the Child, *supra* note 25; Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, June 25, 1998, 38 I.L.M. 517 (1999) *available at* http://www.un.org/Depts/Treaty/collection/notpubl/27-13eng.htm, *reprinted in* 5 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, at V.B.18, [hereinafter Aarhus Convention].

71. For details on the Berlin Intergovernmental Conference and its "Berlin Commitment," see *Berlin Conference on Children*, *supra* note 68.

72. *See* Aarhus Convention, *supra* note 70.

73. As of September 2007, the Convention had been ratified by forty-one primarily European and Central Asian states and the European Community. The state parties are members of the Economic Commission for Europe and states have consultative status with the Commission. *Id.*

74. U.N. Econ. Comm'n for Eur. (UNECE), About the Aarhus Clearinghouse, http://aarhusclearinghouse.unece.org/about.cfm (last visited Apr. 30, 2008).

75. For details on the U.N. Special Session on Children, see UNICEF's website at http://www.unicef.org/specialsession/press/01pr47.htm. For details on the Berlin Intergovernmental Conference and its "Berlin Commitment," see *Berlin Conference on Children*, *supra* note 68.

76. *See* FRFG website, *supra* note 56.

expressly acknowledges the late German ethicist Hans Jonas who, in his influential book, *The Imperative of Responsibility*, admonished everyone to "[a]ct so that the effects of [our] action[s] are compatible with *the permanence of genuine human life on earth*."[77] I concur. Who would not?

But how does the FRFG's broad definition (or Jonas's famous appeal that inspired it) translate to specific concrete issues of environmental law and policy? What is its text when confronted with the question of whether or not it is just, morally or legally, for today's children and future generations to have to inherit a legacy of nuclear and hazardous waste, loss of biodiversity, ozone depletion, and global warming?

The above-quoted Final Report of the May 2001 Berlin Conference on Children is suggestive when it equates intergenerational ecological justice with "the obligation to leave behind a world that is better or at least as good as the one we inherit."[78] Environmental philosopher Peter Brown argues, in the tradition of John Locke, that all peoples, including future peoples, have three categories of rights: "bodily integrity," "moral, political and religious choice," and "subsistence rights," the protection of all three of which, he further argues, is the responsibility of present generations and their governments.[79]

A more juridically defined response, however, spelled out in her pioneering book *In Fairness to Future Generations*,[80] is provided by environmental law scholar Edith Brown Weiss. Dr. Brown Weiss cites three basic principles of intergenerational ecological "equity" (as she calls it): conservation of options, conservation of quality, and conservation of access.[81] Intergenerational equity (or justice) is achieved, she argues, when

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77. HANS JONAS, THE IMPERATIVE OF RESPONSIBILITY: IN SEARCH OF AN ETHICS FOR THE TECHNOLOGICAL AGE (Hans Jonas trans., 1st English ed. 1984) (emphasis added). Jonas's book is credited with having catalyzed the environmental movement in Germany. Renown for his work on the social and ethical problems created by technology, he argued that human survival depends on our efforts to care for our planet and its future.

78. *Berlin Conference on Children*, *supra* note 68, at 8.

79. PETER BROWN, ETHICS, ECONOMICS AND INTERNATIONAL RELATIONS 20–21 (2000).

80. BROWN WEISS, *supra* note 9. *In Fairness to Future Generations* received the Certificate of Merit Award in 1990 from the American Society of International Law, and has been published in French, Japanese, Spanish, and Chinese.

81. *Id.* While Brown Weiss does not say so, the three principles clearly rest comfortably with the Civil Law doctrine of usufruct from which the Common Law doctrine of waste was derived. In general, the doctrine of usufruct concerns the right to use, enjoy, and profit from personal or real property vested in another provided that such use, enjoyment, and profit does not alter the substance of the property in question. On the incorporation of this Civil Law doctrine into the Common Law and its early evolution, see, for example, WYNDHAM ANSTIS BEWES, THE LAW OF WASTE: A TREATISE ON THE RIGHTS AND LIABILITIES WHICH ARISE FROM THE RELATIONSHIP OF LIMITED OWNERS AND THE OWNERS OF THE INHERITANCE WITH REFERENCE TO THE TENEMENTS 82 (Sweet & Maxwell 1894) (discussing Roman law in context of timber harvest).

each living generation:

- "does not unduly restrict the options available to future generations in solving their problems and satisfying their own values"—and thereby recognizes that future generations are "entitled to diversity [of natural and cultural resources] comparable to that enjoyed by previous generations";[82]

- "maintain[s] the quality of the earth so that it is passed on in no worse condition than [it] received it"—and thereby recognizes that future generations are "entitled to a quality of the planet comparable to the one enjoyed by previous generations";[83] and

- "provide[s] its members with equitable rights of access to the legacy from past generations" and "conserve[s] this access for future generations."[84]

These principles of intergenerational ecological justice are widely endorsed in the environmental literature and appear now to be widely accepted as the general norm.

I endorse this tripartite definition of intergenerational justice as well. I do so, however, less because it has proven popular (though that is important) than because of its virtues. As Westra has observed, Brown Weiss's definition "comprise[s] both rights and duties, and these include both '*intra*generational' and '*inter*generational' aspects."[85] Also appealing, particularly within the "two-hundred-year-present" framework strategically adopted in this Article, her definition lives well with both the ethical

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82. BROWN WEISS, *supra* note 9, at 39; *see also* Brown Weiss, *Intergenerational Fairness*, *supra* note 22, at 1, 5.

83. BROWN WEISS, *supra* note 9, at 39; *see also* Brown Weiss, *International Fairness*, *supra* note 22, at 5 (cautioning that in implementing this principle, "trade-offs are inevitable"); *accord* BARRY, *supra* note 64.

84. BROWN WEISS, *supra* note 9, at 38; *see also* Brown Weiss, *Intergenerational Fairness*, *supra* note 22, at 5. This "conservation of access" principle, it may be noted, foreshadows the above-mentioned 1998 Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters. Aarhus Convention, *supra* note 70. For helpful insight into the Aarhus Convention, see Jeremy Wates, *The Aarhus Convention: Promoting Environmental Democracy*, *in* SUSTAINABLE JUSTICE: RECONCILING ECONOMIC, SOCIAL AND ENVIRONMENTAL LAW 393 (Marie-Claire Cordonier Segger & C.G. Weeramantry eds., 2005) (introducing "a new kind of environmental agreement . . . link[ing] environmental rights and human rights").

85. WESTRA, *supra* note 26, at 136 (emphasis added).

rationales that give intergenerational justice moral purpose and the jurisprudential theories that give it legal standing.[86]

II. THE ETHICAL AND PRAGMATIC RATIONALES FOR INTERGENERATIONAL JUSTICE

To define "intergenerational justice" is not to answer why it is needed. Indeed, there doubtless are some who would argue that it matters not at all. As seventeenth-century English essayist Joseph Addison famously imagined of a miserly college alumnus asked to contribute generously to the well-being of his successors: "'We are always doing something for Posterity,' says he, 'but I would fain see Posterity doing something for us.'"[87] Addison, I hasten to add, was contemptuous of such people, finding them of "poor and base heart, void of all generous principles and love to mankind."[88]

In the contemporary literature, many of the answers given to why intergenerational justice matters would have pleased Joseph Addison. Prominent among them are those of philosophers Alfred North Whitehead and Joel Feinberg. The self-contained independent person with concern for no one else, Whitehead held, is a concept that, at risk to self-interest, fails to comprehend human society as a web of interdependent relations with the past, present, and future, and thus is "without any validity for modern civilization."[89] Feinberg, in a much cited essay, put it this way: "[Despite] their present facelessness and namelessness . . . , we can tell . . . that the shadowy forms in the spatial distance belong to human beings . . . ; and this imposes a duty on us not to throw bombs in their direction."[90] The identity and interests of future persons may be vague, he contended, but the realization that future persons have interests that are affected by present action is enough to remind the living that we have a duty to minimize harm to those who are yet to live. Significantly, most if not all of the world's religions espouse these same views.[91] Future generations, it has been said, should be "inheritors of God's creation," not mere survivors.

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86. For additional virtues, see *infra* Part II.B.

87. Joseph Addison, No. 583, THE SPECTATOR, Aug. 20, 1714, *reprinted in* THE WORKS OF JOSEPH ADDISON, COMPLETE IN THREE VOLUMES 373 (1864). Addison was co-founder of The Spectator.

88. *Id*.

89. ALFRED NORTH WHITEHEAD, ADVENTURES OF IDEAS 34 (1933).

90. FEINBERG, *supra* note 17, at 181–82.

91. *See, e.g.*, ARC-Alliance of Religions and Conservation, Faiths & Ecology, http://www.arcworld.org/faiths.htm (providing a comprehensive overview documenting the ecological views of Bahá'í, Buddhism, Christianity, Daoism, Hinduism, Islam, Jainism, Judaism, Shintaoism,

Additional answers to our why-does-it-matter question are conveniently grouped as follows:

- because the earth, its natural and cultural environment especially, does not belong to one generation only, but, instead, is held by past, present, and future generations in common, as a species forming the community of humankind as a whole;[92]

- because, as members of a community and a culture, we benefit from sacrifices and investments made by members of prior generations;[93]

- because each generation has a duty to maintain and improve civilization to such extent as is required to uphold and further just institutions for the benefit of the next;[94]

- because each generation has a contract with the next generation to pass on the gifts it has inherited jointly from the past;[95]

- because each generation has a duty not to inflict dramatic harm upon succeeding generations who can do no harm, ergo will do no harm, to their predecessors;[96]

- because no generation should be deliberately favored or disadvantaged over another;[97]

- because no generation should have to envy the impersonal resources enjoyed by predecessor generations;[98]

Sikhism, and Zoroastrianism); *see also* THE CLIMATE INSTITUTE (AUSTRALIA), COMMON BELIEF: AUSTRALIA'S FAITH COMMUNITIES ON CLIMATE CHANGE 5–39 (2006) (reporting "a dialogue on the morality of climate change" among Anglicans, Bahá'ís, Baptists, Buddhists, Catholics, Evangelical Christians, Greek Orthodox, Hindus, Jews, Lutherans, Muslims, and Sikhs, among others, including The Salvation Army).

92. BROWN WEISS, *supra* note 9, ch. 2.

93. NORTON, *supra* note 36, at 338.

94. RAWLS, *supra* note 65, at 293.

95. PETER BARNES, CAPITALISM 3.0: A GUIDE TO RECLAIMING THE COMMONS 12 (2006).

96. ONORA O'NEILL, TOWARDS JUSTICE AND VIRTUE 113–21 (1996); Henry Shue, *Climate*, *in* A COMPANION TO ENVIRONMENTAL PHILOSOPHY 450 (Dale Jamieson ed., 2001) ("Failing to deal with climate change constitutes inflicting harm on generations who could have been spared all such harm."); *see also* Henry Shue, *Harming the Grandchildren*, Ethics and Climate Change Conference Abstracts, http://depts.washington.edu/ponvins/ecc/abstracts.html (last visited Apr. 30, 2008) (abstract of paper presented at conference) [hereinafter Shue, *Harming the Grandchildren*].

97. Tremmel, *Generational Justice*, *supra* note 57, at 7.

- because the impact of environmentally degrading policies at the hands of present generations tends often to be long-term and therefore threatens and harms future generations only;[99]

- because, even if they do not have them now, future generations will have properties tomorrow shaped substantially by the values practiced by present generations today, and that is reason enough;[100]

- because present actions may not only deprive future generations of benefits they might otherwise have enjoyed, but also inflict upon them disadvantages and problems they would not seek;[101]

- because the policies of present generations will affect not only the interests of future generations, but, as well, their rights and, what is more, the obligations their affected rights will impose on their contemporaries;[102]

- because future generations are under-represented in legal and political processes and thus disadvantaged relative to the power of present generations to affect adversely their quality of life;[103]

- because advancing science and technology have expanded the sphere of human control and thereby given present generations greater capacity and consequent responsibility to offset future dangers and risks;[104]

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98. PAGE, *supra* note 27, at 64–65.

99. *Id.* at 38.

100. FEINBERG, *supra* note 17, at 181–82; Routley & Routley, *supra* note 32.

101. Clark Wolf, *Intergenerational Justice*, *in* A COMPANION TO APPLIED ETHICS 279, 280 (R.G. Frey & Christopher Heath Wellman eds., 2003).

102. Wilfred Beckerman, *Intergenerational Justice*, INTERGENERATIONAL JUSTICE REV. 1, 4 (2004). The author explains by quoting Routley & Routley, *supra* note 32, at 292: "Future items *will* have properties even if they do not have them now, and that is enough to provide the basis for moral concern about the future. Thus the thesis of obligations to the future does not presuppose any special metaphysical position on the existence of the future." Any jurist reading this argument for intergenerational moral behavior surely must ask why it could or should not be sufficient for legal concern about the future as well.

103. Emmanuel Agius, *Intergenerational Justice*, INTERGENERATIONAL JUSTICE REV. 24 (2005).

104. JONAS, *supra* note 77; Hans Jonas, *Technology and Responsibility: The Ethics of an Endangered Future*, *in* RESPONSIBILITIES TO FUTURE GENERATIONS, *supra* note 3, at 23, 34–35; *see also* Dieter Birnbacher, *Responsibility for Future Generations: Scope and Limits*, INTERGENERATIONAL

- because science and technology can work wonders only if they are guided by principles of intergenerational solidarity, cooperation, and sharing;[105]

- because today's children and future generations will need a preserved environment to live, and live well;[106]

- because, at the very least, even if all individuals do not want offspring, all societies need and therefore have affection for their children, grandchildren, great-grandchildren, and thus care about their future well-being at a minimum.[107]

Each of the foregoing—essentially ethical—rationales for intergenerational justice, including those of Whitehead, Feinberg, and the above referenced worldwide religious communities,[108] is, I submit, compelling, separately and especially together. They raise and convincingly answer issues fundamental to twenty-first century morality and, in so doing, give legitimacy to efforts to prevent and minimize climate change harms to future generations.

The rationales are compelling also from a pragmatic point of view. When all is said and done, concern for intergenerational justice is critical to any f*easible* as well as legitimate solution to global climate change. The importance of this fact cannot be overstated. If we do not etch a profile in courage marked by respect for future generations, it is likely that we will have more than our conscience to chide us. Oxford University moral philosopher Henry Shue, when exploring the moral and physical implications of failing to deal with climate change and with future

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JUSTICE REV. 22 (2005); *cf.* ARC-Faiths and Ecology, The Dalai Lama on Protecting the Environment, http://www.arcworld.org/faiths.asp?pageID=64 ("It is not difficult to forgive destruction in the past which resulted from ignorance. Today however we have access to more information, and it is essential that we re-examine ethically what we have inherited, what we are responsible for, and what we will pass on to coming generations.") (last visited Apr. 30, 2008).

105. Emmanuel Agius, *Intergenerational Justice*, *in* HANDBOOK OF INTERGENERATIONAL JUSTICE, supra note 57, at 317.

106. *See* BARNES, *supra* note 95, at 5 (introducing a modern definition of "the commons").

107. *See* RAWLS, *supra* note 65, at 284–98 (discussing "justice between generations" and their assumed "time preference"). Rawls premises this rationale—a psychological generalization he calls the "motivational assumption," *id.* at 292—on a "chain of concern" model of distributive justice that assumes self-interested as well as empathetic fairness from one generation to the next. PAGE, *supra* note 27, at 164.

108. *See* ARC-Alliance, *supra* note 91; *see also* THE CLIMATE INSTITUTE (AUSTRALIA), *supra* note 91.

generations firmly in mind, put it this way:

> 1. Failing to deal with climate change constitutes, not failing to help future generations, but inflicting harm on them;
>
> 2. Failing to deal with climate change constitutes inflicting harm on generations who could have been spared all such harm;
>
> 3. Failing to deal with climate change constitutes not simply continuing to make it worse, but unnecessarily creating opportunities for it to become significantly worse by feeding upon itself through positive feedbacks that would otherwise not have occurred; and
>
> 4. Failing to deal with climate change constitutes not only unnecessarily creating opportunities for the planetary environment to become significantly worse, but also unnecessarily creating opportunities for it to become catastrophically worse.[109]

In sum, potentially severe "inconvenient truths" await disregard of intergenerational appeals for climate justice, morally or legally defined. Assuming we care about the sustainability of our planet and the survival of our species (or of only our own societies or descendants), they point to the conclusion that our self-interest depends on our achieving ecological justice for future generations. It also is the right thing to do. "A thing is right," wrote Aldo Leopold "when it tends to preserve the integrity, stability and beauty of the biotic community."[110]

There remains, however, a potentially disconcerting question. Regarding climate change, is it not enough to evince concern for present generations who already are being harmed by climate change? Might it not be persuasively argued, environmental law scholar Richard Brooks asks, *advocatus diaboli*, "that no special attention has to be given to future generations because such protection is implied in the protection of present generations?"[111] Brooks continues:

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109. Shue, *Harming the Grandchildren*, supra note 96.

110. ALDO LEOPOLD, A SAND COUNTY ALMANAC 224–25 (1949).

111. Memorandum from Richard O. Brooks to Professors Burns H. Weston and Tracy Bach, Vermont Law School, Time and the Rights of Future Generations (Nov. 5, 2007) (on file with the author).

> Let's take the First Amendment Freedom of Speech clause. Assume it protects the present generation. Does it also protect a future person whose freedom of speech might be harmed? Does a present case involving the freedom of speech carry implications for a future person's freedom of speech? The argument may be made that environmental harms to future generations are different because there is no present threat but only a future one. But even if this is correct (and one might doubt it), doesn't law deal with future threats, both in common law and constitutionally, even if there isn't a present serious threat? For example, in common law, injunction of a nuisance may involve minimal present harm but threaten future harm. Moreover, doesn't the rationale of deterrence accept the future effect of a law, irrespective of whether there is a present deterrence?[112]

Professor Brooks's point is not to be summarily dismissed. As noted at the outset, in all legal systems that prioritize custom, predictability/stability, and coherence at least in theory, legal decision-making is as much about the future as it is about the past. This certainly is true of the American legal system. Furthermore, in our pursuit of happiness, authenticity, and freedom, constitutional law scholar Jed Rubenfeld reminds us that modernity directs us to live in the present.[113] The future, we are commonly advised, will take care of itself.

We are thus left to ask: will efforts to protect present generations against climate change harms not also benefit future generations simultaneously? And will this self-focus not buy us happiness, authenticity, and freedom for being helpful to others at the same time? The answer: "Yes, sometimes in the near term, depending on the harm and the corrective chosen."

But as Rubenfeld cautions, and Brooks would agree, modernity's imperative rests on an inadequate, deforming picture of the relationship between human happiness, authenticity, and freedom on the one hand and time on the other, utterly disregarding that these values—indeed, being human itself—necessarily engage the past and future as well as the present. What is more, confirming Rubenfeld, near-sightedness has its consequences. Without accounting for the harms that mostly future

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112. *Id.*

113. *See* JED RUBENFELD, FREEDOM AND TIME: A THEORY OF CONSTITUTIONAL SELF GOVERNMENT 3 (2001) ("The demand to live in the present . . . is a matter, in the first instance, not of pleasure but of freedom.").

generations are likely to suffer, there is no guarantee that solutions for the present will be adequate for the future, hence no guarantee that genuine human happiness, authenticity, and freedom can be realized.

At least six other pragmatic reasons explain why it is better to be far-sighted (sometimes even beyond three and a half generations forward) and why, therefore, it is essential to place future generations and intergenerational justice front and center in our worldview:

> (1) future generations will be more severely damaged by climate change than present generations—indeed, they will be its greatest victims, especially in the relatively near future before physical and psychological adaptations can set in for the lucky;[114]
>
> (2) while climate change harms obviously will not affect future generations until they actually populate Earth, the threats to them already exist, in potentially cataclysmic ways, mounting exponentially;
>
> (3) climate change solutions that plan for the well-being of future generations are better positioned to combat climate change than those that plan for the well-being of present generations because they likely will be constructed to combat not only the relatively minor effects of climate change felt in the present, but also the harsher effects of climate change that hold out, at least cumulatively, the real possibility of planetary catastrophe in the future;
>
> (4) it defies common sense to expect that domestic law systems as presently constituted, even when faced with urgent problems such as climate change that recognize no political boundaries, will rule instinctively let alone swiftly in favor of planetary over national interests; and accordingly, there is no reason to expect that, absent some historic shift, they can or should be invested with significant authority to frame humanity's legal climate change agenda and strategy;
>
> (5) it is disregard of the interests of future generations and intergenerational justice that has in large part led to nuclear and hazardous waste, loss of biodiversity, ozone depletion, and global warming (not to mention high rates of youth

114. *See supra* note 1 and accompanying text.

> unemployment, the insecurity of state pension or retirement systems, the public debt, etc.); and
>
> (6) just as there is nothing more practical than a good theory, so is there nothing more pragmatic than ethical behavior, and particularly when the brief for such behavior is powerful, as in the instant case of ecological justice for future generations, and when it is pursued in societies committed to democratic governance in both word and deed.

Thus, just as there are many good reasons to champion the interests and needs of present generations—as well as the value that attention to them can have for future generations (in common law systems especially)—so also are there many good reasons to champion the interests and needs of future generations. There are in fact abundant reasons why the interests and needs of future generations must be accorded large deference and just treatment, even if this is costly to present generations. As shown above, some of these reasons are ethical, some pragmatic.

Indeed, there are reasons that are both ethical and pragmatic at the same time. Recall, for example, the above-noted claim that intergenerational justice matters for the ethical reason that today's children and future generations need a preserved environment to live in dignity.[115] To fulfill this need—and, one must add, the need of today's children and future generations to fulfill the ecological obligations that they will have to *their* future generations—*all* members of the present community of nations, rich and poor alike, must share in the burdens of climate change adjustment. This universal sharing of responsibility is unlikely to happen, however, unless it is equitable in its conception and execution—made to reflect the uneven capabilities and conditions of the developed and developing worlds.

If so done, it is not unreasonable to expect that present-day wealthy industrialized economies should accept a "polluter pays" duty to make up for past greenhouse-gas-emission sins by providing low-cost and otherwise generous transfers of capital, technology, and skills to help the poor and emerging economies modernize, without having to rely heavily upon carbon-based energy—a matter of profound self-interest. In the end, the ecological options and access to resources of future generations would be benefitted.[116] So also, however, are the environments of present generations

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115. *See supra* note 106 and accompanying text.

116. The application of the "polluter pays" principle in the intergenerational context is consistent with Brown Weiss's "conservation of options" and "conservation of access" principles of

and, not coincidentally, the economies of their wealthy members—a win-win outcome that is as pragmatic as it is ethical. This, I would argue, is the stuff of which human happiness, authenticity, and freedom are made. It also is the stuff of which every major theory of social justice is made.

III. FOUNDATIONAL THEORIES OF INTERGENERATIONAL JUSTICE

It is a familiar view that ethical and pragmatic values are essential components of effective social justice. But they are not sufficient. Ethical and pragmatic arguments supporting the idea that future generations *should* have rights (and present generations duties corresponding to them) do not of themselves answer whether future generations *can* or *do* have rights (or present generations duties corresponding to them). In the context of climate change, inevitable conflicts between the interests of present and future generations cannot be consistently or reliably resolved by resort to what are essentially intuitive judgments. Needed is a theory (or theories) of justice upon which intergenerational justice (and all the ethical and pragmatic rationales for it) may be convincingly founded. Social rights and duties are necessarily based in coherent theories of social justice.

This Article cannot hope to provide a fully developed theory of intergenerational justice. This would take a book or more.[117] However, I do briefly explore several lines of philosophical thought to understand the providence they bring to such a theory.[118] Ultimately, I favor a theory of intergenerational justice that behooves a world public order of human dignity, one that is spatially and temporally inclusive in reach and rooted in the value of respect.

Presently, theories of social justice tend to divide between "libertarian" and "liberal" theories. Libertarian theories of social justice, sometimes called "conservative," maintain that government should protect private property and enforce only people's "negative" rights ("freedoms from"). Liberal theories, by contrast, favor "positive" rights ("rights to"), accepting

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intergenerational justice. *See supra* text accompanying notes 82 & 84. For elaboration, see generally BROWN WEISS, *supra* note 9, at 40–45, chs. III and IV.

117. Brown Weiss, for one, has done large service in this regard, specifically in relation to the global environment. BROWN WEISS, *supra* note 9. See also the works of Derek Parfit, defining the problems of how we can and should relate to future people. PARFIT, REASONS AND PERSONS, *supra* note 5; Derek Parfit, *Comments*, 96 ETHICS 832, 854–862 (1986); Parfit, *Energy Policy*, *supra* note 5; Derek Parfit, *Equality or Priority?*, *in* THE IDEAL OF EQUALITY (Matthew Clayton & Andrew Williams eds., 2000) [hereinafter Parfit, *Equality or Priority?*]; Derek Parfit, *Future Generations: Further Problems*, 11 PHIL. & PUB. AFF. 113, 113–19 (1982) [hereinafter *Future Generations*]; Derek Parfit, *On Doing the Best for Our Children*, *in* ETHICS & POPULATION 100 (Michael D. Bayles ed., 1976).

118. In this exploration, I am indebted to Edward Page for helpful insight. PAGE, *supra* note 27.

government as a promoter of socioeconomic and political well-being, although not to the exclusion of civil and political "freedom from" rights.

Thus, libertarian theorists do not favor social or political agendas that invite governmental intervention. In support of this view and in the intergenerational context, most assert that it is conceptually impossible for future generations to be protected by social justice norms—which is to say future generations cannot, and therefore do not have rights.[119] Their argument is summarized in the following syllogism:

- any coherent theory of social justice involves conferring rights on people;
- future generations, being unborn, are not yet people;
- therefore the interests of future generations cannot be promoted or protected according to any theory of justice.

From this perspective, intergenerational justice is a conceptual impossibility that precludes further discourse. All that is conceded in defense of future generations is that they will have interests—of one sort or another—and that, for one or more of the reasons discussed previously,[120] we, the living, have a *moral* but not a *legal* obligation to appraise our policies with those interests in mind.[121]

I disagree with this line of reasoning. If future interests can generate moral obligations to be fulfilled by present-day duty-bearers, it also is true that proxy or surrogate rights-holders, lawfully appointed, can cause future interests to be treated as *legally* recognized *rights*.[122] The difference between future interests that summon moral duty and those that evoke legal entitlement is not a function of some metaphysic. Rather, it is a function of precisely that which distinguishes the "ought" from the "is" in law: some at least minimal degree of simultaneously authoritative and effective control or enforcement. This is well known to all legal systems.

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119. *See, e.g.*, GAUTIER, *supra* note 3; NOZICK, *supra* note 3, at 33 ("[N]o moral balancing act can take place among us; there is no outweighing of one of our lives by others."); Ruth Macklin, *Can Future Generations Correctly Be Said to Have Rights?*, *in* RESPONSIBILITIES TO FUTURE GENERATIONS, *supra* note 3, at 151. But compare to the statutory language cited *supra* note 8.

120. *See supra* text accompanying notes 89–107.

121. *See, e.g.*, Beckerman, *Intergenerational Justice*, *supra* note 3, at 54 (explaining that future generations may have "moral standing" if not legal rights). See also the authorities cited *supra* note 3.

122. *See* Christopher D. Stone, *Should Trees Have Standing? Toward Legal Rights for Natural Objects*, 45 S. CAL. L. REV. 450, 464 (1972) (proposing the idea that proxies or surrogates may litigate or otherwise represent non-human biospheric entities).

Furthermore, as philosopher Annette Baier has observed, "[t]he ontological precariousness of future generations that some see as a reason for not recognizing any rights of theirs is not significantly greater than that of the future state of present persons."[123] As a result, the ontological argument does not by itself excuse us from assuming legal responsibility to them.[124] At the very least, we cannot on this basis disclaim our moral responsibility to explore the theory (or theories) upon which the ecological rights of future generations might be established. "[T]he critical vulnerability of nature to Man's technological intervention—unsuspected before it began to show itself in damage already done," Hans Jonas has admonished, "requires a commensurate ethics of foresight and responsibility, which is as new as are the issues with which it has to deal."[125] "[N]ovel powers to act require novel . . . rules and perhaps even a new ethics."[126]

I therefore turn to liberal theories of social justice that, as previously noted, have in common the acceptance of government as a facilitator of rights as well as a commitment to individual liberty comparable to libertarian theories. Liberal theorists believe that government should promote and enforce positive rights (for example, health, education, economic well-being, etc.) and likewise nurture and expand public goods (for example, clean air and other environmental goods, information/ knowledge, law enforcement, etc.).[127]

Some liberal theorists support these rights and goods on utilitarian grounds.[128] However, as the utility principle (famously defined by Jeremy Bentham as "the greatest happiness of the greatest number"[129]) is conceived by utilitarians as the sole measure of right and wrong, it is not a favored approach to climate change ethics. Dominant instead are contractarian theories of social justice, which view just norms, institutions, and procedures as those arrived at by free and rational agreement among all relevant parties—"the ideal contract." Of course, unanimity of agreement is typically unachievable and, indeed, phenomenally impossible when it

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123. Annette Baier, *The Rights of Past and Future Generations*, *in* RESPONSIBILITIES TO FUTURE GENERATIONS, *supra* note 3, at 171, 174.

124. KANT, *supra* note 33, at 50–51.

125. Jonas, *supra* note 104, at 28, 31 (emphasis omitted).

126. *Id.* at 35.

127. On public goods, see *supra* note 63.

128. *See, e.g.*, LOMBORG, *supra* note 13 (endorsing utilitarianism at least implicitly); Beckerman, *Intergenerational Justice*, *supra* note 3 (same). *See generally* S. FRED SINGER, HOT TALK, COLD SCIENCE: GLOBAL WARMING'S UNFINISHED DEBATE (1998).

129. JEREMY BENTHAM, INTRODUCTION TO THE PRINCIPLES OF MORALS AND LEGISLATION 4–5 & n.1 (Prometheus Books 2007) (1780).

comes to unborn contractual parties. Accordingly, most contractarian theories, particularly those that concern themselves with intergenerational justice, argue that just social arrangements "are those that *could be* the object of a free and rational agreement. . . . [and therefore] are often called *hypothetical contractarian conceptions of justice*."[130]

A. Two Prominent Contractarian Theories of Social Justice

Significantly, there is, among the most prominent contractarian theories of social justice, a convergence of opinion that future generations have a legal—as well as moral—right to an environmental legacy that leaves them no worse off (more or less) than the generation preceding them. While perhaps not equally useful to the interests of future generations, it seems not to matter whether the rights are distributive or reciprocity-based in character or whether their guiding principle is equality, priority, sufficiency, or some other value. This convergence applies to today's living children—"the first generation"—as well as to unborn persons. To avoid confusion, however, I consider this matter in terms of future *unborn* generations only. Most social justice theorists do not include lives-in-being when arguing for or against the idea of intergenerational rights.

1. Distributive Justice

Theories of distributive justice, which date back at least to Aristotle, are today most prominently associated with John Rawls and Ronald Dworkin.[131] They are concerned with how social goods are allocated among society's diverse members and may be understood in both substantive and procedural terms.

Substantive theories of distributive justice, as they might be called, commonly assert that the distributive allocation must be fair to all, as if it is the result of an ideal contract freely and rationally negotiated.[132] As such,

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130. Wolf, *supra* note 101, at 284.

131. *See, e.g.*, RAWLS, note 65, at 310–15; JOHN RAWLS, JUSTICE AS FAIRNESS: A RESTATEMENT 50 (2001) (discussing "the problem of distributive justice"); DWORKIN, *supra* note 96.

132. It may be noted that Rawls's "original position"–"veil of ignorance" thought experiment and Dworkin's auction and insurance market devices are classic examples of hypothetical contractualism, each of which are designed to achieve neutrality, ergo fairness, in moral and legal decision-making. RAWLS, *supra* note 64, at 17-22, 136–42; DWORKIN, *supra* note 98, at 65–71, 73–83. Dworkin's theory is an attempt to improve upon Rawls's theory by overcoming some of its shortcomings, in particular to prevent profiteering or suffering in the distribution of goods due to one's undeserved natural abilities or disabilities (unknown and therefore beyond the control of the physically able or handicapped in Rawls's "original position"–"veil of ignorance" scenario). Hereinafter, however, I rely extensively on Rawls's approach but not Dworkin's, which is difficult to apply in the

whether fairness is measured by equality (to everyone the same welfare, resources, or capabilities), priority (to each according to one's contribution or need), or sufficiency (to everyone enough to pursue one's aims and aspirations without major distress or dissatisfaction), they are result-oriented and consequently speak to both sides of the contractual equation—the rights-holders and the duty-bearers—to ensure fair results. In the intergenerational context, recalling that legal duties do not exist absent corresponding legal rights, proxies or surrogates must be authorized to represent the interests of the unborn rights-holders.

Procedural theories of distributive justice, in contrast, are process-oriented. They are concerned with the fairness and transparency of resource allocation decisions. Akin to notions of "due process" (United States), "fundamental justice" (Canada), "procedural fairness" (Australia) and "natural justice" (other common law jurisdictions), they focus on the administration of distributive justice. In the intergenerational setting, they require, like substantive theories, lawfully appointed agents, competent to act on behalf of the unborn, to ensure that moral rights and duties are accorded legal status.

There are numerous variants of distributive justice.[133] At their core, however, especially when they are considered in combined substantive-procedural terms and when sufficiency is the guiding value, they give foundational support to Brown Weiss's tripartite definition of intergenerational ecological justice.[134] Their warp and woof is fairness—in the quantity and quality of diverse resources distributed and in the access to them given by one generation to the next. Assuming persons or institutions authorized to represent future generations, the central question is not whether future generations have rights and present generations have duties

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intergenerational setting. Dworkin's central contention that the demands of distributive justice are most effectively revealed by appraising the interaction of mature adults in idealized markets is perhaps useful in helping to clarify how best to ensure intergenerational equality of personal and impersonal resources even while being insensitive to the needs and interests of children. *See* PAGE, *supra* note 27, at 62–67.

Further, concerned to improve the public good, but recognizing that the market does not always succeed, he does advocate robust state support for art and culture to benefit future as well as present generations. "We inherited a cultural structure," he writes in *A Matter of Principle*, "and we have some duty, out of simple justice, to leave that structure at least as rich as we found it." RONALD DWORKIN, A MATTER OF PRINCIPLE 232–33 (1985). But Dworkin's scheme requires a complex taxation and capital transfer system to achieve its desired results, not easily managed in the intergenerational setting. His theorizing about the rights of future generations appears not to have gone beyond his concern for the arts and culture. And it is not clear that his call for a strong state-supported cultural structure does not reflect more a politically liberal preference than a quest for neutrality.

133. For examples of useful expositions see NOZICK, *supra* note 3, at 149–231; Parfit, *Equality or Priority*, *supra* note 117, at 81.

134. *See* BROWN WEISS, *supra* note 9, at 38; *see also* Brown Weiss, *Intergenerational Fairness*, *supra* note 22.

in relation to them. The central question is how fair distribution should be measured. This is what Rawls called the "fair share" or "just saving" question—what and how much present generations should save for the benefit of future generations.[135] The exact measure of "fair share" is, of course, open to differing interpretations.[136]

2. Reciprocity-Based Justice

Reciprocity-based theories of social justice likewise support the Brown Weiss's definition of intergenerational ecological justice. As implied from their denomination, their unifying premise is that only those who contribute to the well-being of others are entitled to the full sweep of rewards that society has to offer. The idea is as old as the Bible at least: "Give, and it shall be given to you. . . . For whatever measure you deal out to others, it will be dealt to you in return."[137]

A self-interested interpretation of this contribution principle is that the good that one gives to others must be good also for oneself. Otherwise, norms of reciprocity will fail to generate consensus and cooperation among the otherwise competing parties. This interpretation is not now especially favored among Western theorists. Nevertheless, it is not hard to see how, among rational beings, the self-interest that resides in conserving resources, safeguarding ecological diversity, or curbing climate change for one's own sake or the sake of one's family, descendants, or country—each involving potentially multiple generations—can generate consensus and cooperation.[138] Nor is it hard to see how such environmentally defined self-interest can serve simultaneously the interests of unborn generations.

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135. Space limitations prevent discussion of this complex issue in this Article. For a helpful summary and critique of Rawls in this regard, however, see Wolf, *supra* note 101, at 286–91. For calling my attention to this arbitration and its treatment of intergenerational ecological justice, I am deeply indebted to Professor Jonathan C. Carlson, my long-time Iowa colleague, collaborator, and friend.

136. *Id.*

137. *Luke* 6:38.

138. There are of course people who either do not procreate or do not care about the well-being of their descendants. Arguably, therefore, it is unfair to expect such people to sacrifice their present well-being in the same way that we expect people with descendants to do. Edward Page responds to this issue persuasively as follows:

> Perhaps the strongest response is that, since even the childless and loveless derive *present* benefits from additional people in society, such as those related to extra contributions coming into the pension system, it could be argued that the former are also bound by a duty of fair play to treat the well-being of the next generation as a public good.

It is the interpretation of the contribution principle that values mutuality over self-advantage, however, that resonates most with notions of intergenerational ecological justice and Brown Weiss's definition of it. The history, from the 1997 Kyoto Protocol[139] to the 1994 U.N. Convention on Climate Change,[140] is illustrative of how this is so. Both the slowness of states to ratify the Protocol (a period of seven years) and the refusal of the United States even to ratify it were the result, in major part, of differing views of fair reciprocity relative to the percentage reductions of greenhouse gas emissions that, at the time, were required of the developing and developed countries respectively.

Again, what matters most for present purposes are two key points that merit special notice. Together they underpin the relationship between climate change and that part of reciprocity-based justice that is concerned with the entitlements of future persons and the obligations of living persons.

First, notions of fairness are at the heart of both the self-interest and mutuality representations of reciprocity-based justice, just as notions of fairness permeate and shape theories of substantive and procedural distributive justice. As Rawls put it, "we are not to gain from the cooperative labors of others without doing our fair share."[141]

Second, this reciprocity-based fairness is applicable intergenerationally as well as intragenerationally. Reciprocity is of course not to be found coming from people not yet born except when they are represented by authorized agents living in the present. At the same time, while this latter arrangement is helpful, it is not required for reciprocity-based justice to be realized. For example, by invoking a "stewardship model" of intergenerational reciprocity,[142] it is reasonable to contend that intergenerational rights and duties be held in relation to generations past and present—as well as future—so that each generation gives to the next a fair share of the fair share it received from the generation preceding. Similarly, invoking a "chain of concern model" of intergenerational

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PAGE, *supra* note 27, at 117. In any event, the issue seems a minor one when compared to the enormity and pervasiveness of the climate change threat to the human and natural environment worldwide. Arguably, therefore, it may be discounted for practical even if not theoretical purposes.

139. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, FCCC/CP/1997/L.7/Add.1, *reprinted in* 37 I.L.M. 32 (1998) and 5 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, V.E.20d.

140. United Nations Framework Convention on Climate Change, *opened for signature* May 9, 1992, 1771 U.N.T.S. 107 (*entered into force* Mar. 21, 1994), *reprinted in* 5 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, V.E.19.

141. RAWLS, *supra* note 65, at 112. The exact measure of "fair share" is of course open to differing interpretation.

142. *See* PAGE, *supra* note 27, at 119–24 (explicating the "stewardship model").

reciprocity,[143] made famous by Rawls in relation to familial consanguinity,[144] one can reasonably argue that intergenerational rights and duties are held for one's blood descendants for the same purpose. As Tremmel has written, seemingly invoking the stewardship and chain of concern models of intergenerational reciprocity simultaneously, "it is possible to apply the principle of reciprocity indirectly. Most people would agree that it is 'just' to give back to future generations what we received from former generations (just like we owe back our children what we received from our parents)."[145] Each of these modeled arguments can of course lead to a cascade of reciprocal rights and duties that surpasses even the "two-hundred year present," that is, our operational temporal space here.[146]

In sum, from this twin reciprocity-based perspective one can challenge directly the skeptics who downgrade the ethical-legal status of unborn generations on the grounds that they are existentially incapable of responding to present attempts to safeguard the human and natural environment against the hazards of climate change. Intergenerational justice—defined as fair reciprocity—is as viable a theoretical warrant as intergenerational justice based on distributive justice, perhaps even more so.

B. A Preferred Contractarian Theory of Social Justice

We have seen that both distributive and reciprocity-based theories of social justice support the concept of intergenerational justice in general and intergenerational ecological justice in particular. Each theory validates that future generations can have legal as well as moral claims of right against present generations and that, *ipso facto*, present generations can have legal as well as moral obligations of duty relative to future generations.

In the intergenerational setting, however, both suffer from a need to defend against the "non-identity" and "non-reciprocity" problems that, in this setting, some critics find inherent in each. I refer to the claim that we cannot know the identity of unborn persons upon which issues of ethics and justice are said to depend; and the claim that the reciprocity that underwrites justice between non-contemporary generations (assuming such is possible in the absence of identifiable future persons) is qualitatively too

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143. *See id.* at 117–21 (clarifying the "chain of concern model").

144. *See* RAWLS, *supra* note 65, at 288 (discussing the assumption that each "generation cares for its immediate descendants, as fathers say care for their sons").

145. Tremmel, *A Response to Beckerman*, *supra* note 60, at 6.

146. *See supra* text accompanying note 18.

different to match the reciprocity—the mutual tolerance and forbearance—that underwrites justice among contemporaries.[147] Future generations can pay forward to pay back, but they cannot pay backward.

In the discussion of distributive and reciprocity-based theories of social justice, I disregard these two propositions because it is argued that each is a non-issue in the intergenerational ecological justice setting. In most if not all of the relevant scholarly literature, each is formulated with reference to the well-being of particular people, not of whole generations. Also, each tends to be formulated with reference to a remote and unfathomable future exclusively, with little or no attention paid to the knowable proximate. In short, the non-identity and non-reciprocity arguments do not negate distributive and reciprocity-based theories of social justice as foundations upon which to ground intergenerational ecological justice. They serve, rather, to divert responsible attention from creative legal approaches to preferred ecological futures.

Nevertheless, it is helpful to highlight, if only as a precautionary measure, an additional contractarian theory of social justice that depends on neither identity nor reciprocity *stricto sensu* as a precondition of intergenerational justice. It is *respect-based justice*. Without discounting that intergenerational justice can be grounded on distributive and reciprocity-based social justice theory, it provides yet stronger support in this regard because it embraces, among other perspectives, a transgenerational global community, partnership, or social contract for intergenerational justice founded on the notion of human solidarity.

Respect-based justice builds on two distinct but conceptually related intellectual traditions: (1) the relational metaphysics and "process philosophy" of British philosopher and mathematician Alfred North Whitehead;[148] and (2) the idea of human rights, the core value of which is respect, conceived as the honoring of difference, freedom of choice, equality of opportunity, and aggregate well-being in value processes.[149] I turn first and briefly to Whitehead.

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147. PAGE, *supra* note 27, at 100.

148. *See generally* ALFRED NORTH WHITEHEAD, PROCESS AND REALITY: AN ESSAY IN COSMOLOGY (1929); WHITEHEAD, *supra* note 89. In contrast to traditional philosophies, Whitehead asserted the interrelationship of matter, space, and time. The end result is his conclusion that "nature is a structure of evolving processes. The reality is the process." ALFRED NORTH WHITEHEAD, SCIENCE AND THE MODERN WORLD: LOWELL LECTURES 90 (1925).

149. *See* Burns H. Weston, *Human Rights*, *in* 20 ENCYCLOPAEDIA BRITANNICA 656 (15th ed. 2005) (providing the history as well as the meaning and scope of human rights), *available at* http://international.uiowa.edu/centers/human-rights/resources/publications/recurrent.asp.

1. Relational Metaphysics and Process Philosophy

Whitehead's relational metaphysics—and his consequent vision of the past, present, and future as a unified whole—invites a perspective on social ethics and offers an ethical foundation on which to ground intergenerational justice. Summarizes moral philosopher and theologian Emmanuel Agius:

> Whitehead's philosophical understanding of the universe as an interconnected web of relations, as well as the ontological nature of the relational self [whereby each person is constituted by her/his relations and with no other existence than as a synthesis of those relations] offer a new paradigm of human society. In contrast to the individualism of the liberal tradition, process philosophy defines human society as a relational "structure of experience." Every epochal structure of experience is related to an antecedent and succeeding structures. . . . To see . . . present events within a given society in isolation from the past and the future is to avoid the present reality of its relational character . . . . [Furthermore,] [e]very society is relational [in that] its structure of experience extends to other communities. There is a network of relations between all the nations of the world. . . . [But] our interdependence does not end with the nation or even the global community. Relations extend not only over space but also across time; the scope of our relationships is broadened to include the whole family of humankind, which includes past, present and future generations.[150]

In other words, "every generation," according to Whitehead, "is related to all preceding and succeeding generations which collectively form the community of [humankind] as a whole."[151] And this fact, in turn, spells inescapable interdependencies with commensurate rights and obligations—a perspective long held and advocated by indigenous peoples. Thus, article 11(1) of the 2007 U.N. Declaration on the Rights of Indigenous Peoples proclaims the right of indigenous peoples "to maintain, protect and develop the *past, present and future* manifestations of their cultures."[152] And thus also does its article 25 proclaim their right "to maintain and strengthen their

150. Agius, *supra* note 103, at 327–28.

151. *Id.* at 328.

152. United Nations Declaration on the Rights of Indigenous Peoples, G.A. Res. 61/295, art. 11, U.N. GAOR, 61st Sess., U.N. Doc. A/RES/61/295 (Sept. 13, 2007) (emphasis added), *available at* http://www.un.org/Depts/dhl/resguide/r61.htm.

distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and *to uphold their responsibilities to future generations in this regard*."[153]

Most if not all of the world's religions, important to a man of faith such as Whitehead and reputedly influential with him,[154] take the same stance as well. The Book of Genesis, for example, reminds Christians and Jews that they are part of the created order, that their first calling by God is to be stewards of the earth and the rest of creation, and that the Earth is not subject to Man's/Woman's absolute ownership but is, rather, given to Man/Woman to use and protect.[155] Similarly, the Holy Qu'ran instructs Muslims that Allah created humans to be guardians or trustees (khalifa) of His creation, that "nature does not belong to us to do with as we wish, but is entrusted Allah to our safe-keeping."[156] Faith-based exhortations supportive of intergenerational ecological justice and from all across the religious spectrum are seemingly endless.[157]

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153. *Id*. art. 25 (emphasis added).

154. *See, e.g.*, Paul Weiss, *Recollections of Alfred North Whitehead*, *in* 10 PROCESS STUD. 44, 44–56 (1980), *available at* http://www.religion-online.org/showarticle.asp?title=2486. Whitehead, it merits notice, was the son of an Anglican minister.

155. In 2007, following the release of the Australian Climate Institute's "dialogue on the morality of climate change," and citing *Genesis* 1:28–29, Canberra's Anglican Bishop George Browning, Chair of the worldwide Anglican Communion Environmental Network, had this to say:

> [W]hen we exploit God's creation to breaking point, we break the most fundamental commandment known to us: out of our greed and selfishness, we knowingly cause the degradation of the world's ecosystems instead of protecting the design that issues from the Creator's generosity. Wilfully causing environmental degradation is a sin. . . . The Christian faith is certainly about personal salvation. But it is . . . first and foremost *a concern for the whole of the created order*—biodiversity and business; politics and pollution; rivers, religion and rainforests. The coming of Jesus brought everything of God into the sphere of time and space, and everything of time and space into the sphere of God. . . . Therefore, if Christians believe in Jesus they must recognise that concern for climate change is not an optional extra but a core matter of faith.

Anglicans on Climate Change, http://www.arcworld.org/faiths.asp?pageID=99 (last visited Apr. 30, 2008); *see also* THE CLIMATE INSTITUTE (AUSTRALIA), *supra* note 91, at 5–39 (reporting "a dialogue on the morality of climate change").

156. What Do Muslims Teach About Ecology, http://www.arcworld.org/faiths.asp?pageID=32 (last visited Apr. 30, 2008). The author is a biologist and Islamic scholar who was appointed by the Muslim World League to compile the *Islamic Faith Statement* for ARC. Islamic Faith Statement, http://www.arcworld.org/faiths.asp?pageID=75 (last visited Apr. 30, 2008).

157. *See, e.g.*, WHITEHEAD, *supra* note 89. Note also that a general philosophy of intergenerational justice has been expressed in both Western and non-Western secular thought for many centuries. *See, e.g.*, ALEXANDER GILLESPIE, INTERNATIONAL ENVIRONMENTAL LAW, POLICY AND ETHICS 110–11 (1997); CHRISTOPHER G. WEERAMANTRY, UNIVERSALISING INTERNATIONAL LAW 434–35, 438–44 (2004) (focusing on concerns for sustainable development in ancient non-Western civilizations, but clearly including considerations of respect for the interests of future generations).

Respect-based justice builds also on Whitehead's "common good," a central theme of social ethics and his "process philosophy." Within Whitehead's system, however, the common good is not merely the sum of individual goods (as individualistic and liberal theories of society would have it). It is, rather, "a state of equilibrium in the interplay of individual goods"[158] that resides in all of humankind. In Whitehead's system, the common good is the good of humankind as a whole which includes, as noted above, past, present, and future generations. Also, it embraces the entire earth-space environment, so that social justice, in Whiteheadian terms, assumes an obligation to share the "common heritage"—Earth's natural resources, its fresh water systems, the oceans, the atmosphere, and outer space, all of which belong to all generations in intertemporal partnership—and thus prohibits any generation from excluding another from its fair share of that heritage.

In this regard, Whitehead could have been influenced by the argument famously put forward by the United States in the 1893 *Bering Sea Fur Seals Arbitration* between the United States and Great Britain, contending that both national and international jurisprudence place limits on claimed property rights.[159] The United States bid the arbitrators[160] to consider two legal principles:

> First. No possessor of property, whether an individual man, or a nation, has an absolute title to it. His title is coupled with a trust for the benefit of mankind.
>
> Second. The title is further limited. The things themselves are not given him, but only the usufruct or increase. He is

158. Agius, *supra* note 103, at 328.

159. *See* Argument of the United States at 2–8, Fur Seal Arbitration (U.S. v. Gr. Brit.), *reprinted in* 9 FUR SEAL ARBITRATION, *supra* note 44 (involving U.S. legislation aimed at protecting populations of fur-bearing animals, including fur seals, from over-exploitation and interpreted by the U.S. Treasury to permit seizure of Canadian (British) vessels engaged in the hunting and killing of seals on the high seas at least sixty miles from the nearest U.S.-owned land at a time when today's exclusive economic zone (EEZ) was non-existent and the three-mile territorial sea rule applied). For calling my attention to this arbitration and its treatment of intergenerational ecological justice, I am indebted to Professor Jonathan C. Carlson, my long-time Iowa colleague, collaborator, and friend.

160. Pursuant to an arbitration treaty between the United States and Great Britain, concluded February 29, 1892, the United States appointed U.S. Supreme Court Justice John M. Harlan and U.S. Senator John T. Morgan as arbitrators; the British appointed Lord Hannen and Sir John Thompson as arbitrators; and the President of the French Republic, the King of Italy, and the King of Norway and Sweden each appointed neutral arbitrators.

> but the custodian of the stock, or principal thing, holding it in trust for the present and future generations of man.[161]

Thereafter, in a passage that could have been written with present-day greenhouse gases and climate change in mind, the United States expressed the ideal of intergenerational justice as Whitehead might have written it:

> The second proposition above advanced, namely, that the title which nature bestows upon man to her gifts is of the usufruct only, is, indeed, but a corollary from that which has just been discussed, or rather a part of it, for in saying that the gift is not to this nation or that, but to mankind, all generations, future as well as present, are intended. The earth was designed as the permanent abode of man through ceaseless generations. Each generation, as it appears upon the scene, is entitled only to use the fair inheritance. It is against the law of nature that any waste should be committed to the disadvantage of the succeeding tenants. The title of each generation may be described in a term familiar to English lawyers as limited to an estate for life; or it may with equal propriety be said to be coupled with a trust to transmit the inheritance to those who succeed in at least as good a condition as it was found, reasonable use only excepted. That one generation may not only consume or destroy the annual increase of the products of the earth, but the stock also, thus leaving an inadequate provision for the multitude of successors which it brings into life, is a notion so repugnant to reason as scarcely to need formal refutation.[162]

Regrettably, but perhaps understandably from an 1893 perspective, the arbitrators did not accept this argument. It was a "novel" argument, they said, insufficiently grounded in international law, so that the practical result of giving effect to it would be to rule that an international tribunal, bound by the terms of a treaty establishing it, can make new law and apply it retrospectively.

Essential to understand, however, is that the arbitrators did not reject, as a theoretical foundation for intergenerational ecological justice, the *idea* of intergenerational trusteeship (or partnership or stewardship) as expressed by counsel for the United States. They rejected only the United States' claim

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161. Argument of the United States at 59, Fur Seal Arbitration (U.S. v. Gr. Brit.), *reprinted in* 9 FUR SEAL ARBITRATION, *supra* note 44.

162. *Id.* at 65–66 (footnotes omitted).

that it was, in 1893, part of positive international law and therefore within the arbitrators' substantive jurisdiction to invoke and apply it. Possibly the same result would obtain today; possibly other decision-makers now at the beginning of the twenty-first century would likewise see the argument of the United States as not yet written into positive law. But if so, it would be because their jurisprudence or that of their solons will not yet have achieved a temporally sophisticated understanding of distributive or reciprocity-based theories of social justice upon which to ground intergenerational rights and duties—or that they will not yet have caught up with a readily available Whiteheadian respect-based theory of social justice to do the same.

Also, at a time when global climate change threatens severely, it would be an unwise—potentially disastrous—posture in the extreme, failing to comprehend, as Whitehead argues, that human society is a web of interdependent relations with the past, present, and future.[163] Social justice in Whitehead's relational worldview "demands a sense of solidarity with the whole family of humankind,"[164] including unborn generations. If personal identity is a factor, it is in an ethos of species identity; if reciprocity is at all pertinent, it is in the mutual caring that arises from species identity. And at the heart of it all, as in the case of distributive and reciprocity-based theories of social justice, is the fundamental ideal of "justice as fairness,"[165] the skein that runs throughout the Brown Weiss definition of intergenerational ecological justice, certifying both the rights of future generations (children and the unborn) and the duties of those living in the present.

2. Human Rights Doctrine and Philosophy

Human rights date back to antiquity,[166] and as a consequence of political and social revolutions in the seventeenth, eighteenth, and twentieth centuries, they found their way into the legal systems of modern states. But it was not until the rise of Nazi Germany and the Holocaust that the idea of individual human rights truly came into its own to become a moving force on the international as well as national plane. Soon thereafter, during the 1950s and 1960s when colonial empires began to give way to self-governing impulses and when governing elites in general did the same

163. *See* WHITEHEAD, *supra* note 89, at 34.

164. *Id.* at 330.

165. RAWLS, *supra* note 131, at 5.

166. Examples, albeit by other names, include "the law of the Gods," and "natural rights." For historical explication, see Weston, *supra* note 149, at 656–57.

relative to minority demands for equality, it evolved to embrace groups as well as individuals, writ in such notions as the "family of man" and the "family of nations." Later, during the 1970s and 1980s, spurred by the first global Earth Day in April 1970 and NASA's "blue marble" photo of "spaceship earth" in December 1972, it evolved further still to embrace the human species as a whole across both space and time. Hence arise such contemporaneously claimed group rights as the right to self-determination and the right to a clean, healthy, ecologically balanced, and sustainable environment (supplementing earlier proclaimed civil and political rights, on the one hand, and social, economic, and cultural rights, on the other).[167] Today, mindful that many (if not most) of these rights are being profoundly challenged by atmospheric pollution and consequent climate change, intergenerational rights are now additionally proclaimed and increasingly recognized, legally as well as morally. It can be said that they constitute a new "third wave" (or "third generation") right.[168]

Whitehead's relational worldview reverberates in this respect-based setting. His holistic "human solidarity" outlook across space and time is at the core of intergenerational human rights discourse. A relatively recent opinion of the President of the Inter-American Court of Human Rights underscores this interface—and in so doing reaffirms, it may be noted, the United States' argument in the *Bering Sea Fur Seals Arbitration* as well. "Human solidarity manifests itself," Judge Cançado-Trindade observed, "not only in a spatial dimension—that is, in the space shared by all the peoples of the world—but also in a temporal dimension—that is, among the generations who succeed each other *in the time*, taking the past, present and future altogether."[169] He then added, acutely: "It is the notion of human

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167. *See id.*; BROWN WEISS, *supra* note 9, at 24.

168. I opt for the expression "third wave" only for the obvious reason that it is less susceptible to confusion in intergenerational justice discourse. In no way do I otherwise resist the "third generation" characterization, much less the historical acuity that brought it into being. The idea of generations of rights was the brainchild of French-Czech jurist Karel Vasak, formerly Director of the Division of Human Rights and Peace, later Legal Advisor to UNESCO and the World Tourism Organization, and still later the first Secretary-General of the International Institute of Human Rights in Strasbourg. For historical detail, Weston, *supra* note 149, at 658. As my past human rights scholarship repeatedly attests, I adopted this manner of characterizing the evolution of civil-political, social-economic-cultural, and solidarity or group rights, perhaps because of a love of history, notwithstanding criticisms of it derived from the fact that "generations" come and go and that human rights do not. Now, however, because the use of "generations" obviously risks confusion in intergenerational rights discourse, I hereafter choose the term "wave" in lieu of "generation" to trace the evolution of human rights over time. It is a choice that fits well also my belief that both the terminology and substance of intergenerational rights are here to stay.

169. Bámaca-Valésquez v. Guatemala, Case No. 70, Inter-Am. C.H.R. 92 (Nov. 25, 2000) (separate opinion of Judge Cançado-Trindade, ¶ 23), *available at* http://www.corteidh.olr.cr/docs/casos/articulos/seriec_70_ing.pdf.

solidarity, understood in this wide dimension, and never that of State sovereignty, which lies on [sic] the basis of the whole contemporary thinking on the rights inherent to the human being."[170]

Arguably more important for my immediate purpose, however, is that, in keeping with Whitehead's transgenerational worldview, human rights theory does not require grappling with the interdependent non-identity and non-reciprocity issues that haunt, however unconvincingly, other theories of social justice in the intergenerational context. Respect for others—deceased, living, or unborn—is possible without personal acquaintance or knowledge; and, if genuine, it ordinarily is practiced free of charge, without reciprocal preconditions. It is possible to respect some one or thing without detailed familiarity or expectation of return. Empowerment to do good unto others—dead, living, or unborn—requires no license.

The instant case of intergenerational justice, in the context of climate change, perfectly illustrates the point. It is possible for present generations to choose a legacy of respect for the ecological rights of future generations that is without expectation of return save possibly the spiritual satisfaction of having so chosen. Indeed, unless it can be shown that humans do not care about the future beyond their lifetimes, a proposition that flies in the face of common experience, it is essential that they do so. The business of present generations choosing a legacy to bequeath to future generations is the indispensable first step toward the realization of intergenerational justice. "The [fundamental] question at issue," writes Norton, "is a question about the present; it is a question of whether the community will, or will not, take responsibility for the long-term impacts of its actions" and in so doing "rationally choose and implement a bequest package—a trust or legacy—that they will pass on to future generations."[171]

One must hope so. And one must also hope that such a bequest would entail a commitment to the widest possible intergenerational sharing of all the values of human dignity,[172] qualified only by the limitation that the

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170. *Id.*

171. NORTON, *supra* note 36, at 334–35.

172. The values of human dignity to which I refer are the "welfare values" of wealth, well-being, skills, and enlightenment, on the one hand, and the "deference values" of power, respect, rectitude, and affection, on the other. For this typology, we are intellectually indebted to the germinal work: HAROLD D. LASSWELL & ABRAHAM KAPLAN, POWER AND SOCIETY: A FRAMEWORK FOR POLITICAL INQUIRY (1950). Lasswell and Kaplan write: "By 'welfare values' we mean those whose possession to a certain degree is a necessary condition for the maintenance of the physical activity of the person. . . . Deference values are those that consist in being taken into consideration (in the acts of others and of the self)." *Id.* at 55–56. A complementary way to speak about and act upon what fundamentally is required to be human is to invoke the language of "human capabilities" developed by Amartya Sen and Martha Nussbaum—i.e., "Life," "Bodily Health," "Bodily Integrity," "Senses, Imagination, and Thought," "Emotions," "Affiliation" ("Friendship" and "Respect"), "Other Species,"

rights of present and future generations in any particular instance may be restricted to the extent necessary to secure the comparable rights of the other and the aggregate common interest of generations past, present, and future.[173] Ideally, these values would include all those proclaimed as rights in the 1948 Universal Declaration of Human Rights,[174] the 1966 Covenant on Economic, Social and Cultural Rights, and the 1966 Covenant on Civil and Political Rights[175]—part of the so-called International Bill of Human Rights and its embrace of life, liberty (including but not limited to property, health, culture, and community). Ideally, too, they would include those values that have been emerging as rights ever since—in particular, the right to a clean, healthy, ecologically-balanced, and sustainable environment.[176] When addressing specifically the two fundamental questions that provoke this essay, however, a legacy of respect must be defined in terms of those values that can help to mitigate or prevent the climate change and related environmental harms that are certain or likely to damage future lives and interests. This is best done by putting respect-based justice into service on behalf of future generations everywhere according to the following incomplete propositions[177]:

> (1) "each generation has towards the previous one the right to respect for its right to—," and

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"Play," and "Control Over One's Environment" ("Political" and "Material"). Bernard Williams, *The Standard of Living: Interests and Capabilities*, *in* THE STANDARD OF LIVING 94, 100 (G. Hathorn ed., 1987) (providing an early advocacy view of a capabilities approach to human rights); s*ee also* Martha C. Nussbaum, *Capabilities, Human Rights, and the Universal Declaration*, *in* THE FUTURE OF INTERNATIONAL HUMAN RIGHTS 25, 42–47 (Burns H. Weston & Stephen P. Marks eds., 1999); Amartya K. Sen, *Equality of What?*, *in* 1 THE TANNER LECTURES ON HUMAN VALUES 195 (1980), *reprinted in* AMARTYA K. SEN, CHOICE, WELFARE AND MEASUREMENT 353–69 (1982).

173. *See generally* MYRES S. MCDOUGAL, HAROLD D. LASSWELL & LUNG-CHU CHEN, HUMAN RIGHTS AND WORLD PUBLIC ORDER: THE BASIC POLICIES OF AN INTERNATIONAL LAW OF HUMAN DIGNITY (1980) (providing a model for this formulation).

174. Universal Declaration of Human Rights, G.A. Res. 217A, at 72–77, U.N. GAOR, 3d Sess., 1st plen. mtg., U.N. Doc. A/810 (Dec. 12, 1948), *reprinted in* 3 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, III.A.1.

175. International Covenant on Economic, Social and Cultural Rights, *opened for signature* Dec. 16, 1966, 993 U.N.T.S. 3 (entered into force Jan. 3, 1976), *reprinted in* 3 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, III.A.2; International Covenant on Civil and Political Rights, *adopted* Dec. 19, 1966, S. Exec. Doc. E, 95–2 (1978), 999 U.N.T.S. 171, *reprinted in* 3 INTERNATIONAL LAW AND WORLD ORDER, *supra* note 44, III.A.3.

176. *See supra* note 166.

177. For the inspiration that led to these following formulations, I am indebted to Axel Gosseries. Axel Gosseries, *Constitutionalizing Future Rights?*, INTERGENERATIONAL JUSTICE REV. 10, 11 (2004).

> (2) "each generation has towards the next one the obligation to respect its right to—."

The virtue of these propositions is twofold. First, they conceive the rights of future generations as correlates of the duties of present generations and thus demonstrate how a respect-based theory of social justice, put into practice by present generations, can ignore the *non-identity* problem. Second, they conceive the rights of future generations as payback for the accumulated capital received by present generations from predecessor generations and thus demonstrate how a respect-based theory of social justice, though not required to do so, can ignore the *non-reciprocity* problem. These are not attributes that distinguish distributive and reciprocity-based theories of justice relative to intergenerational justice even though, as emphasized, they are nonetheless capable of providing it foundational support.

There remains, of course, the completion of the above incomplete propositions, and to this end I again invoke the three principles of intergenerational justice developed by Edith Brown Weiss[178]:

> (1) each generation has towards the previous one the right to respect for its right to (i) "conservation of options," (ii) "conservation of quality," and (iii) "conservation of access"; and
>
> (2) each generation has towards the next one the obligation to respect its right to (i) "conservation of options," (ii) "conservation of quality," and (iii) "conservation of access."

For all the reasons stated previously, I endorse these propositions of respect-based intergenerational justice. But why, it may be asked, should anyone else accept these three principled propositions? Professor Brown Weiss lists four reasons. The three principles, she writes:[179]

- "allow future generations the flexibility to operate within their own value system and do not require one generation to predict the values of another";

178. BROWN WEISS, *supra* note 9, at 38 (emphasis added); *see also supra* text accompanying notes 82–84.

179. BROWN WEISS, *supra* note 9, at 5.

- "promote equity among generations by respecting both the rights of future generations not to be deprived by the present generation's preferences for its own well being and the rights of the present generation to use the environment free from unreasonable constraints to protect indeterminate future needs";

- "[are] reasonably definite and clear in application to forseeable [sic] situations"; and

- "[are] shared by different cultural traditions, and generally [are] acceptable to different political and economic systems."[180]

It is these four virtues, among others, that make Brown Weiss's definition of intergenerational justice compelling.

Still, who is to say that these virtues—or more importantly the principles of intergenerational justice to which they refer—should be endorsed by the rest of the humankind? They are, after all, the product of a Western scholar from the industrialized world.

Helpful in this regard is the previously noted work of John Rawls and, in particular, his proposed thought experiment,[181] akin to Kant's "categorical imperative,"[182] in which a group of thinking men and women of diverse characteristics (race, class, creed, etc.) come together in their private capacity (i.e., not as state representatives) in some "original position" to construct a just society with their personal self-interests in mind, but without knowing their own position in it (economic, social, racial, etc.). Behind this "veil of ignorance," these "original position" decision makers, rationally contemplating their own self-interest, freely choose a society that is fair to all. It is neither unreasonable nor irrational to assume that they would include a set of environmental values from which all would benefit as much as possible and, by the same token, suffer the least possible disadvantage.

Nor is it unreasonable or irrational to assume that the same "original position" decision makers would demonstrate and promote respect for groups as well as individuals and that among the groups would be future generations of people. In defense of her three principles of intergenerational environmental justice, Professor Brown Weiss, following

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180. Brown Weiss, *Intergenerational Fairness*, *supra* note 21, at 5.

181. *See* RAWLS, *supra* note 65, at 17–40, 136–42.

182. IMMANUEL KANT, GROUNDING FOR THE METAPHYSICS OF MORALS 2 (James W. Ellington trans., Hackett Publishing Co. 3rd ed. 1993).

Rawls,[183] shows us how:

> [A]ssume the perspective of a [rational] generation that is placed somewhere along the spectrum of time, but does not know in advance where it will be located. Such a generation would want to inherit the common patrimony of the planet in as good condition as it has been for any previous generation and to have as good access to it as previous generations. This requires that each generation pass the planet on in no worse condition than it received it and provide equitable access to its resources and benefits.[184]

In this statement of respect for the ecological rights of future generations, Brown Weiss and Rawls are at one. Writes Rawls in 1993, updating his 1971 account of the principled choices available to persons in the "original position":

> [T]he correct principle is that which the members of any generation (and so all generations) would adopt as the one their generation is to follow and as the principle they would want preceding generations to have followed (and later generations to follow), no matter how far back (or forward) in time.[185]

Especially noteworthy, however, is Brown Weiss's supplemental observation that "[i]mprovements made by prior generations in the natural and cultural resource base of the planet [also] must be conserved for all future generations."[186] This notion of conserving improvements for future generations, she emphasizes, "is consistent with a view of human society as a partnership extending to all generations," the purposes of which "include sustaining the life-support systems of the planet and attaining a healthy and decent environment for the human community, [requiring] each generation to conserve the improvements of its predecessors."[187] Brown Weiss adds: "If one generation fails to conserve the planet at the level of quality received, succeeding generations have an obligation to repair this damage, even if it is costly to do so."[188] She thus argues forcefully for "a minimum level of equality among generations," a generational entitlement to a

183. *See* RAWLS, *supra* note 65, at 291–92.
184. BROWN WEISS, *supra* note 9, at 24.
185. JOHN RAWLS, POLITICAL LIBERALISM 274 (1993).
186. BROWN WEISS, *supra* note 9, at 24.
187. *Id.*
188. *Id.*

"planet and cultural resource base at least as good as" the one enjoyed by the generation preceding.[189]

Embedded in these statements is a contractarian viewpoint akin to Whitehead's process philosophy of human solidarity across space and time as a basis of justice for the global common good. Brown Weiss's underlying point, with which I agree, is that we humans are "integrally linked with other parts of the natural system"[190] and that we also are inherently linked to one another over time, one generation to another, past to present and present to future, in a continuing partnership of shared responsibility for "the common patrimony of earth."[191] She writes:

> In describing a state as a partnership, Edmund Burke observed that "as the ends of such a partnership cannot be obtained in many generations, it becomes a partnership not only between those who are living but between those who are living, those who are dead, and those who are to be born." The purpose of human society must be to realize and protect the welfare and well-being of every generation.[192]

This requires, Brown Weiss concludes, "sustaining the life-support systems of the planet, the ecological processes, environmental conditions, and cultural resources important for the survival and well-being of the human species, and a healthy and decent human environment."[193]

Embedded, too, is an endorsement of international human rights law and policy—the apotheosis of respect-based justice in the modern world—both as a foundation upon which to build intergenerational justice and as a basis for defining its full meaning. The historic Universal Declaration of Human Rights, elaborating on the human rights provisions of the U.N. Charter, proclaims its "recognition of the inherent dignity and of the equal and inalienable rights of *all members of the human family* [as] the foundation of freedom, justice and peace in the world."[194] And multiple subsequent human rights instruments—from the International Covenant on Economic, Social and Cultural Rights[195] and the International Covenant on

189. *Id.* at 24–25.

190. Brown Weiss, *Our Rights and Obligations*, *supra* note 22, at 199.

191. *Id.*

192. BROWN WEISS, *supra* note 9, at 23 (citing EDMUND BURKE, *Reflections on the Revolution in France* 139–40 (1790), *in* 2 WORKS OF EDMUND BURKE 368 (1905)).

193. *Id.*

194. Universal Declaration of Human Rights, *supra* note 174, at 71 (emphasis added).

195. International Covenant on Economic, Social and Cultural Rights, *supra* note 175.

Civil and Political Rights[196] to the Convention on the Rights of the Child[197] and beyond—are at one in articulating, Brown Weiss observes, "a fundamental belief in the dignity of all members of the human society and in [an] equality of rights, which extends in time as well as space."[198]

Such expressions of human solidarity are inspiring. However, it is not a convincing justification of the rights to which future generations are entitled simply to argue that international human rights law itself settles the matter. First, not all states, certainly not the United States, have ratified even some of the core international human rights instruments. Second, much of international human rights law, particularly as it relates to civil and political rights, may be said to be Western inspired, fueling the debate over the universality of human rights that has surfaced between different cultures in recent years.[199] Third, all human-rights instruments are filled with ambiguity and indeterminacy—sometimes deliberately to ensure signature and ratification—and thus require interpretation to inform the content of universalism even when the concept of it has been accepted.[200] Finally, when their plenipotentiaries are not signing human rights treaties and voting for human rights resolutions as mere gestures for temporary public relations purposes, states, including states that profess the universality of human rights, typically hedge their bets by resorting to reservations, declarations, and statements of understanding so as to ensure that certain practices deemed central to their legal or other cultural traditions will not be rendered unlawful or otherwise anachronistic.[201]

How then are human rights—a dialectic about interpersonal and intergroup respect across space and time—to be justified as a foundation

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196. International Covenant on Civil and Political Rights, *supra* note 175.

197. Convention on the Rights of the Child, *supra* note 25.

198. BROWN WEISS, *supra* note 9, at 26.

199. For extended treatment of the universalism versus cultural relativism debate, see Burns H. Weston, *The Universality of Human Rights in a Multicultured World: Toward Respectful Decision-Making*, *in* THE FUTURE OF INTERNATIONAL HUMAN RIGHTS 65 (1999); *see also* Burns H. Weston, *Human Rights and Nation-Building in Cross-Cultural Settings*, 60 ME. L. REV. (forthcoming June 2008).

200. As Philip Allot has reminded us, "[I]n all societies governments have been reassured in their arrogance by the idea that, if they are not proved actually to be violating the substance of particularized human rights, if they can bring their willing and acting within the wording of this or that formula with its lawyerly qualifications and exceptions, then they are doing well enough." PHILIP ALLOTT, EUNOMIA: NEW ORDER FOR A NEW WORLD 288 (1990).

201. As Upendra Baxi observes, "Any international human rights lawyer worth her or his calling knows the riot of reservations, understandings, and declarations that parody the texts of universalistic declarations. The 'fine print' of reservations usually cancels the 'capital font' of universality. In this sense, claims concerning the universality of human rights are diversionary, embodying the politics *of*, rather than *for*, human rights." Upendra Baxi, *Voices of Suffering and the Future of Human Rights*, 8 TRANSNAT'L L. & CONTEMP. PROBS. 125, 149–50 (1998).

upon which to build intergenerational justice and as a basis for defining its full meaning? The answer, I believe, lies once again in a Rawlsian "veil of ignorance" social construct that can elicit as much as possible a culturally, ideologically, and politically unbiased result. A generation not knowing where along the spectrum of time it is situated, but acting rationally in its own self-interest, would likely hope for a bequest of accumulated social capital from its predecessor that would most guarantee the fairest distribution of basic wants (rights) and needs (capabilities) among all human beings and thereby ensure that all would benefit as much as possible and, by the same token, suffer the least possible disadvantage. Herein lies, I believe, the theoretical justification for human rights, from antiquity to the present day, as a foundation upon which to build intergenerational justice and as a basis for defining its full meaning—a kind of share-and-share-alike Golden Rule that all generations would choose to satisfy the fundamental requirements of socioeconomic and political justice, the minimum conditions for a life of dignity.

Thus is revealed, I believe, the strength of a respect-based theory of intergenerational justice. Supplementing the similarly capable distributive and reciprocity-based theories of social justice but avoiding their weaknesses, it persuasively establishes, entirely on its own, the legal foundation for intergenerational ecological justice upon which claims for the protection of future generations against climate change harms may comfortably rest. Indeed, it lays the legal foundation upon which even the claim of right to a clean, healthy, ecologically balanced, and sustainable global environment itself may comfortably rest.[202]

CONCLUSION

The subtitle to this Article, "Foundational Reflections," is intended to convey a necessary modesty. Many environmentalists, philosophers, historians, economists, students of politics, and others have evinced profound insight as well as concern about the environment that our children

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202. This right (or a more syntactically circumscribed rendition thereof) has emerged in recent years as one of several group rights called "third generation" solidarity rights. *E.g.*, ALEXANDRE KISS & DINAH SHELTON, GUIDE TO INTERNATIONAL ENVIRONMENTAL LAW 237–41 (2007). "Third wave" human rights is a term better used in the present context. *See supra* discussion at note 168. These rights include the right to self-determination, the right to development, the right to peace, and the right to human disaster relief, and, now, the rights of future generations. Weston, *supra* note 149, at 658–59. The third wave right to a clean, healthy, ecologically balanced, and sustainable global environment to which future generations are legally entitled will be the subject of another essay forthcoming within the next year. Weston, *supra* note 199.

and future generations will or should inherit. Lawyers, however, have not been especially active in this realm, leaving it to only a select few—Edith Brown Weiss especially—to do theoretical battle on behalf of our common environmental future.[203] It therefore behooves the legal profession, myself included, to approach this battle with humility and to pledge respectful collaboration across disciplinary lines.[204] As is well known, a variety of transformational ideas born of transdisciplinary synthesis have animated the environmental movement of approximately the last four decades. I have in mind a geographically expanded attention to regional and global problems, a species expanded attention to non-humans, and an organically expanded attention to ecosystems, each of which has been most successful when transdisciplinary out-of-the-box thinking has prevailed. The time is now—nay, long past due—for the same dynamic to be brought seriously to bear for the sake of future generations in a temporally expanded view of ecological well-being. Indeed, as the U.N.'s Intergovernmental Panel on Climate Change has made abundantly clear, there is literally no time to waste.[205]

This Article is so dedicated, concluding that there is ample theory to establish that future generations can have legal as well as moral rights to protection from climate change harms and that the ecological rights of future generations define the ecological duties of present generations. Remaining is the all-important imperative to build upon this theory an ecological legacy, national and international, from which our children, grandchildren, great-grandchildren, and other future generations can benefit and of which we, the living, can be proud.

This is no small task, to be sure. It requires, of course, in addition to the litigation of select cases, the interpretation of existing laws and the adoption of new ones (constitutional amendments, statutes, regulations, treaties, declarations, resolutions, etc.), all dedicated to the unambiguous acceptance into positive law of the right of future generations to a clean, healthy, ecologically balanced, and sustainable global environment, and the corresponding duty of present generations to safeguard and fulfill that right. Environmental guardianships, trusts, insurance schemes, even the development of a Law of the Commons—these projects and more must be on the agenda, and at all levels of social organization from the most local to

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203. The work of Edith Brown Weiss is much relied upon in this Article.

204. *See* RICHARD O. BROOKS ET AL., LAW AND ECOLOGY: THE RISE OF THE ECOSYSTEM REGIME, at xi–xv (2002) (emphasizing the importance of incorporating ecosystem studies to the legal process—through a more comprehensive interdisciplinary or multi-disciplinary approach—due to its central role in shaping and understanding environmental law and policy).

205. *IPCC Second Assessment*, *supra* note 1; *IPCC Fourth Assessment*, *supra* note 1.

the most global. But it requires yet more fundamentally a coming to grips with the philosophical, scientific, economic, legal, and psychological-political perspectives and tools upon which the construction of intergenerational justice depends—including the clarification of societal goals that reflect the preciousness of life; the policy-sensitive identification of ecological thresholds and irreversibilities; the development of holistic techniques of risk assessment and cost-benefit measurement; the careful crafting of precaution in the face of scientific uncertainty and human fallibility; and, not least, the systematic nurturing of an ethic of species identity accompanied by a sense of moral urgency to put it into effect. A key example: the rapid cultivation of an enlightened self-interest that accepts the world's unequal development as a universally shared problem threatening to environmental sustainability as well as social well-being, hence demanding of immediate, universally shared responsibility.[206]

Happily, the legal profession has begun to mobilize along these lines and is doing so, as it should, with accelerating speed.[207] This is encouraging. However, given the enormity and immediacy of the climate change threat, rapid mobilization is not enough. Needed above all is intellectual and political daring and, yes, intellectual and political heroism, too—"[n]ot occasional heroism, a remarkable instance of it here and there, but constant heroism, systematic heroism, heroism as governing

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206. *E.g.*, Lothar Gündling, *Our Responsibility to Future Generations*, 84 AM. J. INT'L L. 207 (1990).

207. I am pleased to note, by way of example, the Climate Legacy Initiative of the Environmental Law Center of Vermont Law School and The University of Iowa Center for Human Rights (http://www.vermontlaw.edu/cli). Especially noteworthy, too, is the work of the Science and Environmental Health Network (http://www.sehn.org); also the Constitutional Law Foundation (http://www.conlaw.org), the Cousteau Society (http://www.cousteau.org), and Earthjustice (http://www.earthjustice.org).

New pertinent scholarship of note, supplementing and supporting the work of Edith Brown Weiss, include FUTURE GENERATIONS AND INTERNATIONAL LAW (Emmanuel Agius et al. eds., 1998), especially Philippe Sands, *Protecting Future Generations: Precedents and Practice*, at 89 therein; RENÉ JEAN DUPUY, LA COMMUNAUTÉ INTERNATIONALE ENTRE LE MYTHE ET L'HISTOIRE (1986); Alexander C. Kiss, *La Notion de Patrimoine Commun de L'humanité*, 175 RECUEIL DES COURS 113 (Hague Acad. Int'l Law 1982); H.E. Judge C.G. Weeramantry, *Achieving Sustainable Justice Through International Law*, *in* SUSTAINABLE JUSTICE, *supra* note 84, at 15. Also noteworthy is the launching of a new multidisciplinary journal, THE INTERNATIONAL JOURNAL OF THE COMMONS. Less futuristic and innovative, but also encouraging is the American Bar Association's publication of GLOBAL CLIMATE CHANGE AND U.S. LAW (Michael B. Gerard ed., 2007). For an early ecological exploration with a juridical bent, alas still timely after more than three decades, see RICHARD A. FALK, THIS ENDANGERED PLANET (1971) and RICHARD A. FALK, A STUDY OF FUTURE WORLDS (1975). For an early action plan initiative on behalf of future generations, see JACQUES YVES COUSTEAU, A BILL OF RIGHTS FOR FUTURE GENERATIONS (Proceedings, No. 34) (Orion Society 1979), available at http://www.eurocbc.org/page721.html.

principle."[208] No matter how persuasive its theoretical underpinnings, intergenerational ecological justice is not self-executing and will not happen without it.

208. RUSSELL BANKS, CONTINENTAL DRIFT 40 (1985).

LAW FOR THE ECOLOGICAL AGE

Joseph H. Guth[*]

> It is revolting to have no better reason for a rule of law than that so it was laid down in the time of Henry IV.
>
> Oliver Wendell Holmes, Jr., *The Path of the Law*[1]

> A thing is right when it tends to preserve the integrity, stability and beauty of the biotic community.
>
> Aldo Leopold, *A Sand County Almanac*[2]

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1. Oliver Wendell Holmes, Jr., *The Path of the Law*, 10 HARV. L. REV. 457, 469 (1897).
2. ALDO LEOPOLD, A SAND COUNTY ALMANAC 224–25 (Oxford Univ. Press 1968) (1949).

INTRODUCTION

Nothing is more important to human beings than an ecologically functioning, life sustaining biosphere on the Earth. It is the only habitable place we know of in a forbidding universe. We all depend on it to live and we are compelled to share it; it is our only home. As the summary of the United Nation's 2005 Millennium Ecosystem Assessment Synthesis begins:

> Everyone in the world depends completely on Earth's ecosystems and the services they provide, such as food, water, disease management, climate regulation, spiritual fulfillment, and aesthetic enjoyment[3]

The economic value of these services as calculated by economists is stunning, and yet dollar values barely begin to describe the Earth's full worth to us.[4] Many deep physical and psychological aspects of our human nature dovetail with the attributes of the Earth, often in ways that we perceive only dimly, if at all.[5] The Earth's biosphere seems almost magically suited to human beings and indeed it is, for we evolved through eons of intimate immersion within it. Many of us are animated by moral and religious impulses to treasure and respect the creation that sustains us. We cannot live long or well without a functioning biosphere, and so it is worth everything we have.

But the growing human enterprise now threatens to overwhelm the ecological viability of the Earth. We suddenly see that the biosphere has a shockingly small physical size, that many important resources are finite,

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3. MILLENNIUM ECOSYSTEM ASSESSMENT, ECOSYSTEMS AND HUMAN WELL-BEING: SYNTHESIS 1 (2005), *available at* http://www.millenniumassessment.org/documents/document.356.aspx.pdf. The Millennium Ecosystem Assessment was an evaluation of the world's ecosystems and human well-being carried out between 2001 and 2005 under the auspices of the United Nations by over 2000 people, including 1360 experts from ninety-five nations. *Id.* at ii–ix.

4. *See generally* J.B. Ruhl, *Ecosystem Services and the Common Law of "The Fragile Land System,"* 20 NAT. RES. & ENV'T 3 (2005), *available at* http://www.law.fsu.edu/faculty/profiles/ruhl/2005-FragileLandSystem20NREFall.pdf (compiling literature on ecosystem services); Douglas A. Kysar, Sustainability, Distribution and the Macroeconomic Analysis of Law 42–45 (2001), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=268949 (on the valuation of ecosystem services).

5. *See* EDWARD O. WILSON, THE CREATION: AN APPEAL TO SAVE LIFE ON EARTH 26–36, 62–69 (2006) (discussing the vital connection between the earth and the human race).

and that the Earth has a limited capacity to assimilate environmental damage. Our myriad and ever-multiplying increments of damage do not occur in isolation, but form a networked web of assaults each compounding the effects of the others, accumulating in both space and time.

Repeated reports from the broad scientific community have documented the mounting scale of our cumulative impacts on the global environment. They demonstrate that "global ecosystem services . . . are being degraded or used unsustainably."[6] They indicate that sustained human activities are now crossing thresholds of sudden irreversible changes. By some detailed estimates, humanity is overusing the ecological resources of the Earth and this overshoot is causing mounting ecological degradation.

And yet, we are torn over how we wish to live on the Earth. In part, we have a strong impulse to preserve and share it. As Roman law declared in 535 A.D.: "By the law of nature these things are common to mankind–the air, running water, the sea and consequently the shores of the sea."[7] But people also seek material wealth, and the right of individuals to own property has been enshrined as a universal right under the United Nations 1948 Declaration of Universal Human Rights.[8] Competing for wealth, individuals and nations have long fought for possession and domination of the Earth. Some societies have learned to live on the land for extended periods, while others have not, instead collapsing with the loss of entire civilizations.[9] As Aldo Leopold put it: "the oldest task in human history [is] to live on a piece of land without spoiling it."[10]

In America, we feel these same warring impulses. Some of our institutions reflect our desire to preserve the Earth for all, such as our extensive public lands, the public trust doctrine of the common law, public ownership of wildlife, state constitutions that guarantee rights to a clean environment, the open access we still permit to many resources, and government environmental legislation. But we also have a strong tradition of private ownership of land, and we lionize the private accumulation of wealth derived from its exploitation and degradation.

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6. MILLENNIUM ECOSYSTEM ASSESSMENT, *supra* note 3, at 1.

7. J. INST. 2.1.1, *available at* http://www.fordham.edu/halsall/basis/535institutes.html.

8. Universal Declaration of Human Rights, G.A. Res. 217A, art. 17, U.N. GAOR, 3d Sess., 1st plen. mtg., U.N. Doc. A/810 (Dec. 12, 1948), *available at* http://www.un.org/Overview/rights.html.

9. *See generally* JARED DIAMOND, COLLAPSE: HOW SOCIETIES CHOOSE TO FAIL OR SUCCEED 18–19 (2005) (discussing "the comparative method to understand societal collapses to which environmental problems contribute").

10. ALDO LEOPOLD, *Engineering and Conservation* [1938], *in* THE RIVER OF THE MOTHER OF GOD AND OTHER ESSAYS BY ALDO LEOPOLD 249, 254 (Susan L. Flader & J. Baird Callicott eds., 1991).

The way we accommodate these competing interests is embodied in our law, especially the law of property. Through our property laws we specify both the rights of landowners to use their land for private purposes and their obligations to the community. Property laws (broadly defined to encompass all laws affecting how we live on the Earth, including liability and environmental law) provide powerful incentives and disincentives that shape how landowners and other economic actors behave toward each other, the public, and the land. To reshape how our society lives on the Earth, we will have to alter the laws of property and the system of incentives they provide.

Thinking through the structure of our property laws raises essential questions of law and government: what is the proper scope of private rights in land; what is the responsibility of private landowners to manage their lands for the good of the community; when should landowners be liable for damage they externalize onto others; what responsibility do we each have to avoid actions that taken alone would cause no harm but contribute to a global ecological crisis; what is the proper role of government in regulating private behavior toward the Earth; is government the best steward of nature, or are private owners more effective as they obey the dictates of the market in seeking private gain; and finally, to what extent are we, the living, responsible for the well-being of future generations?

The answers to these questions are not fixed under American government and law, for the Constitution neither defines nor guarantees any particular structure of property rights. Legal historians have shown that property rights have never been set in stone, and it can be surprising to realize just how malleable they have been over time. In fact, they have been continuously and sometimes dramatically modified through the centuries as our circumstances and social objectives have changed.

The starting premise of this Article is that under our system of democratic government through the rule of law, property law must serve the public welfare, and it is up to each generation to define that law for itself. When the nation was founded, property rights emphasized the obligation of landowners to do no harm to others, which served the public welfare by promoting a stable agrarian economy. But this system of property rights, suited to a pre-industrial age, was transformed during the nineteenth and twentieth centuries specifically and intentionally to promote the Industrial Revolution. The new structure of property law was grounded in a new vision of the public welfare, which presumed that industrial growth provided a net benefit to society even if it caused damage that would not have been permitted under the old law. This new structure of property rights for the industrial age established a preference for economic activity,

and permitted environmental damage unless plaintiffs could show it was "unreasonable" in view of society's desire for economic growth.

As we will see, the resulting legal structure, still with us today, envisions not only that the economy can grow forever, but also that the total scale of legally-justified damage to the Earth can grow forever as well. It was invented when the American continent seemed "empty," when pollution sinks and resources seemed boundless and the atmosphere infinite, and there always was another forest, another river, another fishery that could be sacrificed to the social priority of economic growth. This is the essential environmental problem with our modern property law: it promotes an economy that is permitted to inflict damage to the Earth, while containing no means of constraining cumulative environmental damage to a scale that is ecologically sustainable.

This problem infects both of our legal system's two principal sources of evolving law: the common law, created by judges as they resolve private disputes; and legislative law. Throughout most of our history the common law has been the nation's major source of property law. Indeed, the common law spearheaded the nineteenth-century transformation of our legal system, and its modern doctrines of negligence and nuisance established general principles of property law that remain widely applicable today. More recently, in response to the common law's failure to address environmental destruction unleashed by the Industrial Revolution, government, especially the federal government, has enacted the modern environmental statutes. Even so, as we will see, most of this legislation was built around the same core structure as the modern common law. It generally harbors the same core presumption that economic activity provides a net social benefit, places the same burdens on efforts to control that activity, and is incapable of restraining the economy's cumulative ecological damage to a sustainable scale.

Some federal laws and recent state and local laws take a more progressive approach by adopting environmental or health objectives uncompromised by immediate economic interests, restricting development in ecologically sensitive areas, and implementing the precautionary principle. However, it is socially corrosive for the political branches of government to attempt to implement a substantially different balance of social interests than does the common law. The U.S. Supreme Court's takings jurisprudence has inflamed this divide by questioning legislation that creates more restrictions on landowners than those imposed by common law. This has encouraged property owners to view environmental legislation as invasions of their common law property rights—as efforts by government to take their property and give it to the public. This divide

fuels the call for government to compensate property owners whenever legislation diminishes the value of their property under existing property laws or imposes costs not required by those laws. Thus, our entire legal system, including both legislation and the common law, must be transformed if we are to channel our economy into a new, ecologically-sustainable path.

My purpose here is to propose a specific new principle of law that would promote the social imperative of maintaining an ecologically-healthy, self-sustaining, and self-renewing biosphere. The essential step is to incorporate into the law a clear response to an inescapable fact of our current circumstances: the Earth has a finite capacity to sustain ecological damage, and by exceeding this capacity we diminish the welfare of both present and future generations. The law must incorporate new structures designed to restrain the total scale of ecological damage.

The specific new rule I propose is one of common law. I focus on the common law in part because it is of general and broad applicability and still constitutes society's most comprehensive expression of the proper resolution of property conflicts. The common law provides a straightforward way to identify the core structure that defines how we resolve these conflicts today, to understand the overarching system of economic incentives and disincentives generated by that structure, and then to specify how that structure must be altered to prioritize ecological interests. But my intent is that the principle embodied in this new rule be incorporated into legislation as well.

The realignment of property rights represented by this proposed new legal principle would be profound. Its effects would be equal in scope to the realignment that occurred in the nineteenth century, and equally wrenching to existing property owners. To justify and explain this new transformation, this Article proceeds as follows. Parts I through III are designed to accomplish three preliminary tasks. Part I explains the basis of my starting premise that under the American form of democratic government, each generation has the power and responsibility to restructure property rights so as best to further the public welfare. Part II examines briefly the structure of property rights during the pre-industrial age, comparing it with our current law to reveal just how adaptive property law has been in the past, and can yet be today. Part III examines in much more detail the structure of property rights of the industrial age to reveal specifically how it promotes economic activity and why it leads to environmental destruction.

Then, Part IV sets out the tort of "ecological degradation." Part IV.A situates this proposed new rule of property law as an effort to build

concretely on the work of many others who have proposed that the common law should place greater value on environmental interests. Part IV.B sets out the actual language of this new tort, including a definition of conduct that should be deemed unreasonable in view of our current circumstances. This new tort places the burden of proof on those whose conduct may contribute to ecological degradation and it specifies who should have standing to bring an action. Finally, it defines an element designed to assist our society in transitioning to this new structure of property rights: an affirmative defense to liability. This defense would be available to those who have at present no less damaging alternatives to their conduct but are vigorously seeking such alternatives.

It may be ambitious to think that a judge at common law might soon adopt the law exactly in the form I here propose. And yet, in our new circumstances, when the mounting scale of environmental damage has become ecologically unsustainable, we are soon going to need laws something like this tort of ecological degradation if we are to live long and prosper on the Earth. My purpose is to explore the past evolution of law and our ability to reshape it again today, and to provide specific proposals that I hope will advance the development of a new law for the ecological age.

I. UNDER THE AMERICAN SYSTEM OF GOVERNMENT, PROPERTY RIGHTS MUST PROMOTE THE PUBLIC WELFARE

This Part briefly discusses some principles of American property law, including its sources, its purpose, its relationship to the economy, and how it evolves. These principles inform and underpin the analysis in the following parts. A full discussion of these underlying principles is beyond the scope of this Article, but it will be helpful for the reader to see my starting premises.

Law in the New World was strongly influenced by English law and legal history, in which the crown, church, and parliament struggled for control of the law.[11] But when the United States was founded as an independent constitutional democracy of self-governing people, American law and government embarked on a new course, with an independent life

11. For a discussion of the history of English and early American property law, see JAMES W. ELY, JR., THE GUARDIAN OF EVERY OTHER RIGHT: A CONSTITUTIONAL HISTORY OF PROPERTY RIGHTS 10–25 (3rd ed. 2008); ERIC T. FREYFOGLE, THE LAND WE SHARE: PRIVATE PROPERTY AND THE COMMON GOOD 3–6, 45–63, 108–24 (2003).

and tradition of their own. American law became subject to democratic control and derived from the expressed will of the people.

Three American institutions specify the law: state and federal constitutions; state and federal legislation created by the political branches of government (and implementing regulations); and state and federal common law created by judges as they resolve private disputes.[12] The founding document of the United States, the Constitution, sets forth the public purpose of American government:

> We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defense, *promote the general Welfare*, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.[13]

Similar purposes to promote the public welfare animate the state governments under express provisions of state constitutions.[14] And the driving force behind the common law is and has always been "*salus populi suprema lex est*: 'the good of the people is the supreme law.'"[15] Thus, American law is infused at all levels with the essential purpose of furthering the people's welfare, and is answerable always to the democracy.[16]

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12. *See, e.g.*, Justice Evelyn Keyes, *The Literary Judge: The Judge as Novelist and Critic*, 44 HOUS. L. REV. 679, 686 n.14 (2007) (discussing positive legal principles which include "the Constitution, statutes, rules, and case law").

13. U.S. CONST. pmbl. (emphasis added).

14. *See, e.g.*, PA. CONST. art. 1, § 27 ("Pennsylvania's public natural resources are the common property of all the people, including generations yet to come."); *see also* Oliver A. Pollard, III, Note, *A Promise Unfulfilled: Environmental Provisions in State Constitutions and the Self-Execution Question*, 5 VA. J. NAT. RES. L. 351, 351 (1986) ("[S]tates have adopted broad constitutional provisions addressing environmental concerns.").

15. See discussions of the historical role of this maxim in American law in FREYFOGLE, *supra* note 11, at 79–83; and in WILLIAM J. NOVAK, THE PEOPLE'S WELFARE: LAW & REGULATION IN NINETEENTH-CENTURY AMERICA 9–10, 35–50 (1996).

16. The American democracy exerts ultimate control over all three of the nation's sources of law. The legislative and executive branches are subject to direct democratic control through the electoral process. The judiciary is either elected directly or appointed by the elected branches. Except for judicial interpretation of a constitution, the elected branches with legislation can overrule judicial decisions, including principles of common law. Even judicial interpretations of constitutions are ultimately subject to the democracy's control over judicial elections and appointments, and the democracy can alter both the state and federal constitutions (though sometimes requiring a supermajority). Finally, within the federal government's constitutionally enumerated powers, the Supremacy Clause, U.S. CONST. art. VI, cl. 2, permits the democratic will of the United States, as a whole, to preempt state laws. *See* Alexandra B. Klass, *Common Law and Federalism in the Age of the Regulatory State*, 92 IOWA L. REV. 545, 548, 566–79 (2007) (discussing environmental law and its relationship between federal and state law and between legislation and common law). Thus, there is no

This same purpose underpins all American property law, including environmental and liability law.[17] Historically, the right to private property has been justified by various theories rooted in ancient struggles for power between the church, the people, and their kings.[18] In the United States, however, property is solely a creature of law. Private property rights have long been viewed in the United States as a fundamental underpinning of liberty, and rightly so.[19] But they have never been absolute, and comprise one interest that must be balanced with others. Property rights represent a grant to some people of wealth and power over others, and their enforcement requires the use of public power. They exist subject to the needs of the whole community and solely according to law,[20] which must be grounded in the people's consent. As Professor Eric Freyfogle explains, under our democratic government, private property can be legitimately justified only as one component of a system conceived to advance the common good:

> Property draws its philosophic justification from the common good, which means that the common good should supply the polestar for crafting property law. Individual liberty, vital and necessary though it is, enters the picture only to the extent that its recognition promotes the good of people generally.[21]

United States courts have recognized this principle since the beginning of the nation. In 1837, United States Supreme Court Chief Justice Roger Taney wrote for the Court: "While the rights of private property are sacredly guarded, we must not forget, that the community also have rights, and that the happiness and well-being of every citizen depends on their

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source of legal power in the United States that can permanently frustrate the democratic will of the people, as our system is intended to operate. *Id.*

17. For purposes of this Article, "property laws" include traditional rules governing ownership of property but also common law liability doctrines such as negligence and nuisance, state and federal environmental statutes, regulations and tax laws, and constitutional environmental rights, because all these laws together determine how we resolve conflicts between property and other interests and, ultimately, how we live on the land. *See generally* DANIEL H. COLE., POLLUTION & PROPERTY: COMPARING OWNERSHIP INSTITUTIONS FOR ENVIRONMENTAL PROTECTION 1–19 (2002) (outlining the relationship between environmental protection and property law, and discussing the complex typology of property regimes).

18. ELY, *supra* note 11; FREYFOGLE, *supra* note 11, at 4–5, 106–34, 204–07.

19. ELY, *supra* note 11, at 3–4, 26, 43.

20. *Id.* at 4–9, 17–25, 33–41, 59–66; NOVAK *supra* note 15, at 19–50.

21. FREYFOGLE, *supra* note 11, at 208; *see also* ELY, *supra* note 11, at 4, 25, 33 (discussing principle that private property is subject to the public good).

faithful preservation."[22] This was more fully explained in a famous opinion in 1851 by Lemuel Shaw, Chief Justice of the Supreme Judicial Court of Massachusetts, in upholding the power of Massachusetts to limit how far a private property owner could extend a pier into Boston Harbor:

> We think it is a settled principle, growing out of the nature of well ordered civil society, that every holder of property, however absolute and unqualified may be his title, holds it under the implied liability that his use of it may be so regulated, that it shall not be injurious to the equal enjoyment of others having an equal right to the enjoyment of their property, nor injurious to the rights of the community. All property in this commonwealth . . . is derived directly or indirectly from the government, and held subject to those general regulations, which are necessary to the common good and general welfare.[23]

James Kent, Chancellor of New York, viewed by some as one of the most "comprehensive American legal minds" and a staunch defender of private property, put it succinctly in 1826: "Private [property] interest[s] must be made subservient to the general interest of the community."[24]

The history of American property law reflects our judges' abiding concern with the people's welfare. It also reveals profound historical changes in their conception of how best to promote that welfare. This history reveals not just how we came to have the laws we have, but also just how malleable property laws have been over time. Recognizing this helps us to set ourselves free to imagine the legal institutions we need in our current circumstances, including those of the common law. Oliver Wendell Holmes, Jr. in 1897 urged judges and the people to embrace this freedom and responsibility:

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22. Charles River Bridge v. Warren Bridge, 36 U.S. (11 Pet.) 420, 548 (1837) (upholding a legislative charter for a new toll bridge over the objection of the owner of a pre-existing state-chartered bridge who claimed the competition from new bridge would reduce the value of his charter).

23. Commonwealth v. Alger, 61 Mass. (7 Cush.) 53, 84–85 (1851); *see also* NOVAK, *supra* note 15, at 21 (showing that this famous passage was "firmly entrenched in the intellectual, political, and legal traditions of nineteenth-century America"); ELY, *supra* note 11, at 61 (explaining that few jurists questioned this power of the states to regulate property in the interests of the community).

24. NOVAK, *supra* note 15, at 9 (quoting and discussing JAMES KENT, COMMENTARIES ON AMERICAN LAW, 265 (New York, O. Halsted 1826)); *see also id.* at 50 (James Kent's writings quoted and discussed); ELY, *supra* note 11, at 33 ("To newly independent Americans, respect for economic rights did not encompass unfettered liberty to use property in any manner. [The theory of republican government justified] subordinating private interests to the pursuit of public welfare.").

> It is revolting to have no better reason for a rule of law than that so it was laid down in the time of Henry IV. It is still more revolting if the grounds upon which it was laid down have vanished long since, and the rule simply persists from blind imitation of the past.[25]

Another of our greatest justices, Benjamin Cardozo, similarly viewed the evolution of the law, including the common law, as a continual, experimental search for pragmatic rules that serve justice and the public welfare in view of changing circumstances.[26] Cardozo observed that property may be regulated for the common good, and that each generation must "work out for itself" what that regulation shall be: "new times and new manners may call for new standards and new rules."[27]

The views shared by Holmes and Cardozo also are shared by judges today, including current U.S. Supreme Court Justice Antonin Scalia. Justice Scalia acknowledges that common law judges are understood to "make" law rather than "discover" it as a somehow preexisting body of rules.[28] The job of common law judges, like the "great judges" (as he called Holmes and Cardozo), is to devise the "best rule of law," the "laws that ought to govern mankind."[29] Most fields of common law, including property and liability law, remain open to this judicial lawmaking, perhaps even more today than ever in Scalia's estimation.[30] Is Justice Scalia troubled by this? Far from it: "I am content to leave the common law, and the process of developing the common law, where it is. It has proven to be a good method of developing the law in many fields—and perhaps the very best method."[31]

As we consider the "best" rules of property for our circumstances, the U.S. Constitution provides us with no guidance as to what those rules should be. While the Constitution contains several provisions relating to property and economic concerns, including the Commerce Clause,[32] the Contract Clause,[33] and the Fifth Amendment's Takings Clause,[34] it does not

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25. Holmes, *supra* note 1.

26. BENJAMIN N. CARDOZO, THE NATURE OF THE JUDICIAL PROCESS 21–32, 112–19 (Yale Univ. Press 1949) (1921).

27. *Id.* at 87–88.

28. ANTONIN SCALIA, A MATTER OF INTERPRETATION: FEDERAL COURTS AND THE LAW 10 (1997).

29. *Id.* at 7, 9.

30. *Id.* at 12.

31. *Id.*

32. U.S. CONST. art. I, § 8, cl. 1.

33. *Id.* art. I, § 10, cl. 2.

define property and does not establish any general right to any particular property interest.[35] Just as the Constitution neither creates nor protects any particular property right, as it does so many other rights, it does not provide any particular vision of what structure of property rights would best serve the public welfare. It does not allocate property rights between public and private ownership. It sets forth no particular way to balance property rights with other important competing components of the public welfare. It does not prioritize private property in relation to public health or the environment. Those decisions are left to Congress and, most importantly, the States, the common law, and ultimately, the democracy. Under the Constitution, then, it falls to each generation of Americans to define democratically the public welfare and develop a structure of property laws that will best serve it.

In thinking through our property laws, we must recognize that law is *antecedent* to the economy.[36] Law does not spring from the economy itself. Rather, law, especially property law, forms the foundation of the economy, the infrastructure within which economic actors operate.[37] By prioritizing various interests and specifying how conflicts between them should be resolved, law provides a system of incentives and disincentives, the rules of competition, that shape what economic actors do as they maximize their own gain.[38] Viewing property laws as restraints on liberty is nearly always an incomplete and one-sided view, for even as they restrain one interest, they simultaneously liberate another. Liberty is implicated on both sides of all property laws.[39] To take one example, just as pollution control laws

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34. *Id.* amend. V (barring the federal government from taking private property for a public use without just compensation); *id.* amend. XIV, § 1 (applying the Fifth Amendment to the states: "nor shall any State deprive any person of life, liberty, or property, without due process of law").

35. *See* ELY, *supra* note 11, at 42–58 (describing generally procedural constitutional provisions relating to property). While it is clear that property interests are created only by sources of law other than the Constitution, some commentators find merit in the notion that the U.S. Supreme Court should develop a "patterning definition" of what attributes a right must have to qualify as a property right for purposes of the Fifth Amendment's Takings Clause, but even this the Court has not done. *See* DAVID A. DANA & THOMAS W. MERRILL, PROPERTY: TAKINGS 58–85 (2002).

36. This discussion relies heavily on the work of economist Daniel W. Bromley, who has discussed in depth the pervasive role of legal and other social institutions (especially including property rights) in shaping the market economy (even supposedly "free markets"), challenged the characterization of laws as "constraints," and shown how transformation of law results from political and legal processes that are grounded in human values and concerns that are outside of market-guided economic behavior. *See* DANIEL W. BROMLEY, SUFFICIENT REASON: VOLITIONAL PRAGMATISM AND THE MEANING OF ECONOMIC INSTITUTIONS 3–84 (2006); s*ee also* TOM BETHELL, THE NOBLEST TRIUMPH: PROPERTY AND PROSPERITY THROUGH THE AGES 3, 13, 314, 319–20 (1998) (concluding that law is "antecedent to economy" and determines economic behavior).

37. *Id.*

38. *Id.*

39. DANIEL W. BROMLEY, *supra* note 36, at 31–34, 37–38, 54–62, 75–76, 80–83.

restrain industry from externalizing pollution, they liberate polluted communities from its unwanted burdens.[40]

By changing the system of economic incentives and disincentives, new legal rules can change what the economy determines is best to produce and how to produce it. But whether such changes are good or bad must be determined from a perspective outside the economy itself—from a perspective rooted in ethics, social justice, our current reality, and a vision of how the general welfare is best promoted.[41]

Some economists and lawyers insist otherwise, starting with the existing market and then judging proposed new property rules by calculating whether they would produce net economic benefits. Lawyers from the school of "law and economics" even seek to explain property laws including liability rules as following from the dictates of economic efficiency.[42] The central flaw in this approach to law is that what the existing economy calculates to be "economically efficient" to produce is determined always by reference to the rules that already exist.[43] Granting such an initial preference to the existing market economy can only result in justifying the very economic behavior that is already being judged economically efficient according to existing institutions. Defining the "best" laws as those that maximize the existing economy is an exercise in circular reasoning that can only validate and enhance the power of the status quo, and that indeed is its likely purpose.[44]

Thus, we cannot look to the existing economy to generate on its own new principles for prioritizing interests or resolving conflicts between them. Abolition of slavery and child labor, for example, obviously threatened established economic interests. The nation was driven to take those steps not to make the economy more efficient, but to further an evolving national vision of social justice.

Some progressive economists have decried the excessive ecological destruction being wrought by our current economy and suggested concepts for its restructuring. For example, Herman Daly has urged that we must incorporate into our economy some means for containing the scale of

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40. *Id.* at 12, 59, 65–66.

41. *Id.* at 34–41, 119–21.

42. *See, e.g.*, WILLIAM M. LANDES & RICHARD A. POSNER, THE ECONOMIC STRUCTURE OF TORT LAW 1 (1987) (explaining that tort law illustrates judges' efforts to promote economic efficiency).

43. BROMLEY, *supra* note 36, at 44–50, 54–66, 67–71, 199–211.

44. *Id.* at 10–13; *see also* BETHELL, *supra* note 36, at 314, 319–20 (criticizing the law-and-economics view that economic efficiency can drive creation of just rules of property).

"throughput" and for more equitably distributing its benefits.[45] Paul Hawken, Amory Lovins, and L. Hunter Lovins have proposed new principles of "Natural Capitalism" for treating nature as a form of capital that is finite, valuable, and irreplaceable, recognizing that not all resources are substitutable by the accumulation of other forms of wealth, and preserving and investing in such natural capital.[46] Thomas Princen has suggested that we reorganize our economic activity around the principle of "sufficiency," whereby we accept the benefits that the Earth can provide over the long-term as sufficient for us to live on.[47]

But principles of behavior such as these are not going to arise out of the economy. If we wish to align our economic behavior with the Earth's ecological realities, we must explicitly adopt this social goal and then restructure our property laws so that they will provide economic actors with the incentives to behave as we wish them to. Individuals are sometimes able to resist the economic incentives provided by the law and to adopt their own ethical relationships with the land. But if we wish to reshape how our entire society lives on the Earth, we will have to alter our laws of property.

When the legal system alters property rights, the social transformations are wrenching for those caught up in them. Though many gain when laws are altered for the common good, some lose vast property rights in the process. Slave owners lost "property" when slavery was abolished, men lost property rights in their wives' estates as the status of women changed, and others experienced profound losses when "the states abolished feudal tenures, abrogated primogeniture and entails, ended imprisonment for debt," and reduced other traditional and ancient rights.[48] Many Americans lost extensive property rights as nineteenth-century common law altered liability rules to accommodate the industrialization of the nation.[49]

Though some may feel such losses are unjust and more than they should rightly bear, our general rule has been that such losses do not generate a right of compensation, and must be borne as society readjusts the balance of interests in pursuit of the public welfare.[50] Accordingly, we recognize no property right in any particular rule of the common law that

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45. HERMAN E. DALY, BEYOND GROWTH 32 (1996); *see also* Kysar, *supra* note 4, at 20–51 (reviewing calls in literature for constraints on scale, redistribution, and other principles of ecological economics).

46. PAUL HAWKEN ET AL., NATURAL CAPITALISM (1999).

47. THOMAS PRINCEN, THE LOGIC OF SUFFICIENCY (2005).

48. Joseph L. Sax, *Property Rights and the Economy of Nature: Understanding* Lucas v. South Carolina Coastal Council, 45 STAN. L. REV. 1433, 1447–48 (1993).

49. *See infra* Part III.A.

50. *See, e.g.*, Sax, *supra* note 48, at 1449–51 (discussing the general rule that loss of property rights due to legal evolution does not generate a right to compensation).

could serve as the basis of a claim for compensation when that law is changed.[51] We do not compensate losses caused by legislation, unless they amount to a taking under the Constitution's Fifth Amendment.[52] As the U.S. Supreme Court put it:

> Under our system of government, one of the State's primary ways of preserving the public weal is restricting the uses individuals can make of their property. While each of us is burdened somewhat by such restrictions, we, in turn, benefit greatly from the restrictions that are placed on others. These restrictions are "properly treated as part of the burden of common citizenship." Long ago it was recognized that "all property in this country is held under the implied obligation that the owner's use of it shall not be injurious to the community," and the Takings Clause did not transform that principle to one that requires compensation whenever the State asserts its power to enforce it.[53]

Recognizing all such claims whenever the law is altered would impede the development of the law, including the common law, in its effort to serve the people's welfare and respond to the evolving understanding of justice. It would reduce the incentives for people to look ahead of the law and adapt to changing circumstances. It would lock our society into the structure of a fixed time and circumstances and defeat the very evolution our legal system is designed to undergo.[54]

With these principles of American government and law in mind, let us turn to American property law as it was structured when the United States was founded. As Part II shows, early American property law was suited to a pre-industrial society in which population was low and the Earth's resources were plentiful.

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51. Munn v. Illinois, 94 U.S. 113, 134 (1877) ("A person has no property, no vested interest, in any rule of the common law.").

52. U.S. CONST. amend. V, amend. XIV, § 1.

53. Keystone Bituminous Coal Ass'n v. DeBenedictis, 480 U.S. 470, 491–92 (1987) (citations omitted); *see also id.* at 488 n.18 (summarizing 100 years of case law and concluding "the Court has repeatedly upheld regulations that destroy or adversely affect real property interests").

54. *See* Sax, *supra* note 48, at 1449–51 (discussing reasons for the general rule that loss of property rights due to legal change does not generate a right to compensation).

II. PROPERTY RIGHTS AND THE PUBLIC WELFARE IN THE PRE-INDUSTRIAL AGE

When the Constitution was ratified in 1789, the United States was a country of less than four million people with an essentially agrarian economy. To Americans, the new continent seemed boundless. Thomas Jefferson and many others advocated widespread land ownership to promote individual economic independence and civic order, and believed that states should grant land to all citizens who were thought to have a right to acquire property.[55] As Jefferson saw it, "The earth is given as a common stock for man to labour and live on."[56] North America's vast expanses of pristine forest, prairies, wetlands, and mountains, though long inhabited and lived upon, were regarded widely by society and by the courts as a wilderness full of "vacant" and "worthless" lands that cried out to be "settled," "cultivated," "subdued," and "improved."[57] American policy was to transfer this government-claimed wilderness to private owners who would make it useful.[58] And so, Americans hungry for land set out to settle the territory claimed (whether legitimately or not) by the new nation.

Property laws reflected these circumstances and social outlook. Early American law protected the right of landowners to be personally secure from invasions; to use their land economically; to clear and cultivate it; and to otherwise put it to what was considered its ordinary, natural, and primarily agrarian use.[59] The social commitment to the use of land led to legal restrictions on aggregation by speculators of undeveloped land and to laws designed to force landowners who did not cultivate their lands to relinquish them to the state.[60] The law permitted the public to use privately owned lands for subsistence if the lands were unenclosed and

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55. *See generally* Stanley N. Katz, *Thomas Jefferson and the Right to Property in Revolutionary America*, 19 J.L. & ECON. 467, 469–70 (1976).

56. *Id.* at 480 (quoting Jefferson letter dated Oct. 28, 1785).

57. John G. Sprankling, *The Antiwilderness Bias in American Property Law*, 63 U. CHI. L. REV. 519, 530–32 (1996) (documenting the widespread view of both state and federal judges at the turn of the nineteenth century that wilderness was valueless land that should be brought under cultivation).

58. *Id.* at 529–30.

59. *Id.* at 521–56 (describing early American common law and alterations from traditional English law designed to promote exploitation of wilderness); ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 62–66 (5th ed. 2006) (describing early common law); MORTON J. HORWITZ, THE TRANSFORMATION OF AMERICAN LAW 1780–1860, at 31–34 (1977).

60. ELY, *supra* note 11, at 17–18; *see* FREYFOGLE, *supra* note 11, at 52–55 (explaining how the idea that all citizens have "the right to *acquire* land on reasonable terms" underlies early anti-hoarding laws in New York, Virginia, and North Carolina).

uncultivated.[61] As long as they did not interfere with the owner's actual use, the public could freely enter private land to hunt, fish in navigable waters, trap, and forage for lumber, berries, fruit, flowers, nuts, and herbs.[62] As the South Carolina Supreme Court explained in 1818, even if privately owned, "[t]he forest was regarded as a common" that hunters were privileged to enter at their pleasure and need not depart even if asked to do so by the owner.[63] Similarly, the public retained certain rights in navigation, fishing, and recreation along the seashore and in tidal and running waters that were protected from undue interference by private landowners by common law courts under the public trust doctrine.[64]

Despite America's abundance of land, small population, and low-impact economy, conflicts between private rights and the public interest did arise. From the beginning, American government had the power to regulate private land uses in the public interest, and it did so frequently.[65] But the most important institution for resolving property conflicts was the common law. For centuries in both England and America, the core legal structure defining the contours of private property rights was the frequently invoked common law maxim, "*sic utere tuo ut alienum non laedas*" ("use your own so as not to injure another").[66] As the eighteenth-century legal commentator

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61. For a discussion of early public rights in private land, see FREYFOGLE, *supra* note 11, at 22–24, 255–56.

62. *Id.*

63. *See* FREYFOGLE, *supra* note 11, at 255 (quoting and discussing M'Conico v. Singleton, 9 S.C.L. (2 Mill) 244 (S.C. 1818)); s*ee also* Sprankling, *supra* note 57, at 553 n.183 (compiling hunting cases).

64. Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 471, 475–90 (1970).

65. *See* Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1056–60 (1992) *(*Blackmun, J., dissenting) (compiling references demonstrating extensive early American land use regulation). Scholars have extensively documented what often seems to us today to be a surprising amount of early American land use and economic regulation designed to both prevent harm and promote social objectives in land management. *See* ELY, *supra* note 11, at 17–25; FREYFOGLE, *supra* note 11, at 58–63 (explaining how the idea that "an owner's right to use land and the corresponding power of government to control that use" led to "a vigorous tradition of regulating land uses in the public interest"). *See generally* John F. Hart, *Colonial Land Use Law and Its Significance for Modern Takings Doctrine*, 109 HARV. L. REV. 1252 (1996) ("[C]olonial legislators believed that it was a legitimate use of government power to promote the public good by restricting the right of private landowners to use their land as they saw fit.").

66. HORWITZ, *supra* note 59, at 32; NOVAK, *supra* note 15, at 42–50 (explaining the broad applicability of *sic utere tuo*); FREYFOGLE, *supra* note 11, at 67–69 (noting the importance of *sic utere tuo as* reflected in a New York case from 1805 where the majority observed "that the 'no harm' rule was 'a familiar maxim' of property law"). The common law did contain many procedural formalities and a variety of other complex property rules, but these were of comparatively narrow applicability. *See* Sprankling, *supra* note 57, *passim* (discussing waste, adverse possession, possession as notice to purchaser, and good faith improver doctrines); HORWITZ, *supra* note 59, at 32–74 (discussing

William Blackstone put it, a neighbor was expected not to interfere with another's quiet enjoyment of his or her land because "it is incumbent on [a neighboring owner] to find some other place to do that act, where it will be less offensive."[67]

The principle of *sic utere tuo* imposed a rule of strict liability without regard to the social utility of the interfering activity or whether the actor was somehow at fault.[68] None of this was relevant, as the New York Court of Appeals explained in 1849 in a case where the defendants damaged a home while building a nearby canal:

> If the plaintiff's [damage occurred], the inconvenience to him would be the same whether the [damage was] by accident or design, with an intent to injure him or from an anxious wish to preserve his property. The actual damage to the plaintiff would be the same whatever might be the motive for the act which caused it.
>
> How the defendants performed their work was in this view of no consequence: what they did to the plaintiff's injury was the sole question.[69]

Thus, the liability rule of *sic utere tuo* was built on the core presumption that damage to property was highly undesirable and should be discouraged. It was a legal rule that strongly motivated economic actors to avoid projects that would damage their neighbors, for the law left little doubt that they would be held liable for that damage. Though this rule restrained landowners from undertaking damaging projects, it was also a source of property rights that freed landowners from the burden of being damaged by others and ensured all landowners the right of private enjoyment of their land without interference. The balance of interests struck by *sic utere tuo*, a guiding principle of the economy, was one of comity and of justice, well-suited to the priorities of ensuring individual privacy and stabilizing the

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prescription, waste, and just compensation); W. PAGE KEETON ET AL., PROSSER AND KEETON ON TORTS §§ 6, 28, 86 (West 5th ed. 1984) (outlining historical procedures and forms of action).

67. SIR WILLIAM BLACKSTONE, 3 COMMENTARIES ON THE LAWS OF ENGLAND 217–18 (Univ. of Chicago Press 1978) (1768).

68. HORWITZ, *supra* note 59, at 70, 85; FREYFOGLE, *supra* note 11, at 69–70.

69. Tremain v. Cohoes Co., 2 N.Y. 163, 164 (1849); *see* Hays v. Cohoes Co., 2 N.Y. 159, 162 (1849) (stating additional facts); *see also* Susquehanna Fertilizer Co. v. Malone, 20 A. 900, 902 (Md. 1890) (holding that the fertilizer company must pay damages for air pollution because "[t]he neighboring owner is entitled to the reasonable and comfortable enjoyment of his property, and, if his rights in this respect are invaded, he is entitled to the protection of the law, let the consequences be what they may").

economy by protecting settled agrarian land uses from disruption.[70] The principle of *sic utere tuo* functioned as the law's essential principle for adjudicating liability and, together with the law's overarching goal of *salus populi suprema lex est* ("the welfare of the people is the supreme law"), formed the common law's "blueprint," its fundamental property rights structure for governing the pre-industrial economy.[71]

However, while it restrained landowners from altering nature in ways that would damage neighbors, *sic utere tuo* was concerned essentially with people's direct effects on each other and did not protect the environment for its own sake. Indeed, when transplanted to America, the strict liability imposed by *sic utere tuo* encouraged people to seek out, as Blackstone recommended, distant and unsettled wilderness territory where they could more freely work their land and subdue nature without troubling any neighbors.[72]

As settlers moved into the nation's seemingly boundless lands, their goal was to cultivate the wilderness, and the law encouraged and enabled them to do so. We look back and see that "pioneer settlers destroyed forests, denuded prairies, drained wetlands, and plowed deserts as the centuries proceeded," resulting in the destruction of most of America's original "wilderness lands."[73] But we can also understand the settlers' behavior as reflecting a pre-industrial conception of how best to use the Earth to promote the public welfare. While land was made available to private owners for their dominion, landowners were forbidden from using their lands in any way that caused damage to their neighbors or interfered with public rights to navigation and fishing, and they were required to make their unused lands openly available to the public for subsistence.

In the industrial age to come, however, land uses would intensify, and conflicts would mount between neighbors as well as between private property owners and the public interest. The traditional legal principle of *sic utere tuo* would be rethought and, in the end, all but swept away.

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70. HORWITZ, *supra* note 59, at 31–32, 70 (identifying cases and discussing the broad economic impact of *sic utere tuo*).

71. *Id.*; NOVAK, *supra* note 15, at 42–50 (explaining how *sic utere tuo* and *salus populi* governed the preindustrial economy).

72. BLACKSTONE, *supra* note 67, at 217–18; *see also* Sprankling, *supra* note 57, at 555–56 ("American courts often refused injunctive protection for wilderness lands, reasoning that they were essentially valueless."); HORWITZ, *supra* note 59, at 75.

73. Sprankling, *supra* note 57, at 530. Only 10%–20% of America's original wilderness lands remain. *Id.* at 559–63.

III. PROPERTY RIGHTS AND THE PUBLIC WELFARE IN THE INDUSTRIAL AGE

The rise of the Industrial Revolution as a dominating social force in the eighteenth and nineteenth centuries brought with it the new idea that the public welfare could best be promoted by encouraging industrial growth. This resulted in a profound restructuring of our property law and the system of economic incentives and disincentives it provides.

This Part examines in detail how American property laws were altered to promote economic growth, why the modern structure of the law is leading inexorably to the cumulative environmental destruction we see all around us, and why it is no longer appropriate in view of our current circumstances. Part III.A first examines the structure of the core liability doctrines of the common law, negligence and nuisance, and traces three major implications of that structure. The Article then examines how many of the federal environmental laws mirror the structure of these common law doctrines (Part III.B), shows how the failure of the common law to evolve is impeding legislatures from adopting more progressive legislation (Part III.C), and, finally, considers the claims of property rights activists that the solution to our environmental problems lies in altering who owns the land (Part III.D). Then, Part IV will propose a new principle of law for the ecological age, embodied in the tort of ecological degradation.

A. The Pro-Economic-Growth Structure of the Modern Common Law

The Industrial Revolution's dams, mills, factories, and canals used land with increasing intensity, causing damage that more and more frequently extended to neighboring, increasingly populated lands. Sometimes things went wrong, causing fires, floods and explosions, while pollution and other kinds of damage were inherent in the activities themselves. The pre-industrial common law imposed strict liability for many of these impacts, and the cost of this liability threatened many of the new industries that were arising.[74] As these conflicts reached the courts, judges began to struggle with the idea that perhaps this disruptive industrial activity was nevertheless desirable, that it might promote the public good even though the lands of neighbors were sometimes damaged.

74. HORWITZ, *supra* note 59, at 67–71, 74–75, 85, 101–02.

Historians identify *Palmer v. Mulligan* as the first American case to openly promote this radical new way to think about liability.[75] The 1805 case arose when the defendants built a new sawmill on the Hudson River that altered the river's flow and otherwise complicated the operation of the plaintiffs' sawmill, which had been in place 200 yards downriver for several decades.[76] The two dissenting justices found the case an easy one under the prevailing law:

> The defendants have clearly . . . no right to obstruct the plaintiffs in the enjoyment of the water. They have an equal right to build a mill on their soil, but they must so use the water, and so construct their dam, as not to annoy their neighbor below in the enjoyment of the same water.[77]

But the three-judge majority was not so sure. Justice Brockholst Livingston acknowledged for the majority that application of the "familiar maxim" of *sic utere tuo* would indeed protect the downriver mill and probably eliminate the upriver mill.[78] He was concerned, however, that this would effectively grant the first mill owner an exclusive right to a large portion of the Hudson and deprive the public of the "benefit which always attends rivalry and competition."[79] Justice Livingston sought instead to take into account the rights of all landowners, not just the first, to use their property and also the wider public's economic interest in having all landowners use their land productively.[80] He concluded that society would be best served if the downstream mill owners suffered the damage, articulating a new legal standard for liability: "the maxim *sic utere tuo ut alienum non laedas* should be limited to such cases only where a manifest and serious damage is the result of such use or enjoyment."[81]

This decision is considered the first time the American legal system allowed an enterprise to damage a neighboring landowner without paying compensation based on an explicit consideration of the relative economic efficiencies of competing uses of land.[82] However, the problem of exactly how to balance the interests, of defining a new legal test to determine when

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75. FREYFOGLE, *supra* note 11, at 66–69 (discussing the importance of the case); HORWITZ, *supra* note 59, at 2–3, 37–38; *see also* Palmer v. Mulligan, 3 Cai. 307, 307 (N.Y. Sup. Ct. 1805) (allowing detriment to a downstream saw mill).

76. *Palmer*, 3 Cai. at 307.

77. *Id.* at 320.

78. *Id.* at 313–14.

79. *Id.*

80. *Id.*

81. *Id.* at 314.

82. HORWITZ, *supra* note 59, at 38.

landowners should be liable for damage they did, was difficult and would remain unsettled for many years. The test articulated by Justice Livingston was a simplistic one that focused only on whether the damage was "manifest and serious" without explicitly articulating or balancing the interests Livingston was concerned with, and could not be applied in a principled or predictable way. Many courts refused to follow *Palmer v. Mulligan*, and even decades later prominent commentators and judges found it "manifestly unjust" and "certainly contrary" to established law.[83] Not until after the Civil War would many judges begin to seriously consider whether the benefits of a defendant's actions should excuse liability.[84]

Scholars have tracked the long, convoluted, and uneven path by which the common law incorporated a balancing of economic interests into its rules of liability.[85] The transformation was not complete until well into the twentieth century, more than one hundred years after *Palmer v. Mulligan*. The resulting modern common law, in the core doctrines of negligence and nuisance, has almost completely abandoned the old principle of strict liability.[86] Following the lead of *Palmer v. Mulligan*, the new law now permits landowners not only to degrade their own lands, but often also to externalize the consequences of their activities by damaging neighboring lands.

The most crucial step in this transformation was that judges came widely to accept Justice Livingston's belief that industrial activity generally produces a net social benefit despite the damage it causes[87] and further, that society would be better off if everyone tolerated this damage rather than remain mutually undisturbed in the quiet enjoyment of their land. Judges did not reach this conclusion about economics and the social good through detailed calculation of all the social costs and benefits or quantitative economic analysis of any kind.[88] They simply adopted the passionate belief in industrialization that was widespread in American society. The optimism of the times was expressed in 1873 by the New York State Court of Appeals in a case holding that the defendants were not liable for damage their

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83. *Id.*

84. *Id.* at 37–40, 85–108.

85. *See id.* at 63–108 (recounting the history of the transformation from *sic utere tuo* to modern negligence and nuisance law); FREYFOGLE, *supra* note 11, at 65–77; RESTATEMENT (SECOND) OF TORTS § 822 cmt. b (1965) (summarizing historical development of nuisance law).

86. *See* John C. P. Goldberg & Benjamin C. Zipursky, *The Moral of Macpherson*, 146 U. PA. L. REV. 1733, 1754 (1998) (discussing how Holmes "argued that modern common law generally rejected strict liability").

87. *See, e.g.*, Platt v. Johnson & Root, 15 Johns. 213 (N.Y. Sup. Ct. 1818) (citing Justice Livingston).

88. *Id.*

exploding boiler caused to a neighbor's property:

> The general rules that I may have the exclusive and undisturbed use and possession of my real estate, and that I must so use my real estate as not to injure my neighbor, are much modified by the exigencies of the social state. We must have factories, machinery, dams, canals and railroads. They are demanded by the manifold wants of mankind, and lay at the basis of all our civilization. [The damaged neighbor] receives his compensation . . . by the general good, in which he shares, and the right which he has to place the same things upon his lands.[89]

In *Pennsylvania Coal Co. v. Sanderson*, the Pennsylvania Supreme Court expressed a similar concern with the traditional common law liability rules when it decided to allow a coal mine to pollute a stream, thereby rendering it unfit for use by a downstream property owner for fresh water, fish, ice, and other domestic purposes.[90] The court did not allow Mrs. Sanderson to recover money damages, fearing that if all similarly injured landowners were able to recover damages and perhaps injunctions, the state's coal industry would not survive, to the wider public's detriment.[91] In the court's view, the better law was that "the rightful use of one's own land may cause damage to another without any legal wrong"[92] and the better policy was that "[t]o encourage the development of the great natural resources of a country trifling inconveniences to particular persons must sometimes give way to the necessities of a great community."[93]

Responding to this ascendant view of the social value of economic growth, judges developed new legal rules that would promote industrialization rather than impede it. They formally replaced the core presumption implemented by *sic utere tuo*, that defendants should pay for the damage they do, with a new core presumption that was precisely its opposite: that defendants should not pay compensation for damage they do to others. In his famous 1881 treatise, *The Common Law*, Oliver Wendell Holmes, Jr., concisely explained both the new confidence in economic activity and the rationale for a legal rule insulating it from liability:

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89. Losee v. Buchanan, 51 N.Y. 476, 484–85 (1873).
90. Pa. Coal Co. v. Sanderson, 6 A. 453, 462–65 (Pa. 1886).
91. *Id.* at 455–56.
92. *Id.* at 457.
93. *Id.* at 459.

> A man need not, it is true, do this or that act—the term *act* implies a choice—but he must act somehow. Furthermore, the public generally profits by individual activity. As action cannot be avoided, and tends to the public good, there is obviously no policy in throwing the hazard of what is at once desirable and inevitable upon the actor.[94]

Judges still faced the difficult task of developing a new test for when a defendant would be liable. The test needed to be more workable than Justice Livingston's and effectively balance the various competing interests. They focused not simply on the severity of damage, as had Justice Livingston, but on defining when the defendant could be said to be at "fault."[95] The general concept of "fault" had long been known in the law. But in the nineteenth and twentieth centuries, judges developed a detailed concept of fault-based liability that now lies at the core of the common law.[96]

Under the modern common law's central liability doctrine, defendants are now liable only when they are "negligent."[97] Negligence is defined as conduct that creates an "unreasonable" risk of harm.[98] "Unreasonable" is defined not in ethical or moral terms, but explicitly as a cost–benefit principle:

> Where an act is one which a reasonable man would recognize as involving a risk of harm to another, *the risk is unreasonable and the act is negligent if the risk is of such magnitude as to outweigh what the law regards as the utility of the act* or of the particular manner in which it is done.[99]

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94. OLIVER W. HOLMES, JR., THE COMMON LAW 95 (Dover Publications 1991) (1881).

95. *See id.* at 77–129 (discussing the history of liability based on fault and strict liability); *cf.* HORWITZ, *supra* note 59, at 85–108 (explaining that before the nineteenth century, fault was used in relatively few and limited causes of action, and calling its detailed elaboration as the central principle of modern liability law the "triumph of negligence").

96. HORWITZ, *supra* note 59, at 85–108.

97. RESTATEMENT (SECOND) OF TORTS § 281 (1965) (providing a typical statement of the rule of negligence that now applies in all fifty states).

98. *Id.* § 282; s*ee also* KEETON ET AL., *supra* note 66, § 30, at 164–65 (noting that negligence requires failure to protect against "unreasonable risks").

99. RESTATEMENT (SECOND) OF TORTS § 291 (emphasis added); KEETON ET AL., *supra* note 66, at 173 ("[T]he standard of conduct which is the basis of the law of negligence is usually determined upon a risk-benefit form of analysis: by balancing the risk, in the light of the social value of the interest threatened, and the probability and extent of the harm, against the value of the interest which the actor is seeking to protect, and the expedience of the course pursued.").

This rule is worthy of close examination, for within its structure can be found the balance of social interests that the law seeks to implement. The key elements are: (1) who bears the burden of proof, (2) the facts that the party bearing the burden of proof must establish, and (3) the certainty with which those facts must be established. Under the modern rule, defendants are presumed not liable, and plaintiffs carry the burden of proof to show that defendants were negligent.[100] To carry this burden, damaged plaintiffs must generally prove that the defendant could have taken a step to prevent the damage that was "reasonable" under a cost–benefit analysis.[101] To do this, plaintiffs usually must identify the cost-effective measure that the defendant should have adopted, such as installing a guardrail or scrubbing a waste stream. Plaintiffs must establish these facts by a preponderance of the evidence, meaning that plaintiffs must show they are more likely true than not.[102]

In addition to revising the law of negligence, judges also altered the law of "nuisance." This is the core environmental tort, the common law's central doctrine for recognizing people's interests in the enjoyment and use of land, including economic, aesthetic, and recreational uses.[103] Nuisance is the common law's primary vehicle for addressing virtually all environmental issues, including land uses as well as air, water, land, and groundwater pollution. The structure of modern nuisance, like negligence, places the burden of proof on plaintiffs to prove by a preponderance of the evidence that the defendant's intentional acts[104] are "unreasonable." As in negligence, "unreasonable" is defined explicitly by a cost–benefit test:

> [a]n intentional invasion of another's interest in the use and enjoyment of land is *unreasonable* [and therefore a nuisance] if

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100. RESTATEMENT (SECOND) OF TORTS § 382A, cmt. a (stating that in a negligence action a plaintiff carries the burden of proof by preponderance of the evidence).

101. KEETON ET AL., *supra* note 66, at 173.

102. RESTATEMENT (SECOND) OF TORTS § 328A.

103. GERALD W. BOSTON & M. STUART MADDEN, LAW OF ENVIRONMENTAL AND TOXIC TORTS 38 (1994).

104. Nuisance generally is based on intentional acts, but it can also be based on unintentional acts. *See* RESTATEMENT (SECOND) OF TORTS § 822(b) (explaining that nuisance liability can be imposed for "unintentional" conduct, but only where it also falls under other common law rules imposing liability for negligence, reckless conduct, or abnormally dangerous activities). Thus, nuisance liability for "unintentional" conduct is essentially liability under these other common law doctrines and is called nuisance only because an interest in land is involved. Accordingly, herein, "nuisance" refers to intentional nuisances, which are not fundamentally grounded in those other provisions of tort law.

> (a) *the gravity of the harm outweighs the utility of the actor's conduct . . . .*[105]

Thus, the central liability doctrines of the modern common law harbor at their core the presumption that economic activity provides a net benefit to society, and impose liability only where damaged plaintiffs can prove this presumption false by showing that the costs of a particular action outweigh its benefits. This structure does not just allow defendants to avoid liability by proving that their conduct provides a net public benefit. It installs the presumption of net benefit as the starting point of the law, and requires plaintiffs to prove it false before the law will act on their behalf.

Judges did not stop there, but elaborated many other provisions in transforming the liability rules of the common law. Indeed, the law of negligence and nuisance now constitutes a substantial intellectual edifice defining what it means to be at "fault."[106] Many of these provisions impose substantial additional legal burdens on plaintiffs, which serves to further insulate economic actors from liability. These include requiring proof that a defendant had a legal "duty" to protect the plaintiff from unreasonable risk, that the harm was reasonably "foreseeable" at the time of the defendant's conduct, and that the harm was "proximately" caused by the defendant's conduct.[107] Liability can even be apportioned between the defendant and the plaintiff if both are negligent.[108] Private nuisance has been further curtailed by the requirement that the harm be "significant," and public nuisance by the "special injury/different in kind" rule, which precludes private plaintiffs from seeking redress for damage inflicted on the general

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105. *Id.* § 826(a) (emphasis added). Section 826(b) provides a rarely used second test whereby "unreasonableness" can be found if the harm is "serious" and the defendant can afford to pay compensation. This second test would authorize an imposition of liability even if the defendant's actions have a net social utility, but only if the enterprise would remain economically viable. Even so, very few courts have adopted the principle of section 826(b) and others have explicitly rejected it. *See* PERCIVAL ET AL., *supra* note 59, at 69–73; LANDES & POSNER, *supra* note 42, at 49; BOSTON & MADDEN, *supra* note 103, at 68–73, 93–96. While the balancing test of nuisance is not identical to that of negligence, the essential point is that in all American jurisdictions today, nuisance law places the burden of proof on damaged plaintiffs and requires a balancing of the interests of the person harmed, of the actor and of the community. *See* RESTATEMENT (SECOND) OF TORTS § 826, cmt. c; KEETON ET AL., *supra* note 66, at 629–32.

106. RESTATEMENT (SECOND) OF TORTS §§ 281–503. The statement of the fundamental rules of negligence by the Restatement (Second) of Torts comprises over 250 sections of law (§§ 281–503) and nearly 600 pages of law and explanatory commentary. RESTATEMENT (SECOND) OF TORTS, pamphlet 2, 1–593. The law of nuisance comprises another thirty-one sections of law (§§ 821A–840E) and nearly 100 pages of law and explanatory commentary. RESTATEMENT (SECOND) OF TORTS, 83–179.

107. *See* KEETON ET AL., *supra* note 66, at 263–300, 356–59 (discussing proximate cause, foreseeability, and duty).

108. *Id.* at 451–53.

public unless they have suffered physical harm or economic loss that differs from that suffered by the public generally.[109] Additional burdens on plaintiffs have gained attention recently, such as judicial demands for "sound science" that disfavor new understandings of health and ecological impacts, secret settlements that conceal problems from the public, and corporate financial influence over science and the judiciary.[110]

The common law retains some doctrines that more readily impose liability. Remnants of strict liability continue in the doctrines of trespass and "abnormally dangerous" and "ultrahazardous" activities.[111] But courts have narrowly circumscribed the ability of these doctrines to significantly redress environmental harm, and the prevailing structure of the modern common law is one that protects and promotes economic activity using the presumption of net benefit.

The modern doctrines of negligence and nuisance are effective as rules of law because they do much more than simply state a policy preference for industrial growth that courts must then somehow accommodate. They specify rules of decision that tell courts how to resolve specific disputes that come before them. The preference for economic growth over other interests is automatically implemented every time these rules are applied because that preference is embedded within their structure. Courts need not explicitly reaffirm the policy goal in their decisions or even take note of it; the goal is furthered simply by application of the law's decision-making rules.

These legal doctrines broadly govern the economy, and have not, by and large been displaced by the modern environmental statutes.[112] The common law rules form the structural backbone of many of the nation's more recent environmental laws, and they continue to provide "background" laws that apply wherever gaps in legislation remain.[113] These legal doctrines constitute fundamental principles of American property law, and exert a profound influence on the ongoing development of our economy.

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109. RESTATEMENT (SECOND) OF TORTS §§ 821C, 821F (1965) (discussing the requirement of "significant" harm and the special injury rule); Denise E. Antolini, *Modernizing Public Nuisance: Solving the Paradox of the Special Injury Rule*, 38 ECOLOGY L.Q. 755–894 (2001) (discussing the history of the "special injury rule").

110. *See* Carolyn Raffensperger & Nancy Myers, *Shifting Burdens: A Proposal for Tort Reform*, *in* PRECAUTIONARY TOOLS FOR RESHAPING ENVIRONMENTAL POLICY 299, 299–317 (Nancy Myers & Carolyn Raffensperger eds., 2006).

111. *See* BOSTON & MADDEN, *supra* note 103, at 21–26, 106–18 (discussing limitations of trespass and strict liability under "abnormally dangerous" and "ultra hazardous" theories).

112. Klass, s*upra* note 16, at 547–51.

113. *Id.* at 557–64.

As time has passed, the full implications for the Earth of the legal doctrines enshrined in the modern common law have become ever more clear. To three of these I now turn.

1. Because Plaintiffs Bear the Burden of Proof, in Practice the Law Permits Conduct That Does Not Have a Net Social Benefit

As we have seen, the common law intentionally allows damage to lie where it falls whenever the defendant's conduct produces a net social benefit. In theory economic actors should incur liability for damage whenever their activities fail to produce this benefit. In practice, however, the law often fails to impose liability when it should. This happens because the burden of proof is placed on the plaintiff rather than on the defendant.

In reality, it is not always possible to determine whether a particular activity provides a net benefit. Often plaintiffs cannot obtain the evidence they need either because it does not exist or because they do not have the resources they need to develop it. When a claim cannot be established, or even brought to court, courts defer to the default state established by the allocation of the burden of proof. Because the law must decide cases, in cases of doubt the allocation of the burden of proof determines the outcome. Thus, by placing the burden of proof on plaintiffs, the law intentionally chooses to err on the side of economic growth.

As can be seen in the historic cases, when judges developed these rules of common law, they had a certain kind of industrial damage before them: fires, explosions, floods, collisions, and other such discrete events.[114] Plaintiffs often are able to carry their burden of proof in such cases, even when it involves damage to human health or the environment. The common law has historically been able to redress environmental damage caused by such discrete events, including acute forms of water pollution, air pollution, and damage to agricultural lands.[115] Courts have even enjoined substantial enterprises because of the environmental damage they were causing.[116]

But in the context of modern environmental problems, the common law's burdens are accentuated and made far more difficult for plaintiffs to carry. Today, environmental damage often involves the cumulative incremental actions of many different actors, sometimes with substantial

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114. *See* PERCIVAL ET AL., *supra* note 59, at 61–87.
115. *Id.*
116. *Id.*

lags in time between action and effect.[117] The intricate interconnections and interdependence of nature's elements make it impossible to achieve any real understanding of many adverse impacts on the environment and human health. Pervasive gaps persist in our understanding of the impacts of pollution and other forms of environmental damage on ecosystems and on individual species, including ourselves.[118] Since market prices are not available for many attributes of the environment and human health, damage to them is often difficult to value and compare to more concrete and immediate economic benefits. When damage is diffuse and affects a large number of dispersed people, victims often have difficulty working together to seek redress through the judicial system.[119] Individuals and communities often have difficulty mustering the resources they need to confront the economic and political power of those causing environmental damage.

For all these reasons, environmental plaintiffs struggle especially hard to prove that damage is "unreasonable," that causation was "proximate," and damage was "foreseeable" and "substantial." Whenever they cannot do so, the law defaults to its preference for economic growth and allows the defendant to continue its activity. The law's allocation of the burden of proof confers on economic activity the status of being society's preferred interest. No wonder scholars conclude:

> There is wide agreement that private nuisance actions alone are grossly inadequate for resolving the more typical pollution problems faced by modern industrialized societies . . . [and that] even in cases of public nuisance, the common law has proved to be a crude mechanism at best for controlling the onslaught of modern-day pollution.[120]

2. The Change in Liability Rules Constituted an Uncompensated Transfer of Valuable Property Rights to Industrial Interests

The law's abandonment of *sic utere tuo* in favor of modern negligence and nuisance law represented an historic shift in property rights. No compensation was paid to those who lost their rights and began to bear the burdens of externalized environmental damage—the farmers whose fields

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117. *See generally* Wendy Wagner, *Common Ignorance: The Failure of Environmental Law to Produce Needed Information on Health and the Environment*, 53 DUKE L.J. 1619 (2004).

118. *Id.*

119. David A. Dana, *Setting Environmental Priorities: The Promise of Bureaucratic Solution*, 74 B.U. L. REV. 365, 376 (1994).

120. PERCIVAL ET AL., *supra* note 59, at 75, 87.

were burned by stray sparks or flooded when dams broke and the fishers whose waters were polluted—except perhaps to the extent they shared in the "general good" of economic development, as the New York Court of Appeals once put it.[121]

Does the struggle over possession of such property rights really matter? Some economists assert that the structure of property rights does not matter very much at all. The famous Coase Theorem, named after Nobel Prize winning economist Ronald Coase, holds that in a certain idealized world (where there are zero transaction costs, perfect information, and flawless markets so that prices reflect all true costs), optimal environmental protection will occur regardless of how property rights are allocated.[122] The classic hypothetical situation in Coase's idealized world is a factory polluting a neighborhood. If the law allows the factory to pollute, the neighborhood can buy out this right and prevent the pollution if that is of sufficient value to it.. Conversely, if the neighborhood has the legal right to prevent the pollution, then the factory can buy out this right, if it so desires. Either way, the correct (meaning most cost-effective) amount of environmental protection will be achieved. Under this theory we should eliminate government regulation, which will only serve to create inefficiency and distort the proper economic resolution of these conflicts. Instead, we can simply rely on existing property law with no need to be concerned with its particular structure.

In the real world, the structure of the law has a profound impact on the resolution of these types of conflicts. The real world is not one of zero transaction costs. Douglass C. North, another Nobel Prize winning economist, has calculated that 45% of the U.S. economy in 1970 was devoted to "the transaction sector."[123] In addition, the real world does not have perfect information or perfect markets. Information imperfections, externalities, absence of prices for environmental attributes, and other market failures are pervasive in the U.S. economy.[124] These market imperfections systematically prevent people from being able to negotiate the socially efficient solutions that economists envision. This is true regardless of who initially holds the property rights. Transaction costs

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121. Losee v. Buchanan, 51 N.Y. 476, 485 (1873); *see also* Sax, *supra* note 48, at 1449.

122. COLE, *supra* note 17, at 3–4.

123. Douglass C. North, *Economic Performance Through Time*, Nobel Lecture, *in* NOBEL LECTURES: ECONOMIC SCIENCES, 1991–1995, at 112, 113 (Torsten Persson ed., 1997), *available at* http://nobelprize.org/nobel_prizes/economics/laureates/1993/north-lecture.html.

124. *See* E. HERMAN DALY & JOSHUA FARLEY, ECOLOGICAL ECONOMICS 157–220 (2004) (discussing pervasive market failures in the U.S. economy, including many relating to the environment); Joseph E. Stiglitz & Carl E. Walsh, *Introduction to Imperfect Markets*, *in* PRINCIPLES OF MICROECONOMICS 227–39 (2002).

make the state that is established as preferred by the property rights regime difficult to dislodge, even to achieve a socially optimal result.

An example illustrates the scale and impact of this problem under the current common law. The Clean Air Act amendments of 1990 constituted a massive revision of the Act. Industry resisted the amendments, convinced that it would impose enormous costs for dubious benefits. Yet, when in 2005 the White House Office of Management and Budget evaluated costs and benefits of many of the specific regulations promulgated as a result of this legislation, it concluded that the social health benefits outweighed the costs, sometimes by ten or twenty-fold.[125] The communities, or at least those suffering health impacts, should theoretically have been able to achieve these results under the common law. After all, failure to install the pollution control equipment was "unreasonable" under the modern test of negligence. However, the burdens of proof imposed on plaintiffs and the real world transaction costs make such a suit virtually impossible.

But the more important point is that, leaving aside the problem of transaction costs, the structure of the property rights regime represents the allocation of vast wealth to the recipients of property rights. For example, even in a Coasian perfect world, both the neighborhood and the factory would desire the power to control the right to pollute. Neighborhoods do not want to pay polluters to stop pollution that involuntarily harms them, and polluters do not want to pay communities for the right to pollute. This is not how either side wishes to spend its limited resources, even if economists say society would benefit overall they did. The law's distribution of wealth through the allocation of property rights is a fundamental issue of social justice.

The nineteenth-century transformation of the common law entailed a massive redistribution of wealth as the burden caused by economic development was shifted away from industrial interests and onto the less powerful people in our society. This transformation in liability law is viewed by some historians as the leading means by which the less powerful elements of society have "subsidized" the nation's economic growth in the

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125. OFFICE OF INFO. & REGULATORY AFF., OFFICE OF MGMT. & BUDGET, VALIDATING REGULATORY ANALYSIS: 2005 REPORT TO CONGRESS ON THE COSTS AND BENEFITS OF FEDERAL REGULATIONS AND UNFUNDED MANDATES ON STATE, LOCAL, AND TRIBAL ENTITIES 8 (2005), *available at* http://www.whitehouse.gov/omb/inforeg/2005_cb/final_2005_cb_report.pdf. For example:

> [EPA's] final rule limiting emissions of air pollution from nonroad diesel engines [generated] $28.6 billion in annual benefits and $1.3 billion in annual costs, and the final rule implementing National Emission Standards for Hazardous Air Pollutants from . . . boilers and process heaters [generated] $17 billion in annual benefits and $900 million in annual costs.

Id. at 7.

name of public welfare.[126] It was an uncompensated transfer of wealth, one that was and continues to be painful for those on the losing end of the new law, but one that judges implemented in order to serve their assumption that economic growth generally benefits society.[127]

3. The Existing Common Law Cannot Restrain the Total Scale of Damage to the Earth

Finally, we now reach the essential problem with the structure of the common law, the problem that makes it utterly unsuitable for our times. The issue is *scale*.

As we have seen, the common law intentionally allows all conduct unless that conduct is shown to fail a social cost–benefit test. The law functions by evaluating the unreasonableness of each specific challenged act, which comprises comparing the costs and benefits that flow from that act. This means that the cost–benefit justification of each increment of damage to the Earth is evaluated separately, each on a case-by-case basis. As the economy grows under the guidance of this legal structure, total economic activity and the accumulation of damage that the law permits grow together. The economy may grow forever, but so may the total scale of the accompanying environmental damage. This structure remains in place no matter how large the cumulative ecological damage to the Earth becomes. The law is structured solely around the concept of net economic benefit and contains no independent mechanism for constraining the total scale of cost–benefit justified ecological damage we inflict on the Earth.

This legal structure was designed in a time when the world was viewed as "empty," when the total human impact on the environment was small compared to the resources and assimilative capacity of the nation and the Earth as a whole. Judges of the nineteenth century, surely thinking in terms of such an empty world, could have foreseen no reason to be concerned with the total scale of the human enterprise. Indeed, they set out to make it grow as rapidly as possible.

The global economy, especially the American economy, has seen astonishing growth during the last two centuries. While global population has risen almost seven-fold from 1 billion to 6.5 billion since 1800, global Gross Domestic Product (GDP) has grown even faster, rising fifty-fold in

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126. *See* HORWITZ, *supra* note 59, at xv–xvi, 63–108 (outlining other nineteenth-century changes in the law but emphasizing changes in liability laws); FREYFOGLE, *supra* note 11, at 73–75 ("Even substantial harm was now allowed . . . when it predictably flowed from an economically important enterprise.").

127. Sax, *supra* note 48, at 1447–51.

the 180 years from 1820 to 1998.[128] The U.S. economy has far outstripped the global economy, rising over 600-fold between 1820 and 1998,[129] while the American population grew roughly 28-fold (from about 10 million to about 280 million).[130]

In the neoclassical economics that dominates public policy today, no theoretical limit exists on the potential growth of GDP, and further growth is commonly hoped to be the solution to global poverty.[131] A typical growth rate of 3% per year, if extended for decades, translates to a doubling roughly every twenty-five years. Indeed, the World Bank projects that total world income will quadruple (i.e., two doublings) by 2050.[132] Can the U.S. and world GDP continue to grow at this rate, which would mean expanding by at least another fifty-fold (equivalent to five to six more doublings) in the next 180 years, just as they did in the last? Our current political economy, driven by an insatiable consumer culture, the desperate needs of the poor, and resistance to significant redistribution between rich and poor, seems bound and determined to try.

The obsessive commitment to this permanent GDP growth is grounded in the belief that GDP measures human welfare. Reflecting an abiding faith in the net social benefit of economic activity, GDP measures only the total dollar value of all goods and services sold each year and incorporates no deduction for depletion of natural resources or damage to human health, the environment, or many other components of any true vision of human welfare.[133] It counts liquidation of resource stocks such as oil, forests, and fisheries solely as positive contributions to GDP.[134] Even defensive expenditures such as environmental remediation and medical costs for industrially caused disease are recorded as positive contributions to GDP, with no debit for the underlying damage.[135]

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128. ANGUS MADDISON, ORG. FOR ECON. CO-OPERATION AND DEV., THE WORLD ECONOMY: A MILLENNIAL PERSPECTIVE 261 (2001), *available at* http://www.theworldeconomy.org.

129. *Id.*

130. U.S. DEP'T OF COMMERCE, HISTORICAL STATISTICS OF THE UNITED STATES, COLONIAL TIMES TO 1970, PART 1, at 8 (1975), *available at* http://www2.census.gov/prod2/statcomp/documents/CT1970p1-01.pdf; U.S. CENSUS BUREAU, U.S. SUMMARY: 2000, at 2 (2002), *available at* http://www.census.gov/prod/2002pubs/c2kprofoo-us.pdf.

131. *See* THE WORLD BANK, ECONOMIC PROSPECTS, OVERVIEW AND GLOBAL OUTLOOK—MANAGING THE NEXT WAVE OF GLOBALIZATION (2007), *available at* http://www-wds.worldbank.org/external/default/WDSContentServer/wdsp/ib/2007/09/18/000020439_20070918154547/Rendered/pdf/381380replacem1.nomic1Prospects12007.pdf.

132. THE WORLD BANK, RESPONSIBLE GROWTH FOR THE NEW MILLENNIUM—INTEGRATING SOCIETY, ECOLOGY, AND THE ECONOMY 1 (2004).

133. DALY & FARLEY, *supra* note 124, at 228.

134. *Id.* at 233.

135. *Id.* at 223–44 (discussing how GDP calculations leave out many critical components of human welfare).

By failing to include these losses in GDP accounting, we are deluded into accepting environmental degradation because it seems to be justified by the benefits. Because of our incomplete accounting, however, we do not know which economic activity actually provides a net benefit to society, not for the economy as a whole, for any particular industry, or even for any particular enterprise. In fact, all we really know is that the owners of each enterprise believe they can make a profit for themselves under our current legal institutions and the market incentives they provide.

As the human enterprise has grown so dramatically over the last two centuries, we have come to understand that we no longer live in an empty world. The biosphere suddenly appears as a thin film on the surface of the Earth. Many resources that we depend on for survival, such as arable land, fresh water, and stocks of fish have become finite and exhaustible. Perhaps even more importantly, the biosphere has a limited capacity to assimilate our environmental damage and still sustain life. Three attributes of the biosphere itself seem to conspire against us. First, it has a finite physical size. This means both that resource stocks are limited and that our pollution and environmental damage become concentrated as they accumulate within the confines of the biosphere. Second, the various components of the biosphere, both living and nonliving, are deeply interdependent and interconnected. Thus, various forms of damage do not occur in isolation, but form a networked web of assaults, each compounding the effects of the others. Finally, the time scale on which the land evolves is immense when compared to the human time frame. When we deplete the Earth of its species and ecosystems, the lost richness is not recoverable in any time frame that is relevant to us.

Global warming is painfully typical: each small increment of greenhouse gas emissions would be literally harmless if there were no other emissions; today's emissions will persist for centuries, compounding those of the past and future; the impact of climate change is magnified by its interplay with other ecological assaults.

As a result, the ecological damage we do is cumulative, not just in space but also in time, as the generations pass. The Earth and its interdependent ecosystems can assimilate on a permanent basis only a maximum rate of ecological damage without becoming biotically impoverished, with decreased ability to sustain life, including us. Once we overshoot this ecologically sustainable assimilative capacity, we must inexorably diminish and eventually devastate the biosphere. We can foresee that under conditions of overshoot, the Earth's decreasing assimilative capacities, in a vicious feedback loop, will accelerate the biosphere's decline.

Have we already surpassed the Earth's ecologically sustainable assimilative limits? In 2005, a report compiled by over 2000 scientists from ninety-five countries concluded that 60% of global ecosystem services were "being degraded or used unsustainably," including fresh water, capture fisheries, air and water purification, and the regulation of natural hazards and pests.[136] In its most recent report, involving over 400 scientists and policymakers, the U.N. Environment Programme (UNEP) concluded that current environmental trends threaten human development and imperil our overall wellbeing.[137] Previously sustained human activities are now crossing thresholds of sudden irreversible change, causing the collapse of fisheries, dead zones in the sea, regional climate change, and loss of species, and it is difficult to know exactly where other thresholds may lie or when they may come upon us.[138] By some detailed estimates, humanity reached and surpassed the Earth's sustainable biocapacity in the 1980s.[139] The UNEP report concluded that humanity is overusing the ecological resources of the Earth and therefore degrading many elements of the environment.[140] Similar extensive degradation of ecosystems across the United States has been documented as well.[141]

As a matter of simple logic, as GDP grows in a finite biosphere, the accompanying damage that the legal system views as cost–benefit justified must inevitably reach and then surpass the amount of ecological damage that the Earth can assimilate. Beyond the Earth's assimilative limits, each additional increment of environmental damage will have an adverse effect on the environment far greater than the effect it would have had on an empty world. Eventually further GDP growth accompanied by environmental damage will actually become "anti-economic," decreasing rather than increasing human welfare.[142]

Some believe we long ago surpassed the point at which further economic growth increased the public welfare. Others calculate that we

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136. MILLENNIUM ECOSYSTEM ASSESSMENT, *supra* note 3, at 2.

137. U.N. ENV'T PROGRAMME [UNEP], GLOBAL ENVIRONMENT OUTLOOK—ENVIRONMENT FOR DEVELOPMENT GEO-4, at 6 (2007), *available at* http://www.unep.org/geo.

138. *Id.* at 362–63.

139. WORLD WILDLIFE FUND, LIVING PLANET REPORT 2006, at 2 (2006), http://assets.panda.org/downloads/living_planet_report.pdf.

140. UNEP, *supra* note 137, at 202 box 6.1.

141. *See* REED F. NOSS ET AL., ENDANGERED ECOSYSTEMS OF THE UNITED STATES: A PRELIMINARY ASSESSMENT OF LOSS AND DEGRADATION (1995) (unpaginated document), *available at* http://biology.usgs.gov/pubs/ecosys.htm (reporting "more than 30 critically endangered, 58 endangered, and more than 38 threatened ecosystems").

142. Kysar, *supra* note 4, at 41 (discussing "anti-economic" growth).

likely reached and surpassed this point more recently.[143] Still others, sequestered in privileged refuges, will find the damage to the Earth acceptable until the last tree is felled. We do not know how far down this path we will go or how profound our losses will be. But this much is clear: exceeding the ecologically sustainable assimilative capacity of the Earth is the inevitable result of the economic path the common law has set us on. Neither the current law nor, the market it shapes, contain any way to stop it.

The central presumption of the common law that environmental damage can be economically justified can be true only so long as the world is "empty." It becomes false when the world is "full," when cumulative environmental damage exceeds the capacity of the Earth to assimilate it. Thus, the belief of Justices Livingston and Holmes that economic activity tends to benefit the public will not always be true. Once we overshoot the Earth's assimilative capacity, and begin to devastate the ecological systems on which we depend, the law can no longer justify a starting presumption that economic activity furthers the public welfare even where it causes ecological damage.

Moreover, under these conditions, cost–benefit analysis can no longer be justified as a tool for evaluating the reasonableness of individual increments of environmental damage. Each incremental impact, if taken alone, might have caused little or even no harm at all in an empty world. But under conditions of ecological overshoot each increment of damage contributes to an immeasurable, indeed infinite, loss. This infinite loss cannot be meaningfully allocated among the various increments of damage. Once we are degrading the environment at an unsustainable rate, attempting to justify increments of damage using cost–benefit principles is profoundly misguided and represents a denial of the biological realities of life on the Earth. Under conditions of ecological overshoot, the core structure of the modern common law cannot be justified as one that furthers the public welfare. At that point, it is no longer legitimate as an American rule of law.

Common law courts have considered damage resulting from cumulative harmless acts by multiple defendants as, for example, where a stream is

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143. *See, e.g.*, JOHN TALBERTH ET AL., THE GENUINE PROGRESS INDICATOR 2006 A TOOL FOR SUSTAINABLE DEVELOPMENT 19 (2006), *available at* http://www.rprogress.org/publications/2007/gpi%202006.pdf (concluding that the U.S. economy has been stagnant since the 1970s if environment and social determinants are considered); DALY & FARLEY, *supra* note 124, at 233–44 (compiling studies showing the importance of full-cost accounting); Kysar, *supra* note 4, at 33–41 (discussing alternative measures of economy showing growth in true welfare may have ceased); MILLENNIUM ECOSYSTEM ASSESSMENT, *supra* note 3, at 9 (accounting for depletion of forest and energy resources and damage from carbon emissions caused eight developing countries to have negative rather than positive net savings in 2001).

polluted by numerous parties.[144] Under the old principle of *sic utere tuo*, prevention of the damage was not as difficult as it is today. Defendants could be enjoined from contributing to damage even if their contribution was slight.[145] Similarly, whenever a right is strongly protected by the common law, such as the public's right to navigate waterways, defendants can be enjoined from small contributions to an invasion of that right.[146]

Under the modern doctrines of negligence and nuisance, however, the law's focus on the "fault" of defendants has made prevention of cumulative damage more difficult. Torts commentator Dean Prosser found such situations to be "very troublesome" since no defendant's conduct is unreasonable, no defendant is at fault, and there is "no negligence, and no nuisance" even though plaintiffs may be seriously damaged.[147] Indeed, proponents of an economics-based structure in the common law openly admit that modern nuisance law fails to prevent cumulative impacts, and go so far as to call this problem "insoluble in common law theory."[148]

Modern courts have struggled to develop a new doctrinal basis for preventing cumulative impacts. In an important 1973 case, the Northern District of Illinois admirably enjoined defendants' sewage discharges because they constituted "a significant portion of the total discharge" into Lake Michigan, even though taken alone they may not have caused the eutrophication of the lake.[149] Finding that there was "not much authority squarely on point" for its decision, the court nevertheless rejected the defendants' contention that individual causation was required. The court

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144. Woodyear v. Schaefer, 57 Md. 1 (1881).

145. *See id.* at 5, 7 (noting that contributor to polluted stream must be restrained, even if contribution "might amount to little or nothing," for the defendant "and those situated like him, must learn to act upon the maxim: *sic utere tuo ut alienum non laedas*"); United States v. Luce, 141 F. 385, 415 (C.C.D. Del. 1905) ("The principal question after all is whether the defendants . . . [a]re . . . duly observing the precept, *sic utere tuo ut alienum non laedas*?").

146. *See* People v. Gold Run Ditch & Mining Co., 4 P. 1152, 1155–56 (Cal. 1884) (enjoining defendant from dumping mining debris into American and Sacramento Rivers despite allegation that defendant's 600,000 cubic yards per year of debris alone would not impair navigation, explaining that "all unauthorized intrusions upon a water highway . . . are nuisances"); The Lockwood Co. v. Lawrence, 77 Me. 297, 309–10 (1885) (enjoining each contribution of waste into river by three upstream sawmills as unreasonable in view of cumulative interference with downriver mill's right to use river).

147. *See* KEETON ET AL., *supra* note 66, at 354–55. This treatise cites several authorities for the proposition that a contributor of a harmless impact might nevertheless be held liable if he or she knew or should have known that others had created a situation where any additional impact would result in unreasonable damage. *Id.*; *see also* RESTATEMENT (SECOND) OF TORTS § 840E, cmt. b (1965) (citing same proposition). Unfortunately, the cases cited date mostly from the turn of the twentieth century or earlier, and many sound clearly in *sic utere tuo* rather than modern negligence and nuisance. KEETON ET AL., *supra* note 66, at 354–55 (citing *Woodyear*, 57 Md. 1; *Luce*, 141 F. 385).

148. *See* LANDES & POSNER, *supra* note 42, at 52.

149. Illinois v. City of Milwaukee, 1973 U.S. Dist. LEXIS 15607, *20–22 (D. Ill. 1973), *rev'd on other grounds*, 599 F.2d 151 (7th Cir. 1979), *vacated*, 451 U.S. 304 (1981).

found that such a rule would make it "impossible to impose liability on any polluter."[150]

Despite *Illinois v. City of Milwaukee*, common law doctrine on cumulative impacts remains nascent at best and does not yet provide a useful tool for constraining cumulative environmental damage. One recent example is illustrative. In *California v. General Motors Corp.*, California's Attorney General sued six automakers on the theory that the greenhouse gas emissions from their cars created a nuisance by contributing to global warming.[151] The Northern District of California dismissed the case on jurisdictional grounds based in part on a finding that the common law could not resolve the cumulative impacts problem. The court stated that the law left it

> without guidance in determining what is an unreasonable contribution to the sum of carbon dioxide in the Earth's atmosphere, or in determining who should bear the costs associated with the global climate change that admittedly result from multiple sources around the globe. Plaintiff has failed to provide convincing legal authority to support its proposition that the legal framework for assessing global warming nuisance damages is well-established.[152]

Some courts have recognized that the common law needs to develop an entirely new structure in view of our changing circumstances, as we will see in more detail in subsequent parts. For example, the Wisconsin Supreme Court has observed: "The policy of favoring unhindered private development in an expanding economy is no longer in harmony with the realities of our society."[153]

But in general, common law courts have been reluctant to fully embrace this task. Some judges have even disclaimed responsibility for doing so, believing instead that any new balance of priorities is for legislatures to establish. New York State's highest court took this position in a 1970 case in which it decided not to enjoin a cement plant that was damaging neighboring property along the Hudson River not too far from the site of the conflict between two sawmills that was adjudicated in *Palmer v. Mulligan* in 1805. Instead of considering how the law should guide the economy in view of current circumstances, as Justice Livingston did two

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150. *Id.* at *21–22.

151. California v. Gen. Motors Corp., No. C06-05755 (MJJ), 2007 U.S. Dist. LEXIS 68547, at *46 (N.D. Cal. Sept. 17, 2007).

152. *Id.*

153. Prah v. Maretti, 321 N.W.2d 182, 190 (Wis. 1982).

centuries earlier, this time the New York court cautiously observed that the problem of air pollution was widespread, technical, and would require "a carefully balanced consideration of the economic impact"[154] and concluded:

> A court should not try to do this on its own as a by-product of private litigation and it seems manifest that the judicial establishment is neither equipped in the limited nature of any judgment it can pronounce nor prepared to lay down and implement an effective policy for the elimination of air pollution. This is an area beyond the circumference of one private lawsuit. It is a direct responsibility for government and should not thus be undertaken as an incident to solving a dispute between property owners and a single cement plant—one of many—in the Hudson River valley.[155]

This hesitance, which contrasts so deeply with the attitudes of the judges who created the modern common law, is found in many of our contemporary judges. It is reflected in *Connecticut v. American Electric Power Co.*, a 2005 decision on a suit brought by six state attorneys general alleging that power companies' carbon dioxide emissions contributed to global warming and constituted a nuisance.[156] There could hardly be a more important issue regarding the proper balance of property rights in today's world. And yet, the court dismissed the case on jurisdictional grounds, finding that resolution of the issues "requires identification and balancing of economic, environmental, foreign policy, and national security interests" that courts should not undertake at common law.[157]

While the common law has hesitated to address the modern consequences of its own rules, government has stepped in. State legislatures and Congress have begun to exercise their inherent power to restructure property rights and to overrule the common law according to democratic will. As we turn now to government regulation, however, we will see that many of the new federal statutes are patterned on the common law.

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154. Boomer v. Atl. Cement Co., 257 N.E.2d 870, 871 (N.Y. 1970); s*ee also* Save Sand Key v. U.S. Steel Corp., 303 So. 2d 9, 13 (Fla. 1974) (reversing a lower court that had abandoned the "special injury rule" (which limits the law of nuisance) as outdated in view of modern environmental problems, choosing instead to "adhere resolutely" to precedent); Antolini, *supra* note 109, at 781–84 (discussing the special injury rule and the *Save Sand Key* case).

155. *Boomer*, 303 N.E.2d. at 871.

156. Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265 (S.D.N.Y. 2005).

157. *Id.* at 241; *see also Gen. Motors Corp.*, 2007 U.S. Dist. Lexis 68547, at *9–16 (taking same position in global warming public nuisance suit against auto manufacturers).

B. Many Modern Environmental Statutes Mirror the Structure of the Modern Common Law

American legislatures have the independent power to regulate private property to further the public welfare and, like common law judges, have used this power in a variety of ways throughout our history. Early American statutes addressed environmental problems like waste, smoke, and contamination of drinking water.[158] Then, as the nineteenth century progressed, legislatures supported rapid development of resources, ratifying and reinforcing the common law's new goal of promoting economic development.[159] Eventually, as the modern common law failed to control mounting environmental problems, state and federal governments were forced to intervene to protect the environment. Government began designating land as protected public property and slowed its transfer to private ownership. Today about forty percent of the area of the United States is owned by federal, state, and local governments.[160] In the late nineteenth and early twentieth centuries, conservation legislation promoted preservation on these mostly distant public lands, addressing issues like migratory birds, eagles, water conservation, and management of wilderness and wildlife refuges.[161] By the middle of the twentieth century, federal and state governments also were compelled to address the widespread pollution and other environmental damage being externalized by industry operating on private property.[162]

These efforts culminated in the landmark federal environmental laws of the 1970s.[163] What is striking about these laws, however, is the degree to which many of them incorporate the same structure as the modern common law, thereby reflecting the same balance of interests that had been so carefully defined in that law. Many of these statutes harbor the same presumption of net benefit and the same allocation of the burden of proof as

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158. *See supra* notes 22–24 & 65 and accompanying text for discussion of early American regulation of property rights.

159. *See* PERCIVAL ET AL., *supra* note 59, at 88–89 (discussing late nineteenth-century regulations); FREYFOGLE, *supra* note 11, at 75–77 ("[L]egislatures [did] their part to use statutory law and public funds to promote economic growth.").

160. *See* Sprankling, *supra* note 57, at 559–60 (outlining history of transfers of public land to private hands); RUBEN N. LUBOWSKI ET AL., U.S. DEP'T OF AGRIC., MAJOR USES OF LAND IN THE UNITED STATES, 2002, at 35 (2006), *available at* http://www.ers.usda.gov/publications/EIB14 (citing current land ownership statistics).

161. *See* PERCIVAL ET AL., *supra* note 59, at 88 (summarizing early conservation laws); RICHARD J. LAZARUS, THE MAKING OF ENVIRONMENTAL LAW 47–50 (2004).

162. PERCIVAL ET AL., *supra* note 59, at 90.

163. *See id.* at 90–92 (discussing the rise of the modern environmental movement and related federal regulation).

the common law. They do not provide administrative agencies with blanket authority to prevent damage to public health and the environment. Instead, with some exceptions, the statutes define a balancing of interests, providing only the authority to implement "reasonable" or "cost-justified" regulations.[164] The Toxic Substances Control Act of 1976 (TSCA) provides a case in point.[165] In order to regulate a commercial chemical under TSCA, the burden of proof is on the Environmental Protection Agency (EPA) to provide "substantial evidence" that (1) the chemical presents or will present an "unreasonable" risk to health and the environment, (2) the benefits of regulation outweigh both the costs to industry of the regulation and the lost economic and social value of the product, and (3) the EPA has chosen the least burdensome way to eliminate only the unreasonable risk.[166] Both TSCA itself and the courts are clear that economic and social factors must be considered as well as environmental and human health effects when the EPA determines whether a risk is "unreasonable" under TSCA.[167]

If not all federal environmental statutes are as clear as TSCA in requiring regulations to be cost–benefit justified, Executive Order 12866 removes all doubt as to how they must be interpreted by federal agencies.[168] That Presidential Executive Order commands all federal agencies to propose or adopt a regulation only if the benefits justify the costs (unless a particular statute requires otherwise). The White House Office of Management and Budget (OMB) actively enforces E.O. 12866, which gives that document a central role in shaping all federal environmental regulations.[169]

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164. *See, e.g.*, *id.* at 344–45 & fig.4.1 (outlining burdens of proof of twelve federal law provisions).

165. Toxic Substances Control Act, 15 U.S.C. §§ 2601–2629 (2000).

166. 15 U.S.C. §§ 2618(c)(B), 2605(a).

167. 15 U.S.C. § 2605(a), (c); *see also* Corrosion Proof Fittings v. Envtl. Prot. Agency, 947 F.2d 1201 (5th Cir. 1991) (analyzing TSCA burdens of proof). For discussion of TSCA and its various burdens of proof, see Joseph H. Guth et al., *Require Comprehensive Safety Data For All Chemicals*, 17 NEW SOLUTIONS 3, 233–58 (2007), an earlier version of which is available at http://www.louisvillecharter.org/paper.safetydata.shtml.

168. *See* Exec. Order No. 12,866, 3 C.F.R. 638 (2007), *available at* http://www.archives.gov/federal-register/executive-orders/pdf/12866.pdf (stating that "each agency shall . . . propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs"). *See generally* OFFICE OF MGMT. & BUDGET, CIRCULAR A–4, CIRCULAR TO THE HEADS OF EXECUTIVE AGENCIES AND ESTABLISHMENTS (2003), *available at* http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf(providing detailed OMB guidance to all federal agencies on conduct of regulatory cost–benefit analysis under E.O. 12,866).

169. OMB's extensive evaluation of regulations under E.O. 12,866 before promulgation and after issuance is reflected in its Annual Reports to Congress on the Costs and Benefits of Federal Regulations, available at http://www.whitehouse.gov/omb/legislative/index.html (last visited Apr. 30, 2008).

This approach to implementing the nation's environmental laws, commonly promoted under the rubric of "reasonable regulation," means that federal agencies cannot act to protect public health and the environment unless they prove their measures are cost-effective. Regulations failing that test are deemed "unreasonable," even if those causing the damage can afford to prevent it. Under this test, the measuring rod for the unreasonableness of costs is the value of the benefits, not the ability of the enterprise causing the damage to bear them. Thus, a very large and wealthy industry need not avoid externalizing costs onto society, even if it can afford to do so with resources deriving from the very activity that is externalizing the costs, if the cost of prevention outweighs the benefits. This structure, like that of the common law, is grounded, almost invisibly, on the presumption that economic activity is likely to provide a net benefit to society even if it causes health and environmental damage. It is designed to ensure that such activity will not be interfered with except by specific, narrowly tailored cost–benefit justified measures.

These statutes, which generally supplement rather than displace the common law,[170] have enabled improved environmental protection despite harboring that law's same basic structure. They have done this partly by deploying the resources of government to meet the agencies' burdens of proof on the cost–benefit determinations. Federal agencies are able to address issues such as environmental and health impacts, economic costs, and causation on an industry-wide, nationwide, and population-wide basis rather than in the narrower context of a tort suit between specific plaintiffs and defendants. Also, because these statutes generally regulate future environmental damage and do not attempt to impose liability for past environmental damage (except for a few statutes relating to hazardous waste cleanup), they avoid some of a plaintiff's additional burdens at common law such as specific causation of particular plaintiffs' injuries, whether the damage was "foreseeable," whether defendants had a "duty" to the plaintiffs, and whether plaintiffs themselves were at fault.

However, the burden of proof remains, as under the common law, on those seeking to protect the environment. Uncertainty, lack of information, inability to track the chains of causation, and lack of market values for health and the environment all work against the government in its efforts to prove regulations are "reasonable." The struggle to carry this burden of

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170. The federal statutes for the most part do not preempt the common law. *See* PERCIVAL ET AL., *supra* note 59, at 98–101 (outlining a general pattern of coexistence of common law and federal environmental statues); Klass, *supra* note 16, at 570 n.143 (identifying savings clauses in numerous environmental statutes and concluding that "the broad savings clauses in most federal statutes have left ample room for state common law to be a major player in environmental-protection efforts").

proof draws government, environmentalists, and industry into bitter conflict over the value-laden assumptions inevitably involved in such cost–benefit issues as discounting, data gaps, interpretation of emerging science, monetization of human lives, and the monetary valuation of portions of the Earth.[171] The burden of proof on government remains substantial, and can result in judicial rejection of regulations even when an agency has created a massive supporting record.[172]

Most importantly, however, these laws, like the common law, are unable to address the cumulative scale of the ecological damage we are doing to the Earth. Agencies must develop their regulations medium-by-medium, chemical-by-chemical, industry-by-industry, each according to the dictates of the applicable governing statute and E.O. 12,866,[173] and each in isolation from the others. In each such regulatory cost–benefit calculation, an increment of economic costs is monetized and then traded off dollar-for-dollar against health and environmental benefits, which are usually monetized as well.[174] The monetized cost of regulations can even be converted to a number of "statistical lives" (based on the argument that each $7–15 million of regulatory expenditures reduces society's wealth, and therefore health, enough to cause loss of one statistical "life").[175] Saving and losing "lives" thus appears, or seems to appear, on both sides of all

171. *See generally* FRANK ACKERMAN & LISA HEINZERLING, PRICELESS: ON KNOWING THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING 36 (2004) ("Even when the methods [of cost–benefit analysis] are applied in good faith by neutral or environmental investigators . . . the results tilt strongly toward business as usual, and rejection of health and environmental protection."); THOMAS O. GARITY ET AL., SOPHISTICATED SABOTAGE: THE INTELLECTUAL GAMES USED TO SUBVERT RESPONSIBLE REGULATION (2004) (providing extensive discussions on how the tools of cost–benefit analysis systematically undervalue health and environmental impacts to prevent regulation).

172. For example, the EPA's comprehensive asbestos rule governing all aspects of asbestos use in the United States, which had taken ten years to develop and was based on a monumental public record, was challenged by industry and then struck down in large part by the Court of Appeals for the Fifth Circuit. Corrosion Proof Fittings v. Envtl. Prot. Agency, 947 F.2d 1201, 1227–28 (5th Cir. 1991) (concluding that the EPA had not provided substantial evidence to support most of the regulation); *see also* U.S. GEN. ACCOUNTING OFFICE, CHEMICAL REGULATION: OPTIONS EXIST TO IMPROVE EPA'S ABILITY TO ASSESS HEALTH RISKS AND MANAGE ITS CHEMICAL REVIEW PROGRAM 28–29 (2005) (discussing the Fifth Circuit's ruling); U.S. GEN. ACCOUNTING OFFICE, TOXIC SUBSTANCES CONTROL ACT: LEGISLATIVE CHANGES COULD MAKE THE ACT MORE EFFECTIVE 3 (1994) (arguing that the EPA met its evidentiary burden). To this day, the U.S. has not fully banned asbestos despite such action in numerous countries around the world.

173. Exec. Order No. 12, 866, 3 C.F.R. 638.

174. *See generally* OFFICE OF MGMT. & BUDGET, *supra* note 168, *available at* http://www.whitehouse.gov/omb/circulars/a004/a-4.pdf (providing detailed guidance to all federal agencies on conduct of regulatory cost–benefit analysis under E.O. 12,866).

175. *See* ACKERMAN & HEINZERLING, *supra* note 171, at 61–90 (putting the value on one human life at $6.1 million); Cass R. Sunstein, *Beyond the Precautionary Principle*, 151 U. PA. L. REV. 1003, 1027–28 (2003) (compiling references and discussing the theory that an "expensive regulation can have adverse effects on life and health," including the possibility of death).

regulatory proposals, even that of no regulation. This makes the efforts of environmental and health advocates to avoid cost–benefit analysis, and instead prioritize the goal of avoiding damage, appear unscientific and unreasonable and even to "paralyze" our ability to take any action at all.[176] These laws seem to give us no choice but to maximize monetized net benefits and statistical lives in each regulation, one regulation at a time.

But this apparent constraint is actually just an artifact of the overarching structure of these federal laws. That legal structure does not permit regulators to lift their heads to take account of what is happening to the world around them, for it was created when the world seemed empty and scale seemed not to matter. That structure has spawned a corps of cost–benefit experts who claim the mantle of science. However, it is profoundly unscientific because it ignores, and even prevents us from considering, what is of truly historic importance in our current circumstances—the science demonstrating our overshoot of the Earth's ecological capacities. Instead, it is grounded in an outdated core assumption—that cost–benefit justified damage to the Earth may increase without limit. It is a legal structure that allows the Earth to die a death of a thousand cuts, ignoring the cumulative impacts while we busily justify each cut as if it alone was inflicted.

Thus, like the modern common law, many of the federal environmental statutes, especially when implemented under E.O. 12866, simply cannot respond to the reality of what we are doing to the Earth as a whole, a reality that so plainly requires us to restrain the total scale of cumulative ecological damage to the Earth's assimilative limits. American government can take stronger steps to protect the environment, and has done so in some instances. The next subpart turns to those stronger steps and the corrosive consequences of their divergence from the common law.

C. More Progressive Government Environmental Laws Open up a Divide with the Lagging Common Law

Stronger steps taken by the federal government include: the "fishable" and "swimmable" water quality goals and wetlands protection provisions of the Clean Water Act;[177] the health-based standards for certain pollutants under the Clean Air Act;[178] the "reasonable certainty of no harm" standard

176. *See* Sunstein, *supra* note 175, at 1028 (discussing the idea that the precautionary principle can "paralyze" regulatory action).

177. Clean Water Act, 33 U.S.C. §§ 1251–1387 (2000).

178. Clean Air Act, 42 U.S.C. §§ 7401–7671(q) (2000).

for pesticide food tolerances under the Food Quality Protection Act;[179] protections for endangered species under the Endangered Species Act;[180] the Clean Air Act's cap-and-trade system for sulfur dioxide;[181] and recent legislative proposals for regulating carbon dioxide emissions.[182] These and other progressive laws diverge from the common law structure by fixing specific standards of human health and environmental quality without specifically balancing countervailing economic interests. States, counties, and cities have also implemented stronger steps, such as the adoption of precautionary laws that are focused on avoiding harm to human health and the environment and searching for less damaging alternatives.[183] These laws do not yet constitute a comprehensive effort to control the total scale of our environmental damage, and yet the bitter criticism that the industry reserves for them reflects their divergence from the prevailing structure of our law.

This divergence has opened up a divide between progressive environmental legislation and the common law.[184] This divide sets up property owners to view environmental laws not as a legitimate democratic expression of the proper structure of property rights in our current circumstances, but as invasions of their rights, as efforts by government to take their property and give it to the public. It exposes environmental laws to the charge of being impositions of a repressive and authoritarian government. It allows conflicts over property rights to be characterized as the heroic struggle of private individuals for freedom from government. This divide fuels calls by property owners for legislatures to adhere to the rights embodied in the common law and spawns legislative measures, such as Oregon's Measure 37, under which society must compensate private

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179. Food Quality Protection Act, Pub. L. No. 104-170, 110 Stat. 1489 (codified as amended in scattered sections of 7 and 21 U.S.C.).

180. Endangered Species Act, 16 U.S.C. §§ 1531–1544 (2000).

181. 42 U.S.C. § 7651(a)–(e).

182. *See, e.g.*, McCain-Lieberman Climate Stewardship and Innovation Act of 2005, S. 1151, 109th Cong.; PEW CTR. ON GLOBAL CLIMATE CHANGE, SUMMARY OF MCCAIN-LIEBERMAN CLIMATE STEWARDSHIP AND INNOVATION ACT OF 2005, *available at* http://www.pewclimate.org/policy_center/analyses/s_1151_summary.cfm.

183. *See* BE SAFE, Center for Health, Environment and Justice, Precautionary Policy Clearinghouse, http://www.besafenet.com/ppc/archives/environmental_precaution/index.html (last visited Apr. 30, 2008) (compiling laws, ordinances, and policies reflecting the precautionary principle).

184. This section draws heavily from the work of Professor Eric Freyfogle, who has written about the profound significance of this divide between the common law and environmental laws. *See* FREYFOGLE, *supra* note 11, at 79–84 ("[T]he mere fact that legal rhetoric divided the private and public realms represented a critical shift in reasoning, a shift that would have far-ranging implications up to our day.").

interests when environmental legislation reduces the market value of those rights.[185]

This legal divide has thus brought into prominence the Takings Clause of the Fifth Amendment. This constitutional provision traditionally required compensation for outright government appropriation of property or permanent physical occupation, but did not historically require compensation when government regulated land use to prevent harm to the community.[186] Not until 1922 did the U.S. Supreme Court find that a mere regulation of land use could amount to a taking.[187] Thirty-five years after the Pennsylvania Supreme Court made clear in *Pennsylvania Coal Co. v. Sanderson* that the state's common law would not prevent the coal industry from polluting Mrs. Sanderson's stream,[188] the Pennsylvania legislature tried to prohibit that industry from causing subsidence of surface land.[189] But in *Pennsylvania Coal Co. v. Mahon*, the Court found that Pennsylvania had gone "too far" in restricting Pennsylvania Coal's use of its private property, the underground coal, and that the state law was an unconstitutional taking.[190] While the Court has struggled ever since to define exactly when government regulation goes "too far" under the Fifth Amendment, it has recently articulated a clear resistance to government property restrictions that go substantially beyond those that inhere in the common law.[191]

In the landmark case *Lucas v. South Carolina Coastal Council*, a South Carolina law to preserve fragile beachfront barred a landowner from building houses on his land.[192] The landowner claimed this law effected a taking of his property and that he was owed compensation. Justice Scalia's opinion for the 6–3 Court held that when legislation denies an owner of "all

185. OR. REV. STAT. ANN. § 197.352 (West 2005) (amended 2007).

186. *See* Mugler v. Kansas, 123 U.S. 623, 668–69 (1887) ("A prohibition simply upon the use of property for the purposes that are declared, by valid legislation, to be injurious to the health, morals, or safety of the community, cannot, in any just sense, be deemed a taking or an appropriation of the property for the public benefit."); Keystone Bituminous Coal Assn. v. DeBenedictus, 480 U.S. 470, 491 (1987) ("[N]o individual has a right to use his property to create a nuisance or otherwise harm others . . . .").

187. Pa. Coal Co. v. Mahon, 260 U.S. 393, 421 (1922).

188. Pa. Coal Co. v. Sanderson, 6 A. 453 (Pa. 1886).

189. *Mahon*, 260 U.S. at 421.

190. *Id.* at 415–16.

191. Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1020 (1992) (stating that government regulation that leaves a landowner with "no economically viable use" can be considered a taking).

192. *Id.*; *see* Michael C. Blumm & Lucus Ritchie, Lucas's *Unlikely Legacy: The Rise of Background Principles as Categorical Takings Defenses*, 29 HARV. ENVTL. L. REV. 321 (2005) (discussing *Lucas* and its progeny).

economically beneficial or productive use of land,"[193] the Fifth Amendment requires compensation if the legislation creates more restrictions than "background principles of the State's law of property and nuisance already place upon land ownership."[194] Thus, said the Court, the central question is whether the new government restrictions were "part of [the landowner's] title to begin with."[195] The Court warned that while new "background principles" may evolve with time, they may not be "newly legislated or decreed (without compensation)" in the very action challenged.[196] Remanding the case on this issue, the Court voiced suspicion that the South Carolina statute could be in accord with the State's background principles, claiming that it "seems unlikely that common-law principles would have prevented the erection of any habitable or productive improvements on [Lucas's] land."[197]

After *Lucas* nearly every case in which property owners challenge legislation as a taking raises as a threshold issue whether the legislation accords with preexisting background principles of nuisance and property law.[198] Much environmental legislation has survived these challenges because courts have found that it either does not depart significantly from existing "background principles" or that it does not eliminate all economically productive uses of land.[199] But what about more far-reaching efforts, such as legislation intended to preserve the environment without subjecting the decision to an economic efficiency test? What about legislation more like that at issue in *Lucas* itself—legislation that regulates land uses on an ecosystem scale, puts the health of ecosystems foremost, and requires landowners to preserve or even restore natural services that their lands provide to the community? Courts are clear that such

193. *Lucas*, 505 U.S. at 1015; *see* DANA & MERRILL, *supra* note 35, at 103–04. The Court assumed that the land had no value because of the procedural posture of the case, even though it is very likely to have had some remaining market value. Thus, the total economic wipeout rule of *Lucas* arguably may apply whenever development is prohibited, even if some value remains.

194. *Lucas*, 505 U.S. at 1029.

195. *Id.* at 1027.

196. *Id.* at 1029.

197. *Id.* at 1031.

198. Exactly which laws constitute such pre-existing "background principles" is still being developed by the Court. Justice Scalia's opinion made clear that background principles may not include such common law maxims as "*sic utere tuo ut alienum non laedas*" but must comprise specific modern rules of nuisance and property law. *Lucas*, 505 U.S. at 1026. Nevertheless, these laws are thought to include, besides the state's common law of nuisance, many pre-existing principles of state property law including the public trust doctrine, the natural use doctrine, customary rights, water rights, the wildlife trust, Indian treaty rights, and state statutes and regulations. *See* Blumm & Ritchie, *supra* note 192, at 341–60 ("Lower courts have upheld several doctrines of property law as background principles to defeat takings challenges at the threshold level.").

199. *Id.* at 321.

regulations, particularly those protecting wetlands and coastal areas from development, will be held invalid if they exceed applicable state "background principles."[200] As legislatures and the people consider stronger steps to protect the Earth, now they must always be aware of the potential financial consequences if such legislation turns out to fall afoul of *Lucas*. For *Lucas* makes clear what the Supreme Court believes should happen when legislation goes too far in valuing ecological interests: "[w]hen . . . a regulation that declares 'off limits' all economically productive or beneficial uses of land goes beyond what the relevant background principles would dictate, compensation must be paid to sustain it."[201]

Lucas is a clear expression of the Supreme Court's discomfort with an emerging ecological view of property law. It expresses the Court's view that, subject only to today's property and nuisance law, landowners have a constitutionally protected expectation that they can put their land to some economically viable use.[202] The decision is grounded in the Court's conception of today's property and nuisance law as an established and stable structure of property rights. As Professor Joseph Sax put it:

> *Lucas* represents the Court's rejection of pleas to engraft the values of the economy of nature onto traditional notions of the rights of land ownership. Justice Scalia assumes that redefinition of property rights to accommodate ecosystem demands is not possible. The Court treats claims that land be left in its natural condition as unacceptable impositions on landowners.[203]

Lucas is contrary to so much of our legal history. It is ironic that the property system the Supreme Court now regards as a preferred system is the "product of a modern economy that itself destroyed common rights in property because such rights were no longer functional in a capitalist society."[204] Our current property rights arose out of an evolutionary process

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200. *See id.* at 336 n.93, 337 n.94 (citing cases overturning environmental laws); Heaphy v. Dep't of Envtl. Quality, No. 257941, 2006 Mich. App. LEXIS 1192 (Mich. Ct. App. Apr. 18, 2006) (affirming owner of three lakeshore lots was entitled to $1.7 million in compensation and could also retain ownership of the lots where Michigan's Sand Dune Protection and Management Act banned home construction).

201. *Lucas*, 505 U.S. at 1030.

202. *Id.* at 1027–28 (1992); *see* Craig Anthony Arnold, *The Reconstitution of Property: Property as a Web of Interests*, 26 HARV. ENVTL. L. REV. 281, 317, 328–29 (2002) (discussing the *Lucas* majority's view of historical property expectations).

203. Sax, *supra* note 48, at 1446.

204. *Id.* at 1449.

that did not require compensation to those who lost rights, and that same process should be permitted to continue. The Court's elevation of the existing common law as a preferred standard of property rights, even though legislatures find it antiquated and common law courts are urging legislative action to remedy that law's shortcomings, is simply unwarranted and perhaps even "revolting," to use Justice Holmes's term.[205] Justice Kennedy, who concurred with the result in *Lucas*, but disagreed with much of the reasoning of Justice Scalia's opinion, was surely correct in questioning its preference for the existing common law:

> The common law of nuisance is too narrow a confine for the exercise of regulatory power in a complex and interdependent society. The State should not be prevented from enacting new regulatory initiatives in response to changing conditions, and courts must consider all reasonable expectations whatever their sources.[206]

Nevertheless, *Lucas* is the law. As the common law continues to stagnate, *Lucas*'s takings doctrine ultimately constrains truly ecological legislation. Two other lurking constitutional doctrines also threaten federal legislation that diverges too far from the common law. One is the doctrine of standing. A thorough discussion of federal standing doctrine is not necessary here, except to note that while the Supreme Court requires that to sue in federal court "a plaintiff must allege personal injury fairly traceable to the defendant's allegedly unlawful conduct and likely to be redressed by the requested relief."[207] There are now four Justices with a very narrow view of what kind of injury that is, a view that is very hostile to ecologically-oriented environmental claims. In the recent case of *Massachusetts v. EPA*, Chief Justice Roberts concluded in a dissent joined by Justices Scalia, Thomas, and Alito that global warming does not cause the kinds of injuries that confer standing on a state to challenge the EPA's failure to regulate greenhouse gases under the Clean Air Act.[208] One more Justice holding these views would have a devastating impact not just on global warming law but on federal environmental law generally.

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205. Holmes, *supra* note 1.

206. *Lucas*, 505 U.S. at 1035 (Kennedy, J., concurring opinion) (citations omitted); *see also id.* at 1047–61 (Blackmun, J., dissenting opinion) (recounting the long history of the power of legislatures to regulate property in the interest of public safety even if all value is lost, as well as the transformation of common law property rights the during nation's history).

207. Allen v. Wright, 487 U.S. 737, 738 (1984).

208. Massachusetts v. Envtl. Prot. Agency, 127 S. Ct. 1438, 1463–78 (2007) (Roberts, C.J., dissenting).

A second additional lurking constitutional issue is the scope of the federal government's power to regulate the environment under the Commerce Clause. I wish only to note that the scope of the federal Commerce Clause power, which has been the basis of most of the federal environmental laws, has been questioned by conservative Justices more in the past few years than it was for many previous decades. Substantial narrowing of the Commerce Clause power would pose a threat to significant portions of current federal environmental legislation.[209]

At root, these three constitutional threats to progressive environmental legislation are manifestations of the discomfort and confusion caused by the emerging divergence of goals between two significant components of the nation's legal system, the "private" common law and the "public" environmental laws. The common law thus retains a central role in America's democratic effort to live by the rule of law. It may not suddenly stand in place, fixing in time a particular structure of "private" law, leaving the legislative branches to try to develop property rights on their own. Common law judges are simply not free to follow the advice of the court in *Boomer v. Atlantic Cement Co.*,[210] as they unfortunately did in the recent New York and California global warming cases, and forego their independent responsibility to develop the law as needed to further the public welfare.[211] For under our system of law, abdication of this responsibility forces democratic government to assume centralized control over the environment and simultaneously, because of *Lucas*, fosters doubt about the legitimacy of those democratic efforts and engenders social turmoil.[212]

D. Are Private or Public Landowners the Best Inherent Stewards of the Land—or Does That Question Even Matter?

American society continues to be roiled over whether private owners, governments, or the public are the best stewards of nature.[213] Because the issue of ownership is often portrayed as the essential issue of environmental

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209. *See* Klass, *supra* note 16, at 576–79 (suggesting greater reliance on state common law in view of potential impact on federal legislation of recent Commerce Clause cases).

210. Boomer v. Atl. Cement Co., 257 N.E.2d 870, 874–75 (N.Y. 1970) (holding that a cement plant producing air pollutants should pay damages instead of being subject to an injunction).

211. Connecticut v. Am. Elec. Power Co., 406 F. Supp. 2d 265. (S.D.N.Y. 2005); California v. Gen. Motors Corp., 2007 U.S. Dist. Lexis 68547, at *9–16.

212. *See* Arnold, *supra* note 202, at 352–53 (highlighting the importance of establishing duties of stewardship with common law property rules to avoid excessive government control).

213. For an exhaustive analysis of environmental protection as a function of private, public, and mixed ownership regimes, see generally COLE, *supra* note 17.

protection, this Article considers this one last issue before turning to the design of a new rule of law for the ecological age. As this subpart will conclude, the question of whether private parties or the public control the Earth is not what really matters. What matters most is the structure of the laws that govern the behavior of landowners, whether public or private, and the interests those rules protect and promote.

A common starting point in the ownership debates is Professor Garrett Hardin's famous *Science* paper of 1968, in which he described the "tragedy of the commons" that results when a valuable depletable resource is owned by no one.[214] In a hypothetical example, Hardin explored how the incentives created by unconstrained open access to a common pasture lead each rancher to rationally continue increasing his own herd even after the combined herds of all ranchers grow beyond the carrying capacity of the pasture:

> Each man is locked into a system that compels him to increase his herd without limit—in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.[215]

Hardin concluded that while government could manage resources through coercion, a better solution is to divide resources into private parcels so that each owner would be motivated by his or her interest to use the land wisely.[216] This suggests that more privatization of the Earth, not less, is the solution to environmental degradation. Hardin was not the first to make these arguments, but his article crystallized the ideological ownership debate.[217]

The argument for private ownership rests in part on a belief that government is incapable of managing resources for the long-term benefit of the public. Government is said to centralize power and make one-size-fits-all decisions, which is inappropriate because ecological realities are

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214. Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1243–48 (1968), *available at* http://www.sciencemag.org/sciext/sotp/pdfs/162-3859-1243.pdf.

215. *Id.* at 1244.

216. *Id.*

217. *See* FREYFOGLE, *supra* note 11, at 157–78 (discussing the influence and implications of Hardin's article).

supposedly localized and decentralized.[218] Government is said to operate according to "public choice theory," under which it does nothing more than serve special interest groups, causing politicians to manage resources for short-term electoral benefits rather than to preserve long-term value: "there is no 'voice of the future' in government equivalent to the rising market price of an increasingly valuable resource."[219]

In contrast, private property advocates hold, the discipline of the market makes private owners seeking their own self-interest the best inherent stewards of nature:

> The current market price reflects the present, discounted value of all future revenue flows that are expected to stem from the asset. The ability to capitalize future value into an asset's present value induces property owners to consider long-term implications of their asset-use decisions. It creates a strong incentive for owners to consider fully the effects of deferring consumption of their asset returns. Furthermore, it implies that property owners will be responsible to future users. Any activity that reduces the future benefits or increases the future costs stemming from an asset results in a reduction of that asset's current value. As soon as an appraiser or potential buyer anticipates future problems, his assessment of a property's value falls, and the owner's wealth declines immediately.[220]

Private owners are sometimes capable of admirable stewardship efforts, like those of the Nature Conservancy and other land trusts that set aside millions of acres of lands for conservation. Other private interests are leading the way in developing sustainable agriculture, renewable energy, and many other green practices and technologies.[221] And yet private owners are also capable of extensive depredation of the Earth. In the nineteenth century, private owners in the United States clearcut vast areas of forest

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218. TERRY ANDERSON & DONALD LEAL, FREE MARKET ENVIRONMENTALISM 14–24 (2001) (discussing the theory of free market environmentalism and the failure of political decision making in relation to resource management).

219. COLE, *supra* note 17, at 90 (quoting RICHARD L. STROUP & JOHN A. BADEN, NATURAL RESOURCES: BUREAUCRATIC MYTHS AND ENVIRONMENTAL MANAGEMENT 24 (1983)); *see also id.* at 87–93 (discussing free-market environmentalist critique of government).

220. *Id.* at 94 (quoting Richard L. Stroup & Sandra L. Goodman, *Property Rights, Environmental Resources and the Future*, 15 HARV. J.L. & PUB. POL'Y 427, 427–41 (1992)).

221. Green technology is drawing more investment than ever. *See The Going Green 100 Winners*, ALWAYS ON: THE INSIDER'S NETWORK, Sept. 4, 2007, http://alwayson.goingon.com/permalink/post/18632 (honoring private companies said to be "transforming the global energy, water, agriculture, transportation, construction, manufacturing, and resource recovery establishments").

cover and then discarded them as useless land. In the 1930s, private farmers created the great Dust Bowl trying to get rich through plainly inappropriate land use practices.[222] In the 1990s, timber owners in the Pacific Northwest liquidated ancient redwood forests to pay off loans they secured in order to buy the forests in hostile takeovers.[223] Many wildlife species have long since gone extinct in England, where wildlife is mostly privately owned.[224]

These depredations happen for a reason. While private owners will sometimes preserve resources, if private economic gain is their only goal, economists expect them to liquidate all resources, renewable as well as nonrenewable, whenever: (a) an immediate profit can be made from harvesting the resource, which can then be reinvested elsewhere, and (b) the interest rate paid for capital in the human economy exceeds the productivity of the resource.[225] In other words, private owners maximize their own gain by harvesting resources and selling them for cash whenever the cash can be invested for a higher rate of return than that provided by the resource itself. Essentially, the market subjects all privately-owned resources to the test of whether they can deliver the same rate of return as capital in the human economy.

Here then lies the crux of the limitations of private ownership. Private owners value resources based on the prices they can obtain in the market, and this market is shaped by the prevailing structure of property rights. Private owners recognize no value for what economists call "public goods" or "public services," resources that are valuable only to the larger public, including future generations, but not to the private owners themselves. For example, even if a tract of forest plays an important ecological role in moderating climate, controlling runoff in a watershed, or providing habitat for wildlife, the owner of the tract cannot practically derive any income from that value and therefore has no economic incentive to preserve it. Because, as we have seen, our property law imposes no affirmative obligation to provide such public goods or services, private owners are free to destroy or degrade resources based on a market value that does not account for any value to the broader society. Whenever the law permits such environmental losses their value is not reflected in the market price of

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222. *See* FREYFOGLE, *supra* note 11, at 165–67 (discussing the Dust Bowl); COLE, *supra* note 17, at 16 (discussing the creation of the Dust Bowl as the result of private entrepreneurship).

223. COLE, *supra* note 17, at 16 (discussing the liquidation of redwoods in the Pacific Northwest).

224. *Id.* at 97; *see also id.* at 25–27 (discussing ownership of wildlife in the United Kingdom).

225. *Id.* at 16, 96–99 (discussing economic incentives governing private liquidation of resources).

the goods and services produced, and the resulting markets can only encourage private owners to inflict ever more such losses on society.[226]

Thus, our current property rights structure motivates private owners to preserve only the most financially productive resources, while steadily liquidating our stores of natural capital and steadily eroding the biosphere. They are doing what seems economically sensible, but that is only because our law fails to account for so much of the true value of the Earth to the public welfare. Under the structure of our current property law, private interests in land are simply not adequately aligned with the public welfare in our current circumstances.

This problem is made more acute, not less, by the division of the land among many private owners, a problem that Professor Eric Freyfogle has called the "tragedy of fragmentation."[227] Millions of fragmentary private owners cannot individually achieve ecological preservation, and it is nearly impossible for them to voluntarily cooperate on an ecological scale. Each owner has great freedom both to externalize ecological damage and to disrupt the ecological benefits that their lands confer on adjacent lands and waters. Those who refrain from disrupting the land are at a disadvantage when they must compete economically with those who do disrupt it. Our law motivates the multitude of competing private owners to impose externalities each upon the other and provides those who choose to preserve the Earth with little recourse against neighbors who do not.

Professor Craig Anthony Arnold has shown how the law's common conceptualization of property ownership as a bundle of separately tradable rights further fragments the land.[228] The bundle-of-rights concept masks the true nature of property as a web of interconnecting interests in which people are linked together into a community. It both leaves out the responsibilities of landowners to the community and, by promoting the fragmentation of rights and duties among many different people, encourages unethical behavior toward the land as a whole.[229]

Recall Garrett Hardin's conclusion in his analysis of commons resources: "Freedom in a commons brings ruin to all."[230] But notice: Hardin's ranchers are not really free. Indeed, "each man is locked into a system that compels him" to destroy the commons.[231] What is it that

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226. *See id.* at 85–109 (discussing the theory and limitations of free-market environmentalism).

227. FREYFOGLE, *supra* note 11, at 177–78; *see also* Sax, *supra* note 48, at 1445–46 (showing that modern legal structure fails to recognize biological interconnections of land).

228. *See generally* Arnold, *supra* note 202.

229. *Id.* at 305–06, 349–59.

230. Hardin, *supra* note 214.

231. *Id.*

"compels" these supposedly "free" ranchers to unethical self-destruction? It is the burdens they each impose on the others as they compete, the cumulative, externalized burdens of their own acts. And these burdens grow steadily more acute as the scale of the human enterprise encroaches ever further upon the carrying capacity of the Earth. Fragmentary private ownership governed by our current property law does not solve this problem. Today's fragmentary private owners in competition with each other are no more free to preserve the environment than are Hardin's ranchers with no property rights at all.

Private property advocates recognize that the current market causes excessive destruction of valuable resources when those resources are public goods. Their solution is to create private property rights in all resources of the Earth that need to be preserved.[232] They further advocate the transfer to private ownership of public lands and waters and the elimination of most if not all government environmental regulations.[233] This transfer of rights must result in the specification of private property rights in all valuable resources of the biosphere. Or, as one writer put it, "the whole world will have to be privatized" in order to save it.[234] The idea is that all the private owners of nature would maintain the value of their property by using their property rights to prevent damage to the land, air, water, and wildlife that they own. Thus, free-market environmentalists envision a system of complete specification of private property rights in the Earth enforced and maintained by the common law.[235]

This scheme raises, of course, numerous practical problems. It is doubtful that private property rights could ever be specified and allocated in many important resources because they are fugitive and dispersed, such as the atmosphere and, presumably, every species in the web of life. Private property advocates claim that this is really just a matter of cost and that when a resource becomes valuable enough, its privatization will become feasible (though even this assumes we can determine the value of every component of the biosphere before it is depleted).[236] One can also question whether government's role in the specification, distribution, and enforcement of the new property rights would really require less government effort, competence and good faith than would direct regulation.

But the more important concern resides in the structure of the common law that would police the conflicts between all the private owners of the

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232. ANDERSON & LEAL, *supra* note 218, at 4–8.
233. *Id.*
234. BETHELL, *supra* note 36, at 18.
235. ANDERSON & LEAL, *supra* note 218, at 4–26; COLE, *supra* note 17, at 93–95.
236. ANDERSON & LEAL, *supra* note 218, at 4–8, 23.

Earth. As we have seen, the common law does not regard property rights as absolute, for they inevitably come into conflict, but rather prioritizes and balances interests so as best to serve its conception of the overall public welfare.[237] The problem we face is not that people have no common law rights in their health and in the environment, but that the current structure of the law makes them difficult to vindicate. People affected by air pollution, for example, can already assert a right to be free of such harm, though they carry many heavy burdens under the laws of negligence and nuisance. In a lawsuit under the common law, they would gain nothing by owning the air as well because the current law would do no more than implement its existing core judgment as to how to best balance their interests with those of economic growth.[238]

Private ownership of the Earth might sometimes result in better stewardship than open access. But under the current structure of the common law, more private property rights would not lead to the kind of ecological protection called for by our current circumstances. It would only take us further down the road we are already on, placing ever more of the Earth into private hands while leaving in place the common law's core conception that the public welfare is best promoted by encouraging economic growth.

Supporters of government ownership and regulation urge that government is uniquely capable of a broad view of the public interest in the Earth, including both long time horizons (extending even to future generations) and broad geographical scope (extending to the whole nation and even beyond). Government has stepped in to prevent the predations of private interests under the common law, by retaining and conserving extensive public lands and more recently by implementing the environmental laws even over industry objections.

On the other hand, private property advocates can cite many dispiriting examples of poor environmental stewardship by government (often

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237. *See* Hardin, *supra* note 214.

238. Free market environmentalists seem to recognize the difficulty the existing common law poses for their proposal. Sometimes they call for some kind of "strict liability" to vindicate the new property rights they seek, but without articulating how conflicts between all the rights would be resolved or recognizing how rare strict liability actually is in our current property law. *See* ANDERSON & LEAL, *supra* note 218, at 5, 8. Sometimes they acknowledge that legal remedies other than the common law may be necessary, particularly where the environment is damaged by cumulative small impacts. *See* BRUCE YANDLE, COMMON SENSE AND COMMON LAW FOR THE ENVIRONMENT—CREATING WEALTH IN HUMMINGBIRD ECONOMIES 115 (1997). At other times they urge revisionist defenses of the historical effectiveness of the common law in protecting the environment. *See, e.g.*, THE COMMON LAW AND THE ENVIRONMENT: RETHINKING THE STATUTORY BASIS FOR MODERN ENVIRONMENTAL LAW (Roger E. Meiners & Andrew P. Morriss eds., 2000).

resulting from flaws in the democratic process that allow private interests to obtain gains for themselves), including poor compliance records of government industrial and military facilities, grants of below-market grazing and mineral rights, timber sales, irrigation projects, environmentally destructive dams, poorly constructed laws that create perverse incentives, and laws whose costs are argued to vastly exceed the benefits.[239] The poor environmental records of communist East European nations also raise questions about the effectiveness of complete government ownership of property.[240]

Leaving aside this ideological debate, however, the stewardship records of both government and private owners as they actually function in the real world are decidedly mixed, and neither is satisfactory. Perhaps the best lesson is that any landowner, whether private or governmental, charged with both environmental protection and other goals such as economic gain or national defense, will find difficulty in prioritizing consistent, long-term ecological preservation.[241] Thus, as scholars from Professor Morris Cohen in 1927[242] through Professor Eric Freyfogle today[243] have long argued, the real issue is not who owns the Earth. What governs how we live on the land is the way that the law prioritizes the manifold human interests in property and resolves conflicts between those interests.

Under the rule of law in the United States, all landowners, whether public or private, are subject to the laws of property, and they pursue their interests according to the incentives those laws provide.[244] We cannot solve

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239. *See* COLE, *supra* note 17, at 90–93.

240. *Id.* at 105–07.

241. *See id.* (using Poland to exemplify the conflict European communist countries experienced between economic development and environmental protection).

242. As soon as the regulatory takings case *Pennsylvania Coal Co. v. Mahon* was decided in 1922, the scholar Morris Cohen stressed that the real issue in property law is "not the maintenance or abolition of private property, but the determination of the precise lines along which private enterprise must be given free scope and where it must be restricted in the interests of the common good." Morris R. Cohen, *Property and Sovereignty*, 13 CORNELL L.Q. 8, 21 (1927). For further discussion of this prophetic article, see FREYFOGLE, *supra* note 11, at 89–90.

243. Eric T. Freyfogle, *Goodbye to the Public-Private Divide*, 36 ENVTL. L. 7 (2006).

244. Writer Peter Barnes has made the very interesting proposal that government should place property rights in commons resources under the control of trusts that would be insulated from democratic political pressures, deploy the assets in the common interest and derive income from them to be passed on to members of the public. PETER BARNES, WHO OWNS THE SKY? (2001); PETER BARNES, CAPITALISM 3.0 (2006). Leaving aside the very difficult issues relating to the accountability of such trusts within our constitutional democracy, this novel structure of ownership and control (like other proposals to alter ownership of the earth) would not by itself resolve the essential question we are addressing herein—how best to balance our interests in the earth. This yet-to-be-defined balance would have to be specified in the laws creating the trust. How else would the trustees resolve the conflicts of interest between, for example, preserving clean air and licensing pollution to obtain trust income? And

our environmental problems by adjusting who owns the land. What we must do instead is focus on restructuring our property laws so that they will define the rights and responsibilities of all landowners, both public and private, so as best to serve the public welfare in the full world we face today.

IV. PROPERTY RIGHTS AND THE PUBLIC WELFARE IN THE ECOLOGICAL AGE

We are called on to develop a property law suited to our own time, when our growing cumulative impacts threaten the ecological viability of the Earth. We must develop a rule of law by which we can constrain our cumulative environmental damage to an ecologically sustainable scale.

A legal constraint on the scale of ecological damage would constitute a new overarching principle of economic behavior. It would reinforce the growing social norm of environmental responsibility. It would reshape the rules of economic competition by removing the law's current incentives for economic actors to compete by externalizing environmental impacts onto others and replacing them with incentives to avoid ecological damage. It would relieve society of the burdens imposed by those who cause ecological degradation.

This legal principle would be intended to redirect the economy onto ecologically sustainable paths by creating a legal preference for economic development that does not contribute to ecological degradation. This new legal structure would intentionally avoid the cost–benefit structure of the current law, and prioritize the avoidance of ecological damage because it alone, unlike any other form of costs or benefits, must be capped. Cost–benefit analysis might help us choose among alternatives as we develop a less damaging economy. But we could no longer justify each increment of environmental damage as we do under our current law, by monetizing it and trading it for economic benefits. Under an enforceable constraint on scale, we would be motivated perpetually to reduce environmental damage per unit of output so that our economy could continue to develop within the ecological reality imposed by the Earth. This principle would permit and indeed encourage use of resources whose supplies are not limited and that can be obtained without contributing to ecological degradation. We may even be able to increase true human welfare indefinitely, as long as we are inventive enough.

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just as importantly, unless the nation's property laws were restructured, trust property would be subject to being damaged by externalities just as it is today.

This legal structure would be intended to provide the foundation for the economic restructuring advocated by progressive economists. It would encourage us to preserve natural capital (as suggested by Hawken et al.[245]) and to reorganize our economic activity around the principle that the capacities of the Earth are sufficient for us to live within (as suggested by Princen).[246] It would be similar to the independent constraint on the scale of economic throughput (as suggested by Daly), though it would be intended to allow the economy to develop and grow in any and all ways that are consistent with maintaining the ecological integrity of the Earth.[247] It would respond to the call for legal scholars to take account of the issue of scale in legal decision making (as suggested by Kysar).[248]

A. Legal Scholars Have Begun to Develop New Legal Rules Placing Greater Value on Ecological Interests

For decades, legal scholars have urged that the law should place a higher value on the ecological integrity of the Earth. They have made progress that is worth reviewing, for I propose to build on it in proposing a new rule of law.

Some scholars have focused on working within the current structure of the law but strengthening its ability to recognize economic value of ecological services.[249] Others have urged substantive transformation of the

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245. HAWKEN ET AL., *supra* note 46.

246. PRINCEN, *supra* note 47.

247. *See* DALY, *supra* note 45, at 31–60 (distinguishing economic "development" (quality improvement and fixed scale) from economic "growth" (quantitative increase in scale of throughput)). Using Daly's terminology, some forms of economic growth would implicate ecological degradation, while other forms may not if they utilize resources that are plentiful and can be obtained without causing ecological degradation (such as renewable energy). *Id.*

248. Kysar, *supra* note 4, at 7–9, 75–77.

249. *See* Ruhl, *supra* note 4, at 7 (proposing an intensive effort to monetize the value to people of ecosystem services, which would more frequently enable plaintiffs to carry their burden to prove that damage to the ecological natural capital necessary to provide such services is "unreasonable" under current legal standards). Monetizing ecosystem services values is critical for achieving greater ecological protection to the extent possible without restructuring the common law. *Id.* This approach will have difficulty in the all-important circumstances where "degradation of natural capital often is caused by the cumulative effects of dispersed and diverse actions, and the resulting depletion of ecosystem services may be distant in time or location" and values are not readily monetizable. *Id.* at 10; *see also* Klass, *supra* note 16, at 556–60 (stating that common law should assimilate new federal and state environmental laws by defining new forms of *per se* negligence and nuisance, and to better employ the vast body of information and expertise the administrative agencies have developed to identify and quantify harm to public health and the environment); Science & Environmental Health Network, Ethical Economics, True Cost Clearinghouse, http://www.sehn.org/tcc.html (last visited Apr. 30, 2008) (documenting the economic, health, and social costs of pollution, worker exposures, and resource exploitations, as well as the underreported benefits of remediation and precautionary policies).

legal rules themselves. For example, scholars have urged that the law should impose a new duty of stewardship that would require landowners to maintain the ecological value of their lands for the benefit of the community and avoid projecting ecological harm onto their neighbors.[250] They have also highlighted the need for the common law to account for the total scale of damage, the effects of many small cumulative impacts, the carrying capacity of the land, and the preservation of ecosystem integrity.[251] They have proposed that our right to live on the land be only in the nature of usufruct (i.e., a right to use the land only so long it is not diminished for future generations).[252] They have urged that doctrines such as the public

250. *See, e.g.*, Ray Kirsch, *Note: What's The Buzz? Common Law for the Commons in Anderson v. State Department Of Natural Resources*, 29 HAMLINE L. REV. 338, 339 (2006) (common law should impose "a duty of reasonable care" for ecological impacts of landowner's activities on neighboring lands); FREYFOGLE, *supra* note 11, at 215–24, 260–61 (common law should be "updated" to translate ecological needs of the community into duties of stewardship imposed on landowners); *See also* Terry W. Frazier, *Protecting Ecological Integrity within the Balancing Function of Property Law*, 28 ENVTL. L. 53, 55 (1998) (property rights are flexible and common law should place more value on ecological integrity in its balance of interests in our current reality); Robert Goldstein, *Green Wood in the Bundle of Sticks: Fitting Environmental Ethics and Ecology into Real Property Law*, 25 B.C. ENVTL. AFF. L. REV. 347, 421–27 (1998) (common law should create obligations for landowners to act as good stewards of the land, rebalance property rules to preserve the status quo of an unaltered environment and recognize that when landowners externalize damage onto neighbors they are damaging the property rights of those neighbors and the community); *see also* James P. Karp, *A Private Duty of Stewardship: Changing Our Land Ethic*, 23 ENVTL. L. 735, 749 (1993) (common law judges should alter property rights by building on the doctrines of nuisance and waste to create a duty of stewardship requiring landowners to use and maintain land so as not to interfere with any significant natural resource value).

251. *See, e.g.*, FREYFOGLE, *supra* note 11, at 203–27, 229–30 (calling for the development of a new "Private Property for an Ecological Age," where the common law would require landowners to take account of today's values and variety of harms; natural variations in the land; a better balancing of conservation needs with economic needs; and revision of the harm-benefit test in a takings analysis); David S. Wilgus, Comment, *The Nature of Nuisance: Judicial Environmental Ethics and Landowner Stewardship in the Age of Ecology*, 33 MCGEORGE L. REV. 99, 125–29 (2001) (noting that property rights are subject to the public good; common law should recognize interconnectedness of nature and that we are reaching the carrying capacity of the land; nuisance law should be guided by principles of ecology, ecological preservation, maintaining the land as shared heritage of all and the greater public good when evaluating reasonableness landowners' externalities); Lynda L. Butler, *The Pathology of Property Norms: Living Within Nature's Boundaries*, 73 S. CAL. L. REV. 927, 1001–04 (2000) (describing how common law can be used to redefine property rights to restrict private land uses according to their cumulative impact on natural systems); David B. Hunter, *An Ecological Perspective on Property: A Call for Judicial Protection of the Public's Interest in Environmentally Critical Interests*, 12 HARV. L. REV. 311 (1988) (calling for law to recognize the ecological value of lands in the public interest).

252. FREYFOGLE, *supra* note 11, at 230–53 (arguing that public rights in water, wildlife, and soil should be reclaimed, with private owners having only use rights in all ecologically important resources and development rights only as necessary to promote the public good); Sax, *supra* note 48, at 1452 (stating that common law should accommodate "the economy of nature" by redefining land ownership in terms of usufructuary rights, in which a landowner "does not have exclusive dominion of her land; rather, she only has a right to uses compatible with the community's dependence on the property as a resource").

trust doctrine, the natural use doctrine, strict liability, and public ownership of wildlife be expanded to further the interests of ecological protection.[253] And they have urged the amendment of state and federal constitutions to include expressions of environmental rights.[254]

However, stringent assertions of a value or a right cannot be implemented literally as practical rules of law. They inevitably come into conflict with other human interests and rights, and then judges are left to decide how best to accommodate the conflicting interests. Recall the difficulty the common law had in implementing even Justice Livingston's proposal to only impose liability for damage that was "manifest and serious."[255] Even constitutional expressions of environmental rights, like virtually all other human rights, are difficult for courts to implement literally to their full extent. Illustrative is a recent case in which the Pennsylvania Supreme Court considered the environmental rights enshrined in the Pennsylvania Constitution.[256] The state constitution could not more clearly express Pennsylvanians' rights to a healthy environment, the importance of future generations, and the state's public trust obligations.[257] The court, however, was unwilling to fully enforce even such clear, strongly articulated rights, and instead balanced them with other interests. As the court said:

> [T]he responsibility of government to protect the environment from private injury is . . . clear. PA. CONST. Art. I, § 10 provides that:
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> The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these

253. *See, e.g.*, Arnold, *supra* note 202, at 349–59 (noting that common law doctrines of public trust, natural use, nuisance, and wildlife governance should evolve and establish landowner responsibility to maintain and contribute to ecological integrity and duty of care toward the natural and human environments beyond an owner's property lines); Sax, *supra* note 64 (arguing common law should expand the public trust doctrine beyond traditional focus on fishing, navigation, and commerce in tidelands and navigable waters into a comprehensive tool for natural resource management and environmental protection); *see also* BOSTON & MADDEN, *supra* note, at 103 (reviewing literature calling for the expansion of the strict liability doctrine to protect the environment).

254. *See, e.g.*, Dan L. Gildor, *Preserving the Priceless: A Constitutional Amendment to Empower Congress to Preserve, Protect, and Promote the Environment*, 32 ECOLOGY L.Q. 821 (2005) (advocating for an environmental rights amendment to the U.S. Constitution).

255. *See supra* notes 55–58 and accompanying text.

256. Machipongo Land & Coal Co. v. Commonwealth, 799 A.2d 751 (Pa. 2002).

257. *Id.*

> resources, the Commonwealth shall conserve and maintain them for the benefit of all the people.
>
> *In this case, we are required to weigh the governmental obligation to protect the environment against the individual right to do as one wishes with property one owns*.[258]

Nor would expanding the scope of many existing common law doctrines as they are currently structured necessarily accomplish all we might hope for. Consider, for example, the idea of expanding the public trust doctrine substantially beyond its historical concern with public rights in navigation, fishing, and recreation along the seashore and in running waters. It is surely true that, in principle, our state and federal governments hold the Earth in trust for current and future generations and are obligated to deploy it for the public welfare. And yet this begs the question of how this trust should be managed. Should every resource of the Earth be protected, or may some be used to meet current needs? Is our priority economic growth or ecological preservation? The answers, of course, depend entirely on one's conception of the general welfare under the prevailing circumstances. This is why Professor Joseph Sax, while urging expansion of the public trust doctrine in his seminal article of 1970, also characterized it as lacking intrinsic substantive content and as functioning primarily as a device for courts to ensure that the democratic process works properly in determining what the public interest actually is.[259] The law's current conception of how to promote the public welfare therefore lies at the root of why the public trust doctrine has been used to promote economic expansion as often as it has resource protection.[260]

We need specific rules of law that do more than strongly state a right, policy preference, or general objective that is then left to courts to somehow accommodate in cases that come before them. We need new laws that, like the modern doctrines of negligence and nuisance, actually specify rules of

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258. *Id.* at 754–55 (emphasis added).

259. Sax, *supra* note 64, at 521 ("The 'public trust' has no life of its own and no intrinsic content. It is no more—and no less—than a name courts give to their concerns about the insufficiencies of the public process.").

260. *See* Richard J. Lazarus, *Changing Conceptions of Property and Sovereignty in Natural Resources: Questioning the Public Trust Doctrine*, 71 IOWA L. REV. 631, 641 (1986) ("[T]he traditional trust doctrine concept in the United States became as much a legal basis for economic expansion as for resource protection."); Ruhl, *supra* note 4, at 6 (finding that while the public trust doctrine holds theoretical promise, it has not been widely embraced by common law courts or expanded significantly beyond its traditional applications); Blumm & Ritchie, *supra* note 192, at 341–46 (explaining that the public trust and natural use doctrines have not been widely adopted or applied by common law courts, but remain viable background principles in some jurisdictions).

decision that courts must use in resolving concrete disputes. These new rules of decision should, like the modern common law rules, contain within their structure an embedded policy objective. But this time the goal should be promoting an ecologically viable biosphere.

While having long made general calls for reform, property scholars are just beginning to develop such practicable rules of law.[261] For example, Professor Denise Antolini has called for the common law to permit public nuisance actions where the plaintiffs suffer the same harm as the community and not just when they suffer a "special injury." She proposes "[a] new 'actual community injury' test, which would require a plaintiff in public nuisance cases to show shared, not unique, injury."[262] Professor John Sprankling has urged the common law to recognize wilderness as a separate category of specially protected real property. In doing so, he has proposed specific modifications to the doctrines of waste, good-faith improver, adverse possession, trespass, and even nuisance (to define environmental damage in wilderness explicitly as a factor militating *in favor of*, rather than *against*, finding a nuisance).[263]

Some scholars have also begun to more directly confront the legal structure that lies at the core of our law. Professor Eric Freyfogle has proposed a revival of *sic utere tuo* as the guiding principle of land ownership, this time with harm defined in the context of our new circumstances.[264] Armed with these doctrines, he has argued, common law judges could ban harm producing practices such as "destroying wetlands, allowing soil to erode, and draining aquifers."[265]

Commentator James M. Olson has urged that the key step in reforming negligence and nuisance law is to reallocate the burden of proof.[266] He has proposed that the common law should require those who have impaired or are seeking to impair any aspect of the global commons that is critical to human needs and ecological sustainability, to bear the burden of proof to justify their conduct. This would establish as the status quo the natural and self-sustaining limits of the Earth in its unpolluted or less polluted state.[267]

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261. *See* Arnold, *supra* note 202, at 320–21 (observing that nature-oriented property scholarship lacks specific detailed proposals for property doctrines, citing work of John Sprankling as a "rare example" of what is needed).

262. Antolini, *supra* note 109, at 892.

263. Sprankling, *supra* note 57, at 521.

264. FREYFOGLE, *supra* note 11, at 262.

265. *Id.* at 262–63.

266. James M. Olson, *Shifting the Burden of Proof: How the Common Law Can Safeguard Nature and Promote an Earth Ethic*, 20 ENVTL. L. 891, 900 (1990).

267. *Id.*

Finally, Professor Bruce Pardy, Law Professor at Queens University in Canada, has gone further by focusing directly on the issue of scale.[268] Focusing on legislation rather than common law, he has proposed a statutory structure that would define a limit to a society's total ecological impact and then proscribe individual behavior that, if extended to all people in society, would exceed that ecological limit.[269] This is the kind of law we need—a specific rule addressing the issue of scale. Given the current structure of American common law and the Supreme Court's takings doctrine under *Lucas*, we might expect the United States to experience difficulty implementing such a far-reaching statute without some accompanying movement in the common law. Moreover, this particular approach to constraining scale may be too restrictive. We are going to need cooperative strategies, like cap and trade systems, whereby people can work together to limit their total ecological impacts and then allocate the allowed impacts to some members of society rather than equally distribute them to everyone.

B. The Tort of Ecological Degradation

As the central liability rules of our society, negligence and nuisance may very well remain sensible for most situations, such as accidents, medical malpractice, noisy or otherwise inappropriate neighbors, and even many invasions of interests in land that do not threaten the Earth's ecological integrity. I propose to leave these doctrines as they are for most situations and to define a new, additional property law for the specific purpose of limiting the total scale of ecological degradation.

Other forms of law, including legislation, should adopt this same goal as well. But under our legal system and current Constitutional takings doctrine, legislation alone cannot fully transform our property rights leaving the common law behind pursuing outdated goals. The common law must also evolve so as to avoid the legal system's partition into two spheres, each pursuing different visions of the public welfare. We need the common law, in the course of resolving private, essentially local disputes, to evolve into a tool by which communities and neighbors can work together to liberate

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268. Bruce Pardy, *In Search of the Holy Grail of Environmental Law: A Rule to Solve the Problem*, 1 MCGILL INT'L J. SUST. DEV. L. & POL'Y 29 (2005). The Science & Environmental Health Network's proposal of a new model National Environmental Protection Act (NEPA) focuses on the burden of proof and cumulative impacts, which places the burden of proof on proponents of a project to demonstrate that their project will not contribute to ecological degradation or unfair treatment of people. Joseph H. Guth, Model State Environmental Quality Act of 2007 (2007), http://www.sehn.org/lawpdf/ModelStateEQA2007.pdf.

269. Pardy, *supra* note 268.

themselves from the burdens of ecological degradation. Thus, I propose a new common law rule, but believe that its central principle should be incorporated into all our law.

Set out below is a proposal for a tort of "ecological degradation." The parts that follow explore the structure and key provisions of this new tort.

ECOLOGICAL DEGRADATION

Sec. 1. A person is subject to liability for ecological degradation if his or her conduct is a legal cause of an unreasonable ecological threat.

Sec. 2. An ecological threat is any effect on the natural world that may contribute to ecological degradation.

Sec. 3. An ecological threat is unreasonable unless the person whose conduct is a legal cause of the threat, demonstrates by a preponderance of evidence that the threat does not contribute to ecological degradation.

Sec. 4. A person whose conduct is a legal cause of an unreasonable ecological threat may be relieved of some or all liability for ecological degradation if the person demonstrates by a preponderance of the evidence that:

(a) The person has no feasible alternative to the conduct that is likely to contribute less to ecological degradation; and

(b) The person is conducting a vigorous program to develop a feasible alternative to the conduct that is likely to contribute less to ecological degradation.

Sec. 5. Any member of a community that may be affected by an ecological threat may bring an action for ecological degradation.

1. Contributing to Ecological Degradation

Many have suggested imposing strict liability for environmental impacts. But such a rule, if literally implemented, would make it impossible for people to live on the Earth. We cannot exist without having some effects on the world around us. We should tie potential liability more closely and specifically to what is damaging the public welfare.

Thus, this tort aims to prevent not all environmental impacts, but only ecological degradation. By "ecological degradation," I mean to refer to the concepts used by scientists when they describe the decline of the Earth's biosphere. For example, Noss et al. have described the ongoing biotic impoverishment of ecosystems in the United States in terms of the

"degradation in the structure, function or composition of an ecosystem."[270] UNEP's 2007 *GEO-4 Report* frequently uses the term "degraded" to describe the state of many elements of the environment.[271] The United Nations 2005 *Millennium Ecosystem Assessment* describes global ecosystem services as being "degraded" or used unsustainably.[272] The Swedish government has defined sixteen environmental quality goals and numerous environmental quality indicators that are intended to describe the quality and state of the environment that should be achieved and maintained over the long term.[273] Aldo Leopold defined "land health" as the "capacity for self-renewal in the soils, waters, plants, and animals that collectively comprise the land."[274] To Leopold, "a thing is right when it tends to preserve the integrity, stability and beauty of the biotic community."[275] Wendell Berry has taught that "land health" is the "one value" that upholds the entire web of life, that human well-being is linked to land health; and that a property rights system intended to promote the public welfare must discourage land uses that threaten land health.[276]

Thus, "ecological degradation" is intended to mean the biotic impoverishment and decline in the self-sustaining and self-renewing capacity of the biosphere. While there may be a better term, what matters most is that the law supplies this substantive content to whatever term is used. For it is ecological degradation that now threatens the long-term public welfare and that the law must now prevent.

This proposed law recognizes that ecological degradation often results from the cumulative effect of many smaller impacts that would not cause ecological degradation by themselves. There is but one way to respond to this reality: when ecological degradation is threatened or is actually occurring, we must all be responsible for each of our acts that *contributes* to it. Accordingly, under this proposed law, any effect on the natural world that may contribute to ecological degradation is subject to potential liability.

This test is at once both broader and narrower than the old common law rule of *sic utere tuo*. It is broader because it explicitly addresses small impacts that taken alone may do no harm. Also, it addresses not just harm

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270. *See* NOSS ET AL., *supra* note 141.

271. UNEP, *supra* note 137, *passim*.

272. MILLENNIUM ECOSYSTEM ASSESSMENT, *supra* note 3, at 6–11.

273. *See* Envtl. Objectives Secretariat, Swedish Envtl. Prot. Agency, Environmental Objectives Portal, http://www.miljomal.nu/english/about.php.

274. LEOPOLD, *Conservation: In Whole or in Part?* [1944], *in* THE RIVER OF THE MOTHER OF GODS, *supra* note 10, at 318.

275. LEOPOLD, *supra* note 2.

276. *See* FREYFOGLE, *supra* note 11, at 151–56 (discussing Wendell Berry's ideas and advocacy).

landowners inflict on the land of others, but harm they do to their own property including damage that withdraws ecological benefits from the larger community. It is narrower because it focuses specifically on effects that contribute to ecological degradation, and not on anything that affects people's quiet enjoyment of their land.

This legal test is intended to allow us to find ways to live on and alter the Earth as we inevitably must, but it proscribes undermining the ecological systems we need to survive. By focusing directly on the ecological integrity of the land, it imposes a broad duty of ecological stewardship on each of us. It is also intended to motivate us to work together to achieve stewardship goals. Whenever people jointly constrain the cumulative effects of their actions (as, for example, where all those sharing a watershed or fishery work cooperatively to avoid its degradation), then individual acts permitted by such an agreement ought not to be subject to this tort (at least to the extent they affect the watershed or fishery).

The law must also define the causal nexus between a defendant's acts and an "effect on the natural world that contributes to ecological degradation."[277] Emission of pollution from a factory could certainly be a legal cause of such an effect. But what about supplying the materials that the factory uses in generating pollution, or the purchase by consumers of the factory's products? The question of "legal cause" can be a difficult one, but it is one that the common law has developed in the context of other rules of law. This working proposal does not resolve this issue, but simply acknowledges it by creating potential liability only if "conduct is a legal cause" of an unreasonable ecological threat.

For the law to sanction effects on the natural world that contribute to ecological degradation would surely constitute a significant evolution in the common law. And yet, courts have sometimes made suggestions, if not holdings, along these lines that may be useful to advocates urging adoption of this principle. For example, courts have recognized the importance of adjusting our activities to accommodate the land's natural capacities.[278] They have expressed concern with mounting ecological degradation and

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277. *Supra* Part IV.B (section 2 of the proposed tort of ecological degradation).

278. *See* Prah v. Maretti, 321 N.W.2d 182, 190 (Wis. 1982) (reasoning that "the policy of favoring unhindered private development in an expanding economy is no longer in harmony with the realities of our society"); Just v. Marinette County, 201 N.W.2d 761, 768 (Wis. 1972) ("An owner of land has no absolute and unlimited right to change the essential natural character of his land."); Barrett v. State, 116 N.E. 99 (N.Y. 1917) (upholding state law stocking and protecting public beaver populations over large area on lands of many private landowners); Cawsey v. Brickey, 144 P. 938 (Wash. 1914) (upholding law distinguishing land based on inherent features, and banning hunting on those lands where hunting is not suitable). For further discussion of significance of these cases, see FREYFOGLE, *supra* note 11, at 30–33 (*Barrett*); 35–36 (*Cawsey*); 94–95 (*Just*); 97–98 (*Prah*).

suggested an evolution in judicial conceptions of the public welfare.[279] They have even recognized the importance of avoiding small impacts, now that cumulative effects have become so significant.[280]

Governments have also taken small, though helpful, steps that would help to ratify this new legal definition of unreasonable acts. As mentioned earlier, some federal legislation has diverged from the common law structure by fixing specific standards of human health and environmental quality. Some local governments have also implemented stronger steps, such as the adoption of precautionary laws that are focused on avoiding harm to human health and the environment and searching for less damaging alternatives.[281] More specifically, however, state and federal governments have also begun to recognize the importance of cumulative impacts. For example, the United States EPA has developed a framework for assessing cumulative impacts where this is required under particular laws, and is charged with developing specific methodologies for assessing multiple chemical exposures.[282] The White House Council on Environmental Quality has begun to develop methods for evaluating cumulative impacts in Environmental Impact Statements and Environmental Assessments of government actions under the National Environmental Policy Act of 1969 (NEPA).[283] The California Environmental Protection Agency is developing

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279. *See, e.g.*, Machipongo Land & Coal Co., Inc. v. Commonwealth, 799 A.2d 751, 772–73 (Pa. 2002) (explaining that a land owner's expectation of being able to mine coal despite adversely affecting the watershed of a stream that is a source of drinking water is no longer reasonable); R & Y, Inc. v. Municipality of Anchorage, 34 P.3d 289, 298 (Alaska 2001) (pointing to "the unique ecological and economic value that wetlands provide in protecting water quality, regulating local hydrology, preventing flooding, and preventing erosion" and finding that regulations protecting such wetlands "provide ecological and economic value to the landowners whose surrounding commercially-developed land is directly and especially benefited").

280. *See* Illinois v. City of Milwaukee, No. 72 C 1253, 1973 U.S. Dist. LEXIS 15607, *20–22 (D. Ill. 1973), *rev'd on other grounds*, 599 F.2d 151 (7th Cir. 1979), *vacated*, 451 U.S. 304 (1981); *see also supra* note 149 and accompanying text; Grant's Farm Assocs., Inc. v. Town of Kittery, 554 A.2d 799, 801–02 (Me. 1989) (upholding that a permit was properly denied because a ten percent worsening of traffic was "causation" of detriment to environmental and community interests); Gardner v. N.J. Pinelands Comm'n, 593 A.2d 251, 258 (N.J. 1991) (upholding state statute protecting New Jersey Pinelands, which furthered legitimate government purpose because even if plaintiff's impact was small, cumulative small impacts can be detrimental to environment).

281. *See* BE SAFE, *supra* note 183.

282. *See* U.S. ENVTL. PROT. AGENCY, FRAMEWORK FOR CUMULATIVE RISK ASSESSMENT, EPA/630/P-02/001F (2003) (discussing the EPA's newly developed framework for cumulative risk assessment); NAT'L CTR. FOR ENVTL. ASSESSMENT, U.S. E.P.A., CONSIDERATIONS FOR DEVELOPING ALTERNATIVE HEALTH RISK ASSESSMENT APPROACHES FOR ADDRESSING MULTIPLE CHEMICALS, EXPOSURES AND EFFECTS (EXTERNAL REVIEW DRAFT) 1–2 (2006) (explaining that "[t]he purpose of [the] report is to describe information and risk assessment approaches that can be used to implement the basic cumulative risk concepts" set out in other EPA reports).

283. *See* COUNCIL ON ENVTL. QUALITY, CONSIDERING CUMULATIVE EFFECTS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT 49–57 (1997) (setting forth methods for evaluating cumulative

guidance on conduct of cumulative impacts analysis as a critical component of its implementation of California's Environmental Justice legislation.[284]

2. Allocating the Burden of Proof to Defendants

A critical question is how to allocate the burden of proof. Should a plaintiff have to prove a defendant's act contributes to ecological degradation for the law to intercede, or should a defendant have to prove his or her acts do not contribute to ecological degradation? In section 3 of the proposed tort, the burden of proof is allocated to defendants. Thus, a person's conduct that is a legal cause of an ecological threat (i.e., any effect on the natural world that may contribute to ecological degradation) is deemed unreasonable unless that person demonstrates the effect is not likely to contribute to ecological degradation.

A recent statutory case from the Court of Appeals for the Ninth Circuit illustrates the overarching importance of this structural element of the law.[285] In *Earth Island Institute v. Hogarth*, Congress prohibited labeling cans of tuna as "dolphin safe," if the tuna was caught using "purse-seine" nets.[286] Congress believed that such nets were not safe for dolphins.[287] Congress allowed this restriction to be relaxed, however, if the Secretary of Commerce found that scientific studies demonstrated that purse-seine nets could be used without harming dolphin populations.[288] Consequently, those who wished to use the nets had the burden of proving that they did not harm dolphin populations.[289] When the case came to court, the scientists did not know whether the nets were harming dolphin populations or not—the evidence was inconclusive.[290] Nevertheless, the Secretary of Commerce argued he could change the dolphin-safe labeling requirement.[291] The Court disagreed and required the Secretary to meet the burden of proof that the

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impacts), *available at* http://www.nepa.gov/nepa/ccenepa/sec5.pdf; s*ee also* 40 C.F.R. § 1508.7 (2007) (explaining that CEQ regulations define cumulative effects as impact on environment resulting from past, present, and future incremental impacts).

284. *See* CAL. ENVTL. PROT. AGENCY, ENVIRONMENTAL JUSTICE ACTION PLAN 4 (2004), *available at* http://www.calepa.ca.gov/EnvJustice/ActionPlan/Documents/October2004/ActionPlan.pdf (developing guidance on cumulative impacts).

285. Earth Island Inst. v. Hogarth, 484 F.3d 1123 (9th Cir. 2007); *see also* Joseph H. Guth, *How Dolphins Got the Benefit of the Doubt and Why It Matters*, RACHEL'S DEMOCRACY & HEALTH NEWS, May 03, 2007, http://www.precaution.org/lib/07/prn_dolphins_get_benefit_of_doubt.070501.htm (discussing the Earth Island Institute case and the issue of the allocation of burden of proof).

286. *Earth Island Inst.*, 484 F.3d at 1127.

287. *Id.*

288. *Id.*

289. *Id.*

290. *Id.* at 1128.

291. *Id.* at 1133–34.

law imposed:

> The Secretary then points to the inconclusive nature of all the agency's studies and claims that the absence of evidence allows him to make a change in dolphin-safe labeling requirements. This court already rejected such reasoning . . . when it held that there is no basis on which to change the status quo if all of the evidence is inconclusive.[292]

Therefore, because this Act allocates the burden of proof to economic actors, the inconclusive nature of the science meant that the Secretary could not authorize steps that would increase the risk to dolphins. Dolphins had the benefit of the doubt, and the law protected them.

We have seen how the allocation of the burden of proof defines the condition that the law prefers, the condition that it protects in cases of doubt. We have also seen how environmental claims have become especially hard to prove, and may become harder even as ecological degradation mounts.[293] Because the legal system must decide cases, it is not a question of whether the law should prefer one interest or another when the facts are inconclusive, but which interest. The law must decide what it values most in cases of doubt. Under our current circumstances, in cases involving conflicts between economic and ecological interests, in cases of doubt the law should prefer the health of the land to unimpeded economic activity.

Allocation of the burden of proof also reflects what we intrinsically believe is most likely to be happening when we can't be sure, in cases of doubt. As we have seen, when nineteenth century judges placed the burden of proof on plaintiffs in negligence and nuisance, they simply believed that industrial activity was likely to create a net benefit even where it also caused damage. Thus, they built into the law the presumption that accorded with what they thought was the most likely reality. But now, the only reasonable presumption in the ecological age is that industrial effects on the natural world are likely to be contributing to ecological degradation.

Other factors inform the allocation of the burden of proof as well. It should reflect which party is in the best position to bring forward information the court needs to resolve disputes, and which party is in the

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292. *Id.*

293. *See* Peter Montague, *Human Ignorance Is Growing*, RACHEL'S DEMOCRACY & HEALTH NEWS, Apr. 26, 2007, http://www.precaution.org/lib/07/prn_editorial.070426.htm (arguing that the ongoing disruption of ecological systems presents ecological scientists with a moving target as an object of study, thereby causing uncertainty about our impacts on the Earth may now be increasing with time).

best position to take steps to avoid the harm the law seeks to prevent.[294] Courts should be cognizant of imbalances of power and resources that systematically impede vindication of particular interests. Also, because the rules of the common law establish and reinforce social norms, the allocation of the burden of proof should reflect the duty the law believes we each have to the community. For example, if the burden of proof in this tort were allocated to plaintiffs, the social norm reinforced by the law would be: "I am free to act unless someone can prove I am contributing to ecological degradation." But if the burden of proof were placed on defendants, the reinforced norm would be: "I am free to act only if I can demonstrate my acts are not likely to be contributing to ecological degradation."

Considering many of these factors, commentator James Olson has urged that the common law place the burden of proof on those whose actions create an ecological threat in view of the global nature of environmental problems; the interconnectedness of nature and our impacts on it; the limited capacity of the Earth to assimilate environmental damage; the current risks to the Earth's life-sustaining systems; and the difficulties in proving causation of environmental damage.[295] He has also noted the imbalances of economic power, knowledge, and control between average citizens who are harmed by environmental damage and industrial interests causing the damage, and that these imbalances make critical environmental interests difficult to vindicate under the current structure of the law. As he put it:

> When conduct is proposed that would alter ecological relationships, those seeking to alter, or who have altered, this ecological system should have the burden of proof. The party seeking to alter the natural order or introduce chemicals into the environment should have to establish that such alteration would not impair or destroy the underlying, self-sustaining characteristics of nature to justify their conduct. This would put the burden upon those initiating change; those who have the economic incentive and information—those in control—would have the burden of proof, internalizing costs in the process.[296]

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294. *See* KEETON ET AL., *supra* note 66, §§ 38–40, at 238–42 (discussing burden of proof and presumptions).

295. *See generally* Olson, *supra* note 266 (arguing how the burden of proof should be shifted to "the party whose actions threaten environmental values").

296. *Id.* at 900.

Two additional structural issues arise once the burden of proof is placed on defendants. One is to define the evidentiary standard that applies; such as "preponderance of the evidence," "clear and convincing evidence," "beyond a reasonable doubt" or perhaps some other standard. The importance of this standard to the outcome of legal disputes is second only to the allocation of the burden of proof. Obviously, the higher the evidentiary standard, the more difficult it would be for the defendant to carry the burden of proof and the more protective of the environment the tort would be. For this working proposal, I have simply chosen the typical common law civil standard: the "preponderance of the evidence."

A second structural issue is to define the scope of the acts that will be subject to liability if the defendant does not meet his or her burden of proof. It would be impractical if we all had to prove in court that everything we do does not contribute to ecological degradation. The more likely it is that the acts subject to potential liability contribute to ecological degradation, the more powerful the rationale for allocating the burden of proof to defendants. On the other hand, the tort would be eviscerated if so few acts were subject to potential liability that it could not control the total scale of ecological damage.

The current common law of nuisance employs such a gate-keeping function by requiring plaintiffs to show they have suffered a "significant" harm before imposing liability for a nuisance. "Significant" harm is defined as "harm of importance, involving more than slight inconvenience or petty annoyance."[297] In nuisance, "[t]he law does not concern itself with trifles . . ."[298] This test would be too stringent for the new law because its very intent is to prevent the cumulative impact of acts that may not by themselves be "significant." Also, establishing too high an initial burden on plaintiffs would undermine many of the policy goals of placing the ultimate burden of proof on defendants.

This gate-keeping test should be grounded in the goal of preventing ecological degradation. Obviously, some kinds of effects on the natural world raise greater potential for contributing to ecological degradation than others. Drawing this distinction will not always be a simple task, but we should not be deterred. For example, ecologists and ecological economists have identified forms of "critical natural capital" whose ecological function cannot be replaced by other forms of capital.[299] Professor J.B. Ruhl has

297. RESTATEMENT (SECOND) OF TORTS § 821F cmt. c (1965).

298. *Id.*

299. The Sustainable Scale Project, Critical Natural Capital, http://www.sustainablescale.org/ConceptualFramework/UnderstandingScale/MeasuringScale/CriticalNaturalCapital.aspx (last visited

suggested focusing on damage to such capital in nuisance cases.[300] Perhaps a judge might apply this new tort to threats to critical natural capital, with the gate-keeping function designed to focus the law on such resources.

This working proposal offers as a starting point the simple idea that the burden of proof should be placed on defendants whenever their conduct is the legal cause of an "ecological threat." An "ecological threat" is defined as "any effect on the natural world that may contribute to ecological degradation." Thus, for a defendant's conduct to be subject to potential liability under this tort, a plaintiff must demonstrate that it causes an effect on the natural world and that the defendant's conduct may contribute to ecological degradation. The plaintiff must produce evidence rising above the level of pure speculation. The ultimate burden of proof would then shift to defendants to prove that their conduct is not likely to contribute to ecological degradation.

Placing this burden on defendants would unquestionably constitute a dramatic evolution in the law. However the current law is not monolithic; it allocates the burden of proof to defendants and economic actors in some circumstances that may form useful precedential building blocks for judges to build on. For example, the Federal Food Drug and Cosmetic Act requires prescription pharmaceutical manufacturers to demonstrate that a new drug is safe and effective before it may be marketed.[301] Under the Food Quality Protection Act, pesticide manufacturers must demonstrate that there is a "reasonable certainty that no harm will result" from exposure to a pesticide in food before it may be marketed.[302] And, as we have seen, the federal Dolphin Protection Consumer Information Act (1990) requires the Secretary of Commerce and tuna producers to show certain types of fishing are safe for dolphin populations before allowing labeling standards to be changed.[303]

At times the common law too places the burden of proof on defendants. For example, carriers bear the burden to show that they are not negligent when goods or passengers are injured.[304] Some states will shift the burden to defendants to prove they are not negligent under the doctrine of *res ipsa*

Apr. 30, 2008); J.B. Ruhl, *Making Nuisance Ecological* 17–18 (Fla. St. U. College of Law, Public Law Research Paper No. 216, 2006), *available at* http://ssrn.com/abstract=931248.

300. Ruhl, *supra* note 299.

301. Federal Food, Drug and Cosmetic Act, 21 U.S.C. § 355 (2000).

302. Food Quality Protection Act, Pub. L. No. 104-170, 110 Stat. 1489 (codified as amended in scattered sections of 7 and 21 U.S.C.).

303. Earth Island Inst. v. Hogarth, 484 F.3d 1123 (9th Cir. 2007).

304. KEETON ET AL., *supra* note 66, § 38, at 239–40.

loquitur (meaning, "the thing speaks for itself").[305] The burden can also be placed on defendants in alternative liability cases when the negligent conduct of two or more defendants (such as shooting guns across a highway, or causing a "chain collision" of automobiles) has injured a plaintiff. In this situation, many jurisdictions place the burden on defendants to establish which of them is liable.[306] A similar situation arises in products liability cases in which multiple defendants make an identical product, such as a drug, and the injured plaintiff cannot identify which manufacturer's product was actually used.[307] Some courts will apportion liability among the manufacturers and place the burden on them to show that they could not have made the product that damaged the plaintiff.[308] The common law also places the burden on defendants to establish affirmative defenses that can relieve them of liability for otherwise negligent conduct, including the defenses of contributory negligence, comparative negligence, and assumption of the risk.[309]

Finally, our courts might consider what is perhaps the most significant environmental law passed in the world in the last few years, the European Union's regulation known as REACH.[310] That law constitutes a new chemicals policy that will apply to about 30,000 chemicals manufactured in or imported into the European Union.[311] Under REACH, the burden of proof has been placed on industry, as a condition for keeping or placing several classes of hazardous chemicals on the market. Defendants must prove that the socioeconomic benefits of each use of those chemicals outweigh their risks and that there are no suitable alternatives.[312]

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305. *See id.* §§ 39, 40, at 242–62. Courts sometimes invoke this doctrine when a particular event can be deemed unlikely to have occurred unless there was negligence (such as brinks falling from the windows. While most jurisdictions applying *res ipsa loquitur* simply permit negligence to be inferred from the fact that the event has occurred while leaving the burden of proof on plaintiffs, a few states go further to switch the burden of proof to defendants requiring them to introduce evidence of greater weight that the plaintiffs in order to prevail. *Id.* at 258–59.

306. *Id.* § 41, at 270–71.

307. *See id.* § 41, at 271–72, 350–52.

308. *Id.*

309. *Id.* §§ 65–68, at 451–98.

310. EUR. COMM'N, ENV'T DIRECTORATE GENERAL, REACH IN BRIEF 3–5 (2007), *available at* http://ec.europa.eu/environment/chemicals/reach/pdf/2007_02_reach_in_brief.pdf.

311. *Id.* at 15.

312. European Parliament and Council, Regulation 1907/2006, art. 60(4), 2006 O.J. (L 396) 150 (EU), *available at* http://europa.eu.

3. The Affirmative Defense of Ecological Stewardship

A new rule of law holding acts unreasonable if they contribute to ecological degradation would establish a powerful duty of ecological stewardship. It will be a significant human achievement if we someday learn to live on the Earth according to this duty.

We have to recognize that immediate introduction of this rule of law into our current society would be wrenching. Nearly all of us are immersed in a complex integrated industrial economy and entrenched in land use practices that constitute a juggernaut of ongoing ecological degradation. Much of what we do as a society contributes to ecological degradation. If we had been wiser, we might have avoided creating such an economy. But at this point, we are dug in quite deep.

Such a transition in the structure of property rights, even if justified by the public welfare, would raise legitimate concerns. As Professor Carol Rose has pointed out, property rights transitions should be managed fairly because they implicate individual economic welfare, the integrity of society's investments in economic development, and social stability.[313] Resistance to new property laws by private property owners is particularly acute if legal changes are perceived to be unfair or fall disproportionately on just some owners.[314] Concern over disrupting the expectations of private property owners and selectively appropriating property for the public is a key element of the Supreme Court's takings jurisprudence.[315] Reactive property rights legislation can be used not only to impede environmental statutes that stray too far from the common law,[316] but to overrule the common law if it diverges too far from the democratic will.

Responding to these concerns, legislatures and courts have developed a variety of tools to ease property rights transitions, including grandfathering existing uses, phase-in periods and many others.[317] Professor Eric Freyfogle, while advocating profound alterations in our property law, has proposed that private property owners be granted a set of rights or

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313. Carol Rose, *Property Rights and Responsibilities*, *in* THINKING ECOLOGICALLY–THE NEXT GENERATION OF ENVIRONMENTAL POLICY 49, 57 (Marian Chertow & Daniel Esty eds., 1997) ("Owners . . . are entitled to expect fair *transitions* to new ways of managing environmental resources; but no one can expect that existing property uses will forever remain the same.").

314. Univ. of Missouri-Kansas City School of Law, The Fifth Amendment and Takings of Private Property, http://www.law.umkc.edu/faculty/projects/ftrials/conlaw/takings.htm (last visited Apr. 30, 2008).

315. Lucas v. S.C. Coastal Council, 505 U.S. 1003, 1018–19 (1992).

316. *See* discussion *supra* Part III.C.

317. Rose, *supra* note 313, at 55–56.

protections to ensure that they are treated fairly as property rights are altered.[318]

The tort of ecological degradation addresses this issue in section 4 by outlining an affirmative defense to liability for causing an unreasonable ecological threat. Considering our current circumstances perhaps the real tort, the truly unreasonable act that harms the community and is worthy of legal sanction, is for people to continue business as usual without responding to society's need for stewardship. What we need most is for everyone to take meaningful and immediate steps to reduce their contributions to ecological degradation.

The key to reducing environmental impacts until we learn to live within the ecological limits of the Earth is to embark on the course of continually searching for and adopting alternative, less damaging practices. An earlier part of this Article described how the commitment to an ecologically sustainable economy would place our economy on the path of continuing to develop while staying within the ecological capacities of the Earth. This is the path of continually adopting less damaging alternatives. This is why the search for alternatives rather than cost–benefit justification of our existing practices is an emerging hallmark of environmental decision-making designed to protect the Earth and public health.[319]

Accordingly, this affirmative defense focuses on whether a defendant has taken her stewardship obligations seriously by actively seeking less damaging alternatives. Under section 4, to gain relief from liability for causing an unreasonable ecological threat, a defendant would have to prove that (a) she has no feasible alternative to the conduct that is likely to contribute less to ecological degradation; and (b) she is conducting a vigorous program to develop such a feasible alternative. Relief could be tailored to the particular circumstances, and could include contingent injunctions, reduced damages or contingent damages.

Carefully defining the terms of this defense will be necessary to ensure that it does not eviscerate the tort. But also, additional elements could make the defense more stringent. For example, we may need seriously to examine the social value of the products we create. While judging qualitative value is surely difficult, we all know that many of the products

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318. Eric T. Freyfogle, *What is Land? A Broad Look at Private Rights and Public Power*, 58 PLAN. & ENVTL. L. 3, 3–9 (2006).

319. *See* MARY O'BRIEN, MAKING BETTER ENVIRONMENTAL DECISIONS—AN ALTERNATIVE TO RISK ASSESSMENT (2000) (describing alternatives analysis in detail); Nancy J. Myers, *The Checklist at Work*, *in* PRECAUTIONARY TOOLS FOR RESHAPING ENVIRONMENTAL POLICY, *supra note* 110, at 93, 93–105 (identifying factors to consider in evaluating alternatives); European Parliament & Council, Regulation 1907/2006, art. 60(4), 2006 O.J. (L 396) 150 (EU) (discussing the alternatives analysis under REACH).

produced by our society are of little social worth. If we are going to be serious about constraining our scale of ecological damage, we may wish to determine which products actually benefit us and forego the rest. The affirmative defense could include an element requiring that the defendant's conduct be necessary to produce a product or service that is of significant social value.

This affirmative defense would require the law to become much more involved than it is today in analyzing alternative economic conduct. And yet, the law already recognizes the importance of alternatives.[320] A famous case illustrates the ability of courts, including the United States Supreme Court, to inquire into alternatives, examine the defendant's development efforts, and force improvements. In the *Madison v. Ducktown Sulphur* case of 1904, the Tennessee Supreme Court was convinced that there were no alternatives to the defendant's methods of smelting copper.[321] It held that the plaintiffs were entitled to damages for nuisance but refused to order an injunction, primarily due to the great value of defendant's business. The court also found:

> [Defendants] have been and are pursuing the only known method by which these plants can be operated and their business successfully carried on; that the open-air roast heap is the only method known to the business or to science by means of which copper ore of the character mined by the defendants can be reduced; that the defendants have made every effort to get rid of the smoke and noxious vapors, one of the defendants having spent $200,000 in experiments to this end, but without result.[322]

A few years later, in another nuisance suit involving the identical plant, the U.S. Supreme Court itself examined the alternative technologies.[323] The Court was not so sure that there was only one way to do things, and

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320. National Environmental Policy Act, 42 U.S.C. § 4332(C)(iii) (2000) (requiring federal agencies to examine alternatives to proposed actions). The common law also can consider alternatives in evaluating negligence and nuisance. *See* RESTATEMENT (SECOND) OF TORTS § 828(c) (1965) (identifying practicality of preventing or avoiding defendant's harmful conduct as element of its utility); RESTATEMENT (SECOND) OF TORTS § 292 cmt. c (identifying practicality of preventing or avoiding defendant's negligence as element of its utility).

321. Madison v. Ducktown Sulphur, Copper & Iron Co., 83 S.W. 658, 660 (Tenn. 1904).

322. *Id.*

323. Georgia v. Tenn. Copper Co., 206 U.S. 230 (1970).

imposed monitored emissions limits that eventually resulted in development of new methods and dramatic reductions in emissions.[324]

Consider for a moment just a few examples. It may be objected that so many of our land use practices contribute to ecological degradation that this tort cannot practically be implemented.[325] And yet it need not always be so. Many people are actively developing better methods of using the land in ways that accommodate its intrinsic features to benefit both people and the land itself.[326] As these efforts become more widespread, communities and neighbors would be rightly frustrated with the externalities visited upon them by destructive agricultural practices. In that circumstance, should people not be able to demand that courts enforce adoption of needed alternative practices?

Or consider the Gulf of Mexico Dead Zone off the Louisiana continental shelf, which results from nutrient runoff from a multitude of human sources into the Mississippi River watershed. The Dead Zone can only be addressed by reducing each and every incremental contribution to the excessive nutrient load from the entire watershed. Once many neighbors and communities display more stewardship of the watershed and the Gulf, should they not expect the common law to require greater stewardship by all those who are causing this Dead Zone?

Finally, consider global warming, perhaps our largest single ecological problem. It would seem that every release of carbon dioxide now contributes to ecological degradation and is therefore presumptively unreasonable. And people are responding by changing many of their habits and investing in new technologies. Should not neighbors and communities be entitled to seek the assistance of the courts to prevent carbon pollution caused by industry (or even residents) who continue to burn oil and coal to produce electricity or who produce fuel-inefficient vehicles, or who fail to install alternative energy systems or even turn off the lights? Once many members of society actively respond to global warming, would they not reasonably expect the common law courts to enforce the new social norms?

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324. *Id.*; *see also* PERCIVAL ET AL., *supra* note 59, at 82–84 (discussing *Georgia v. Tennessee Copper* and subsequent history).

325. *E.g.*, Southeast Asia Regional Committee, Core Theme 2: Land Use, Land Degradation and Decision Making in the Rural Hinterland, http://www.sarcs.org/new/issp/ct2.htm (last visited Apr. 30, 2008).

326. *See* ERIC T. FREYFOGLE, WHY CONSERVATION IS FAILING AND HOW IT CAN REGAIN GROUND 144–77 (Yale Univ. Press 2006) (describing elements of good land use that benefit current and future generations, and the land itself).

4. Standing

We now come to the question of standing: who should common law courts allow to defend ecological interests by bringing suit under this tort? Today's common law does not allow private persons to assert purely public nuisances.[327] It allows individuals to recover only if they suffer a "special injury" that is "different in kind" from those suffered by the general public.[328] The current common law expects injury to the community as a whole to be addressed only by the government.

Professor Denise Antolini has argued forcefully that any member of a harmed or threatened community should be able to bring suit on behalf of the community.[329] She has proposed that the "special injury rule" be replaced by a "community injury rule" allowing individual community members to defend the public interest, particularly in environmental cases.[330] Professor Antolini has also demonstrated that traditional objections to broadening access to the courts are no longer tenable, including arguments that only the state should assert public nuisances, that a multiplicity of suits would burden the courts, and that the courts would become clogged with trivial suits. The substantial benefits society has obtained under the broad citizen suit provisions of the federal environmental laws provide support for Professor Antolini's arguments.[331] Indeed, the Hawaii Supreme Court has abandoned the traditional special injury rule for public nuisance actions.[332]

In this working proposal, standing is granted to each member of a community that may be affected by an ecological threat. Courts should adopt a broad view of the types of effects on a community that may be prevented. The need for this law is driven by the interconnectedness and interdependence of nature's elements, by the cumulative impact of many incremental effects that are distant in time and space, and by the deep interconnections between human welfare and the Earth. If the law is too focused on direct and monetizable human interests, it encourages us to do damage in remote areas where fewer people are affected. However, in our current situation, we need less populated, more ecologically intact lands to be protected from ecological degradation because all our lands are

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327. RESTATEMENT (SECOND) OF TORTS § 821C (1965).

328. *Id.*; *see also* Antolini, *supra* note 109 (discussing of the special injury rule for public nuisance).

329. Antolini, *supra* note 109, at 862–63.

330. *Id.* at 764.

331. *Id.* at 886–92.

332. Akau v. Olohana Corp., 652 P.2d 1130, 1134 (Haw. 1982); *see* Antolini, *supra* note 109, at 784–86 (discussing *Akau*).

connected. The public welfare is also affected by the health of these more distant lands and people care about them even if they cannot demonstrate a specific concrete connection to them.[333] Common law courts should accept these welfare, ethical, and moral concerns, for they lie at the root of the need for this rule of law.[334]

5. Future Generations

This new rule of law is not limited to ecological degradation occurring in the present, but also regards as unreasonable conduct that contributes to future ecological degradation. The limits to the Earth's capacity to assimilate environmental damage are in part physical, rooted in the finite physical size of the Earth's biosphere, and in part biological, rooted in the intricate interconnections and interdependence of the land community. But the most difficult dimension of the accumulation of impacts for us to perceive and to respond to is that of time. Many of the ecological losses we suffer are essentially permanent because of the vastness of evolutionary time as compared to the span of our own history. The damage we do in our own generation affects not just ourselves but adds to the cumulative ecological degradation that must be borne by all future generations. We externalize our damage not just onto each other, but onto future generations as well. Thus, the future is the true locus of the full effects of cumulative impacts.

This issue was recognized in the first federal environmental law of the 1970's, the National Environmental Policy Act. This statute calls on the federal government to work to fulfill the needs of future generations of Americans.[335] Since then, the long-term impact of accumulating ecological damage has become more apparent, the wisdom of anticipating the consequences of our actions more certain, and the need to establish the principle of intergenerational equity more acute.[336]

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333. *See, e.g.*, *Deforestation and the Greenhouse Effect*, BBC.COM, Mar. 4, 2005, http://www.bbc.co.uk/dna/h2g2/A3556848 (describing the effects of deforestation on other parts on the world).

334. Federal standing doctrine, which governs access to the federal courts, has a more limited view of standing, and requires plaintiffs to allege "personal injury fairly traceable to the defendant's allegedly unlawful conduct and likely to be redressed by the requested relief." *See supra* note 208 and accompanying text. Because each state has the power to determine the rules governing access to its own courts, the rules of standing vary among the states. The common law courts of each state should grant standing to sue under this tort to the maximum extent possible under controlling state law.

335. National Environmental Policy Act, 42 U.S.C. §§ 4331, 4332 (2000).

336. *See, e.g.*, EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY, AND INTERGENERATIONAL EQUITY (Richard Falk ed., 1989) (demonstrating that there is current inequity between generations in the use of natural resources).

One idea for taking responsibility for the long-term consequences of our actions is to establish rights in future generations to an ecologically healthy Earth, and appoint "guardians" with the specific responsibility of enforcing those rights.[337] Courts, which have the power to appoint special masters and scientific advisors to assist with difficult issues they encounter, could also consider appointing such guardians of future generations. These guardians could assist them with the difficult issues and uncertainties of long-term ecological science and also to provide advice, insight, and perspective on the interests of future generations as they adjudicate claims under this new tort of ecological degradation.

CONCLUSION

If we are ever to develop an ecologically sustainable economy, we must free ourselves from the existing system of legal incentives that is compelling us to destroy the Earth. Our law must enforce a limit to the scale of environmental damage that we are collectively permitted to impose on the Earth. This would represent a transformation in the law's understanding of the public welfare and a dramatic evolution in the structure of property law. And yet, we have changed our laws of property before. While we may feel locked in our own place and time, the historical record proves that we are not.

The common law took well over one hundred years to develop the modern rules of negligence and nuisance with which we are struggling today. It may take time to develop the new laws we need, but the law can move quickly when the need becomes apparent. We need a goal, a target that those seeking to protect the Earth and promote a comprehensive vision of human welfare might aspire to and begin to articulate in court.

This Article outlines a tort of ecological degradation that is intended to implement the constraint on the cumulative scale of environmental destruction that we need. It may be difficult to adopt all at once, but its various elements could be implemented step-by-step, case by case. Critical terms of this specific proposal need greater, more concrete elaboration:

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337. *See* Carolyn Raffensperger, Sci. & Envtl. Health Network, *Guardians of Future Generations*, NETWORKER, Sept. 2006, *available at* http://www.sehn.org/Volume_11-5.html; Carolyn Raffensperger & Nancy Myers, Sci. & Envtl. Health Network, *Becoming Guardians—Some Thoughts on How to Move Forward*, NETWORKER, Sept. 2006, *available at* http://www.sehn.org/Volume_11-5.html; *The Bemidiji Statement on Seventh Generation Guardianship*, NETWORKER, Sept. 2006, *available at* http://www.sehn.org/Volume_11-5.html#a3; *see also* Guardians of the Future Homepage, http://www.guardiansofthefuture.org (last visited Apr. 30, 2008) (providing an interactive site for developing the idea of future generation guardianship).

"ecological degradation," "contribute," "legal cause," "feasible alternative," "vigorous program," and "affected." Remedies would need careful thought. Indeed, an entire body of law would have to be developed. Today's doctrines of negligence and nuisance are the result of a long-term, comprehensive effort to define unreasonable acts in terms of net social benefit. We owe ourselves, and future generations, no less an effort to define unreasonable acts in terms of their contribution to ecological degradation.

I have suggested that judges must transform the common law. But it is lawyers who must convince those judges that new rules will further the public welfare while trying to win cases for their clients. Lawyers need to take on this mission, and call on the law to account for the public welfare in the ecological age. As they do this, we can hope that the desire to preserve the ecological integrity of the Earth for ourselves and for future generations will evoke the same passion that courts displayed when they sought to promote "progress" a century ago and longer.

Finally, the most important reason to implement this principle of law is that we must. For while we can call the principle laid down in the tort of ecological degradation a rule of law, it is actually a rule of biology. That no species can live for long beyond the land's ecological capacities is an iron rule that governs life on the Earth. It is a rule by which we must learn to live if we are to accomplish that oldest of human tasks, to live on the land without spoiling it.

RIGHT TO CARBON OR RIGHT TO LIFE: HUMAN RIGHTS APPROACHES TO CLIMATE CHANGE

Svitlana Kravchenko[*]

> We, the human species, are confronting a planetary emergency . . . . But there is hopeful news as well: we have the ability to solve this crisis and avoid the worst—though not all—of its consequences, if we act boldly, decisively and quickly.
>
> Al Gore[1]

> [T]hat which is common to the greatest number has the least care bestowed upon it. Everyone thinks chiefly of his own, hardly at all of the common interest; and only when he is himself concerned as an individual. . . . [E]verybody is more inclined to neglect the duty which he expects another to fulfill . . . .
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> Aristotle, *Politics*[2]

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* J.D., Lviv National University, Ukraine; Ph.D., All-Union Institute of Soviet Legislation, Moscow, U.S.S.R.; LL.D., National Law Academy, Ukraine.

1. Al Gore, Former Vice President of the United States, 2007 Nobel Peace Laureate, Nobel Lecture (Dec. 10, 2007), http://nobelprize.org/nobel_prizes/peace/laureates/2007/gore-lecture.html.

2. 1 THE POLITICS OF ARISTOTLE, ¶ 1261b30–40, p. 30 (Benjamin Jowett trans., Oxford: Clarendon Press 1885).

INTRODUCTION

Human rights form a central part of the thought system of many people in the world, including those in the United States. The enforcement of "rights" in the legal system does not, by itself, change government policy, but the embedding of rights in our thought systems can. I want to ask whether the concept of human rights has a role to play in changing minds—and more importantly, hearts—in our political system. The reason that I focus on hearts is that changes there are more permanent; and where the heart goes, the head tends to follow.

If we come to see human-caused global climate change as violating fundamental human rights—as something as unacceptable as other gross violations of human rights—perhaps we can make the breakthrough in our politics that is essential. Perhaps we can rescue ourselves from the planetary emergency that Al Gore, in the quote above, sees so clearly. Perhaps we can overcome the limitations of human nature that Aristotle saw so clearly more than two millennia ago. Perhaps that which is "common to the greatest number"—the precious planet that sustains our lives—may come to have not the least care, but our *loving* care, bestowed upon it.

Dr. James Hansen of the NASA Goddard Institute for Space Studies has said that a global tipping point could be reached by 2016.[3] According to Hansen:

> If global emissions of carbon dioxide continue to rise at the rate of the past decade, . . . there will be disastrous effects, including increasingly rapid sea level rise, increased frequency of droughts and floods, and increased stress on wildlife and plants due to rapidly shifting climate zones.[4]

The U.N. Intergovernmental Panel on Climate Change (IPCC), in its 2007 Fourth Assessment Report, concluded that "[w]arming of the climate

3. *Earth Climate Approaches Dangerous Tipping Point*, ENV'T NEWS SERVICE, June 1, 2007, http://www.ens-newswire.com/ens/jun2007/2007-06-01-01.asp.

4. *Id.*

system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level."[5] The Report also found "*high agreement* and *much evidence* that with current climate change mitigation policies and related sustainable development practices, global GHG emissions will continue to grow over the next few decades."[6] The Report specifically points out important risks if governments fail to respond, such as species extinction, increases in droughts, heat waves, floods, increased vulnerability of indigenous communities and the poor and elderly, and loss of coastal area and associated impacts.[7]

Even still, the outlook is not completely negative. The Report indicates that there is "substantial economic potential for the mitigation of global GHG emissions over the coming decades that could offset the projected growth of global emissions or reduce emissions below current levels."[8] However, to prevent a catastrophe, we will need to act without delay and adopt a multifaceted approach.[9]

The Conference of the Parties to the U.N. Framework Convention on Climate Change (UNFCCC) met in Bali, Indonesia, in December 2007 to launch comprehensive and inclusive negotiations for a new multilateral framework.[10] It was intended to create commitments beyond the year 2012,[11] the end of the first commitment period under the Kyoto Protocol.[12] The Bali Action Plan was agreed to, and consensus was achieved, only on the last day of negotiations.[13] Under pressure from the United States, the Plan set no worldwide goals.[14] The targets sought by some such as the European Union were omitted and a footnote in the preamble merely drew attention to the IPCC Fourth Assessment Report.[15] These omissions kept

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5. U.N. Env't Programme and World Meteorological Org., Intergovernmental Panel on Climate Change [IPCC], *IPCC Fourth Assessment Report, Climate Change 2007: Synthesis Report* 72 (2007) [hereinafter *IPCC Synthesis Report*], *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf. The Synthesis Report is the fourth element of the IPCC Fourth Assessment Report. *Id.*

6. *Id.* at 44.

7. *Id.* at 64–65.

8. *Id.* at 58.

9. *Id.* at 64, 17–18, 23 ("Responding to climate change involves an iterative risk management process that includes both adaptation and mitigation, and takes into account climate change damages, co-benefits, sustainability, equity, and attitudes to risk.") (citation omitted).

10. Thomas Fuller & Andrew C. Revkin, *Climate Plan Looks Beyond Bush's Tenure*, N.Y. TIMES, Dec. 16, 2007, http://www.nytimes.com/2007/12/16/world/16climate.html.

11. *Id.*

12. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22 (1998) [hereinafter Kyoto Protocol], *available at* http://unfccc.int/resource/docs/convkp/kpeng.pdf.

13. Fuller & Revkin, *supra* note 10.

14. *Id.*

15. *Id.*

the United States at the negotiating table, but at a meeting in Hawaii in January 2008, the United States again refused to agree to any particular targets.[16] A new treaty—the Copenhagen Protocol—is supposed to be negotiated now, to be completed at the next meeting of the Conference of the Parties in December 2009 in Copenhagen, Denmark.

While diplomats and politicians are slowly starting to negotiate a new post-Kyoto treaty, lawyers in the United States and around the world are wondering how to speed up government action. Some believe that litigation has little role to play.[17] Others are wondering whether both litigation and political advocacy centered on human rights can make a difference. If new agreements are reached in Copenhagen, a further question will arise—whether commitments will be kept. The limitations of compliance mechanisms under international environmental law suggest that we should look to claims of human rights violations for potential enforcement, or at least shaming.

I. THE LIMITATIONS OF INTERNATIONAL ENVIRONMENTAL LAW MECHANISMS

The normal application and enforcement of international law occurs in diplomatic actions, in the self-restraint of governments, and sometimes in the compliance mechanisms that are set up to monitor whether countries are carrying out their obligations. In dealing with climate change, it is not clear, however, that these methods will be successful.

A. The United Nations Framework Convention on Climate Change

The UNFCCC plays an important role as a framework for international actions, political decisions, diplomatic negotiations, and coordinated scientific research.[18] It also provides technological and financial assistance for mitigation, adaptation, information exchange, and capacity building.[19] As a framework convention, the UNFCCC does not contain concrete obligations; however, article 2 of the Convention consists of some arguable

16. *Europeans Test US Commitment to Climate Change*, SPIEGEL, Jan. 30, 2008, http://www.spiegel.de/international/world/0,1518,532077,00.html.

17. *See* Shi-Ling Hsu, *A Realistic Evaluation of Climate Change Litigation Through the Lens of a Hypothetical Lawsuit*, 79 U. COLO. L. REV. (forthcoming July 2008), *available at* http://ssrn.com/abstract=1014870 (arguing that litigation is unlikely to make a significant difference in climate change).

18. U.N. Framework Convention on Climate Change, Essential Background, http://unfccc.int/essential_background/items/2877.php (last visited Apr. 30, 2008).

19. *Id.*

legal obligations:

> [T]o achieve in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.[20]

Roda Verheyen has argued that article 2 must be interpreted in accordance with the principles in articles 31 and 32 of the Vienna Convention of the Law of Treaties,[21] giving it at least some persuasive force. Considering that, according to the IPCC Fourth Assessment Report, we have not been able to prevent "dangerous anthropogenic interference with the climate system," that ecosystems do not have sufficient time to adapt to climate change,[22] and that food production is threatened already, the Parties might be seen as already in violation of the UNFCCC. Similarly, it appears that some Parties to the Kyoto Protocol will also fail to meet their obligations, insignificant as those obligations appear to be in light of the size of the problem.

Despite apparent violations of the UNFCCC, the likelihood of effective enforcement action that would to lead to compliance seems slight. Generally, compliance mechanisms of multilateral environmental agreements (MEAs) are weak.[23] Their main goal is to assist and facilitate compliance, not to enforce or punish. They do not have "teeth." They lack serious sanctions, except for a few such as the Basel Convention,[24] the Montreal Protocol,[25] and the Convention on International Trade in

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20. United Nations Framework Convention on Climate Change, *opened for signature* May 9, 1992, 1771 U.N.T.S. 107 (*entered into force* Mar. 21, 1994) [hereinafter UNFCCC], *available at* http://unfccc.int/resource/docs/convkp/conveng.pdf.

21. Roda Verheyen, *The Climate Change Regime After Montreal*, 7 Y.B. OF EUR. ENVT'L L. 237–38 (2007). *See generally* Vienna Convention on the Law of Treaties, *opened for signature* May 23, 1969, 1155 U.N.T.S. 331 (entered into force Jan. 27, 1980).

22. *See, e.g.*, *IPCC Synthesis Report*, *supra* note 5, at 64.

23. Svitlana Kravchenko, *The Aarhus Convention and Innovations in Compliance with Multilateral Environmental Agreements*, 18 COLO. J. OF INT'L ENVTL. L. & POL'Y 1, 15–17 (2007) (explaining some of the shortcomings of MEAs).

24. Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal art. 9, Mar. 22, 1989, 28 I.L.M. 657, *available at* http://www.basel.int/text/con-e-rev.doc.

25. Montreal Protocol on Substances That Deplete the Ozone Layer art. IV, Sept. 16, 1987, 1522 U.N.T.S. 28 [hereinafter Montreal Protocol].

Endangered Species (CITES),[26] which use trade sanctions as measures for non-compliance. MEAs even avoid using the term "sanctions." Instead, they use terms such as "measures"[27] or mention the "consequences" of non-compliance.[28]

The UNFCCC has a Subsidiary Body for Implementation (SBI) that is "established to assist the Conference of the Parties in the assessment and review of the effective implementation of the Convention."[29] Among other duties, it must "assess the overall aggregated effect of the steps taken by the Parties in the light of the latest scientific assessments concerning climate change."[30] The SBI advises the COP on administrative and financial matters, examines information in the national communications and emissions inventories submitted by Parties, and reviews "financial assistance given to non-Annex I Parties";[31] however, this body does not have any enforcement power.

The Convention also has a settlement procedure for a dispute between any two or more Parties concerning the interpretation or application of the Convention, "through negotiation or any other peaceful means of their own choice."[32] In addition, Parties can accept compulsory submission of their dispute to the International Court of Justice (ICJ) or arbitration using procedures adopted by the Conference of the Parties.[33] These provisions appear never to have been used.

B. The Kyoto Protocol

The Kyoto Protocol shares objectives with the UNFCCC. However, in comparison with the Convention, which encourages Parties to stabilize greenhouse gas (GHG) emissions and does not have mandatory obligations, the Protocol has legally binding obligations for developed countries to reduce GHG emissions below a level specified for each of them in Annex B

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26. Convention of International Trade in Endangered Species of Wild Fauna and Flora art. VIII, *opened for signature* Mar. 3, 1973, 993 U.N.T.S. 243 (entered into force July 1, 1975) [hereinafter CITES].

27. *See, e.g.*, Montreal Protocol, *supra* note 25, art. II; CITES, *supra* note 26, art. VIII (both using the term "measures" instead of "sanctions" to describe the trade sanctions).

28. *See, e.g.*, Kyoto Protocol, *supra* note 12.

29. UNFCCC, *supra* note 20, art. 10, ¶ 1.

30. *Id.* art. 10, ¶ (2)(a).

31. U.N. Framework Convention on Climate Change, Convention Bodies, http://unfccc.int/essential_background/convention/convention_bodies/items/2629.php (last visited Apr. 30, 2008).

32. UNFCCC, *supra* note 20, art. 14, ¶ 1.

33. *Id.* ¶ 2.

to the Protocol.[34] These reductions would achieve an overall reduction of 5% below the baseline level of 1990 by the year 2012.[35]

The Kyoto Protocol Compliance Mechanism, in contrast to the mechanism under the UNFCCC, is one of the most comprehensive and rigorous amongst all MEAs, although it is just starting to operate. The Kyoto Implementation Committee consists of two branches—a facilitative branch and an enforcement branch.[36] The "facilitative" approach is claimed to have several benefits, including:

> building confidence in the treaty regime; ensuring that all Parties have the institutional, technical, and financial capacity to fulfill their obligations; reinforcing the Parties' sense of collective action and obligation; demonstrating that obligations are reasonable and attainable; and encouraging greater participation in the regime while lowering resistance to the adoption of additional binding commitments.[37]

The facilitative branch started its operation in May 2006 with a case brought to it by South Africa, on behalf of the Group of 77 and China, entitled "Compliance with Article 3.1 of the Kyoto Protocol."[38] The case was brought against Canada and fourteen other countries, alleging that the countries had failed to submit various kinds of information required by the procedures under the Protocol.[39] The facilitative branch found itself paralyzed, however, and could not take action.[40] A report by the facilitative branch to the Compliance Committee stated:

> The branch made a number of attempts to arrive at a consensus. When all efforts to reach agreement on a

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34. Kyoto Protocol, *supra* note 12, Annex B.

35. U.N. Framework Convention on Climate Change, Kyoto Protocol, http://unfccc.int/kyoto_protocol/items/2830.php (last visited Apr. 30, 2008).

36. Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, 1st Sess., Montreal, Can., Nov. 28–Dec. 10, 2005, *Decision 27/CMP.1, Procedures and Mechanisms Relating to Compliance Under the Kyoto Protocol*, 92, 94–96, U.N. Doc. FCCC/KP/CMP/2005/8/Add.3 (Mar. 30, 2006).

37. DONALD M. GOLDBERG ET AL., CTR. FOR INT'L ENVTL. LAW & EURONATURA, BUILDING A COMPLIANCE REGIME UNDER THE KYOTO PROTOCOL 2 (1998), *available at* http://www.ciel.org/Publications/buildingacomplianceregimeunderKP.pdf.

38. *Report to the Compliance Committee on the Deliberations in the Facilitative Branch Relating to the Submission Entitled "Compliance with Article 3.1 of the Kyoto Protocol,"* 3, U.N. Doc. CC/FB/3/2006/2 (Sept. 6, 2006), *available at* http://unfccc.int/files/kyoto_mechanisms/compliance/application/pdf/cc-fb-3-2006-2.pdf.

39. *Id.*

40. *Id.* at 4.

> decision by consensus had been exhausted, a vote was taken electronically on 21 June 2006, resulting in the failure to adopt either a decision to proceed or a decision not to proceed by a majority of three-fourths of the members present and voting, as required . . . .[41]

The facilitative branch had prepared two draft decisions—one to proceed and one not to proceed. The draft decision to proceed would have stated that the Parties had failed their information obligations and the branch should take "necessary actions to provide advice, facilitation and promotion to each Party concerned;"[42] however, this proposal failed by a vote of 4–4, with two abstentions.[43]

On the decision *not* to proceed, the branch had proposed a finding that:

> a) The communication was not submitted by a Party on its own behalf through a representative duly authorized for this purpose.
>
> The procedures and mechanisms do not provide for the possibility of groups of Parties making submissions by proxy . . .
>
> b) The submission does not clearly and individually name the Parties with respect to which it purports to raise a question of implementation.
>
> c) The submission is not supported by information corroborating the question of implementation it purports to raise, nor does it substantiate that this question relates to any of the specific commitments under the Kyoto Protocol identified in either of paragraphs 5 or 6 of section VII.[44]

This proposal failed by a vote of 5–5.[45] The inability of the facilitative branch to reach a decision by the required three-fourths vote, on even these relatively minor matters concerning information submissions, does not make the Committee's work on the more difficult matters it may confront in the future look promising.

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41. *Id.* at 3.
42. *Id.*
43. *Id.* at 4.
44. *Id.*
45. *Id.* at 5.

C. The International Court of Justice

There is no international environmental court. Even if one were created, international tribunals have only moral authority and lack the power to force states to comply. Are principles of international environmental law robust enough for a case before the ICJ?

There have been only two environmental cases in the ICJ's jurisprudence to date: the Gabčíkovo-Nagymaros case[46] and the Nuclear Testing Case.[47] Some have argued that a small island state that is likely to be inundated by rising seas could press a claim before the ICJ.[48] Professor Rebecca Elizabeth Jacobs has argued that a suit by the South Pacific island nation of Tuvalu would face several problems:

> Tuvalu must show not only that "the United States and Australia are unlawfully causing the island damage, but also that it has a right to future damages that have yet to occur. Tuvalu might succeed by arguing principles of intergenerational rights and the precautionary principle.[49]

The general status of the precautionary principle in international law is not yet settled. In petitioning to the ICJ for damages in the 1995 Nuclear Test Case, New Zealand alleged "by virtue of the adoption into environmental law of the 'Precautionary Principle,' the burden of proof fell on a state [France] wishing to engage in potentially damaging environmental conduct to show in advance that its activities would not cause contamination."[50] The ICJ dismissed New Zealand's claims without ruling on this issue.[51] Justice Weeramantry, however, in his dissent from the court order opinion argued that the precautionary principle is "gaining increasing support as part of the international law of the environment."[52]

In the field of climate change, the status of the principle is stronger. The precautionary principle is embedded within article 3 of the UNFCCC,

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46. Gabčíkovo-Nagymaros Project (Hung. v. Slovk.), 1997 I.C.J. 7 (Sept. 25), *available at* http://www.icj-cij.org/docket/files/92/7375.pdf.

47. Nuclear Tests (N.Z. v. Fr.), 1995 I.C.J. 288, 342 (Sept. 22), *available at* http://www.icj-cij.org/docket/files/97/7187.pdf.

48. Rebecca Elizabeth Jacobs, Abstract, *Treading Deep Waters: Substantive Law Issues in Tuvalu's Threat to Sue the United States in the International Court of Justice*, 14 PAC. RIM L. & POL'Y 103 (2003).

49. *Id.*

50. Nuclear Tests, 1995 I.C.J. at 298.

51. *Id.* at 307.

52. *Id.* at 342 (Weeramantry, J., dissenting).

and provides as follows:

> The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost.[53]

The ICJ's Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons recognized another principle that would be relevant to a climate change lawsuit: it confirmed that the existence of the general obligation of states to ensure that activities within their jurisdiction and control respect the environment of other states or of areas beyond national control is now part of the corpus of international law relating to the environment.[54] This principle of international environmental law was also expressed in the Stockholm Declaration[55] and the Rio Declaration.[56]

Although Tuvalu has yet to bring a case before the ICJ, it continues to claim a right to compensation for damages caused by climate change. Recently the nation changed its approach from international litigation to making a broad request for compensation based on the polluter pays principle.[57] The Deputy Prime Minister of Tuvalu, the Honorable Tavau Teii, said in a speech to the U.N. High Level Meeting on Climate Change, held at the U.N. headquarters in New York in September 2007, that major greenhouse polluters should pay Tuvalu for the impacts of climate change:

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53. UNFCCC, *supra* note 20, art. 3, ¶ 3.

54. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, 1996 I.C.J. 226, ¶ 29, at 241–42 (July 8), *available at* http://www.icj-cij.org/docket/files/95/7495.pdf.

55. Declaration of the United Nations Conference on the Human Environment princ. 21, June 16, 1972, 11 I.L.M. 1420 ("States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources . . . and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of their national jurisdiction.").

56. U.N. Conference on Environment and Development, Rio de Janiero, Brazil, June 3–14, 1992, *Rio Declaration on Environment and Development*, princ. 2, U.N. Doc. A/CONF.151/26 (Vol. I) (Aug. 12, 1992), *available at* http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm [hereinafter Rio Declaration].

57. Press Release, Afelee Pita, Ambassador, Permanent Mission of Tuvalu to the United Nations, Tuvalu Calls for Climate Change Polluters to Pay, Sept. 29, 2007, http://www.tuvaluislands.com/un/2007/un_2007-09-29.html.

> Rather than relying on aid money we believe that the major greenhouse polluters should pay for the impacts they are causing. According to recent reports, funding to assist countries adapt to the impacts of climate change will cost in the region of US$80 billion per year. This cannot be met by aid budgets; it must be new funding based on the polluter pays principle.[58]

Considering Tuvalu, a nation faced with being wiped off the map by climate change, has not pressed forward with a case before the ICJ, it is hard to foresee the ICJ as a likely forum for addressing climate change. Instead, the argument is likely to have more force in strictly political fora.

II. HUMAN RIGHTS AND GLOBAL WARMING

At least four combinations of forums and claims might be used for litigation regarding climate change: international courts or compliance bodies, international human rights bodies, national courts applying international law, and national courts considering human rights claims under domestic law. If international courts or compliance bodies under MEAs offer little hope, what about the means and mechanisms that have been set up to protect human rights, both internationally and nationally?

The Inuit people claimed, in a 2005 petition to the Inter-American Commission on Human Rights, that global warming has an impact on their rights to life, health, culture, and subsistence. While the term "right to life" means something different to most Americans, in other countries it is often associated with the right to a healthy environment. It has been held to require environmentally protective actions in cases decided by regional human rights bodies such as the African Commission of Human Rights and the Inter-American Commission on Human Rights. Other substantive environmental human rights claims have been upheld on other grounds, such as a right to private and family life in the European Court of Human Rights. Finally, the Supreme Courts of India and the Philippines, the Supreme Court of Montana, and trial courts in places like Nigeria (dealing with gas flaring and climate change) have applied substantive environmental human rights claims to resolve cases.

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58. *Id.*

A. Recognition of Linkages Between Human Rights and the Environment

Linkages between human rights and the environment have been discussed and established during the last fifteen years by several scholars.[59] In 1994, the U.N. Special Rapporteur Fatma Zohra Ksentini prepared a final report titled "Human Rights and the Environment" in which she formulated strong and comprehensive linkages between human rights and the environment and provided environmental dimension of fundamental human rights—to life, health, and culture.[60]

In 2002, under the organization of the U.N. High Commissioner on Human Rights and the Executive Director of the U.N. Environmental Programme, a group of experts convened for an Export Seminar on Human Rights and the Environment.[61] The expert participants, which included the present author, reached broad agreement on the growing inter-connectedness between the fields of human rights and environmental protection. In their Conclusions the experts noted:

> [L]inkage of human rights and environmental concerns, approaches and techniques is reflected in developments relating to procedural and substantive rights, in the activities of international organizations, and in the drafting and application of national constitutions. . . . [I]n the last decade a substantial body of case law and decisions has recognized the violation of a fundamental human right as the cause, or result, of environmental degradation. A significant number of decisions at the national and international levels have identified environmental harm to individuals or communities, especially indigenous peoples, arising as a result of violations of the rights to health, to life, to self-determination, to food and water, and to housing.[62]

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59. *See, e.g.*, HUMAN RIGHTS APPROACHES TO ENVIRONMENTAL PROTECTION (Alan E. Boyle & Michael R. Anderson eds., 1996); DINAH SHELTON, ENVIRONMENTAL RIGHTS IN PEOPLE RIGHTS 187–88 (Philip Alston ed., 2001) (discussing the interconnectedness of human and environmental rights laws); LINKING HUMAN RIGHTS AND ENVIRONMENT (Romina Picolotti & Jorge Daniel Taillant eds., 2003) (discussing the relationships between human rights and the environment).

60. Comm. on Human Rights, Sub-Comm. on Prevention of Discrimination & Prot. of Minorities, Special Rapporteur, *Human Rights and the Environment, Final Report*, U.N. Doc. E/CN.4/Sub.2/1994/9 (July 6, 1994) (prepared by Mrs. Fatma Zohra Ksentini) [hereinafter *Final Report*].

61. Expert Seminar on Human Rights and the Environment, Meeting of Experts' Conclusions (2002), *available at* http://www.unhchr.ch/environment/conclusions.html.

62. *Id.*

These linkages were further discussed at the World Summit on Sustainable Development in 2002, being included in the Johannesburg Plan of Implementation.[63] More recently, the interconnectedness of environmental and human rights has been discussed in relation to the issue of global climate change.[64] However, evaluating the connections is not only the domain of academics. The U.N. Human Rights Council in a resolution of March 26, 2008, entitled "Human Rights and Climate Change" emphasized that "climate change poses an immediate and far-reaching threat to people and communities around the world and has implications for the full enjoyment of human rights."[65] The Council decided to undertake "a detailed analytical study of the relationship between climate change and human rights . . . and thereafter to make available the study . . . to the Conference of Parties to the United Nations Framework Convention on Climate Change for its consideration."[66]

B. International Human Rights Forums

Attempts to enforce MEAs such as the UNFCCC or Kyoto Protocol face several limitations. One limitation is that individuals have no standing to file complaints. State challenges against other states for non-compliance with MEAs are rather rare because states care about their diplomatic relations with other countries. A second limitation is that the members of most compliance mechanisms are not truly independent and instead appear as representatives of their governments. For example, the UNFCCC SBI is available only to governments complaining about other governments, and its members, although made up of experts on matters related to climate change, represent their home governments.[67]

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63. World Summit on Sustainable Development, Aug. 26–Sept. 4, 2002, *Johannesburg Plan of Implementation*, ¶¶ 164, 169, U.N. Doc. A/CONF.199/20 (2002), *available at* http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf.

64. *See, e.g.*, Randall S. Abate, *Climate Change, the United States, and the Impact of Arctic Melting: A Case Study in the Need for Enforceable International Environmental Rights*, 26A STAN. ENVTL. L.J. 3 (2007) (considering the bases of international human rights, the impact of climate change on the Inuit, and the bases for recovery for climate change in human rights lawsuits); Timo Koivurova, *International Legal Avenues to Address the Plight of Victims of Climate Change*: *Problems and Prospects*, 22 J. ENVTL. L. & LITIG. 267, 285, 295–98 (2007) (discussing the challenges to climate change damage recovery, within the context of the "Inuit Circumpolar Council's (ICC) human rights petition against the United States," as a human rights issue).

65. Office of the High Commissioner for Human Rights, U.N. Human Rights Council, 7th Sess., U.N. Doc. A/HRC/7/L.21/Rev.1 (Mar. 26, 2008), *available at* http://ap.ohchr.org/documents/E/HRC/resolutions/A_HRC_7_L_21_Rev_1.doc.

66. *Id.*

67. UNFCCC, *supra* note 20, art. 10.

Human rights bodies, on the other hand, are available for complaints from non-state actors—citizens and non-government organizations (NGOs)—and the bodies themselves usually consist of independent experts. Human rights bodies are well established in the form of U.N. Charter organs, such as the U.N. Human Rights Commission and the U.N. Human Rights Council, and in the form of U.N. human rights treaty organs, which include the Human Rights Committee under the International Covenant on Civil and Political Rights (ICCPR),[68] the Committee on Economic, Social and Cultural Rights established under the Covenant of Economic, Social and Cultural Rights, the Committee on the Rights of the Child established under the Convention on the Rights of the Child, and similar bodies under other human rights treaties.

The U.N. Human Rights Committee is not a judicial body, but it does have authority to hear individual complaints. It has considered various complaints by indigenous peoples for alleged harm to their environment under article 27 of the ICCPR.[69] Some of them were successful. Special Rapporteur Fatma Zohra Ksentini has suggested that the U.N. Human Rights Committee

> could expand its general comment on the right to life in order to include environmental concerns or formulate a general comment defining the links existing between civil and political rights and the environment. Moreover, it should be able, through dealing with complaints, to establish case law that will accommodate environmental concerns.[70]

This U.N. body might be used to raise concerns about violations of human rights caused by climate change.

Previously the Prime Minister of Tuvalu requested environmental refugee status for its citizens from both Australia and New Zealand.[71] While New Zealand responded to the plea by allowing seventy-five Tuvaluans to relocate annually to their country, Australia has refused to

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68. International Covenant on Civil and Political Rights, Dec. 16, 1966, 999 U.N.T.S. 171 [hereinafter ICCPR].

69. *See, e.g.*, Bernard Ominayak & Lubicon Lake Band v. Canada, ICCPR H.R. Comm. Commc'n No. 167/1984, U.N. Doc. CCPR/C/38/D/167/1984 (1990); Länsman v. Finland, IPCC H.R. Comm., Commc'n No. 511/1992, U.N. Doc. CCPR/C/52/D/511/1992, 6 (1994) (action by reindeer herders under article 27 of the ICCPR, alleging that a government approved stone quarry would adversely affect their environment, herding activities, and culture (denied)).

70. *Final Report*, *supra* note 60, ¶ 259(e).

71. *Australia Unfazed at Tuvalu over Anger on Climate Change*, TUVALU NEWS, Aug. 30, 2002, *available at* http://www.tuvaluislands.com/news/archived/2002/2002-08-30a.htm.

make any such offer.[72] At a rate of seventy-five Tuvaluan relocations a year, the island would hypothetically not become uninhabited until 140 years have passed—ninety years after scientists predict it will be under water.[73]

Almost all human rights treaties recognize the "right to life."[74] According to article 6 of the ICCPR, "Every human being has the inherent right to life. This right shall be protected by law. No one shall be arbitrarily deprived of his life."[75] Conceivably, inhabitants of Tuvalu could present a claim to the Human Rights Committee that their right to life is being violated. In addition, under article 12 of the ICCPR, the people of Tuvalu might claim a violation of the right to liberty of movement and the freedom to choose their residence.[76]

The issue of environmental refugees displaced by climate change is not limited to Tuvalu, of course.[77] Bangladesh, already one of the poorest nations in the world, also has many citizens near sea level who are vulnerable to rising seas and stronger storms. Other nations with substantial populations at risk include Viet Nam, China, Egypt, the Philippines, Indonesia, the Maldives, and the Marshall Islands.[78] The likelihood of displacement due to flooding from sea-level rise is global and massive. According to the Fourth Assessment Report of the IPCC, more

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72. *Pacific Island Villagers Become Climate Change Refugees*, ENV'T NEWS SERVICE, Dec. 6, 2005, http://www.ens-newswire.com/ens/dec2005/2005-12-06-02.asp.

73. *See* Anwen Roberts, *What Will Become of Tuvalu's Climate Refugees*, SPIEGEL, Sept. 14, 2007, http://www.spiegel.de/international/world/0,1518,505819,00.html (stating that Tuvalu is expected to be underwater within fifty years).

74. *See, e.g.*, ICCPR, *supra* note 68, art. 6 ("Every human being has an inherent right to life."); Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights art. 11, Nov. 17, 1988, O.A.S.T.S. No. 69 [hereinafter Protocol of San Salvador], *available at* http://www.oas.org/juridico/english/Treaties/a-52.html ("Everyone shall have right to live in a healthy environment."); Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters art. 1, June 25, 1998, 38 I.L.M. 517 (1999) [hereinafter Aarhus Convention], *available at* http://www.unece.org/env/pp/documents/cep43e.pdf (endorsing "the right of every person . . . to live in an environment adequate to his or her health and well-being . . . .").

75. ICCPR, *supra* note 68, art. 6.

76. *Id.* art. 12.

77. Climate Institute, Climate Change and Sea Level Rise, http://www.climate.org/topics/sea-level/index.shtml (last visited Apr. 30, 2008).

78. *Id.*

> Some developing countries are especially vulnerable to sea level rise due to their low-lying nature and limited financial resources to respond. Among the most vulnerable are countries with large populations in deltaic coastal regions such as Bangladesh, Viet Nam, China and Egypt. Two populous island nations, the Philippines and Indonesia, have millions who face displacement from their homes from sea level rise. Several small island state nations including the Maldives in the Indian Ocean and the Marshall Islands and Tuvalu in the Pacific could face extinction within this century if rates of sea level rise accelerate.

Id.

than 100 million people will be displaced each year by flooding even when the sea level has risen only by forty centimeters.[79]

However, the U.N. Human Rights Committee can only consider individual complaints against governments that have ratified the Optional Protocol to the ICCPR, thereby accepting the Committee's jurisdiction over such complaints.[80] Although the United States has ratified the ICCPR,[81] it has neither signed nor ratified the U.N. Optional Protocol.[82] Two other main polluters—China and India—ratified the ICCPR in 2005 and 1979, respectively, but have also not ratified the Optional Protocol.[83] Therefore, none of these present and future main emitters of GHG can be challenged by individuals for human rights violations in the Human Rights Committee. Most European nations, on the other hand, have accepted jurisdiction of the Committee to hear complaints and their actions could therefore be examined by the Committee.[84]

C. International Human Rights Courts and Other Bodies

A better opportunity to challenge human rights violations related to climate change may lie in the regional human rights systems, namely, the European Court of Human Rights, the Inter-American Commission and Court of Human Rights, and the African Commission and Court of Human and Peoples' Rights. As we will discuss below, human rights treaties have provisions that explicitly or implicitly recognize environmental rights. In recent years, the regional bodies enforcing these rights have moved to the position that degradation of the environment can violate human rights. In addition to explicit or implicit recognition of the right to a healthy environment in some human rights treaties, some courts interpret fundamental human rights—such as the rights to life, to health, to culture, and to subsistence, as well as the right to respect for private and family

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79. U.N. Env't Programme and World Meteorological Org., IPCC, *IPCC Fourth Assessment Report*, *Climate Change 2007: Impacts, Adaptation and Vulnerability* 334 fig.6.8 (2007), *available at* http://www.ipcc.ch/ipccreports/ar4-wg2.htm.

80. *Id.*

81. U.N. High Comm'r for Human Rights, *Status of Ratifications of the Principal International Human Rights Treaties* 11 (July 14, 2006), *available at* http://www2.ohchr.org/english/bodies/docs/status.pdf [hereinafter *Status of Ratifications*].

82. *Id.* The U.S. Senate also imposed numerous conditions at the time of advice and consent to ratification of the ICCPR, including a declaration that it is not self-executing. U.S. Ratification of International Covenant on Civil and Political Rights, 58 Fed. Reg. 45,934 (Aug. 31, 1993); 138 CONG. REC. S4781-01, *S4783 (daily ed. Apr 2, 1992), *available at* http://www1.umn.edu/humanrts/usdocs/civilres.html.

83. *Status of Ratifications*, *supra* note 81, at 3, 6.

84. *See generally id.* (evidencing ratification of the ICCPR by European countries).

life—in ways that help protect the environment from pollution or degradation.

1. European Court of Human Rights

In Europe, the Aarhus Convention recognizes the "right of every person of present and future generations to live in an environment adequate to his or her health and well-being," and requires each Party to guarantee the procedural "rights of access to information, public participation in decision-making and access to justice in environmental matters."[85] Of equal importance, the European Convention on the Protection of Human Rights and Fundamental Freedoms (popularly known as the European Convention on Human Rights) has provisions concerning the right to life (article 2) and right to private and family life (article 8).[86]

- Article 2 reads in part: "Everyone's right to life shall be protected by law. No one shall be deprived of his life intentionally save in the execution of a sentence of a court following his conviction of a crime for which this penalty is provided by law."[87]

- Article 8 reads in part: "Everyone has the right to respect for his private and family life, his home and his correspondence."[88]

Article 8 has been used in several environmental cases such as *López Ostra v. Spain*,[89] *Guerra v. Italy*,[90] *Fadeyeva v. Russia*,[91] and *Taşkin v. Turkey*,[92] while article 2 has been used in one environmental case, *Öneryildiz v. Turkey*.[93]

In *López Ostra v. Spain*, the first and landmark environmental case of the European Court of Human Rights, applicant Gregoria López Ostra of Spain alleged a violation of her right to privacy and family security under

85. Aarhus Convention, *supra* note 74, art.1.

86. Convention for the Protection of Human Rights and Fundamental Freedoms, Nov. 4, 1950, 213 U.N.T.S. 222, *available at* http://www.echr.coe.int/NR/rdonlyres/D5CC24A7-DC13-4318-B457-5C9014916D7A/0/EnglishAnglais.pdf [hereinafter European Convention].

87. *Id.* art. 2.

88. *Id.* art. 8.

89. López-Ostra v. Spain, 20 Eur. Ct. H.R. 277 (1995).

90. Guerra v. Italy, 26 Eur. Ct. H.R. 357 (1998).

91. Fadeyeva v. Russia, 45 Eur. Ct. H.R. 10 (2005).

92. Taskin v. Turkey, 2004-III Eur. Ct. H.R. 621 (2004).

93. Öneryildiz v. Turkey (*Grand Chamber*), 41 Eur. Ct. H. R. 20 (2004).

article 8 of the European Convention.[94] The applicant based her claim on the siting of a leather processing waste treatment plant near her home, which released fumes, smells, and contamination and "immediately caused health problems and [a] nuisance."[95] Mrs. López Ostra argued that the government had a positive duty to secure her rights under article 8.[96] The Court, while not finding an outright affirmative duty to prevent the pollution, did find the government failed "in striking a fair balance between the interest of the town's economic well-being—that of having a waste-treatment plant—and the applicant's effective enjoyment of her right to respect for her home and her private and family life."[97] Thus, finding a breach of article 8, the Court ordered the government to pay four million pesetas as compensation.[98]

Similarly, in *Fadeyeva v. Russia*, applicant Nadezhda Mikhaylovna Fadeyeva of Russia alleged a violation under article 8 of the European Convention for the government's "failure to protect her private life and home."[99] The applicant lived about 450 meters from Russia's largest iron smelter and alleged "the extent of environmental [air] pollution at her place of residence was and remains seriously detrimental to her health and well-being."[100] The court observed that "over a significant period of time the concentration of various toxic elements in the air near the applicant's house seriously exceeded the [maximum permissible limits]"[101] The court ruled that the government, by not offering any effective solution to help the applicants move from the affected area, "failed to strike a fair balance between the interests of the community and the applicant's effective enjoyment of her right to respect for her home and her private life."[102] Thus finding a breach of article 8, the court ordered the government to pay six thousand euros for non-pecuniary damages.[103]

In *Taşkin v. Turkey*, the Turkish government had persisted in authorizing a mining process using sodium cyanide after numerous national court decisions ruling that the authorizations were illegal.[104] The European Court of Human Rights ruled that the mining for gold using sodium cyanide violated the right to respect for private and family life in breach of

94. *López-Ostra*, 20 Eur. Ct. H.R. ¶¶ 6, 44.
95. *Id.* ¶ 8.
96. *Id.* ¶ 51.
97. *Id.* ¶ 56.
98. *Id.* ¶ 65.
99. Fadeyeva v. Russia, 45 Eur. Ct. H.R. 10, ¶ 64 (2005).
100. *Id.* ¶¶ 10–11, 71.
101. *Id.* ¶¶ 11, 87.
102. *Id.* ¶¶ 133–34.
103. *Id.* ¶¶ 134, 138.
104. Taskin v. Turkey, 2004-III Eur. Ct. H.R. 621, ¶¶ 11–89 (2004).

article 8.[105] The court also concluded that the government's refusal to abide by its own courts' decisions deprived the citizens of "their right to effective judicial protection in the determination of their civil rights."[106] The particular civil right at issue was the national right, under article 56 of the Turkish Constitution, "to live in a healthy [and] balanced environment."[107]

In *Guerra v. Italy* the court discussed both article 2 and article 8.[108] In that case, forty applicants lived in the town of Manfredonia, approximately one kilometer from a "high risk" chemical factory that produced fertilizers and other highly toxic chemicals.[109] Accidents due to malfunctions had occurred in the past. During the most serious accident, "one hundred and fifty people were admitted to the hospital with acute arsenic poisoning."[110]

The court held unanimously that it was unnecessary to consider the case under article 2 of the Convention because it ruled that article 8 had been violated.[111] However, Judge Walsh, in his concurring opinion, said that article 2 was violated as well because it "also guarantees the protection of the bodily integrity of the applicants."[112] Judge Jambrek in his concurring opinion also made "some observations on the possible applicability of article 2 in this case."[113] The protection of health and physical integrity was, in his view, related to the "right to life."[114] He continued:

> [P]erson(s) concerned face a real risk of being subjected to circumstances which endanger their health and physical integrity, and thereby put at serious risk their right to life, protected by law. . . .
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> . . . .
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> . . . It may therefore be time for the Court's case-law on Article 2 (the right to life) to start evolving, to develop the respective implied rights, articulate situations of real and serious risk to life, or different aspects of the right to life. Article 2 also appears relevant and applicable to the facts of the instant case, in that 150 people were taken to hospital

105. *Id.* ¶ 126.
106. *Id.* ¶ 127.
107. *Id.* ¶¶ 132, 90.
108. Guerra v. Italy, 26 Eur. Ct. H.R. 26, ¶¶ 56–62 (1998).
109. *Id.* ¶ 13 (stating that the factory "was classified as 'high risk' according to the criteria set out in Presidential Decree").
110. *Id.* ¶ 15.
111. *Id.* ¶¶ 62, 75.
112. *Id.* (Walsh, J., concurring).
113. *Id.* (Jambrek, J., concurring).
114. *Id.*

> with severe arsenic poisoning. Through the release of harmful substances into the atmosphere, the activity carried on at the factory thus constituted a "major-accident hazard dangerous to the environment."[115]

In 2002 the European Court of Human Rights for the first time decided to apply article 2 in *Öneryildiz v. Turkey*, an environmental case clearly involving loss of life.[116] The applicant complained that the accident on April 28, 1993, in which nine members of his family died, had occurred as a result of the negligence of the relevant authorities.[117] An expert committee's report indicated that "the waste-collection site in question breached the Environment Act and the Regulation on Solid-Waste Control and consequently pose[d] a health hazard to humans and animals."[118] The report observed that no measures had been taken to prevent a possible explosion of methane gas from the dump, and that such an explosion subsequently occurred.[119] The explosion buried ten homes, including that of the applicant.[120] The court held that as a consequence there had been a violation of article 2.[121]

A dramatic explosion and landslide, along with the widespread knowledge that methane can explode, led the court to the conclusion that the right to life in article 2 had been violated, but what are the prospects for bringing such a claim in Europe concerning loss of life from human-induced climate change? It is increasingly accepted that warm ocean waters fuel hurricanes and that climate change will cause hurricanes and tropical storms to become more intense—lasting longer, unleashing stronger winds, and causing more damage to coastal ecosystems and communities.[122] This will result in dramatic and adverse impacts on life and property, both of which are central concerns of human rights regimes. Hurricane Katrina caused a loss of 1300 lives and $80 billion in economic damage.[123] Although hurricanes are not a problem in Europe, heat waves are. For example, heat waves killed more than 52,000 people in 2003 in

115. *Id.*
116. Öneryildiz v. Turkey (*Grand Chamber*), 41 Eur. Ct. H.R. 20, ¶ 18 (2004).
117. *Id.* ¶ 63.
118. *Id.* ¶ 15.
119. *Id.* ¶ 23.
120. *Id.* ¶ 18.
121. *Id.* ¶ 118.
122. *IPCC Synthesis Report*, *supra* note 5, at 46.
123. Nat'l Oceanic & Atmospheric Admin. [NOAA], Noteworthy Records of the 2005 Atlantic Hurricane Season, http://www.noaanews.noaa.gov/stories2005/s2540b.htm (last visited Apr. 30, 2008).

Europe.[124] "As the mercury climbs, more frequent and more severe heat waves are in store. Accordingly, the World Meteorological Organization estimates that the number of heat-related fatalities could double in less than 20 years."[125]

If sufficient evidence could be accumulated to support a case linking heat wave deaths and GHG emissions, who could be the defendants in a complaint to the European Court of Human Rights? One possibility might be states that are members of the Council of Europe but have not introduced mandatory and significant reduction programs for GHG emissions. The Russian Federation is a party to the European Convention on Human Rights and its Optional Protocol.[126] The European Court of Human Rights has found Russia in violation of article 8 in the past.[127] The Russian Federation ratified the Kyoto Protocol in 2004, and therefore has obligations to reduce GHG emissions below its 1990 levels.

2. Inter-American Commission and Court of Human Rights

The Inter-American Commission and Court of Human Rights are known as strong bodies for the protection of indigenous peoples' rights. Legal instruments include the American Convention on Human Rights[128] and the Additional Protocol to the Convention (the Protocol of San Salvador), which recognizes that "[e]veryone shall have the right to live in a healthy environment."[129] Although the Protocol of San Salvador has been ratified by only six countries, the American Convention has been ratified by twenty-five countries (not including the United States and Canada).[130] The court enforces the Convention, but the commission is willing to make findings in cases of alleged violation of a third document, the American Declaration of the Rights and Duties of Man, even in matters involving the United States and Canada.

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124. Janet Larsen, *Setting the Record Straight: More than 52,000 Europeans Died from Heat in Summer 2003*, EARTH POL'Y INST., July 28, 2007, http://www.earth-policy.org/Updates/2006/Update56.htm.

125. *Id.*

126. Council of Europe, Parties and Signatories to the European Convention on Human Rights and Additional Protocols, http://conventions.coe.int/Treaty/Commun/ListeTableauCourt.asp?MA=3&CM=16&CL=ENG (last visited Apr. 30, 2008).

127. Fadeyeva v. Russia, 45 Eur. Ct. H.R. 10, ¶ 134 (2005); Ledyayeva v. Russia, Eur. Ct. H.R. Application. Nos. 53157/99, 53247/99, 53695/00, 56850/00, (2008), *available at* http://www.asil.org/pdfs/ilibledyayeva061122.pdf.

128. American Convention on Human Rights, Nov. 22, 1969, O.A.S.T.S. No. 36, 1144 U.N.T.S. 123, *available at* http://www.cidh.org/Basicos/English/Basic3.American%20Convention.htm [hereinafter American Convention].

129. Protocol of San Salvador, *supra* note 74, art. 11.

130. Inter-American Commission on Human Rights, What is the IACHR?, http://www.cidh.org/Basicos/English/Basic4.Amer.Conv.Ratif.htm (last visited Apr. 30, 2008).

The court recognized the land and property rights of indigenous people in the groundbreaking *Awas Tingni* case.[131] The court ruled that the State of Nicaragua violated the right to the use and enjoyment of property by granting a logging concession on traditional lands of the Mayagna (Sumo) Awas Tingni Community.[132] By "evolutionary interpretation" of the right to the use and enjoyment of property, the court held:

> [A]rticle 21 of the Convention protects the right to property in a sense which includes, among others, the rights of members of the indigenous communities within the framework of communal property. . . .
>
> . . . .
>
> . . . Based on this understanding, the Court considers that the members of the Awas Tingni Community have the right that the State. . .carry out the delimitation, demarcation, and titling of the territory belonging to the Community.[133]

The Inter-American Commission on Human Rights has recognized the relationship between human rights and the environmental impacts of development activities. Can it be a tool also for combating climate change? In 2005, for the first time, the commission received a petition requesting relief for a violation of human rights resulting from global warming, allegedly caused by "acts and omissions of the United States."[134] The Inuit peoples of Alaska and Canada argued that the adverse impact on wildlife from climate change—changes in the location number and health of plant and animal species—violates their fundamental human rights to life, property, culture, and means of subsistence.[135]

Some species are starting to move to different locations, exacerbating the Inuit's travel problems; other species cannot make their annual migrations because the ice on which they normally travel is gone.[136] Reduction of sea ice drastically shrinks the habitat for polar bears and seals,

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131. Mayagna (Sumo) Awas Tingni Cmty. v. Nicaragua, 2001 Inter-Am. Ct. H.R. (ser. C) No. 79 (Aug. 31, 2001).

132. *Id.* ¶ 153.

133. *Id.* ¶¶ 148, 153.

134. Petition to the Inter American Commission on Human Rights Seeking Relief from Violations Resulting from Global Warming Caused by Acts and Omissions of the United States at 1 (Dec. 7, 2005), *available at* http://www.earthjustice.org/library/legal_docs/petition-to-the-inter-american-commission-on-human-rights-on-behalf-of-the-inuit-circumpolar-conference.pdf [hereinafter Inuit Petition].

135. *Id.* at 5–6.

136. *Id.* at 3.

pushing them toward extinction.[137] The petition argued that this has impaired the Inuits' right to subsist by altering their food sources.[138] Furthermore, "[g]lobal warming violates these rights by melting the ice, snow and permafrost, changing the weather, and radically altering every aspect of the arctic environment on which Inuit lives and culture depend."[139]

The petition focused on the United States of America because it is one of the largest emitters of GHGs and has, up to this point, refused to join the international effort to reduce emissions under the Kyoto Protocol.[140] The petition asked the commission to declare the United States in violation of rights affirmed in the 1948 American Declaration of the Rights and Duties of Man and other instruments of international law.[141]

In November 2006, however, the petitioners received a letter from the commission, stating that it "will not be able to process your petition at present . . . the information provided does not enable us to determine whether the alleged facts would tend to characterize a violation of rights protected by the American Declaration."[142]

Although it rejected the petition, the commission subsequently held a hearing on March 1, 2007, at the request of petitioners, in which it discussed the connection between human rights and global warming.[143] The former chair of the Inuit Circumpolar Council, 2007 Nobel Peace Prize nominee Sheila Watt-Cloutier, testified to the effects of climate change on the global environment, health, and rights of indigenous peoples.[144] Her testimony went beyond the Arctic to include a broader region—the Caribbean, Central America, Venezuela, and Uruguay.[145] Even without a positive outcome, the petition has become a precedent of using the Inter-American Commission to raise questions of violations of human rights caused by global warming. As Donald M. Goldberg and Martin Wagner,

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137. *Id.* at 4.

138. *Id.* at 3.

139. Press Release, Earthjustice, Inuit Human Rights Petition Filed over Climate Change (Dec. 7, 2005), *available at* http://www.earthjustice.org/news/press/005/inuit-human-rights-petition-filed-over-climate-change.html.

140. Inuit Petition, *supra* note 134, at 6.

141. *Id.* at 5.

142. *Letter of the Inter-American Commission on Human Rights to Mr.Crowley, Ref.: Sheila Watt-Cloutier et al.*, Petition N P1413-05, United States, Nov. 16, 2006 (on file with author).

143. Press Release, EarthJustice, Inter-American Commission on Human Rights to Hold Hearing on Global Warming (Feb. 6, 2007), *available at* http://www.earthjustice.org/news/press/007/inter-american-commission-on-human-rights-Hearing-on-Global-Warming.html.

144. Press Release, Earth Justice, Nobel Prize Nominee Testifies About Global Warming (Mar. 1, 2007), *available at* http://www.earthjustice.org/news/press/007/nobel-prize-nominee-testifies-about-global-warming.html.

145. *Id.*

lawyers for the petitioners, have written:

> [A] report by the Commission examining the connection between global warming and human rights could have a powerful impact on worldwide efforts to address global warming. It would demonstrate that the issue is not merely an abstract problem for the future, but is instead a problem of immediate concern to all people everywhere. Recognition by the Commission of a link between global warming and human rights may establish a legal basis for holding responsible countries that have profited from inadequate greenhouse gas regulation and could provide a strong incentive to all countries to participate in effective international response efforts.[146]

At the very least, the filing of the Inuits' petition and the Inter-American Commission on Human Rights' decision to address the question of how climate change affects human rights has advanced the notion that climate change is an issue involving human rights, not just public policy.

3. African Commission of Human and Peoples' Rights

Article 24 of the African Charter on Human and Peoples' Rights (African Charter) says that "[a]ll peoples shall have the right to a general satisfactory environment favorable to their development."[147] The African Commission on Human Rights enforced the right to health and the right to a satisfactory environment in the case *Social and Economic Rights Action Center v. Nigeria*.[148] The Action Center asserted:

> [The] Nigerian government violated the right to health and the right to clean environment as recognized under Articles 16 and 24 of the African Charter by failing to fulfill the minimum duties required by these rights. This, the Complainants allege, the government has done by:

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146. Donald M. Goldberg & Martin Wagner, *Petitioning for Adverse Impacts of Global Warming in the Inter-American Human Rights System*, *in* CLIMATE CHANGE—FIVE YEARS AFTER KYOTO 191, 195 (2002), *available at* http://www.ciel.org/Publications/Petitioning_GlobalWarming_IAHR.pdf.

147. African [Banjul] Charter on Human and Peoples' Rights art. 24, June 27, 1981, 21 I.L.M. 58 (1982), *available at* http://www.achpr.org/english/_info/charter_en.html.

148. Soc. & Econ. Rights Action Ctr. v. Nigeria, No. 155/96 (Afr. Comm'n H. & Peoples' R., May 27, 2002), *available at* http://www.escr-net.org/usr_doc/serac.pdf.

> Directly participating in the contamination of air, water and soil and thereby harming the health of the Ogoni population,
>
> Failing to protect the Ogoni population from the harm caused by the NNPC Shell Consortium but instead using its security forces to facilitate the damage.[149]

The commission's ruling stated:

> [D]espite its obligation to protect persons against interferences in the enjoyment of their rights, the Government of Nigeria facilitated the destruction of the Ogoniland. Contrary to its Charter obligations and despite such internationally established principles, the Nigerian Government has given the green light to private actors, and the oil Companies in particular, to devastatingly affect the well-being of the Ogonis. By any measure of standards, its practice falls short of the minimum conduct expected of governments, and therefore, is in violation of Article 21 of the African Charter.[150]

The commission found Nigeria in violation of articles 2, 4, 14, 16, 18(1), 21 and 24 of the African Charter and appealed to the government of the Federal Republic of Nigeria "to ensure protection of the environment, health and livelihood of the people of Ogoniland."[151] The commission asked Nigeria to ensure "adequate compensation to victims of the human rights violations, including relief and resettlement assistance to victims of government sponsored raids, and [to undertake] a comprehensive cleanup of lands and rivers damaged by oil operations."[152] This case could be useful precedent in climate change litigation in situations where a government violates human rights by not fulfilling its duty to protect the environment, health, and livelihood of people from the negative consequences of climate change, and has to resettle and compensate victims.

D. National Courts Safeguarding Human Rights

U.S. domestic courts have been unwilling to hold that environmental rights have gained sufficient status under international law to be

149. *Id.* at 9–10 (bullet points omitted).
150. *Id.* at 12.
151. *Id.* at 15.
152. *Id.*

enforceable in tort. In *Flores v. Southern Peru Copper Corp.*, the plaintiffs alleged a violation of the rights to life and health as violation of customary international law, actionable under the Alien Tort Claims Act (ATCA).[153] The court rejected the argument, holding:

> [T]he asserted "right to life" and "right to health" are insufficiently definite to constitute rules of customary international law. . . . [I]n order to state a claim under the ATCA, we have required that a plaintiff must allege a violation of a "clear and unambiguous" rule of customary international law. . . .
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> . . . .
>
> . . . Far from being "clear and unambiguous," the statements relied on by plaintiffs to define the rights to life and health are vague and amorphous.[154]

The plaintiffs referred to a "right to life" enshrined in the Universal Declaration of Human Rights, the International Covenant on Economic, Social, and Cultural Rights, and the Rio Declaration on Environment and Development; however, the court found these principles "boundless and indeterminate," expressing "virtuous goals" but only "at a level of abstraction" and not establishing the existence of a customary international law "right to life" or "right to health."[155]

On the other hand, in 2005 the Federal High Court of Nigeria (Benin Judicial Division) found that multinational oil companies, by flaring gas during exploration and production activities, violated the "fundamental rights to life (including healthy environment) and dignity of human person guaranteed by Sections 33(1) and 34(1) of the Constitution of [the] Federal Republic of Nigeria, 1999 and reinforced by Arts 4, 16 and 24 of the African Charter on Human and Peoples Rights."[156] The court ordered the respondents to take immediate steps to stop further flaring of gas in the community.[157]

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153. Flores v. S. Peru Copper Corp., 414 F.3d 233, 254 (2nd Cir. 2003).

154. *Id.* (citations omitted).

155. *Id.* at 255.

156. Gbemre v. Shell Petroleum Dev. Co. Nigeria Ltd., No. FHC/B/CS/53/05, at 30 (F.H.C. Nov. 14, 2005) (Nigeria), *available at* http://www.climatelaw.org/cases/case-documents/nigeria/ni-shell-nov05-judgment.pdf.

157. *Id.* at 31.

A right to a healthy environment in various formulations is recognized by the constitutions of 118 nations around the world.[158] The Supreme Court of the Philippines used the right to a "balanced and healthful ecology" in the Constitution of the Philippines to overturn and block government action in *Oposa v. Factoran*.[159] The plaintiffs brought the case on behalf of minor children and generations yet unborn to "prevent the misappropriation or impairment" of Philippine rainforests and "arrest the unabated hemorrhage of the country's vital life-support systems and continued rape of Mother Earth."[160] They alleged, "At the present rate of deforestation, i.e. about 200,000 hectares per annum or 25 hectares per hour . . . the Philippines will be bereft of forest resources after the end of this ensuing decade, if not earlier."[161]

The plaintiffs asked the court to order the defendant to: (1) "[c]ancel all existing timber license agreements in the country"; and (2) "[c]ease and desist from receiving, accepting, processing, renewing or approving new timber license agreements."[162] The court granted the petition, stating that "[t]he right to a balanced and healthful ecology carries with it the correlative duty to refrain from impairing the environment."[163]

The right to life enshrined in the Constitution of India has been interpreted broadly by courts to include a right to a healthy environment. The Supreme Court of India in *Subhash Kumar v. State of Bihar* took a strong position on what is encompassed within the right to life:

> Right to live is a fundamental right under Art. 21 of the Constitution and it includes the right of enjoyment of pollution free water and air for full enjoyment of life. If anything endangers or impairs that quality of life in derogation of laws, a citizen has right to have recourse to Art. 32 of the Constitution for removing the pollution of water or air which may be detrimental to the quality of life. A petition under Art. 32 for the prevention of pollution is

158. EARTHJUSTICE, ENVTL. RIGHTS REPORT 2007: HUMAN RIGHTS AND THE ENVIRONMENT app. (2007), *available at* http://www.earthjustice.org/library/references/2007-environmental-rights-report.pdf.

159. Oposa et al. v. Factoran, G.R. No. 101083, 224 S.C.R.A. 792 (S.C., July 30, 1993) (Phil.), *available at* http://www.elaw.org/node/1343, *reprinted in* 33 I.L.M. 173 (1994).

160. *Id.*

161. *Id.* ¶ 12.

162. *Id.* ¶ 20.

163. *Id.*

> maintainable at the instance of affected persons or even by a group of social workers or journalists.[164]

In Hungary, the Constitutional Court overturned national legislation privatizing forests on the basis of a constitutional right to a "healthy environment."[165] Courts in Bangladesh,[166] Nepal,[167] and Pakistan[168] have made constitutional rulings about violations of citizens' environmental rights. The Constitutional Chamber of Costa Rica's Supreme Court of Justice closed a municipal waste site due to violations of constitutional environmental rights.[169] The Constitutional Tribunal of Peru has ordered officials to set up health monitoring and ordered the Ministry of Mines and private companies to participate in health protection because of violations of health and environmental rights.[170]

The right to a healthy environment has been recognized in the constitutions of several states of the United States, including in the Montana Constitution.[171] The Supreme Court of Montana in *Montana Environmental Information Center v. Department of Environmental Quality* enforced this right when the State tried to lessen protections for water in the state.[172] The Court held that the State's action violated "the constitutional right to a clean and healthy environment and to be free from unreasonable degradation of that environment."[173]

That the highest courts of some nations and U.S. states have been willing to apply constitutional provisions to stop government actions

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164. Subhash Kumar v. State of Bihar, (1991) 1 S.C.R. 5, 13 (India), *available at* http://www.elaw.org/node/2751.

165. Alkotmánybíróság [Constitutional Court], No. 28/1994 (V.20), ABH. (1994) (Hung.); *see also* Stephen Stec, *Rights and Duties Towards a Healthy Environment*, *in* REG'L ENVTL. CTR. FOR CENT. & E. EUROPE, HANDBOOK ON ACCESS TO JUSTICE UNDER THE AARHUS CONVENTION 73, 74 (Stephen Stec ed., 2003), *available at* http://www.elaw.org/node/2423 (describing the "protected forest" case).

166. Farooque v. Gov't of Bangladesh, 17 B.L.D. (AD) 1, 1997, 1 B.L.C. (AD) 189 (1996) (Bangl.) (Flood Action Plan Case), *available at* http://www.elaw.org/node/1300.

167. Prakash Mani Sharma for Pro Public v. His Majesty Government Cabinet Secretariat and others, WP 2991/1995 (1997) (Nepal), *available at* http://www.elaw.org/node/1391 (holding that the court may give orders to give effect to directive principles in constitution, including those concerning the environment).

168. Shehla Zia v. W.A.P.D.A. Human Rights Case No. 15-K of 1992, P.L.D. 1994 Supreme Court 693 (Pak.), *available at* http://www.elaw.org/node/1342 (finding that electromagnetic radiation from power station violated constitutional rights).

169. Carlos Roberto Mejía Chacón v. Santa Ana, No. 3705-93, July 30, 1993 (Sala Constitucional de la Corte Suprema de Justicia) (Costa Rica), *available at* http://www.elaw.org/node/1312.

170. Pablo Miguel Fabián Martínez y Otros, Exp. N. 2002-2006-PC/TC, Sentencia de la Sala Segunda del Tribunal Constitucional) (May 12, 2006), *available at* http://www.elaw.org/node/1754.

171. MONT. CONST. art. II, § 3 ("[Inalienable rights] include the right to a clean and healthful environment . . . .").

172. Mont. Envtl. Info. Ctr. v. Dep't of Envtl. Quality, 988 P.2d 1236, 1249 (Mont. 1999).

173. *Id.* at 1249.

harmful to the environment is barely known among lawyers or academics in the United States. These cases are sure to strike some as adventurous, but they are becoming numerous. Is it too much to believe that such jurisprudence could be enlisted in the fight against global warming?

III. PROCEDURAL RIGHTS AND GLOBAL WARMING

Procedural rights—the right to know, the right to participate in decision making, and the right to have access to justice in environmental matters—were formulated in principle 10 of the Rio Declaration.[174] They can be a powerful tool for combating climate change through litigation. Public access to information on climate change and its effects is necessary to assess the actions or inactions of governments and the emissions of polluting industries. Provisions to enhance public participation also open the door to citizens for lobbying governments for the adoption of needed regulations and measures to combat climate change. Access to justice for citizens and nongovernmental organizations ensures that if governments or industries fail to comply with measures that are adopted, the violations can be brought to the attention of the courts.

Procedural rights are included in the U.N. Framework Convention on Climate Change. Article 6 requires Parties to "[p]romote and facilitate at the national and, as appropriate, subregional and regional levels . . . [p]ublic access to information on climate change and its effects; [and p]ublic participation in addressing climate change and its effects and developing adequate responses."[175]

The Kyoto Protocol similarly requires Parties to facilitate "public access to information on, climate change" and to seek and utilize information from NGOs.[176] In addition, procedural human rights can be found in various other international and national instruments, as discussed next.

A. Access to Information

Access to information is coming to be recognized as a basic human right. For instance, in 1996 the Parliamentary Assembly of the Council of Europe (PACE),[177] with the passage of the Resolution of 1087,[178] took an

174. Rio Declaration, *supra* note 56.

175. UNFCCC, *supra* note 20, art. 6(a).

176. Kyoto Protocol, *supra* note 12, arts. 10(e), 13(4)(i).

177. Council of Europe Parliamentary Assembly, PACE Historical Overview, http://assembly.coe.int/Main.asp?Link=/AboutUs/APCE_history.htm (last visited Apr. 30, 2008). The

important step in the recognition of the right to information as a human right. Resolution 1087 on the Consequences of the Chernobyl Disaster stated that "the Assembly believes that public access to clear and full information on this subject—and many others for that matter—must be viewed as a basic human right."[179]

In *Öneryıldız v. Turkey*, the Grand Chamber of the European Court of Human Rights said broadly that where dangerous activities are concerned, "public access to clear and full information is viewed as a basic human right" in Europe.[180] For this proposition, it cited Resolution 1087 and said that the resolution "makes clear that this right must not be taken to be limited to the risks associated with the use of nuclear energy in the civil sector."[181] The Grand Chamber went further, noting that such a human right to information had previously been found by the Court to be part of the right of private and family life under article 8 of the European Convention on Human Rights where pollution was concerned, citing the decision in *Guerra v. Italy*.[182] The Grand Chamber said that this same right to information "may also, in principle, be relied on for the protection of the right to life, particularly as this interpretation is supported by current developments in European standards," referring back to its discussion of Resolution 1087.[183] The Grand Chamber said that "particular emphasis should be placed on the public's right to information" as a way for governments to "take all appropriate steps to safeguard life for the purposes

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Parliamentary Assembly of the Council of Europe (PACE) was formed in 1949. It consists of 318 representatives (636 with alternates) sent by the national parliaments of the forty-seven states that are members of the Council of Europe, a pan-European institution whose members stretch from Russia to Portugal. Council of Europe Parliamentary Assembly, Assembly Procedure, http://assembly.coe.int/Main.asp?Link=/AboutUs/APCE_structures.htm (last visited Apr. 30, 2008). The Assembly elects the judges of the European Court of Human Rights, among other duties. Council of Europe Parliamentary Assembly, PACE Assembly Structure, http://assembly.coe.int/Main.asp?Link=/AboutUs/APCE_Procedure.htm (last visited Apr. 30, 2008).

178. EUR. PARL. ASS., *Resolution 1087 on the Consequences of the Chernobyl Disaster*, 16th Sitting (Apr. 26, 1996), *available at* http://assembly.coe.int/main.asp?Link=/documents/adoptedtext/ta96/eres1087.htm; *see also* Comm. on the Env't, Reg'l Planning and Local Auths., *The Consequences of the Chernobyl Disaster*, Doc. No. 7538 (1996), *available at* http://assembly.coe.int/Documents/WorkingDocs/doc96/EDOC7538.htm.

179. *Id.* ¶ 4.

180. Öneryildiz v. Turkey (*Grand Chamber*), 41 Eur. Ct. H.R. 20 ¶ 62 (2004).

181. *Id.*

182. *Id.* ¶ 90. This was a rather dramatic, or clever, or just deceptive use of *Guerra*, for in that case Resolution 1087 had been offered to the court as a basis for holding that article 10 recognized a right to obtain information from the government (or at least a duty of government to provide information), and the court had refused to do so. Now, some years later, the Court in *Öneryildiz* chose to refer to another part of the *Guerra* decision in which information had been mentioned as part of article 8—and now the Court used that and Resolution 1087 to assert that the right to information is a "basic human right."

183. *Id.*

of Article 2."[184] It must be asked whether European courts would be willing to take this right concerning access to information on pollution risks and apply it to information relevant to the pollution causing global warming.[185]

The view that the right to information in environmental matters is a basic human right has been stated even more strongly by the Inter-American Court of Human Rights. The American Convention on Human Rights was cited in *Claude Reyes v. Chile*, a recent decision.[186] The American Convention's direct provision on the human right to information, article 13, states that "[e]veryone has the right to freedom of thought and expression. This right includes freedom to seek, receive, and impart information and ideas of all kinds."[187] This language largely tracks article 10 of the European Convention on Human Rights regarding freedom of expression) although the American Convention adds the word "seek."[188]

The American Convention's article 13 could be seen as simply an anti-censorship provision, just as the European Court found in *Guerra*.[189] In fact, the American Convention made that link even more directly in section 2 of article 13, which states "[t]he exercise of the right provided . . . shall not be subject to prior censorship."[190] But the Inter-American Court took a much broader view in the *Claude Reyes* case, saying that by denying information requests by Mr. Reyes the Chilean government had violated article 13.[191] The Inter-American Commission, in presenting the case to the court, had asserted:

> The disclosure of State-held information should play a very important role in a democratic society, because it enables civil society to control the actions of the Government to which it has entrusted the protection of its interests.

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184. *Id.* ¶¶ 89–90.

185. In addition to these convention-based or general human rights claims, many countries in Europe also recognize rights to information through legislation. In the case of members of the European Union, these rights are part of the European Union's Directive on Access to Information. European Parliament and Council Directive 2003/4, 2003 O.J. (L 41) 26, *available at* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:041:0026:0032:EN:PDF.

186. Marcel Claude Reyes v. Chile, 2006 Inter-Am. Ct. H.R. (ser. C) No. 151, ¶ 1, *available at* http://www.corteidh.or.cr/docs/casos/articulos/ seriec_151_ing.pdf.

187. American Convention, *supra* note 128, art. 13(1).

188. *Compare id* ("freedom to seek, receive, and impart information"), *with* European Convention, *supra* note 86 ("freedom . . . to receive and impart information and ideas without interference by public authority and regardless of frontiers.").

189. American Convention, *supra* note 128, art. 13(1); *Guerra*, 26 Eur. Ct. H.R. ¶ 53.

190. *Compare* American Convention, *supra* note 128, art. 13(2), *with* European Convention, *supra* note 86 (stating that the exercise of the freedom of expression "may be subject to such formalities, conditions, restrictions or penalties as are prescribed by law and are necessary in a democratic society").

191. Marcel Claude Reyes v. Chile, 2006 Inter-Am. Ct. H.R. (ser. C) No. 151, ¶ 148, *available at* http://www.corteidh.or.cr/docs/casos/articulos/seriec_151_ing.pdf.

> "Article 13 of the Convention should be understood as a positive obligation on the part of the State to provide access to the information it holds."[192]

The court found it necessary to "determine whether the failure to hand over part of the information requested from the Foreign Investment Committee in 1998 constituted a violation of the right to freedom of thought and expression of Marcel Claude Reyes, and, consequently, a violation of Article 13 of the American Convention."[193]

The court ruled that, indeed, this was a violation. This kind of ruling indicates that, at least in the Americas, the right to gather information on emissions causing global warming is a basic human right that cannot be limited by restrictive national policies.

Returning to Europe, the Aarhus Convention on Access to Information, Public Participation in Decision-Making, and Access to Justice in Environmental Matters recognizes not only the right of the public to receive information upon request (article 4), but also the duty of the government to collect and disseminate information (article 5).[194] This Convention has been ratified by thirty-nine countries of Europe as well as the European Community. U.N. Secretary-General Kofi Annan has characterized its importance: "Although regional in scope, the significance of the Aarhus Convention is global. It is by far the most impressive elaboration of principle 10 of the Rio Declaration, which stresses the need for citizens' participation in environmental issues and for access to information on the environment held by public authorities."[195]

The Aarhus Convention Compliance Committee enforces these provisions, provides guidance through authoritative interpretations of the Convention in its jurisprudence, and facilitates improvement of laws and practices on national levels.[196] It has done so on the question of access to information in cases involving Kazakhstan and Ukraine.[197]

National legislation and some national constitutions also recognize the right to information.[198] The right to information has been enforced in

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192. *Id.* ¶ 58.

193. *Id.* ¶ 65.

194. Aarhus Convention, *supra* note 74, arts. 4, 5.

195. Kofi A. Annan, U.N. Secretary-General, *Foreword to* U.N. ECON. COMM'N FOR EUR., THE AARHUS CONVENTION: AN IMPLEMENTATION GUIDE, at v (2000), *available at* http://www.unece.org/env/pp/acig.pdf.

196. *See* Kravchenko, *supra* note 23, at 34 (summarizing ways that the Aarhus Convention's compliance mechanisms have been effective).

197. *Id.* at 35–39.

198. CONST. OF UKRAINE art. 34, *available at* http://www.rada.gov.ua/const/conengl.htm ("Everyone has the right to freely collect, store, use and disseminate information . . . ."); S. AFR. CONST. ch. 2, § 32 (1), *available at* http://www.concourt.gov.za/site/theconstitution/english.pdf ("Everyone has

matters involving climate change in at least one national court. In Germany, the Berlin Administrative Court in 2006 ordered the release of information about the extent to which Euler Hermes AG, an export credit agency, provides political and economic risk insurance to projects that produce GHGs.[199] The procedural human right to information may well have an important future in disputes where access to information related to climate change is denied to the public.

B. Public Participation

The U.N. Framework Convention on Climate Change requires public participation in addressing climate change and its effects and developing adequate responses.[200] This provision of the Convention can be used in various ways, including to demand participation in the environmental assessment of certain projects and activities that emit GHGs contributing to climate change. Case law involving environmental impact assessment and climate change is evolving in various national courts. For example, in November 2006, in the case *Gray v. Minister for Planning* in New South Wales (NSW), the Land and Environment Court made a decision that an EIA for a large coal mine known as the Anvil Hill Project *must* address global warming.[201] Judge Nicola Pain decided:

> [T]here is a sufficiently proximate link between the mining of a very substantial reserve of thermal coal in NSW, the only purpose of which is for use as fuel in power stations, and the emission of GHG which contribute to climate change/global warming, which is impacting now and likely to continue to do so on the Australian and consequently NSW environment, to require assessment of that GHG contribution of the coal when burnt in an environmental assessment under Pt 3A.[202]

One of the main arguments of the plaintiff was that members of the public must be properly informed in order to determine if they wish to

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the right of access to—(a) any information held by the state; and (b) any information that is held by another person and that is required for the exercise or protection of any rights.").

199. *Bund für Umwelt und Naturschutz Deutschland v. Federal Republic of Germany*, VerwG 10 A 215.04 (Verwaltungsgericht Berlin, 10th Chamber) (Jan. 10, 2006), *available at* http://www.climatelaw.org/cases/case-documents/germany/de-export-jan06.pdf; *unofficial translation available at* http://www.climatelaw.org/cases/case-documents/germany/de-export-jan06-eng.doc.

200. UNFCCC, *supra* note 20, art. 6(a)(iii).

201. Gray v. Minister for Planning, (2006) N.S.W.L.E.C. 720, ¶¶ 96–100, *available at* http://www.austlii.edu.au/au/cases/nsw/NSWLEC/2006/720.html.

202. *Id.* ¶ 100.

make submissions.[203] The NSW court found that defendant's failure to take into account the precautionary principle and intergenerational equity were unlawful: "[T]he requirement for prior environmental impact assessment and approval enables the present generation to meet its obligation of intergenerational equity by ensuring the health, diversity, and productivity of the environment is maintained and enhanced for the benefit of future generations."[204] Soon thereafter, the Land and Resources Tribunal of Queensland took the opposite position in *Re Xstrata Coal Queensland Pty Ltd.*, ruling that that an EIA for a coal mine need not assess greenhouse gas emissions.[205]

In the United States, Friends of the Earth, Greenpeace, and four cities sued the Export-Import Bank (Ex-Im) and the Overseas Private Investment Corporation (OPIC).[206] Plaintiffs alleged that the defendants failed to evaluate the effects of their "financial support . . . [of] fossil fuel projects that emit greenhouse gases" on global climate change.[207] The parties argued that the defendants were "required to conduct an environmental review under NEPA."[208] The court ruled that Ex-Im and OPIC are not completely exempt from NEPA requirements, but did not yet make a decision about whether Ex-Im or OPIC have enough authority over the specific projects in issue that their funding must be subject to EIA requirements.[209] This lingering issue was left to be decided in a future trial. The door is clearly open in the United States to require NEPA review and its concomitant public participation in at least some projects affecting GHG emissions, even in other countries. Even more recently, the U.S. Court of Appeals for the Ninth Circuit has ruled in a case involving potential emissions in the United States that "[t]he impact of greenhouse gas emissions on climate change is precisely the kind of cumulative impacts analysis that NEPA requires agencies to conduct."[210]

Public participation is an important environmental right. To the extent that EIA processes are initiated for projects that may affect the climate, the public will have an opportunity to participate in assessment of the impact of those projects, require public hearings, and raise comments. The resultant

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203. *Id.* ¶¶ 14–15.

204. *Id.* ¶ 116.

205. Re Xstrata Coal Queensland Pty Ltd., (2007) Q.L.R.T. 33, *available at* http://www.austlii.edu.au/au/cases/qld/QLRT/2007/33.html.

206. Friends of the Earth v. Mosbacher, 488 F. Supp. 2d 889, 891 n.1 (N.D. Cal. 2007).

207. *Id.* at 892.

208. *Id.*

209. *Id.* at 889.

210. Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety, 508 F.3d 508, 550 (9th Cir. 2007).

public outcry may halt a project. To the extent that institutions ignore requirements for public participation in decisions that may affect the climate, court actions challenging the decisions as illegal may give environmental procedural rights an important role in overturning them.

CONCLUSION

The accelerating pace of climate change puts the lives of current and future generations in danger. Human rights instruments can bring new arguments to the international and national debates. Attempts to use international human rights bodies, regional human rights courts, or national courts to combat climate change have met mixed success so far. However, they do start to reframe the debate, which might be their greatest contribution.

SUCCESS BY A THOUSAND CUTS: THE USE OF ENVIRONMENTAL IMPACT ASSESSMENT IN ADDRESSING CLIMATE CHANGE

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INTRODUCTION

On April 17, 2007, the members of the United Nations Security Council listened to ambassadors and leaders from fifty-five nations discuss the role of climate change as a global security threat.[1] Many of the most impassioned pleas came from small Pacific island nations, whose geographic isolation and low land levels create an extreme vulnerability to the impacts of climate change. Ambassador Afelee Pita of the coral atoll nation of Tuvalu decried that climate change was a global conflict not "fought with guns and missiles but with weapons from everyday life—chimney stacks and exhaust pipes."[2] Ambassadors from other Pacific island nations called attention to the unprecedented loss of entire nations to rising sea levels, while noting both the immediate potential for widespread population displacement and how related ocean acidification threatens breeding grounds within some of the world's wealthiest fisheries.[3] Despite the significance of the impacts, climate change remains more often a distant diplomatic and political issue.

Ambassador Colin Beck of the Solomon Islands remarked on how ineffectual political treatment produced few tangible results, noting that "currently the issue of climate change is discussed—like a comet—in a substantial way once every four to five years through a conference . . . [but] as soon as such conferences come to a close, it disappears again."[4] Implied in the Ambassador's warning was a concern that the slothful pace, international divisions; and poor domestic implementation of international climate change agreements will fail to stem the rising tide. There is an immediate need for more effective implementation tools. Considerable potential still remains in further elaborating strategies which will integrate climate change goals with localized action.

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1. Edith Lederer, *Security Council Tackles Climate Change*, WASH. POST, Apr. 18, 2007, *available at* http://www.washingtonpost.com/wpdyn/content/article/2007/04/18/AR2007041800219.html.

2. U.N. SCOR, 62nd Sess., 5663rd mtg. at 8, U.N. Doc. S/PB.5663 (Resumption 1) (2007), *available at* http://www.auswaertiges-amt.de/diplo/de/Aussenpolitik/InternatOrgane/VereinteNationen/ForumGF/17-GF/17GF-DebatteVN.pdf.

3. Ambassador Alfred Capelle of the Republic of the Marshall Islands remarked that:

> As our coral reefs continue to vanish due to bleaching and our marine ecology is altered by increasing greenhouse gas emissions, we must emphasize to the Security Council the severe and growing threat posed by climate change to our fish stocks—a critical global food source. The diminishment of food supplies in the face of rising populations not only threatens our own national subsistence, but will also intensify international competition for increasingly scarce essential resources. Such future rivalries will create an invitation to global conflict.

Id. at 17; *see also id.* at 14 (Statement of Ambassador Stuart Beck of Palau).

4. *Id.* at 13.

The complex search for a universal solution to global climate change continues to perplex environmental policy experts. Never before has environmental law faced such a grave but distant challenge that cuts across so many levels of government and involves a multitude of political and socio-economic issues. Yet with all of the attention placed on creating a cooperative international solution, some of the most effective strategies for addressing climate change impacts may already exist in site-specific, localized decision tools such as Environmental Impact Assessment (EIA) laws, which allow a government actor to weigh a variety of environmental impacts and alternatives to proposed action or construction while also allowing both key stakeholders and the interested public to participate in the study and decision-making process. While the legal structure and process may differ between jurisdictions, EIA as a general norm has been unilaterally adopted on a global scale by many national and local governments, as well as independent international institutions. However, relatively few of these jurisdictions have started to analyze climate change impacts as part of their EIA processes. Instead, much of the collective hope for addressing climate change appears to rest on the slow pace of global diplomatic dialogue.

This pursuit for a singular global solution can be likened to many fables, one of which might be King Arthur's legendary search for the Holy Grail. In the satirical film *Monty Python and the Quest for the Holy Grail*, a fictional King Arthur knocks upon the walls of a castle and announces his noble search, only to discover that a taunting Frenchmen within the fortress claims "we've already got one."[5] A disbelieving King Arthur retreats to continue his search only to discover, to his chagrin, that the sarcastic Frenchmen did indeed have the Holy Grail.

In analyzing the ability of EIA to address climate change issues, one hopes that global decision-makers do not repeat King Arthur's follies by completely forsaking an obvious answer. That the United States Senate first recognized the viable application of EIA to climate change in the mid-1980s, and that this application is still not accepted professional practice, suggests that we are still searching in vain for the "Holy Grail" of unified global policy solutions.

This Article, in explaining both the science of climate change as well as the creative flexibility inherent within EIA, demonstrates that EIA can readily analyze and discuss climate change issues in a wide variety of projects. An EIA project can often easily quantify the expected amount of specific greenhouse gasses associated with a particular project, but need not

5. MONTY PYTHON AND THE HOLY GRAIL (Columbia/TriStar Studios 1975).

always do so.[6] This Article first provides an overview of the EIA structure and typical process, focusing upon United States EIA laws which served as a general global template for subsequent EIA laws. Next, this Article provides a brief overview of progress on current global, national and regional efforts to address climate change impacts. The Article then undertakes a critical and detailed examination of the typical EIA process as a means to address climate change impacts, with a focus on structural challenges and existing guidance. The Article compares efforts in other nations under EIA laws to address climate change with limited action taken to date within the United States to do the same. Next, the Article briefly discusses how climate change could be treated in typical EIA studies. Finally, the Article concludes that, while perhaps an imperfect solution by itself, EIA nonetheless provides an important but largely unrealized opportunity for immediate global action on climate change.

I. NEPA & EIA OVERVIEW

The United States enacted the National Environmental Policy Act of 1970 (NEPA) in an effort to "encourage productive and enjoyable harmony between man and his environment," in response to environmental degradation brought about by a largely unbridled postwar economic expansion.[7] The law was introduced by President Nixon as a tool to

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6. *See generally* Michael Gerrard, *Climate Change and the Environmental Impact Review Process*, 22 NATURAL RES. & ENV'T 20–24, *available at* http://www.abanet.org/environ/pubs/nre/winter08/climate_change_environ.pdf (summarizing pending and recent litigation on climate change and briefly discussing comparative policies and procedures under which climate change would be addressed in an EIA study processing).

7. National Environmental Policy Act, Pub. L. No. 91-190, § 2, 83 Stat. 852 (1970) (codified at 42 U.S.C. § 4321 (2000)); *see also* Kevin Preister & James A. Kent, *Using Social Ecology to Meet the Productive Harmony Intent of the National Environmental Policy Act*, 7 HASTINGS W.-NW. J. ENV. L. & POL'Y 235 (2001). Discussing the creation of NEPA, Preister and Kent note:

> NEPA was symmetrically fashioned—section 101 laid out the policy intent, while section 102 laid out the procedural requirements for performing an EIS. For every 'major federal action,' analyses of current conditions and a range of alternatives are to be accomplished, with mitigation measures at least listed and considered that will reduce negative impacts or enhance positive effects.
>
> In section 101, the concept of productive harmony proposes an integration or a balance between people and nature, and states that the benefits of the environment should be shared widely (and fairly) while maintaining environmental quality. Diversity and options are to be preserved. Congress also intended that citizens take individual responsibility to 'preserve and enhance' environmental quality. . . .

encourage federal agencies to bridge complex conflicts between the competing tangle of economic, social, and ecological concerns often surrounding a proposed infrastructure project.[8] When agencies chose to utilize the process as a means to engage and negotiate different interests, NEPA worked effectively in diffusing mutual animosity and in allowing balanced projects to progress. The potential success of NEPA did not go unnoticed. The decade following its inception saw many states create their own versions of NEPA. These "mini-NEPAs," eventually adopted by at least twenty states, applied to the actions of state agencies and their applicants for permits or discretionary approval.[9] At least six "mini-NEPAs," including New York's State Environmental Quality Review Act (SEQRA), extended environmental review to state authority delegated to the local or municipal level for a variety of land use planning actions.[10]

The American experience with EIA was also noticed by the international community. The NEPA model was adopted in varying forms by over 100 nations within their domestic law.[11] This international phenomenon of EIA is unique, given that its rapid international codification took place unilaterally without the mandate of an explicit multilateral environmental agreement or treaty. The prevalence of EIA was noted

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> By contrast, section 102 focuses on procedures by which the effects analysis is to be achieved. It is the action-forcing provisions of the law that call for the creation of environmental impact assessments for federal actions. Although section 102 calls for interdisciplinary approaches that include the social sciences, in almost all cases reviewed by the authors, the social and economic portions of EISs consisted of just a few paragraphs that have little meaning for accomplishing productive harmony.

Preister & Kent, *supra*, at 239–40.

8. *See id.* at 248–50 (proposing six different ways NEPA can harmonize the competing interests which complicate proposed projects).

9. According to a working paper at the Public Law Research Institute at the University of California-Hastings College of Law, the following states are among those with "mini NEPAs": California, Connecticut, District of Columbia, Florida, Georgia, Hawaii, Indiana, Maryland, Massachusetts, Michigan, Minnesota, Montana, New York, North Carolina, Puerto Rico, South Dakota, Virginia, and Wisconsin. Ariela Freed, *Legal Analysis of the Conflicts Between the California Environmental Quality Act and the Forest Practices Act: A Comparison of California, Washington and Federal Law*, at app. (Public L. Research Inst., PLRI Working Papers Series, 2007), *available at* http://w3.uchastings.edu/plri/96-97tex/califwash.htm#top.

10. Kathryn C. Plunkett, Comment, *Local Environmental Impact Review: Integrating Land Use and Environmental Planning Through Local Environmental Impact Reviews*, 20 PACE ENVTL. L. REV. 211, 211–12 (2002).

11. For a thorough inventory of national EIA laws, regulations and policies, see Nicholas A. Robinson, *International Trends in Environmental Impact Assessment*, 19 B.C. ENVTL. AFF. L. REV. 591 app. (1992). Note that in the sixteen years subsequent to the publication of this list, other nations may have adopted EIA.

during the Rio Declaration on Environmental and Development.[12] The Declaration specifically discusses the universal importance of EIA as an environmental decision-making tool, remarking that EIA, "as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority."[13] EIA is emerging as customary international law.[14]

It is important to note that there are critical legal distinctions between NEPA, SEQRA, and the myriad other EIA laws and regulations.[15] For example, SEQRA's jurisdiction over state agency action is broader than NEPA's jurisdiction upon federal agencies.[16] In addition, SEQRA requires further approval to satisfy the statute than NEPA.[17] Such comparative analysis is beyond the focus of this article and is not described in substantial detail. Again, for the limited purposes of this Article, it is acceptable to discuss EIA as a generic term. All EIA laws and regulations share the overarching goal of encouraging government agencies to "stop, look and listen" to the environmental impacts of an action, approval or policy, and to consider the integration of environmental stewardship with their own development goals.[18]

Based upon the framework first codified in NEPA, EIA is a generic term that encompasses a wide spectrum of national and regional laws. These laws mandate a similar pattern of informed governmental decision-making for specific policies, approvals, or infrastructure projects. EIA is

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12. The U.N. Conference on Environment and Development, June 3–14, 1992, *Report of the United Nations Conference on Environment and Development*, ¶ 17, U.N. Doc. A/CONF.151/26 (Aug. 12, 1992).

13. *Id.* The importance of "shall" in the construction implies an affirmative duty on behalf of the Declaration's participants, although the Declaration is not a legally binding treaty.

14. Julie A. Lemmer, *Cleaning up Development: EIA in Two of the World's Largest and Most Rapidly Developing Countries*, 19 GEO. INT'L ENVTL. L. REV. 275, 276 (2007); *see also* Erika L. Priess, *The International Obligation to Conduct an Environmental Impact Assessment: The ICJ Case Concerning the Gabčíkovo-Nagymaros Project*, 7 N.Y.U ENVTL. L.J. 307, 308 n.6 (1999).

> It is becoming a norm of customary international law that nations should engage in effective EIA before taking action that could adversely affect either shared natural resources, another country's environment, or the Earth's commons. EIA is the means of assuring that no state acts so as to harm the environment of another state: a prohibition that exists for all states under international law, as embodied in Principle 21 of the United Nations Stockholm Declaration on the Human Environment.

Robinson, *supra* note 11, at 602.

15. GERRARD ET AL., ENVIRONMENTAL IMPACT REVIEW IN NEW YORK §§ 5.01–5.23, 6.02 (2007).

16. *Id.* §§ 5.01–5.23.

17. *Id.* § 5.01.

18. *Id.*

codified in the United States at both the federal level, as NEPA, and the state level. Over twenty-eight states have so-called "little NEPAs" imposed upon state agencies.[19]

Additionally, the utility of EIA is reaching the international community as well. The primary international models for management of climate change, namely the Kyoto Protocol and United Nations Framework Convention on Climate Change, are still in formulation. These models are in jeopardy of failure as certain developed and developing states have not fully assented to the treaty, and participant states may not meet benchmark emissions goals.[20] Alternative models for coping with climate change, such as EIA, provide valuable secondary tools that immediately advance the issue and work toward establishment of a primary international mechanism. Important international institutions, including the World Bank, mandate EIA for specific funded projects. In addition to the United States, over 100 nations have unilaterally adopted EIA. Although beyond the focus of this Article, EIA is well on its way to achieving the status of customary international law.[21]

Although the precise application varies somewhat depending upon the jurisdiction, EIA applies to major government actions, such as the funding of an infrastructure project, adoption of an administrative rule or policy, or discretionary approval of a private development project.[22] EIA generally requires agencies to first identify and study a wide variety of ecological and social impacts from proposed actions. Then agencies evaluate multiple alternative actions, and, to varying degrees of effectiveness, finalize an alternative that balances the agency's initial goals with environmental

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19. Nicholas A. Robinson, *SEQRA's Siblings: Precedents from Little NEPAs in the Sister States*, 46 ALA. L. REV. 1155, 1156–57 (1982).

20. Catherine Brahic, *Carbon Emissions Rising Faster than Ever*, NEW SCIENTIST.COM, Nov. 10, 2006, http://www.newscientist.com/article/dn10507-carbon-emissions-rising-faster-than-ever.html.

21. ECON. & TRADE BRANCH, U.N. ENV'T PROGRAMME [UNEP], ENVIRONMENTAL IMPACT ASSESSMENT TRAINING RESOURCE MANUAL (2nd ed. 2002), *available at* http://www.unep.ch/etu/publications/EIAMan_2edition_toc.htm; *see also* Lemmer, *supra* note 14, at 279 ("EIA is increasingly considered to be a general principle of international law."). In addition, the Lemmer notes that:

> The existence of the many treaties and other soft law instruments requiring EIA, as well as the number of countries adopting their own domestic EIA regulations, illustrates the fact that the international community has accepted the importance of assessing environmental impacts with a view to reducing and mitigating environmentally harmful aspects of development. Acceptance of the principle is the first step. Successful implementation, however, has proven to be a bigger challenge.

Lemmer, *supra* note 14, at 281.

22. ECON. & TRADE BRANCH, *supra* note 21, at 108.

stewardship.[23] While EIA may address environmental issues in a rote fashion long after decision-makers have reached consensus, it also holds the promise as a creative means of integrating conflicting public goals.[24] An EIA's success, or failure, as a means to advance environmental goals is often rooted in the method and sincerity of its application. The outcome of an EIA project is often determined by the questions investigated during the study process.

EIA has traditionally been used to address more obvious and localized ecological impacts. In practice, EIA has had an increasing tendency to operate on autopilot, producing voluminous amounts of technical data, but often not taking advantage of the process as an opportunity for creative decision-making. This practice has led to the mistaken presumption that EIA is unable to tackle the complex challenges of climate change. Climate change is a nontraditional environmental topic demonstrated by immense volumes of cumulative contribution of pollutant gasses, but few, if any, major contributing sources responsible for a distinctive degree of environmental harm divisible from other sources.[25]

EIA projects also evaluate, and sometimes implement, means of mitigating or minimizing significant environmental effects.[26] Because of the vast cumulative nature of emissions contributions, it is difficult to quantify with reasonable precision a "significant" amount of greenhouse gas emissions. Yet defining "significant" is critical to the application of EIA to climate change. The overwhelming global scale of climate change, which also lacks localized direct impacts,[27] permits no easy scientific delineation between a significant and an insignificant increase in GHG emissions. The only factor by which significance is judged is the aggregate rate of increase in emissions. Using a small rate of increase in GHG emissions as a benchmark permits minimal increases and also ensures that the cumulative impact of infrastructure and development projects will not substantially interfere with other government policies to significantly reduce GHG emissions.

The use of EIA as a means of integrating climate change planning into project-level decision-making will not be considered a primary means to

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23. *See id.* at 105 (discussing the two objectives of an EIA, which are to "inform the process of decision-making" and "promote sustainable development").

24. James T.B. Tripp & Nathan G. Alley, *Streamlining NEPA's Environmental Review Process: Suggestions for Agency Reform*, 12 N.Y.U. ENVTL. L.J. 74, 85–86 (2003).

25. *Id.*

26. ECON. & TRADE BRANCH, *supra* note 21, at 105.

27. Michael Weisslitz, *Rethinking the Equitable Principle of Common but Differentiated Responsibility: Differential Versus Absolute Norms of Compliance and Contribution in the Global Climate Change Context*, 13 COLO. J. INT'L ENVTL. L. & POL'Y 473, 474–75, 490–91 (2002).

manage global climate change. Climate change strategies must not only ensure that future projects do not increase GHG emissions, but must also tackle existing emissions levels. EIA is not intended and could not be used as a comprehensive regulatory or market strategy. Yet as a secondary path, this method provides many compelling advantages. EIA is already a unilateral global custom; it needs no lengthy conferences and no time-consuming treaties.[28] Nor does it require the debate, creativity, political diplomacy, or technical study needed to bring about a novel global solution.

Rather, this application can be immediately and effectively brought into force using existing laws that have been well seasoned by litigation and decades of practice. EIA works to familiarize decision-makers and private interests with the practical, local decisions that will help to implement a multifaceted global approach to climate change. The use of EIA to address climate change compliments a wide range of existing or future regulatory schemes specifically addressing climate change. Moreover, the inherent creativity and deference provided to government agencies in carrying out EIA allows EIA to become a laboratory for novel approaches to integrate climate change into decision-making.

The power of EIAs to implement environmental policy is grossly underestimated. EIA laws are modeled upon NEPA's "hard look" standard, balanced decision-making, and provide the opportunity to creatively integrate lofty environmental goals into a specific level of decision-making and design.[29] As climate change creeps outwards from the staid halls of diplomacy and into the daily lexicon of civil society, designers, and low-level bureaucrats, EIA may prove particularly effective in linking global goals with municipal action.

II. OVERVIEW OF CURRENT ENVIRONMENTAL IMPACT ASSESSMENT LAWS AND PRACTICE

EIA is a model process for environmental decision-making. Broadly speaking, EIA applies directly to government agency action, such as the decision to construct an interstate highway or other infrastructure. In addition, EIA applies to private projects or policies in which a government agency has a sufficient threshold degree of discretionary involvement, such as the granting of a permit to construct over wetlands.[30] The precise

28. Preiss, *supra* note 14, at 308.

29. *See* ECON. & TRADE BRANCH, *supra* note 21, at 108 (discussing international adoption of the EIA process after its implementation in NEPA).

30. *Id.* at 105.

threshold for EIA varies upon the relevant statute and is often a subject of litigation. EIA may also apply to the analysis of generic actions or government policies. Although rarely used, such an application promises to minimize the repetition of later conflicts.

Once it has been decided that EIA applies to a particular action or undertaking, the first step is often a basic "environmental assessment," which provides a basic screening of numerous study categories to determine if the project would potentially result in a significant environmental impact.[31] These study categories vary depending upon the project, but most often include archaeology, historic buildings or landscapes, economic impact, ecological categories, as well as visual or audible impacts.[32] Once the potential for a significant impact is identified, the EIA process will usually move forward toward the compilation of an Environmental Impact Statement (EIS). The EIS is usually more comprehensive than the baseline "environmental assessment" and often includes a greater degree of public participation.[33]

The first step of an EIS is "scoping," in which an agency identifies issues that should be addressed in the assessment.[34] After thorough studies are complete, relevant information is summarized into a Draft Environmental Impact Statement (DEIS), which examines significant impacts of the proposed action within each study category, as well as a reasonable variety of alternatives to the proposed action, including the "no build" alternative, which compares the baseline.[35] After comment and response, the agency then issues a Final Environmental Impact Statement (FEIS), which includes a decision on a preferred action. This decision will typically include a discussion of planned mitigation items, which help offset significant impacts, as well as a justification of the final alternative.[36] It is in the alternatives analysis and in particular the mitigation planning that an agency can outline a creative solution that balances development goals and environmental protection.[37] Although underutilized, agencies may also elect to develop a "generic" or programmatic EIS, which would cover impacts typically associated with a long-term policy or building

31. *See id.* at 191–200 (outlining methods for screening proposed projects to determine the need for a full EIA).

32. *Id.* at 256.

33. *Id.* at 191–200.

34. *Id.* at 227.

35. *Id.*

36. *Id.*

37. MICHAEL GERRARD ET AL., *supra* note 15, §§ 6.01–6.05.

campaign.[38] These actions can then be "tiered" with streamlined, project-specific analysis.[39]

The EIS project can be complex and resource intensive. However, it has played a key role in slowly shifting public agencies away from the "decide, design, and defend" model of expert-oriented planning.[40] One means of escaping the intensive EIS process is the increasingly common use of conditional environmental assessments, under which an agency modifies or mitigates actions earlier in the process, thus avoiding potential significant impacts.[41] While deservedly criticized for evading the participatory formalities, scrutiny, and rigors of the EIS process, conditional assessments may permit for an earlier integration of environmental planning and agency decision-making.[42] EIA is most often utilized on a site-specific or project-by-project basis, in which impacts are often easily quantifiable or discretely defined within a narrow geographic area. Less readily apparent—but by no means less important or nonexistent—is the ability of EIA to address the seemingly complex topic of climate change.

III. THE CURRENT STATE OF CLIMATE CHANGE

It is beyond credible scientific debate that climate change, at some rate, is occurring primarily as a result of green-house gas (GHG) emissions.[43] It

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38. *See* ECON. & TRADE BRANCH, *supra* note 21, at 493–524 (a generic or programmatic EIS may also be referred to as a Strategic Environmental Assessment).

39. *Id.*

40. *See* Leroy Paddock, *Environmental Accountability and Public Involvement*, PACE ENVTL. L. REV. 243, 251–52 (2004).

> [T]he growth in government agency responsibility beginning in the early twentieth century led federal and state governments to employ professional managers who became experts in the mission of their agencies. These expert managers where delegated the responsibility for making decisions on behalf of the government and the people. . . . The rapid expansion of government during the New Deal era significantly increased the role of the executive branch of government and its expert managers. . . . Among other programs designed to make government more accountable to the public, Congress passed the Freedom of Information Act in 1966 . . . providing for the preparation and public view of environmental impact statements. Although there are a number of legal requirements related to public involvement in administrative matters, the procedures for public involvement in agency decision-making still rely on the basic APA public participation requirements enacted some 57 years ago. . . notification only a few weeks before an agency intends to issues a permit.

Id.

41. Bradley C. Karkkainen, *Whither NEPA?*, 12 N.Y.U. ENVTL. L.J. 333, 348 (2004).

42. *Id.*

43. *See* UNEP & World Meteorological Org. [WMO], Intergovernmental Panel on Climate Change [IPCC], *IPCC Third Assessment Report, Climate Change 2001: The Scientific Basis (Summary*

is unlikely to bring about an immediate and single cataclysmic event and is far less obvious to the general public than the visible impacts, such as polluted rivers and hanging smog that spurred NEPA's creation.[44] However, its transformative impact upon ecosystems is felt most urgently in the growing intensity of natural hazards. A sea level rise of only a few centimeters over several generations may escape immediate perception, but its related impacts will most certainly affect both the natural ecosystem and those humans who closely depend upon it.

The most important, but less direct, results of climate change will be felt in four primary areas. First, the productivity of natural and managed biological resources and ecosystems—forest, agricultural and marine—will be affected. Second, climate change will also impact the emergence and distribution of infectious diseases in plants, animals, and humans. Third, extreme weather is expected to raise the costs of travel, trade, tourism, and infrastructure—especially in developing nations. Finally, the character and intensity of ambient air pollution and synergies with climate change will be altered (for example, increased heatwaves).[45]

The ultimate impact of climate change will be borne by both human populations and natural ecosystems. There is general scientific agreement on certain aspects of climate change, including at least a meaningful causal link with human activity and on the long-term catastrophic impact.[46] Less certain is the uniform understanding of the exact timing of long-term impacts, with potential impacts forecasted within a general finite range of outcomes.[47] As with any natural science, global ecology rests upon a settled discipline and continues to increase its knowledge base. This area is a targeted priority for research, development, and funding, therefore increasing the frequency of important conclusions and innovations.

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for Policymakers) 9 (2001), *available at* http://www.ipcc.ch/pdf/climate-changes-2001/scientific-basis/scientific-spm-en.pdf [hereinafter IPCC, *The Scientific Basis*] (expressing high confidence of link between human activities and climate change); *see also* UNEP & WMO, IPCC, *IPCC Fourth Assessment Report, Climate Change 2007: The Physical Science Basis (Summary for Policymakers)* (Susan Solomon et al. eds., 2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf (contribution of Working Group I) (addressing new research findings compiled over the six years since the previous IPCC assessment report).

44. *See generally* IPCC, *The Scientific Basis*, *supra* note 43. (outlining long term consequences of climate change).

45. CTR. FOR HEALTH & THE GLOBAL ENV'T, HARV. MED. SCH., CLIMATE CHANGE FUTURES: HEALTH, ECOLOGICAL AND ECONOMIC DIMENSIONS 6 (2005), *available at* http://www.climatechangefutures.org/pdf/CCF_Report_Final_10.27.pdf.

46. *Id.* at 16–18.

47. *Id.* at 9–10, 112–13.

A. International Initiatives: United Nations Framework Convention on Climate Change

Although primarily centered at the international or multilateral level, there are a variety of current mechanisms at all levels of government which address climate change issues. The most familiar of these tools is the Kyoto Protocol. Based upon the overarching United Nations Framework Convention on Climate Change (UNFCCC) Rio agreement, the Kyoto Protocol set forth specific limits for so-called Annex I nations, developed nations which used GHG emissions to fuel their historical industrialization.[48] Annex I nations must achieve an average of 5% reduction below 1990 levels by the year 2012.[49] Additionally, Annex II nations are a smaller subset of these industrialized nations, which must assist in paying developing nations to help meet GHG emissions targets.[50] Nations which miss this target may be subject to further reductions in future agreements.

National goals for non-Annex I nations, which are primarily developing nations and include both India and China, are not specified in the Kyoto agreement. Such nations may be required to limit GHG emissions in future agreements and must currently report GHG inventories each year.[51] Annex I nations may achieve their goals through national strategies, which include international tradable credits (from other projects which are performing below the targets) and the purchase of offsetting mitigation projects (including forestry-based carbon sequestration) in non-Annex I nations.[52] The United States was a signatory to the Rio Declaration and the UNFCCC; however, the Senate has since repeatedly refused to ratify the Kyoto treaty.

The United States, Australia, China, India, Japan, and South Korea are all member nations in the Asia-Pacific Partnership on Clean Development and Climate, which encourages technological solutions to reduce GHG emissions.[53] The Partnership does not bind members to any specific emissions reduction targets[54] and has been criticized as an ineffectual

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48. Laura H. Kosloff, *Climate Change and Sustainable Development: Linking Climate Change Mitigation with Sustainable Economic Development: A Status Report*, 3 WIDENER L. SYMP. J. 351, 354, 362 (1998).

49. *Id.* at 372–74.

50. *Id.*

51. *Id.*

52. *See id.* at 372 (discussing various carbon offset projects).

53. Asia-Pacific P'ship on Clean Dev. & Climate, http://www.asiapacificpartnership.org (last visited Apr. 30, 2008).

54. *Id.*

response to climate change.[55] However, a number of Annex I nations are struggling to meet their targets, and the ultimate success of the Kyoto methodology is far from certain, regardless of the United States' lack of participation in Annex I.[56] Recent discussions in Bali, Indonesia, at the twelfth meeting of the UNFCCC parties in December 2007 provided a roadmap to future discussions in 2009 in Copenhagen for a post-Kyoto agreement. While difficult political barriers remain regarding the definition of emissions reduction targets for both developing and developed nations, there is relatively little global discussion over specific means to implement and achieve such reduction targets.

B. Domestic Possibilities for Regulating CO_2

Regardless of the slow rate of global discussions, the issue of climate change is one of rapidly increasing national political attention. Recently decided at the national level was *Massachusetts v. EPA*, in which numerous states and cities successfully sued the federal Environmental Protection Agency (EPA), claiming that the agency is required to designate CO_2 as a criteria pollutant under the Clean Air Act.[57] Despite the Supreme Court's five to four holding that CO_2 could constitute a criteria pollutant for the purposes of the Clean Air Act,[58] no clear direction to date has been provided by the EPA regarding the regulation of greenhouse gases under the Act. Notably the majority opinion in *Massachusetts* provided a general legal recognition of climate change.[59] While it encouraged regulation of GHGs under the Clean Air Act, the Court provided validation of climate change impacts as a legitimate public threat, even though some of its scientific complexities were not yet fully understood.

The regulation of GHGs under the Clean Air Act would be compatible with the consideration of climate change issues in EIA documents. While potentially overlapping in discrete areas, such as power plant construction, NEPA has a much broader potential jurisdictional reach.[60] Furthermore, in

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55. *See* Amanda Griscom Little, *Pact or Fiction? New Asia-Pacific Climate Pact Is Long on PR, Short on Substance*, GRIST, Aug. 4, 2005, http://www.grist.org/news/muck/2005/08/04/little-pact/index.html (quoting various officials about the pact, including David Sandlow of the Brookings Institution and a former State Department official) ("It's a great lineup of countries; I just wish they were doing something serious . . . Basically these kind of technology-cooperation partnerships have been around for years. This seems to be nothing but repackaging of existing technology partnerships tied up in a bow.").

56. Brahic, *supra* note 20.

57. Massachusetts v. Envtl. Prot. Agency, 127 S. Ct. 1438, 1449 (2007).

58. *Id.*

59. *Id.* at 1443.

60. *See* 42 U.S.C. §§ 7411 (d)(1), (2) (2000); *see also id.* §§ 4331, 4332.

the industry-specific areas where it does regulate, the "command and control" outcome-oriented structure of the Clean Air Act supersedes the more generalized decision-making approach of NEPA.[61]

Although it repudiated the Kyoto Protocol, the George W. Bush Administration concedes that increasing CO_2 levels are the most important cause of climate change. During a 2004 report to Congress, the administration acknowledged that increasing CO_2 emissions from human sources is the most likely explanation for global warming trends.[62] In addition, the administration predicts that the nation's GHG emissions, if current policies stay in place, will rise 43% between 2000 and 2020.[63] This serious policy issue has caught the attention of numerous states within the United States.

Two important state government initiatives are attempting to establish GHG regulations. The Regional Greenhouse Gas Initiative is an agreement between seven northeastern states, which establishes CO_2 emissions limits for power plants and features a tradable credit and offset program similar to the Kyoto Protocol.[64] In addition, California has committed itself to attaining GHG emissions goals similar to those of the Kyoto Protocol.[65] Pending legal action at the state level is further defining California's state initiative, particularly in relation to the California Environmental Quality Review Act (CEQRA), the state-level EIA law. Finally, over 168 mayors, including those from New York City and San Francisco, have committed to ensuring that municipal operations meet Kyoto targets.[66] Recent attention on climate change issues is not limited to the political arena; popular mass media have also provided increased attention to the issues. While considerable apathy and misinformation persists, the topic is often discussed as reality and is generally within the public lexicon.

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61. *Id.*

62. U.S. GLOBAL CHANGE RESEARCH PROGRAM & THE SUBCOMMITTEE ON GLOBAL CHANGE RESEARCH, OUR CHANGING PLANET: THE U.S. CLIMATE CHANGE SCIENCE PROGRAM FOR FISCAL YEARS 2004 AND 2005, at 4 (2004), *available at* http://www.usgcrp.gov/usgcrp/Library/ocp2004-5/ocp2004-5.pdf.

63. Bradford C. Mank, *Standing and Global Warming: Is Injury to All Injury to None?*, ENVTL. L. 1, 15 (2005).

64. Randall S. Abate, *Kyoto or Not, Here We Come: The Promise and Perils of the Piecemeal Approach to Climate Change Regulation in the United States*, 15 CORNELL J.L. & PUB. POL'Y 369, 374 (2006).

65. *Id.*

66. *Id.*

IV. ENVIRONMENTAL REVIEW IN DEPTH

EIA is intended to be utilized as a decision-making tool. The process works best when an agency chooses to actively engage the impact assessment areas and work with stakeholders to shape a project. An understanding of the boundaries and potential of EIA as a decision-making tool is necessary in detailing how the EIA process may incorporate climate change issues. EIA affords government actors (and private applicants) considerable flexibility as a potential problem-solving opportunity, before construction or program implementation. A primary structural challenge underlying EIA (and in particular its application to the issue of climate change) is in the sometimes ambiguous process of distinguishing "significant" and insignificant environmental impacts, as well as the challenge in analyzing cumulative environmental impacts, particularly in which multiple and external sources combine to cause an impact.

A. EIA as a Flexible Decision-Making Tool

While the EIA process may work relatively well as a means of identifying and disclosing scientific data, it is often lacking in its capacity as a decision-making tool.[67] In practice, EIA is often delayed until long after decisions have been made. EIA documents have grown in their length and scientific complexity, but not necessarily in meaning or relevance.

Commentators have written extensively regarding the factors for this insufficiency, including a lingering concept of an expert-based top-down administrative structure, the growing cost and burden of completing an EIS, and that many of the general goals of EIA have already entered the pre-application project design stage.[68] EIA often has a difficult time tackling non-ecological issues outside of natural science. According to Dr. Lynton Caldwell, one of NEPA's principle drafters:

> Persons hired to prepare NEPA analysis are often unprepared professionally to thoughtfully analyze the social and economic effects of environmental impacts. As a result, rather than an integration of these three critical components, a reader is subjected to a data dump of information about such things as the number of

67. Bradley C. Karkkainen, *Toward a Smarter NEPA: Monitoring and Managing Government's Environmental Performance*, 102 COLUM. L. REV. 903, 904 (2002).

68. *Id.* at 904.

> manufacturing plants, bridges, cemeteries, and schools in a given area.[69]

There is often a gap between the dry, technical, and overwhelming approach of EIA analysis (Caldwell's "data dump"), and the impassioned public opinions that often accompany a project. However, increased public participation and professional training can remedy the legal shortcomings. Such deficiencies should be no excuse for overlooking the potential benefits of EIA as a problem-solving tool.[70] While many commentators have urged for more effective and responsive EIA practice, the need for improved implementation does not prevent the application of the EIA process to climate change issues.

Primarily due to defects in the oversight and administration of the EIA process, agency decisions regarding projects and sufficiency of EIA decisions are often litigated. Generally agencies receive considerable judicial deference regarding the substantive sufficiency of their decisions under EIA; more judicial scrutiny is accorded to alleged violations of the statute's administrative procedure.[71] Consequently, agencies have considerable flexibility in how they describe and analyze impacts.[72] In this regard, EIA differs considerably from a stricter "command and control" method of environmental law. The application of EIA to climate change issues may be an advantage for agencies as their stewardship decisions are less likely to be overturned.

This deference and freedom to custom-tailor solutions will produce fewer challenges from agencies and development interests. This deference allows the regulated community an opportunity to design its own stewardship solutions in which participation is likely to result in more active adoption or "ownership" of custom-tailored climate change solutions. Furthermore, EIA can serve as a laboratory for a wide variety of unproven climate change strategies. While the flexibility and deference cause the EIA process to be viewed by skeptical environmentalists as a "paper tiger;" this same elasticity provides a means of "buy in" which is critical to those entities ultimately entrusted with implementing climate change strategies. Though other strict regulatory avenues of climate change

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69. Dinah Bear, *Some Modest Suggestions for Improving Implementation of the National Environmental Policy Act*, 43 NAT. RES. J. 931, 955 (2003). Dinah Bear is the long-time General Counsel to the Federal Council on Environmental Quality.

70. Karkkainen, *supra* note 67, at 904–05.

71. *Id.* at 903.

72. *Id.* at 908.

also may be pursued, EIA offers a feasible opportunity to bridge local action and international goals on a unilateral and project-specific basis.

Finally, the growing complexity of environmental science has created a quandary for agencies: exactly what is the best means to ensure a "hard look" at environmental impacts? Ultimately, an agency is provided great deference in this determination, but such deference is of little consolation in trying to decipher the myriad of potential EIA study categories. Accordingly, some government entities that oversee respective EIAs have issued various forms of technical guidance.[73] This guidance often describes means in considerable detail by which to conduct inventories and ways to define the threshold of significant impact.[74] However, generic guidance is increasingly used and abused by agencies and courts. The guidance is only intended to broadly describe recommendations, and the ultimate decision of environmental impact description belongs to the agency. Too often, rote compliance with generic guidance has become the *de facto* benchmark of avoiding significant impacts, and technical guidance has been used by courts and attorneys as a substitute for the law itself.[75] This interpretation is generally incorrect; significance of an impact is an inherent characteristic relative to the particular situation and project, and is not an arbitrary delineation by an external source.[76] This confusion over EIA's mandate as a "stewardship" statute, rather than a compliance statute, is important to bear in mind in evaluating how to best tackle climate change issues on a project-specific basis.

B. Pinning the Tail: The Elusive Definition of "Significance"

In defining the "significance" of an environmental impact, EIA is often more reflective of political realities than of a precise scientific threshold. Notably, the process fails to put forth a "magical formula or set of fixed objective standards for determining the environmental significance of an action."[77] One of the few EIA cases at the state level, which attempts to define the "significance" threshold, noted that significant impacts occur "whenever more than a moderate effect on the quality of the environment is

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73. *Id.* at 916.
74. *Id.*
75. *Id.* at 917.
76. *Id.*
77. Spitzer v. Farrell, 294 A.D.2d 257, 258 (N.Y. Sup. Ct. 2002) (mem.), *rev'd on other grounds*, 100 N.Y.2d 186 (2003) (quoting GERRARD ET AL., *supra* note 15, § 2.06, at 2-110 (Instead of automatically meeting a predetermined threshold, "the agency must identify and thoroughly analyze the relevant areas of environmental concern (6 NYCRR 617.7 [c] [1]) and determine if the proposed action may have a significant adverse impact on those areas.")).

a reasonable probability."[78] As courts have generally been either unwilling or unable to draw a line in the regulatory sand, "significance" is a term of art set by project decision-makers. One commentator noted that the subjective determination of environmental "significance" is best summarized in the following famous judicial quote from Supreme Court Justice Potter Stewart regarding the definition of pornography: "I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description; and perhaps I could never succeed in intelligibly doing so. But I know it when I see it . . . ."[79]

However subjective, the administrative definition of "significance" should not be "glossed over" or buried in semantics at the expense of the basic purpose of EIA to inform the public and agencies of the environmental footprint of their decisions.[80] While the procedural steps that lead to the finding of significance are formalized, the ultimate decision (the determination of whether a particular action may have a significant effect on the environment) has subjective elements and is within the lead agency's discretion, subject to judicial review. The determination of significance can have a profound effect on whether the action under consideration will ultimately be implemented. While the exercise of this subjective authority often calls for examination of engineering or scientific data, the latitude accorded to decision-makers in reaching the determination is considerable. As the New York Court of Appeals has recognized: "[T]he question of significance is not arrived at solely by gathering data and making calculations; instead, it is ultimately a policy decision, governed by the rule of reasonableness, that the particular facts and circumstances of a project do or do not call for preparation of a full impact statement."[81] Accordingly, the determination of a "significant" environmental impact of GHG emissions is not a matter of exact quantification, but represents a well-reasoned policy judgment.

The widespread impacts of climate change and the massive volume of GHG emissions on a global scale both prevent the determination of a precise data calculation of "significance." However, this does not prevent the application of climate change to the EIA process. From a purely mathematical standpoint, it is a "reasonable probability" that some degree of climate change would result in increased GHG emissions, but far less

78. Norway Hill Pres. & Prot. Ass'n v. King County Council, 87 Wash.2d 267, 278 (1976).

79. GERRARD ET AL., *supra* note 15, § 2.06[2] (quoting Jacobellis v. State of Ohio, 378 U.S. 184, 197 (1964) (Stewart, J., concurring)).

80. Sierra Club v. U.S. Army Corps of Engr's, 772 F.2d 1043, 1053 (2d Cir. 1985).

81. GERRARD ET AL., *supra* note 15, § 3.05 (quoting Coca-Cola Bottling Co. v. Bd. of Estimate of the City of New York, 532 N.E.2d 1261 (N.Y. 1988)).

certain that a "more than moderate" impact would be realized solely from the presence of particular project or policy. Even substantial GHG increases relative to single projects would result in climate or sea level impacts imperceptible to all but the most advanced of scientific measurements.

C. Climate Change as a Cumulative Issue Under EIA

The determination of a "significant" environmental impact must also consider the incumbent duty within EIA to evaluate cumulative impacts. Such impacts may be "individually minor" but, when viewed in totality, "collectively significant."[82] Although EIA does generally avoid consideration of impacts too attenuated to be reasonably linked to the particular project in question, it also requires consideration of cumulative impacts.[83] The case law concerning cumulative impacts indicates that these "analyses are appropriately concerned with impacts that are sufficiently 'likely' to occur and not with the speculation of any impact that can be conceived of or imagined."[84] For example, a global sense of fear may be too speculative or attenuated. However, science does not indicate that the generalized physical and economic impacts climate change are not merely expected, but are indeed "likely" to occur as a cumulative result of GHG emissions. In many cases, the quantification of precise impacts of climate change may be impossible, either because of a lack of data procedure or because specific causation is inseparable from vast cumulative emissions contributions.

When the cumulative impact of a particular undertaking or project exceeds the ability of sensible quantification, EIA is not necessarily exhausted. Rather, guidance and prudence indicate that qualitative analysis may be applied. "Even when the analyst cannot quantify cumulative effects, a useful comparison of relative effects can enable a decision-maker to choose among the alternatives."[85]

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82. 40 C.F.R. § 1508.7 (2006); *see also* Fritiofson v. Alexander, 772 F.2d 1225, 1242–43 (5th Cir. 1985) (illustrating the importance of cumulative-impacts analysis where EA is the only environmental review taken).

83. N.Y. COMP. CODES R. & REGS. tit. 6, §§ 617.11(b), 617.14(f)(3) (2006); *see also* 40 C.F.R. § 1508.27(b)(7) (requiring consideration of the cumulative significance of an action for the purpose of a NEPA analysis).

84. FED. HIGHWAY ADMIN., QUESTIONS AND ANSWERS REGARDING THE CONSIDERATION OF INDIRECT AND CUMULATIVE IMPACTS IN THE NEPA PROCESS, http://nepa.fhwa.dot.gov/ReNEPA/ReNepa.nsf/All+Documents/8AE2449A6338CAB185256CC50047CC24/$FILE/q&aattachment.doc (last visited Apr. 30, 2008).

85. COUNCIL ON ENVTL. QUALITY, CONSIDERING CUMULATIVE EFFECTS UNDER THE NATIONAL ENVIRONMENTAL POLICY ACT 41 (1997), *available at* http://ceq.eh.doe.gov/Nepa/ccenepa/

As a means of distinguishing the severity of cumulative actions, one may rely upon NEPA's regulatory guidance document, which states that the intensity of an impact may be judged by factors such as duration, frequency, and geographic extent, all of which lend themselves to a consideration of climate change as a significant cumulative effect. Notably, EIA does not always mandate the implementation of precise mitigation alternatives, although it does generally require identification and analytical discussion of such alternatives. While EIA frequently concludes with some degree of mitigation, it is entirely conceivable that a cumulative impact could be identified but not mitigated, were such mitigation deemed infeasible.[86]

Under the existing EIA framework, it is reasonable to discuss climate change on a cumulative basis. The underlying intent and policy of EIA also should be analyzed in light of a cumulative analysis of climate change. If EIA practitioners and agency decision-makers are unwilling to identify or disclose the role of their projects within a complex environmental problem, then these statutes have lost much of the luster and social worth once assigned to them. Actions that are individually minor have led to a wide variety of catastrophic scenarios (genocide not the least among them) which could have been prevented had society chosen to recognize that such actions were "collectively significant." However, if we trust a leaderless chorus, we run the social risk of implicitly encouraging the very sort of blameless catastrophe that has repeatedly marked the last century.

That the cumulative impacts of climate change extend beyond domestic territories does not necessarily exempt EIA. NEPA's section 101(f) recognizes that, in addition to domestic environmental impacts, there is a

> worldwide and long-range character of environmental problems and, where consistent with the foreign policy of the United States, [the government may] lend appropriate support to initiatives, resolutions, and programs designed to maximize international cooperation in anticipating and preventing a decline in the quality of mankind's world environment.[87]

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exec.pdf.

86. Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989); *see also* 40 C.F.R. §§ 1502.14(f), .16(e)–(h), 1505.2(c), 1508.25(b)(3) (2007) (noting that the statute does not require adoption of mitigation measures, only an explanation as to why none were adopted).

87. 42 U.S.C. § 4332(f) (2000).

While multiple judicial decisions have generally not supported the extraterritorial application of EIA,[88] the global nature of climate change is not divisible from acute impacts (ecological and otherwise) that would echo within domestic borders. Therefore, climate change is not an exclusively extraterritorial application of EIA as much as it is an acknowledgement of domestic impacts linked to a shared and larger global challenge. Certainly EIA may analyze the impacts of climate change within a discrete area under domestic jurisdiction (such as the coastal area or shoreline of a domestic state). If climate change also has extraterritorial impacts, then that does not prevent an analysis of more discrete domestic impacts.

1. EIA, Causation & Climate Change

EIA has always been a hotspot of controversy and litigation, as it is implanted at the center of the conflict between its own environmental values and the goals of development. These goals are most often espoused by those agencies charged with carrying out its decision-making process. Judge Harold Leventhal, author of the decision in *Natural Resources Defense Council v. Morton*, noted in 1974 that this conflict is both intentional and expected:

> It is the premise of NEPA that environmental matters are likely to be of secondary concern to agencies whose primary missions are nonenvironmental. NEPA looks toward having environmental factors play a central role in the decisions of such agencies. This goal does not mean environmental considerations are to be more important than every nonenvironmental agency mission; questions of housing, energy, and inflation might have equal claim or even higher priority. But it does mean that environmental factors must serve as significant inputs to governmental policy and must be weighed heavily in the decisional balance. It is the function of review under NEPA to ensure that this purpose is served.[89]

Therefore one can rationally extend Judge Leventhal's 1974 argument to the incorporation of climate change within EIA. Under this regulatory

88. Mayaguezanos por la Salud y el Ambiente v. United States, 198 F.3d 297, 301 n.8 (1st Cir. 1999) (listing cases where courts declined to apply NEPA to extraterritorial actions).

89. *See* James Allen, Note, *NEPA Alternatives Analysis: The Evolving Exclusion of Remote and Speculative Alternatives*, 25 J. LAND RES. & ENVTL. L. 287, 310 (2005) (quoting Harold Leventhal, *Environmental Decisionmaking and the Role of the Courts*, 122 U. PA. L. REV. 509, 515 (1974)).

scheme, climate change need not outstrip or control other more primary agency development goals. Climate change considerations need not halt the march of development. EIA does not mandate specific "caps" to pollution or any other specific outcome, provided that whatever outcome is produced is one which generally well reasoned and provides for some degree of stewardship consistent with the broad goals of EIA. An agency must, in accordance with Judge Leventhal's discussion of judicial review, reach a decision which would satisfy a reviewing court that

> the decision reached is the product of 'reasoned discretion' in light of 'ascertainable legislative intent.' 'The court exercises this aspect of it supervisory role with particular vigilance if it becomes aware, especially from a combination of danger signals, that the agency has not really taken a hard look at the salient problems, and has not genuinely engaged in reasoned decisionmaking.'[90]

EIA alone need not mandate compliance with any particular target or emissions level, as long as the agency in question has provided a reasoned analysis and discussion of relevant impacts. Consistent with the overwhelming judicial treatment of EIA, Judge Leventhal correctly notes that EIA affords the agency relative liberty to design its own flexible solutions, provided that a strict process is followed which affords a "hard look" at environmental impacts.[91] Utilizing this standard of administrative deference mixed with rational analysis, it would be difficult for an agency to deny that an increased rate of GHG emissions is not a "salient" environmental problem, nor that it is unable to conduct a genuine, reasoned analysis of the issue. Climate change has immense challenges for the nations (and people) of the world. Yet "reasoned decision-making" and rational management is well within grasp and can permit at least some degree of management of the GHG emissions relative to population growth and development.

Moreover, causation is an important factor in EIA. Impacts which are too broad, vague, or attenuated often are excluded from the formal decision-making process. For example, the Supreme Court noted that the indirect psychological problems potentially brought about by nuclear power, such as anxiety and fear, were "too remote from the physical environment" to justify its inclusion within EIA analysis.[92] The Court noted

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90. *Id.*
91. *Id.*
92. Metropolitan Edison Co. v. People Against Nuclear Energy, 460 U.S. 766, 774 (1983).

specifically that "some effects that are 'caused by' a change in the physical environment in the sense of" 'but for' causation, will nonetheless not fall within section 102 because the causal chain is too attenuated."[93]

Specifically, the relationship between the environmental effect and the proposed action must have "a reasonably close causal relationship between a change in the physical environment and the effect at issue. This requirement is like the familiar doctrine of proximate cause from tort law."[94] In analyzing the relationship between a proposed action and impacts to climate change, a court "must look to the underlying policies or legislative intent in order to draw a manageable line between those causal changes that may make an actor responsible for an effect and those that do not."[95] Finally, the Court reiterated that the extent of this causation "must be manageable" and limited to the extent that agencies must be able to complete the goal of ensuring informed decision-making.[96]

The causation element pertaining to the wide-ranging impacts of climate change is problematic unless it is understood within its proper legislative context. Proximate causation would provide an easy loophole in which the ultimate conclusion would be that if "everyone" or every GHG emission causes climate change, then no one project could be pinned with a catastrophic burden. Yet the application of climate change issues within an EIA context need not assign the "but for" impact of global fear entirely to a single action (as the plaintiffs would have in *Metro Edison*), but may instead address a cumulative contribution to a large-scale problem to the extent that climate change informs agency decision-making. Such informed decision-making is practiced by many actors and follows a well-reasoned analytical path. Consideration of climate change is well within the underlying policy and intent of EIA as addressing a broad range of potential environmental categories or cumulative impacts, rather than a specific, enumerated list of criteria pollutants.

2. Making the Case: EIA and Climate Change

EIA has the strong potential to be a useful tool in addressing climate change. As a secondary approach, it ensures that other governmental efforts that address existing GHG emissions will not be unraveled by forthcoming (and inevitable) economic development and population growth. In addition, EIA is a process already familiar to many national

93. *Id.*
94. *Id.*
95. *Id.* at 774 n.7.
96. *Id.* at 776.

governments, and it does not require the lengthy creation of a single global agreement. Finally, rather than creating a top-down approach, EIA allows agencies to custom-tailor solutions based on their own local or situational needs. In so doing, EIA can serve as an important link between international standards and local decisions.

3. Existing Guidance

Merely recognizing the philosophical potential for EIA to serve as a means of incorporating climate change issues does not provide real evidence of the realistic feasibility its application. Instead it is necessary to examine both existing guidance documents and best practices that encourage a more deliberate approach to incorporating climate change issues. Once this approach is taken, it is evident that EIA is not only a valid avenue, but a desirable means by which to balance increasing global development with the growing threat of climate change.

4. The CEQ Draft Guidance Document & Congressional Interest

In 1997, the President's Council on Environmental Quality issued a draft guidance document regarding the incorporation of climate change into NEPA documents.[97] While the guidance document is largely silent about recommendations for specific analytical processes for this inclusion, it nonetheless provides a philosophical and legal foundation for an EIA process inclusive of climate change. There is little recorded information regarding the motivation or subsequent treatment of climate change issues by federal agencies or private applicants.[98] This failure to finalize or implement this guidance document underscores the importance of developing specific procedural recommendations, as well as the incorporation of climate change analysis into project-specific EIA documents. Had this issue been pursued with greater fervor, it is less likely that the United States would be lagging behind the global community in regards to climate change planning.

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97. Memorandum from Kathleen A. McGinty, Chairman, Council on Envtl. Quality, to Heads of Federal Agencies, Draft Guidance Regarding Consideration of Global Climatic Change in Environmental Documents Prepared Pursuant to the National Environmental Policy Act (Oct. 8, 1997), *available at* http://www.mms.gov/eppd/compliance/reports/ceqmemo.pdf [hereinafter CEQ, Draft Guidance].

98. The draft guidance was included in at least one federal policy EIS shortly after its issuance. *See* TETRA TECH, FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE CONVEYANCE AND TRANSFER OF CERTAIN LAND TRACTS ADMINISTERED BY THE DEPARTMENT OF ENERGY AND LOCATED AT LOS ALAMOS NATIONAL LABORATORY, LOS ALAMOS AND SANTA FE COUNTIES, NEW MEXICO 17-9 (1999), *available at* http://www.eh.doe.gov/nepa/eis/eis0293/Chapters/Chap-17.pdf.

In the draft guidance document, the CEQ noted first that based upon scientific evidence, in particular the IPCC's scientific conclusions, climate change was a "reasonably foreseeable" impact of GHG emissions and should be considered in NEPA documents.[99] However, federal agencies were granted a very long leash in determining exactly how this goal would be achieved as "each agency must exercise its own independent judgment and discretion . . . to determine the extent to which it should assess global climate change in its NEPA documents."[100] While this statement could hardly be considered a resounding mandate, it also does not completely excuse a failure to consider the issue and does not circumvent NEPA's most basic goal of encouraging a "hard look" at environmental impacts, even when cumulative and indirect. Rather, the draft guidance document may be viewed as an incomplete statement of responsibility. The ensuing decade has provided the environmental and public affairs communities with more experience in the specifics of climate change planning.

The 1997 draft guidance document noted specifically that climate change should be considered by agencies at two levels:

> [T]here are two aspects of global climate change which should be considered for NEPA documents: (1) the potential for federal actions to influence global climate change (e.g. increased emissions or sinks of greenhouse gasses) and (2) the potential for global climate change to affect federal actions (e.g. feasibility of coastal projects in light of projected sea level rise).[101]

Had CEQ's draft guidance document been implemented, agencies would have had to consider climate change as a true "cross cutting" issue. However, the draft guidance document from CEQ is less than encouraging in its recommendations that climate change only be considered at a broad, programmatic level.

First, CEQ admitted that "clearly, both projects and programs proposed by federal agencies, including permits issued by federal agencies, can cause increased emissions or changes in sinks related to greenhouse gases."[102] Despite this admission, CEQ suggested the following:

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99. CEQ, Draft Guidance, *supra* note 97.
100. *Id.*
101. *Id.*
102. *Id.*

> [A]nalysis of the impacts of such emissions or sinks at the project level, however, would not provide meaningful information in most instances. Efforts would be better spent in assessing federal programs which may effect emissions or sinks of these gases. This type of approach recognizes that individual projects may increase greenhouse gas emissions by only marginal amounts, but that the cumulative effect of such emission could be more dramatic.[103]

The draft guidance document is not wholly incorrect. Analytical efforts at the programmatic or policy level would always result in a more effective use of resources and would likely result in a more meaningful and sweeping achievement of numerous environmental goals.[104] The challenging area of EIA would be less often repeated on the more emotional local level and agencies could set overarching parameters long before project proponents are heavily vested in the design or pre-approval phase at which EIA is most often carried out.[105] The use of EIA as an effective early planning and policy tool holds true not just for climate change, but for nearly every issue considered under the EIA umbrella. Despite this widespread recognition of

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103. *Id.*

104. Matthew C. Porterfield, *Agency Action, Finality and Geographical Nexus: Judicial Review of Agency Compliance with NEPA's Programmatic Environmental Impact Requirement After* Lujan v. National Wildlife Federation, 28 U. RICH. L. REV. 619 (1994). For a variety of reasons enumerated in *Lujan*, it is exceedingly difficult to challenge an agency's failure to prepare a generic or programmatic EIS. In particular, specific commitments are typically made on a project-specific basis, meaning that agencies may delay a finding of "final agency action" until many years after substantive policy decisions have been achieved.

> The Lujan decision has been interpreted by courts and commentators in a manner that raises three closely related problems for litigants attempting to obtain judicial review of agency compliance with the programmatic EIS requirement. First, and most significantly, Lujan has been read to hold that an agency's decision not to prepare a programmatic EIS is unreviewable because programs are too broad in scope to constitute reviewable agency action under section 702 of the APA. Second, even if it is accepted that an agency's decision not to prepare a programmatic EIS constitutes reviewable agency action, Lujan has been interpreted to hold that an agency's compliance with NEPA is not 'final' for the purposes of section 704 until some specific commitment of resources has been made. Third, Lujan has been interpreted as holding that section 702 of the APA requires environmental plaintiffs to demonstrate that they use specific areas of land affected by government action. This requirement makes it difficult for environmental plaintiffs to establish standing to challenge the government's failure to prepare programmatic EISs affecting vast areas. . . . however, each of these arguments is based on a fundamental misconception about the nature of the agency action which is subject to review under NEPA.

Id. at 643.

105. Tripp & Alley, *supra* note 24, at 81–82.

the benefits of EIA as a planning tool, agencies have been generally reluctant to take a hard look at the environmental footprint of their core policies, and, despite the inevitable repetition which results, generally prefer to relegate this consideration at the project level, and often in the very late planning stages.[106]

In addition, efforts to litigate the implementation of EIA at the policy level have been generally unsuccessful. As a result, the only meaningful way to address an environmental issue under EIA is at the project level. In addition, increases of GHG emissions, having only a cumulative impact, does not preclude their valid consideration as an environmental impact. In many or most cases, valid data may still be readily obtained at the project level. GHG emissions are frequently quantifiable.[107] CEQ's draft guidance document on climate change is best considered to be an early validation of this application, but also one which was limited at the time of its development by the barely emerging status of climate change planning.

However, CEQ's 1997 draft guidance document was preceded by an earlier recognition of the applicability of EIA to climate change, and may be rooted in earlier CEQ and legislative actions during the twilight of the Reagan Administration. In an appropriations report on CEQ in 1988, the U.S. Senate Committee on Environment and Public Works noted that

> [t]he greenhouse effect and stratospheric ozone depletion are two problems of increasing international concern. Committee hearings on these issues revealed the fact that U.S. Government agencies are not adequately assessing Federal actions and policies that may contribute to these problems. NEPA provides both the legal basis and procedural framework for assessing the potential effects of Federal activities on the global climate and ozone layer which may contribute to increases in atmospheric concentrations of ozone depleting substances or greenhouse gases which can alter the thermal balance of the environment and lead to changes in climate, rising sea levels, and adverse effects on health and the environment, are subject to NEPA and must be subjected to the NEPA process.[108]

Preceding this legislative statement was correspondence in 1986 between Senator John H. Chafee of the Committee and A. Alan Hill, Chairman of

106. *Id.*
107. IPCC, *The Scientific Basis*, *supra* note 43.
108. S. REP. NO. 502, 100th Cong. 2d Sess. 2 (1988).

the CEQ.[109] The letter requested that the CEQ instruct federal agencies concerning their statutory duty to use NEPA to address climate change and to provide agencies with background material to that effect.[110]

In 1987, Chairman Hill responded with an acknowledgement of this responsibility within NEPA and noted three federal agency EIS reports that analyzed climate change and atmospheric issues.[111] The EIS reports were dated 1975, 1977, and 1978; this suggests both an early federal awareness of climate issues as well as an ability to include a well-reasoned (if brief) analysis of the issue within a project-specific EIS, even when the scientific boundaries of climate change were still very much in flux.[112]

In 1988, after eighteen months of public meetings, the CEQ developed draft guidelines for the integration of NEPA analysis and climate change issues (the status of their issuance is unknown).[113] Presumably, these guidelines were related to the 1997 CEQ issuance of draft guidelines. Also that same year, the EPA commented on a draft EIS concerning rulemaking for independent power producers, noting that the EIS was insufficient as it "contains no consideration of 'global warming' issues."[114] Although apparently forgotten long ago in the zeal to pursue (or resist) the single-solution approach of the Kyoto Protocol, it is evident that not only do the boundaries of EIA demonstrate a theoretical basis for including climate change, but actual administrative actions show an early assumption of this duty.

In 1990, scientists from the U.S. Department of Energy's Oak Ridge National Laboratory published a policy research paper entitled *Global Climate Change and NEPA Analysis*, which contained a detailed examination of how federal agencies could integrate climate change into their decision-making and approvals process.[115] Although the policy options and scientific understanding surrounding climate change have advanced in the two decades following the paper's publication, the paper nonetheless presents a compelling analysis, with much information still relevant to today's decision-makers and litigants.

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109. Letter from Senator John H. Chafee to A. Alan Hill, CEQ Chairman (Sept. 12, 1986), *quoted in* Jennifer Woodward, Comment, *Turning Down The Heat: What United States Laws Can Do To Help Ease Global Warming*, 39 AM. U.L. REV. 203, 224 n.160 (1989).

110. *Id.*

111. *Id.*

112. *Id.*

113. *CEQ Developing Guidance*, [Current Developments] ENV'T REP. (BNA) No. 26, at 1243 (Oct. 28, 1988).

114. Environmental Impact Statements and Regulations, 53 Fed. Reg. 40,269 (Oct. 14, 1988).

115. *See* Robert Cushman et al., *Global Climate Change and NEPA Analysis*, *in* ENVIRONMENTAL ANALYSIS: THE NEPA EXPERIENCE 442 (1993).

The paper first notes that an action under an agency's consideration, "ranging from a single activity to the implementation of broad federal policy, may affect global climate, either individually or in consequence with other actions," and that the action under consideration may itself be affected by the impacts of climate change.[116] In addition, the paper briefly explains the sources of GHG emission and the broadly-projected impacts, including an increased frequency in storms, temperature rise, and a sea level rise between one and three meters in the next century.[117] The authors recognized that NEPA had inherent limitations as applied to climate change; specifically, that it was unable to address the reduction of existing GHG levels, its lack of mandated follow-up or oversight during mitigation, and its failure to mandate specific mitigation or environmentally-friendly outcomes.[118]

"Finally, NEPA is written very broadly so that it can be construed as to require consideration of many topics not recognized as important in the late 1960s, global climate change being just one example. However, such broadening could be subject to court challenge."[119] While still open to litigation, NEPA indeed was drafted to include a broad laundry list of environmental issues.

After recognizing its limitations, the authors reviewed several of the congressional bills proposed prior to 1990 which discussed climate change in some form, including eighteen bills which linked climate change and NEPA.[120] These bills ranged from general NEPA amendments to specific requirements for federal agencies to consider extraterritorial actions under NEPA.[121] The report also summarized CEQ's 1988 draft guidance document on climate change and NEPA.[122] Even though the documents remained in draft form, by 1989 the CEQ finally received comments from federal agencies.[123]

Contained in the 1988 draft guidance document, the CEQ determined that "global warming is a 'reasonably foreseeable' impact of emissions of greenhouse gases, and that this impact must be considered in future NEPA

116. *Id.* at 443.
117. *Id.* at 444–45.
118. *Id.* at 448–49.
119. *Id.* at 449.
120. *See id.* at 449–51 (noting there were 120 such bills reviewed).
121. *See id.* (adding that the authors considered project impacts on the global environment either generally or specifically in terms of geographic or thematic categories).
122. *See id.* at 451 (noting that the report deliberately remained in draft form per the directive of the outgoing Reagan administration because of both litigation concerns for existing EIS documents and a lack of tools which measured a project's impact on climate change).
123. *Id.*

documents."[124] The result would have required agencies to "immediately" review and assess "the extent to which their activities contribute to the emission of greenhouse gases and, thus, to global climate change."[125] In addition, the CEQ noted that existing NEPA documents would be in need of potential supplemental or "new programmatic documents" to conform to the proposed guidance document on climate change.[126]

The CEQ further noted that agencies should focus their analysis on the impacts of their broader programs, and in particular the thematic areas of energy, forestry, and transportation.[127] The CEQ recommended the focus on long-range actions because analysis of "individual projects would not provide meaningful information."[128]

In the intervening two decades since the CEQ's initial draft guidance document, scientific understanding progressed greatly. In the late 1980s, climate change was the realm of scientists who were only starting to understand the breadth of contributing causes. However, there is now a far greater scientific and social understanding of climate change. We now know it may be successfully addressed through both the broadest of global policies and the most personal of lifestyle choices.

Subsequent to the CEQ report, the U.S. Department of Energy's report analyzes in further detail how climate change may be addressed through the NEPA process. Noting that the consideration of "the climate change issue involves challenges not typically associated with impacts evaluated in NEPA documents," the authors further analyzed the complexity of this task and suggested potential solutions.[129]

First, the report explained that it may be difficult to tell the decision-maker about an action's impact on climate change in quantitative terms.[130] For example, the authors suggest that an action that had less than a 1% increase in emissions "would undoubtedly have a negligible effect on climate," and thus it would not need to undertake any further emissions analysis.[131] At the time of the paper's publication, the UNFCC had not yet met, and the now well known 1990 Kyoto emissions levels threshold were not in place. Even without such a consensus benchmark, the authors suggested that EIA could be used to at least prevent a net increase in emissions, and that the EIA's "greatest realistic hope is that decision-makers

124. *Id.*
125. *Id.*
126. *Id.* at 452.
127. *Id.* at 453.
128. *Id.*
129. *Id.* at 452.
130. *Id.*
131. *Id.* at 454–55.

will minimize the types of actions that change climate."[132] Two decades later, many decision-makers are just starting to search for tools which will allow them to accomplish that goal.

Finally, the authors discuss the scale of project or program that NEPA activities should apply climate change analysis. While noting that the 1988 CEQ draft guidance was correct in stating that broad government programs would be more likely than site-specific actions to have climate change impacts, the authors noted that site-specific projects could also have significant adverse impacts on greenhouse gas emissions, and that "the classification of an action as a program or project by itself is not an adequate criterion for screening actions for climate change analysis" but that such analysis should be applied on the basis of increased levels of emissions.[133] "The treatment of climate change in project-specific documents might be an acceptable option," as well as a more planning practice, if federal agencies first undertook a cumulative impact assessment of their broader policies, and then subsequently linked or tiered this policy goal directed to site-specific projects or actions. NEPA documents should also consider, in their description of "affected environments," the extent to which climate change would or could change the "baseline" environment in the future, and, if necessary, evaluate how the proposed action could adapt to the impacts of climate change.[134] NEPA documents should also consider "affected environments" and the extent to which climate change would or could change the "baseline" environment in the future, and if necessary, evaluate how the proposed action could adapt to the impacts of climate change.[135]

While an imperfect application, the authors suggested that climate change analysis within NEPA activities would result in more informed decisions, and that climate change itself "is a result of a series of individually small actions, and the 'solution'—if there is one—will likely result from a series of separate steps."[136]

Well ahead of its time, the Department of Energy's paper accurately predicts the challenges faced by contemporary decision-makers. Climate change appears, to be beyond the grasp of all but a handful of international negotiators. However, if climate change results from the cumulative GHG emissions of many "small scale" projects or programs, then it is at that level of decision-making that such emissions can be best analyzed. Seeing past

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132. *Id.* at 455.
133. *Id.*
134. *Id.*
135. *Id.* at 460.
136. *Id.*

the subsequent changes in global consensus and scientific understanding of climate change, the Department of Energy's paper evidences that the integration of climate change planning and EIA activities is not a radical or unrealistic concept, but a very real legal obligation acknowledged long ago.

Recently, the incorporation of climate change analysis within NEPA has again garnered interest in the Senate. The proposed Global Warming Pollution Reduction Act of 2007 (Senate Bill 309) was introduced in January 2007 and is still pending in the Senate's Committee on Environment and Public Works. Ironically, in addition to other regulatory actions, Section 8 of the Bill requires that federal agencies "shall consider and evaluate (1) the impact that the Federal action or project necessitating the statement or analysis would have in terms of net changes in global warming pollution emissions; and (2) the ways in which climate changes may affect the action or project in the short term and the long term." [137]

Senate Bill 309 is one of several proposed climate change bills, and it has substantial political support. Although it is unlikely to be passed without a legislative override of a presumed presidential veto, the bill nonetheless foreshadows a changing political tide on the issue of climate change. While its NEPA provision is only a minor goal of the bill, it is also interesting to note its similarity with the Senate Committee's less formal affirmation of the same topic 20 years earlier. While such legislation would obviously bolster the treatment of climate change under NEPA, it is also somewhat redundant and indicative of the ineffectiveness in relying solely upon broad Congressional intentions.

5. Litigation Involving EIA and Climate Change

Any analysis of climate change issues in the United States should look toward ongoing litigation in addition to legislative intent and the boundaries of EIA. An examination of existing litigation highlights the issues most likely to be raised during future challenges to EIA documents on the basis of climate change.

Although one commentator claims that EIA-related climate change litigation could increase substantially, EIA litigation has only just begun.[138] The issue of EIA as a valid topic of climate change was litigated in the

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137. Global Warming Pollution Reduction Act, S. 309, 110th Cong. (2007), *available at* http://sanders.senate.gov/files/GlobalWarming011207.pdf.

138. Blake R. Bertagna, *"Standing" Up for the Environment: The Ability of Plaintiffs to Establish Legal Standing to Redress Injuries Caused by Global Warming*, 2006 BYU L. REV. 415, 465 (2006) (claiming that NEPA "is the principal statute under which global warming plaintiffs will probably bring their personal injury claims").

District Court for the Northern District of California in *Friends of the Earth v. Watson*, a case in which NGOs and the cities of Boulder, Colorado; Oakland, Santa Monica; and Arcata, California, sued the Overseas Private Investment Corporation and the Export-Import Bank.[139] The plaintiffs claimed that the two organizations were indirectly responsible for 7.3% of global GHG emissions, and directly responsible for 1% of such emissions.[140]

The initial decision rejected the banks' motion for summary judgment since the banks lacked sufficient proof of an "injury in fact," noting that plaintiffs need not demonstrate proof of imminent harm to the degree that so doing would require them to conduct the very review they seek to have the agency undertake.[141] The commentators also noted the potential significance of the decision, remarking, "if the court adheres to its preliminary views on NEPA, it would represent a real step forward in forcing U.S. agencies to either acknowledge the link between climate change and support for new emission sources in developing countries or to risk judicial invalidation of the their projects because of incomplete NEPA reviews."[142]

Subsequent arguments in the case, made in March of 2006, set forth much of the framework needed in applying climate change as an EIA category. First, the plaintiffs argued that NEPA requires consideration of all reasonably foreseeable environmental effects including direct and indirect effects.[143] The plaintiffs reminded the court such indirect effects are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable and encompass effects on air and water and other natural systems, including ecosystems.[144] The settled threshold of reasonably foreseeable in relation to NEPA is that such an impact would be

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139. Friends of the Earth v. Watson, Doc. No. 02-4106, 2005 WL 2035596 (N.D. Cal. Aug. 23, 2005); *see also* Center for Biological Diversity v. Nat'l Highway Traffic Safety Admin., 508 F.3d 508, 548–49 (7th Cir. 2007) (holding that in issuing national fuel efficiency standards, the National Highway Traffic Safety Administration was required to fully consider climate change under NEPA).

140. *See* Friends of the Earth v. Mosbacher, 488 F. Supp. 2d 889, 902 (N.D. Cal. 2007); (forecasting that the forthcoming decision promises to have substantial impacts upon both climate change and EIA practices); s*ee also* Defendant's Cross-Motion for Summary Judgment Memorandum at 1 (March 31, 2006), *id.* OPIC and Ex-Im fund or financially assist projects, including fossil-fuel-fired power plants, which result in over 260 million tons of CO_2 annually, which is approximately 1% of global annual emissions. Indirectly, the two organizations finance oil pipelines which result, indirectly, in oil consumption and annual emissions impact of over 7% of global emissions. *Id.*

141. *Watson*, 2005 WL 2035596, at *2.

142. Stephen L. Kass & Jean M. McCarroll, *Litigating Climate Change via State Regulations*, *Federal Courts*, N.Y. L.J., Apr. 28, 2006, *available at* http://www.clm.com/publication.cfm/ID/75.

143. *Mosbacher*, 488 F. Supp. 2d at 892.

144. *Id.* at 894.

"sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision."[145] The plaintiffs' argument rested upon settled NEPA case law reiterating regulatory guidance in noting that "when the nature of the effect is reasonably foreseeable but the extent is not . . . the agency may not simply ignore the effect."[146]

The *Friends of the Earth v. Watson* opinion also relied heavily upon cases from the Southern District of California as well as the Eight Circuit. In *Border Power Plant Working Group v. DOE*, the District Court for the Southern District of California required DOE to disclose and evaluate the GHG emissions of a single 500 MW gas turbine power plant, despite its relatively minor impact on climate change.[147] In *Mid States Coalition for Progress v. Surface Transportation Board*, the Court of Appeals for the Eighth Circuit found that construction of hundreds of rail lines, with the purpose of increasing coal extraction in Wyoming would be required under NEPA to analyze the environmental impacts from increased coal usage.[148]

However, the application of NEPA to climate change analysis was not a central question in either *Mid States* or *Border Plant*, and the judicial decisions do not analyze this mandate in extensive detail. The District Court for the Southern District of California in *Border Plant* noted NEPA is not necessarily limited to only atmospheric pollutants listed under the Clean Air Act, and that an agency has the affirmative burden of providing evidence that GHG pollutants fall outside of NEPA's boundaries:

> Although the agencies state that plaintiff has provided no authority for the proposition that it must consider the impacts of carbon dioxide and ammonia, neither do the agencies provide reasoning or legal authority for their proposition that they need not disclose and analyze these emissions merely because the EPA has not designated them as criteria pollutants. In fact, one of defendants' consultants advised the agencies that all criteria and non-criterion air pollutants relevant to the proposed action should be assessed.[149]

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145. Mid States Coal. for Progress v. Surface Transp. Bd., 345 F.3d 520, 549 (8th Cir. 2004) (quoting Sierra Club v. Marsh, 976 F.2d 763, 767 (1st Cir. 1992)).

146. *Id.*

147. Border Power Plant Working Group v. Dep't of Energy, 260 F. Supp. 2d 997, 1026–29 (S.D. Cal. 2003).

148. *Mid States Coal. for Progress*, 345 F.3d at 548–50.

149. *Border Power Plant*, 260 F. Supp. 2d at 1028.

The defendants in *Border Power Plant* have argued that the connection between localized impacts and financing decisions encouraging GHG emissions is scientifically speculative such that the connection is so remote there can be no meaningful NEPA analysis of potential impacts on the United States.[150] However, the plaintiffs have noted that climate change impacts need not be precise or rigidly quantified, but only useful for the broad purposes of decision-making, such that one could conclude that a reduction in GHG emissions would be beneficial in addressing climate change. The plaintiffs argued that the connection between the proposed action and impact need only be clear enough to prove the utility of the analysis.[151]

In March of 2007, Judge Jeffrey White of the Northern District of Court of California granted and denied in part the earlier motion to dismiss. Despite the earlier arguments about the application of climate change to environmental impact assessment, Judge White left treatment of the issue to a single footnote, stating that although the Overseas Private Investment Corporation and the Export-Import Bank argued that the approval of additional GHG output would be "too remote and speculative to be considered for purposes of NEPA" the defendants' own reports did not dispute that GHGs contribute as a dominant force to climate change; and accordingly "it would be difficult for the Court to conclude that Defendants have created a genuine dispute that GHGs do not contribute to global warming."[152]

However, the Judge concluded that there was insufficient evidence to determine if the agency actions were the "but for" legal cause of the additional GHG releases or if such actions would have occurred regardless of agency activity or approval.[153] Without such a fact-specific determination, Judge White was unable to determine if the actions of the Overseas Private Investment Corporation and the Export-Import Bank constituted "legally relevant" causes of the GHG emissions increase. Thus,

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150. *Id.* Defendants' memorandum discusses *Dep't of Transp. v. Public Citizen*, 541 U.S. 752 (2004), which notes that although the "'but for' causal relationship is insufficient to make an agency responsible for a particular effect . . . , NEPA requires 'a reasonably close causal relationship' between the environmental effect and alleged cause." In addition, "where an agency has no ability to prevent a certain effect due to its limited statutory authority over the relevant actions, the agency cannot be considered a legally relevant 'cause' of the effect." *Public Citizen*, 541 U.S. at 770.

151. *See* Sierra Club v. Marsh, 769 F.2d 868, 878 (1st Cir. 1985) (noting that the question asked under in the first circuit's opinion is "can one describe [the impacts] 'now' with sufficient specificity to make their consideration useful").

152. Friends of the Earth v. Mosbacher, 488 F. Supp. 2d 889, 918 n.19 (N.D. Cal. 2007).

153. *Id.*

the relevant arguments in the *Friends of the Earth* case remain largely unresolved and are likely to be re-litigated in the near future.

Addressing the decision the day after the *Friends of the Earth* decision was handed down, attorneys representing both the plaintiffs and defendants spoke at an academic symposium. Wrestling with the complexities of integrating climate change and NEPA activities, Geoffrey Hand, the plaintiff's attorney, wondered if there was a precise percentage of emissions that would either require legal standing (by specialized injury) or a threshold trigger for further analysis.[154] Mr. Hand declared such a numbers game to be a "slippery slope," and, echoing the conclusions of the Senate committee in 1988, that NEPA's application to climate change "is a rule of reason . . . you need to look at the underlying purpose of NEPA which is to inform agency decision-making, and think about what authority the agency that is acting has to act on that information—if they evaluate the impacts [on climate change then] what can they do at that point."[155] To Mr. Hand, there is a valid legal argument that "any federal project that contributes to GHG emissions that is approved or financed or permitted by the federal government" would be subject to at least an environmental assessment.[156] To the plaintiffs, such an exercise in reviewing indirect impacts would, not be a fruitless paper chase, but instead a valuable opportunity to reduce overall GHG emissions.[157]

Kevin Haroff, a private attorney speaking on behalf of the Department of Justice (and the author of a recent law review article on the topic), presents a different view—that only a single, unified program can address climate change, and that the application of climate change to NEPA for a site-specific project "is impossible to do . . . we have to look at each case, on a case by case basis, to determine whether or not an environmental review is going to be necessary—I don't think that is going to happen."[158] Such a review of cumulative actions, he notes, would lack a geographic or temporal nexus.[159] To Mr. Haroff, EIA is limited as a tool to address climate change because such an application was not contemplated at the time of the passage of these laws, and such an application fails to address climate change in a comprehensive manner integrated with foreign

154. National Environmental Policy Act Litigation Discussion Session, Univ. of San Francisco Law Review Seminar: The Domestic Response to Global Climate Change (2007) (notes of conference proceedings on file with author).

155. *Id.*

156. *Id.*

157. *Id.*

158. *Id.*

159. *Id.*

policy.[160] Finally, he notes that the Department of Justice claims that the application of climate change within EIA documents would bring federal activities to "come crashing down because it would be bogged down in the environmental review process" and that, as a result, such an application "is completely impracticable."[161]

The existing U.S. NEPA litigation over climate change issues within an EIA context overlooks many of the wider philosophical and legislative boundaries (including the 1988 Congressional Report). However, it is clear that, although proximate causation is likely to be a central issue in any EIA litigation relating to climate change, the scant precedent does not bar such an application.

In addition, climate change has been addressed most substantively in several California EIA actions, which accompany the proposed adoption of regional long-range transportation and growth plans. These lawsuits allege that, given the state adoption of a climate change strategy with specific GHG targets, GHG emissions must be analyzed by relevant EIA documents prepared under CEQA, the state EIA law.

According to Dr. Tony Held of the Jones & Stokes Consultancy, "numerous metropolitan planning organizations have already been notified by the Attorney General of California that global warming analysis needs to be meaningfully addressed as part of the long-term transportation and regional development planning process."[162] Specifically, the State Attorney General and the non-profit Center for Biological Diversity have initiated separate litigations against San Bernadino County, pending in San Bernadino County Superior Court.[163] The San Bernadino lawsuits pertain to an EIA document for the County's General Plan Update, which allegedly fails to reconcile planned population growth with increased GHG emissions.[164] A recent settlement included an acknowledgement by the County that GHGs had to be considered in the EIA analysis, and a promise to therefore incorporate climate change impacts into its comprehensive planning.[165]

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160. *Id.*

161. *Id.*

162. Jones & Stokes, Climate Change Focus Group, http://www.climate-change-eis.com/index.html (last visited Apr. 30, 2008).

163. TONY HELD ET AL., ADDRESSING CLIMATE CHANGE IN NEPA AND CEQA DOCUMENTS (2007), *available at* http://www.climate-change-eis.com/docs/JonesAndStokesClimateChangeCeqaNepa_Aug_2007.pdf.

164. *Id.*

165. Confidential Settlement Agreement, California v. County of San Bernadino, Case No. CIVSS 0700329 (Sup. Ct., San Bernardino, Aug. 28, 2007), *available at* http://ag.ca.gov/cms_pdfs/press/2007-08-21_San_Bernardino_settlement_agreement.pdf.

Two similar lawsuits filed by the Center for Biological Diversity against the California cities of Desert Hot Springs and Banning are pending at the Riverside County Superior Court, and allege inappropriate EIA documents for housing subdivisions, which also fail to analyze GHG emissions.[166] While the path through the courtroom might be painfully slow, it is possible that the California cases could have a non-binding impact in other jurisdiction's EIA cases regarding climate change, should the California courts address topical (rather than procedural) issues. A third, similar lawsuit was recently filed in a Minnesota state district court during September 2007, alleging that an EIS prepared under the Minnesota Policy Act (a "mini NEPA" state law) for a proposed taconite mining and steel mill operation. The lawsuit, *Minnesota Center for Environmental Advocacy v. Holsten*, alleges that the EIS was inadequate because it failed to address significant environmental impacts related to a growth in GHG emissions, and that this failure frustrated a state policy to reduce statewide GHG emissions.[167]

Circumstantial evidence indicates that forthcoming EIA documents may increasingly have to tackle the issue of climate change analysis. In its comments about the proposed scope of an EIA document for the rezoning and redevelopment of a former industrial area in Brooklyn, New York, the Municipal Art Society stated that "under the current structure and mandate of SEQRA/CEQR, the lead agency not only has the ability to examine a project's impact upon climate change, but is under obligation to do so."[168]

The comments by the Municipal Art Society went on to explain that while GHG evaluation tools are still under development, agencies can nonetheless develop a basic accounting and disclosure of GHG emissions, and that the inclusion of climate change in EIA analysis is an important step in achieving much-needed project-specific implementation of broader political goals.[169]

To date, no formal response by the City of New York has been issued to the Municipal Art Society comments. However, the integration of climate change and EIA (under the state SEQRA law) became a priority in 2007 for several New York environmental nonprofits, including Environmental

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166. HELD ET AL., *supra* note 163, at 20.

167. Plaintiff's Reply Brief at 4–7, Minnesota Ctr. for Envtl. Advocacy v. Holsten, No. 31-CV-07-3338 (Dist. Ct. Itasca County, Minn., Sept. 10, 2007), *available at* http://www.mncenter.org/minnesota_center_for_envi/files/complaint3.DOC.

168. Municipal Art Soc'y, *Comments on the Draft Scope of Work for an Environmental Impact Statement, Proposed Domino Sugar Rezoning* 9 (Aug. 2007), *available at* http://www.mas.org/images/media/original/Domino%20Scope.pdf.

169. *Id.* at 9–10.

Advocates of New York and the League of Conservation Voters.[170] In addition, King County in Washington State, which includes the city of Seattle, has recently signed a Statement of Shared Action with the Republic of the Marshall Islands, a low-lying Pacific island nation highly vulnerable to climate change impacts.[171]

As an additional means of demonstrating how municipal or regional governments can address climate change, King County issued an executive order, effective October 2007, which would require any development project undergoing EIA analysis, under local administration of SEPA, the state EIA law, would also contain a detailed analysis of long-term GHG emissions. The County also has developed an automated spreadsheet that contains calculated scientific estimates of GHG emissions based upon factors such as square feet of new construction, or square feet of additional paved surface.[172] King County's executive order justifies the inclusion of climate change as a topic within EIA documents on the basis of both localized impacts of climate change, such as water supply security, curtailed recreational opportunities, and coastal erosion, as well as the inclusion of climate change within the local long-term comprehensive plan.[173] As politicians of all persuasions increasingly realize the need to discuss climate change as an important social topic, the pressure to turn those statements into action will increase.

Some commentators argue that, barring more specific federal action, plaintiffs may utilize federal common law in tort as a means to enjoin further increases in GHG emissions, noting that

> the regulation of CO_2 in order to prevent or slow global warming is particularly well-matched for the federal common law of public nuisance. Public nuisance is an injury, which carries a right deserving of a remedy.

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170. *See generally* LEAGUE OF CONSERVATION VOTERS ONE HUNDRED-DAY AGENDA FOR GOVERNOR-ELECT ELIOT SPITZER 2 (2006), *available at* http://www.nylcv.org/sites/nylcv.civicactions.net/files/100-DayAgenda.pdf.

171. Kessai Note, President, Marshall Is., and Ron Sims, Executive, King County, Wash., Statement of Shared Action Between the Republic of the Marshall Islands and Martin Luther King Jr. County, State of Washington, United States of America (Jan. 26, 2007), *available at* http://www.metrokc.gov/exec/news/2007/pdf/0226globalWarmingMarshallIslands.pdf.

172. King County, Washington, Evaluation of Climate Change Impacts Through the State Environmental Policy Act (Oct. 15, 2007), *available at* http://www.kingcounty.gov/operations/policies/executive/utilitiesaeo/put7101aeo.aspx; DEP'T OF DEV. & ENVTL. SERV., KING COUNTY, WASHINGTON, SEPA GHG EMISSIONS WORKSHEET VERSION 1.7 12/26/07 (2007), *available at* http://www.metrokc.gov/ddes/forms/SEPA-GHG-EmissionsWorksheet-Bulletin26.pdf.

173. King County, *supra* note 172.

> Because federal common law provides an available remedy, it cannot be displaced with a regulatory vacuum.[174]

Assuming that the Clean Air Act does not actually displace such federal common law, a question unanswered by the Supreme Court in *Massachusetts*, one must then ask if any other statutes are specific enough in their treatment of GHGs so as to displace federal common law nuisance claims. The conclusion that "as Congress has not regulated global warming or GHGs in these statutes [including NEPA], it appears that the common law survives" may not be correct should a court find that the Senate Committee report in 1988 constitute sufficient, specific legislative preemption.[175] Certainly, the extent to which relevant EIA law preempts common law should be carefully analyzed in any climate change nuisance action.

It is also important to mention the need to study comparative litigation related to EIA and climate change in other nations. Anecdotal evidence points the reader first to *Australian Conservation Foundation v. Minister of Planning*, in Melbourne Australia, a recent case in which NGOs successfully stopped a federal minister from preventing a regional planning body from considering GHG emissions in deciding to permit a new coal mine, as well as to *Germanwatch and BUND (The German section of Friends of the Earth) v. The German Federal Ministry of Economics and Labour*, filed in 2004, an NGO challenge to a federal agency failing to take climate change into account when administering its program.[176] Additional research may point to more lawsuits around the world. However, climate change litigation is still in its extreme infancy.

Comparative litigation abroad also offers additional positive treatment of climate change within an EIA context. The New Zealand Environmental Court in 2005, in a government challenge of an EIA report prepared under the Resource Management Act of 1991, rejected government arguments that the GHG benefits (reduced emissions through alternative energy) of a wind

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174. Sarah Olinger, Comment, *Filling the Void in an Otherwise Occupied Field: Using Federal Common Law to Regulate Carbon Dioxide in the Absence of a Preemptive Statute*, 24 PACE ENVTL. L. REV. 237, 269–70 (2007).

175. Dan Mensher, *Common Law on Ice: Using Federal Judge-Made Nuisance Law to Address the Interstate Effects of Greenhouse Gas Emissions*, 37 ENVTL. L. 463, 484 (2007).

176. Nat'l Ass'n of Envtl. Law Soc'ys, Climate Change 101 for Lawyers, http://www.naels.org/projects/ccn/gcn/research.htm (last visited Apr. 30, 2008); *see also* Gerrard, *supra* note 6, at 23 (discussing additional recent Australian cases *Gray v. Minister for Planning* (2006) N.S.W.L.E.C. 720 and *Re Xstrata Coal Queensland Pty Ltd.* (2007) Q.L.R.T. 33, and indicating a possible judicial split).

farm were insignificant because of the small size of the farm.[177] In addition, a decision in a recent human rights case in Nigeria, regarding corporate and government sponsorship of gas flaring (venting excess waste oil) in the Niger Delta without undergoing EIA assessments, focused primarily upon localized impacts, but also noted that gas flaring constituted an adverse release of GHGs, and that such practices without an EIA violated Nigerian constitutional rights to life and dignity.[178] While there are few, if any, centralized means regarding global EIA litigation, such lawsuits may also have limited persuasion on U.S. judges.

D. Professional Technical Guidance on EIA and Climate Change

Increasingly public agencies and private applicants rely upon professional consultants to prepare EIA reports. This reliance has generated a substantial global industry in which multinational engineering firms, specialty boutiques, and individual solo consultants proffer expertise in every niche of the EIA process. As both environmental science and legal challenges have grown in complexity, the length and cost of EIA reports also have grown considerably within the United States. The revenues and numbers of consultants also have risen proportionately. Even when agencies and applicants are compelled or seek to incorporate climate change within EIA documents, they will be challenged to do so unless such services or expertise is available from private consultants. Therefore, the incorporation of climate change within the EIA process will also require a shift within the professional community to develop and sell corresponding means or methods.

As a means of preempting or jumpstarting this shift, California's oldest environmental consultancy, Jones & Stokes, has recently issued a draft industry white paper that briefly outlines alternative treatment strategies for climate change within EIA projects.[179] The issuance of the white paper coincided with the creation of a corporate EIA climate change practice group. While doubtless that other competing consulting firms have similar, if underdeveloped, internal capacities, the ability of agencies and applicants to produce meaningful climate change treatment within EIA documents depends upon the capacity of the environmental consulting community.

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177. *See* Sara C. Aminzadeh, Note, *A Moral Imperative: The Human Rights Implications of Climate Change*, HASTINGS INT'L & COMP. L. REV. 231, 237 (2007) (referencing Genesis Power Ltd. v. Franklin Dist. Council, [2005] N.Z.R.M.A. 541 (N.Z.)).

178. *See id.* at 238 (referencing Gbemre v. Shell Petroleum Dev. Co. Nigeria Ltd., No. FHC/B/CS/53/05 (F.H.C. Nov. 14, 2005) (Nigeria)).

179. Jones & Stokes, *supra* note 162.

V. COMPARATIVE INTERNATIONAL TECHNICAL GUIDANCE ON EIA AND CLIMATE CHANGE

In analyzing the potential for an EIA incorporation of climate change, it is important to look abroad. Over 100 nations have adopted EIA laws or policies and it is likely that other nations' experiences with this issue can further inform future domestic and international efforts. As there is no centralized EIA register, it is difficult to ascertain the degree to which the international community has considered EIA as a means of addressing climate change. A cursory survey of available publications indicates that most nations have overlooked this possibility, so there is a need for increased efforts in this area. Notably, the European Union has issued guidance for its member nations, which includes consideration of global climate change issues.[180] However, this guidance is sparse regarding specific strategies to approach areas of concern. Of greater value is Canada's extensive federal guidance for overseeing the EIA process to be implemented by its provinces.

Starting in 2002, Canada took steps to consider the integration of climate change into the existing EIA process.[181] In November 2003, the federal/provincial task force produced a general guide for practitioners,[182] which provided guidance for assessing all projects in terms of GHG emission levels and climate change, as well as assessing the impacts of climate change on a long-term project life. One commentator from the regulated community questioned the reliability of accurate climate change modeling on a site-specific installation, but also noted that "emission levels are a clear area for assessment."[183]

Canadian provinces already have integrated climate change into the EIA process. The process analyzes GHG emissions during scoping and

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180. *See generally* KAREN RAYMOND ET AL., EUROPEAN COMM'N, GUIDANCE ON EIA SCOPING (2001), *available at* http://ec.europa.eu/environment/eia/eia-guidelines/g-scoping-full-text.pdf (proposing guidelines for EIA procedure to members of the European Union). The EIA guidance document describes the scoping procedure required by the European Union. It contains a list of checklist questions which includes identifying whether project releases are likely to effect "global air quality including climate change and ozone depletion." *Id.* at 34.

181. Bob Page, Vice President, Sustainable Development, TransAlta Corp., Keynote Speech at the Int'l Assoc. for Impact Assessment, Integrating Climate Change into Impact Assessment: Challenges for Integrity and Credibility 5 (Apr. 26, 2004), *available at* http://www.iaia.org/non_members/conference/IAIA04/04%20CD-ROM/Keynote-Speeches/OP%20Bob%20Page%20Integrating%20Climate%20Change%20into%20IA.pdf.

182. *Id.*

183. *Id.*

provides more analysis deeper into the EIA project.[184] The threshold for "significance" is not yet well defined. The determination of significance is reached after analyzing a project's related emission volume or intensity common to a particular industry or geographic region, and subsequently attempting to define "low, medium or high volumes or intensity" of emissions.[185] If appropriate, more detailed analysis is then undertaken, including development and consideration of a GHG management plan showing how emissions considerations are addressed through jurisdictional regulations, emissions reduction, and offset measures. The guidance mentions standard measures in passing, such as international emission credit trading, industry best practices, and other compensatory measures. Adaptive management policies that continually monitor and plan responses to changes in science and policy are further encouraged.

In relying upon an adaptive management approach, Canada found that EIA could readily apply to climate change despite the evolving nature of climate change science, technology, policy, and legislation. Furthermore, the guidance encourages interaction between the GHG management plans and other impact areas, such as air and water pollution. The guidance also highlighted case studies of recent EIAs, preceding the 2003 guidance, such as the EIA for the 1000 MW Brooks Power Plant and Coal Mine Project in Alberta.[186] There, the applicant identified the sources and quantity of GHG emissions and subsequently devised a specific design plan for phased future action to accommodate potential modifications.

Another noteworthy case study was the Diavik Diamond Mine project in the Northwest Territories. There the applicant registered with the Voluntary Challenge and Registry Program and agreed to consider the use of on-site wind power as a means of mitigating GHG emissions.[187] The Environmental Assessment guidance was developed before Canada had ratified the Kyoto Protocol—a time in which there was little regulatory framework for GHG emissions. A recent inventory of Canadian environmental assessment documents indicates that their EIA process

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184. CANADIAN ENVTL. ASSESSMENT AGENCY [CEAA], INCORPORATING CLIMATE CHANGE CONSIDERATIONS IN ENVIRONMENTAL ASSESSMENT: GENERAL GUIDANCE FOR PRACTITIONERS (Nov. 2003), *available at* http://www.ceaa-acee.gc.ca/012/014/index_e.htm; *see also id.* annex C (Case Studies of Canadian Approaches), *available at* http://www.ceaa-acee.gc.ca/012/014/c_e.htm; AREVA RES. CANADA, INC., DRAFT PROJECT-SPECIFIC GUIDELINES AND COMPREHENSIVE SCOPING DOCUMENT: ENVIRONMENTAL IMPACT ASSESSMENT OF THE MIDWEST (MINING) PROJECT, *available at* http://www.ceaa-acee.gc.ca/050/documents/18253/ 18253E.pdf (last visited Apr. 30, 2007).

185. CEAA, *supra* note 184.

186. AREVA RES. CANADA, INC., *supra* note 184.

187. Claire Eamer, Climate Change a Factor in Environmental Assessment, http://www.taiga.net/yourYukon/col415.html (last visited Apr. 30, 2008).

continues to analyze GHG emissions, even though the federal commitment to Kyoto's goals is unclear.

Canada's use of adaptive management approaches to GHG management plans, including mitigation measure, is a promising approach to tackling an emerging environmental issue for which general scientific knowledge is certain, but for which new understandings and strategies will emerge. The employment of adaptive management would prevent the legal shell game where regulatory action on climate change is delayed indefinitely because of scientific uncertainty. However, this same scientific uncertainty plagues the guidance. There is very little actual guidance provided instructing how agencies can define a threshold of significance for GHG emissions. Accordingly, there can only be inconsistency between different EIA projects. It is also possible that this somewhat vague approach is attributable to Canada's weak federal structure. Nonetheless, the Canadian EIA model does not appear to have stalled proposed projects and does not appear to have negative economic consequences.

The 2003 Canadian guidance provides an interesting template regarding the integration of GHG concerns to EIA. The application of climate change as an EIA study category suggests that its inclusion is both appropriate and feasible. The Canadian EIA approach to climate change is not only intended to be compatible with current regulatory efforts, but is flexible enough in its application as both regulations and scientific analysis change. The utilization of adaptive management suggests that currently EIA can address the environmental impacts of increasing GHG emissions, but will still be useful in light of future advances in the scientific understanding of climate change.

VI. DOMESTIC EIS EXAMPLES: WIND POWER DEVELOPMENT

Climate change takes a central role in ongoing national debates regarding the location of alternative-energy wind farms. Proponents and opponents haggle over the proper balance between the reduction in GHG emissions and the esthetic and ecological impacts of wind farms. However, notwithstanding the public debate of such issues, EIA documents are reluctant to address the topic. When the issue of wind farms is raised, it is only mentioned in passing and provides no information to aid the reader in evaluating its potential benefits. Due to the scientific consensus that global

warming is a consequence of GHG emissions, wind technology deserves a more prominent role within the EIA process.[188]

Although the effort is sporadic at best, domestic EIAs have discussed climate change in the context of wind energy developments. Wind farms have been lauded by certain environmental interests for their reduced footprint upon ecological resources, while others have questioned impacts of such developments upon the rural, historic, or natural character of the surrounding landscape. EIAs are frequently prepared for large-scale wind farms and have varying degrees of success in fully addressing and mitigating environmental impacts. However, such efforts often involve a discussion of climate impacts. In particular, comparing the baseline "no build" alternative in which traditional CO_2 emitters continue operations with the zero emissions offered by wind energy. This climate change analysis has been undertaken either sporadically or with different degrees of analysis.[189]

A fair reading of the U.S. Department of Energy's (DOE) written guidance for environmental review also permits such discussion. An analysis of impacts might focus on generalities and is not necessarily

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188. Dorothy W. Bisbee, *Coastal Wind Energy Generation: Conflict and Capacity: Symposium Article: Review of Offshore Wind Farms: Ensuring Emission Reduction Benefits Outweigh Visual Impacts*, 31 B.C. ENVTL. AFF. L. REV. 349, 367 (2004).

189. An examination of several wind farm EIS documents shows the range of sophistication and level of treatment. Examining the Condon Wind Farm (Oregon) EIS, one commentator notes:

> [T]he Final EIS added the following paragraph in the "Need for Action" section: "Technologies like wind power generation can help displace additions to the power system that might otherwise come from fossil fuel combustion or hydro-powered generation. Wind power can help meet energy needs without additional emissions of greenhouse gases. The Condon Wind Project is an opportunity to satisfy consumer demand for increasing the amount of renewable energy resources in the region's power supply." This general paragraph alerts the reader to some of the benefits of alternative energy, but does not allow the reader to evaluate these benefits. Section 5.10 of the Draft EIS provides the following brief mention of emission reductions and benefits to global warming concerns: "The proposed project would not generate emissions of gases (such as carbon dioxide) that contribute to global warming. To the extent wind energy reduces the amount of fossil fuel generation, global warming impacts can be avoided."

Id. at 377. However, a comparative analysis of the Maiden Wind Farm Draft EIS, in Washington State, demonstrates:

> [M]ore detail on emission reductions and the project itself is ten times larger. The discussion of air impacts of the no action alternative includes two paragraphs stating that the gas-burning combined cycle combustion turbines that would likely be built in place of the project would emit about 5.81 tons of nitrogen oxides and 3,094 tons of carbon dioxide per average megawatt per year.

Id. at 377–78.

limited to criteria pollutants currently regulated by the Clean Air Act.[190] Reading DOE's guidance in light of the recent *Massachusetts* ruling by the Supreme Court would lend even more credibility to the consideration of GHGs in energy-related EIA documents. Wind farms and their EIA documents have been challenged by opponents, although such arguments do not generally dispute the analysis of GHG emissions within the EIA. Although such discussions often are relatively limited to broad statements, the presence of climate change within domestic EIAs for wind farms further demonstrates the feasibility of integrating climate change issues within an EIA context.

In addition to wind farms, several other domestic EIA documents have recently addressed climate change. Notably, a forthcoming NEPA Environmental Impact Statement of Yakima River Basin Water Storage practices, conducted by the U.S. Bureau of Reclamation, plans to address all project alternatives both with and without the impacts of climate change.[191] It is likely that, within the next three to five years, a substantially higher number of EIA documents will incorporate climate change analysis.

VII. EIA PROCESS & CLIMATE CHANGE

An understanding of the likely process through which EIA documents could identify, disclose, and analyze climate change issues is critical in ensuring the validity of such a proposed incorporation. EIA's inclusion of GHG issues must rest upon much more than principle, legal theory, and

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190. The DOE policy distinguishes between the "affected environment" and the "no action alternative." This is a distinction critical to exploring emission reductions. DOE explains:

> The affected environment's air quality discussion might describe the general climate, wind, temperature, rainfall, ambient concentrations of air pollutants at the site, and current site emissions and emission rates. Also, this discussion would, as appropriate, identify existing air quality permits and specify the attainment status for criteria pollutants. In contrast, impact assessment for the no action alternative would project future site emissions and emission rates without the proposed action. The impact assessment also would identify the impacts of such future emissions on compliance with applicable air quality regulations and permits, the attainment status for criteria pollutants, and human health and environment. Consistent with this policy, renewable electricity generation EISs should forecast what site emissions and cumulative emissions will be in the future in the event that the renewable project does not go forward. This calculation will require a projected increase in air emissions.

Id. at 378.

191. JOHN PETROVSKY & MARK BRANSOM, YAKIMA RIVER BASIN WATER STORAGE FEASIBILITY STUDY: FEASIBILITY ANALYSIS & NEPA/SEPA EIS: PHASE INITIATION CHECKPOINT—ROUNDTABLE MEETING SUMMARY 3 (2007), *available at* http://www.usbr.gov/pn/programs/storage_study/roundtable/mtg3-summary.pdf.

brief descriptions of other experiences. Rather, the proposed incorporation must also be demonstrated as practical and feasible in order to be accepted by government agencies or commercial development interests. This procedural analysis demonstrates that, although climate change is technically complex when viewed as a global issue, its place within an EIA rests comfortably alongside areas traditionally studied within EIA documents. While many EIA laws are created with enough flexibility to permit the treatment of GHGs without additional legislative mandate, a more specific legislative revision of regulations supporting SEQRA, New York State's EIA law, is provided in Appendix I.

A. Scoping & Climate Change

The scoping process allows for the identification of potential study topics and study methodologies as related to a particular project. Study topics that are deemed to be unrelated or irrelevant are likely to be excluded from further analysis. Participation by civil society in the scoping process, through either written or verbal statements is likely to provide a basis for at least some incorporation of climate change issues. Scoping provides an opportunity for agencies to identify creative—and cost effective—means by which to incorporate climate change issues. Specifically, the failure to identify tailored investigatory methods during a scoping process will result in either an insufficient analysis of climate change impacts (and thus open the EIA document to later litigation), or the selection of an analytical approach which is either too intensive or too superficial. The end result of a balanced decision will only be responsive if it is prepared with the right ingredients. Scoping must not only identify that a potential GHG rate increase is evident, thus triggering further climate change study within the EIS, but must also include an analysis of climate change related to the undertaking in question.

B. Alternatives Analysis & Impact Assessment

Under EIA, agencies have general flexibility and discretion regarding final decisions, provided there is an appropriately responsible degree of environmental stewardship.[192] While agencies should meet the broad environmental stewardship goals identified within an EIA statute, final EIA

192. *See* Dep't of Transp. v. Pub. Citizen, 541 U.S. 752, 756–57 (2004) (quoting Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989) ("NEPA itself does not mandate particular results in order to accomplish these ends. Rather, NEPA imposes only procedural requirements on federal agencies with a particular focus on requiring agencies to undertake analyses of the environmental impact of their proposals and actions.")).

products often balance multiple goals and may employ novel or situation-specific means to accomplish these goals. In short, the regulated community assists in writing their own outcomes.[193] This is in sharp contrast to more rigid, pollutant-specific legal strategies, which are often more focused on end-of-pipe emissions caps than situation-specific analysis and balanced design or decision-making.

Pollutant-specific laws, such as the Clean Air Act of 1990 in the United States, utilize a more traditional monitoring and enforcement method of oversight and may also be a potentially effective means to address climate change issues. However, these pollutant-specific laws often predate widespread recognition of climate change issues and may not specifically incorporate GHGs within their enumerated pollutants. While litigation is ongoing, it is possible that such laws will require additional legislative and political action to incorporate GHGs. These laws have also traditionally complimented EIA analysis, and as such are not necessarily contradictory or incompatible.

Furthermore, such laws may only regulate certain thresholds or categories of pollutant emissions. However, in the absence of more rigid end-of-pipe GHG emissions regulations, analysis of climate change under EIA may pursue and analyze a diverse menu of decision-making items. Agencies typically are required to analyze the consequences of a range of potential alternatives, including the "no action" alternative.[194] The "no action" alternative provides a useful opportunity to fully understand the actual rate fluctuations in GHG emissions. Decision-making as part of the alternatives analysis process can also incorporate the decision-making framework suggested by Working Group III of the Intergovernmental Panel on Climate Change in 2001, intended to aid the integration of climate change considerations into government decision-making, or the Group's more recent 2007 guidance.[195] Climate change considerations need not be the ruling factor in selecting a proposed action or alternative, as EIA is most often a "balancing" statute in which a wide range of economic, social, and ecological impacts are weighed against each other.

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193. *See id.* (discussing the requirement of an EIS).

194. *See generally* Matter of Jackson v. N.Y. State Urban Dev. Corp., 67 N.E.2d 429, 436 (N.Y. 1986) ("[A]gencies [have] considerable latitude evaluating environmental effects and choosing among alternatives.").

195. UNEP & WMO, IPCC, *IPCC Fourth Assessment Report, Climate Change 2007: Mitigation (Summary for Policymakers)* 72 (Bert Metz et al. eds., 2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-spm.pdf [hereinafter *Mitigation*] (contribution of Working Group III).

C. Mitigation, Offsets, and Project Redesign

Offsets are a heavily-utilized method for mitigating GHG emissions. Under Kyoto, offsets typically include the funding of forestry or re-forestry projects at a rate by which the CO_2 in newly planted trees will offset emissions caused by existing or increased emissions. This means of "carbon sequestration" is performed on a strictly analytical basis through which the amount of CO_2 generated per acre of planting is matched up to anticipated emissions.[196] It is important to note, that as GHG emissions do not have localized impacts in the realm of climate change, these offsets need not be location-specific. Under Kyoto, mitigation funding of carbon sequestration projects is limited to Annex 2 developing nations.[197] However, these geographic conditions need not necessarily be imposed under an environmental information regime, particularly for a non-member of Kyoto.

A related means of offsetting mitigation is methane capture, under which methane gas is captured from waste sources, such as trash disposal sites or, potentially, agricultural facilities and is diverted for secondary purposes such as energy generation.[198] Additionally, offsets may be obtained by point sources that have taken steps to reduce GHG emissions below an industry standard. Kyoto has thus spurred the creation of an active international trading market in GHG offset and mitigation credits. Other means of offsetting also exist, but are not fully described herein. EIA can utilize both tradable offsetting credits, as well as direct funding of such projects.

Project redesign may lead to a sufficient reduction in GHG emissions. This mitigation analysis is most useful when applied to land use and development projects. Alterations in land use and/or project design may reduce GHG emissions. For example, the creation of residential communities proximate to commercial centers would likely reduce or eliminate otherwise lengthy automobile trips. This item could also include the funding or enhancement of transportation alternatives which reduce CO_2 emissions; for example, the external funding of low emissions busses, or the enhancement of an unmet public transportation need which would reduce automotive congestion.[199] Already, such needs are identifiable in urban areas under existing transportation plans. Also, similar redesign alternatives may encourage energy conservation as a mitigating factor. As

196. *Id.* at 67–68.
197. *Id.*
198. *Id.* at 49.
199. *Id.* at 366–68.

with all alternatives, it is also possible to introduce a strategic combination of alternatives.

The use of carbon neutral green energy alternatives is no longer a conjectural dream, but is a real alternative. Numerous energy programs provide end-user consumers with a green choice by which they can purchase energy from dedicated renewable or non-coal sources. The purchase functions much like an offset.[200] The purchased energy from dedicated green sources is fed into the national or regional grid, even though electrons utilized at the end point may be from GHG emitters. However, like a forestry offset, the end result is identical as the project is responsible for reducing a specific amount of CO_2 emissions.[201]

Finally, a wide variety of creative solutions could be employed as offsetting or mitigation. These creative solutions could include the funding of targeted professional seminars or educational opportunities which focus on climate change, increased funding for graduate research regarding climate change technology or management, or other alternative research and education projects. These solutions may be particularly appropriate when an agency is unable to identify a specific reliable increase in GHG emissions rate, but where a significant increase is verifiable. Such solutions must meet an honest test of good faith, but also evade a detailed description. Agencies may be able to define a wide range of alternative solutions by drawing upon their own resources and technical expertise.

The true genius behind EIA is that it allows agencies to define their own environmental strategy. EIA can serve as the definition for a standards-based approach to environmental law, through which participants are far more likely to implement solutions that they have helped devise. Thus, EIA erases much of the resentment triggered by traditional command and control legal methods which forsake flexibility or situational creativity for consistency.

By employing a standard 1:1 ratio of offsetting and mitigation projects to increased GHG emissions, an agency can be assured that its proposed action will not have a significant impact in regards to climate change issues.[202] The employment of this standard mitigation strategy with appropriate monitoring and implementation is unquestionable in its sufficiency, as the GHG footprint after the proposed action would be no greater than the one before it. In addition, this strategy is highly conducive to the increasingly popular use of pre-mitigated or conditional

200. *Id.* at 293–99.
201. *Id.*
202. ECON. & TRADE BRANCH, *supra* note 21, at 313.

environmental assessments in which agencies attempt to avoid a more intensive EIS by incorporating mitigation action measures during the initial description of the action.[203] Mitigation through redesign, conservation or offsets can be easily integrated into these more basic and conditioned findings.

Finally, the GHG reduction goals established by the Kyoto Protocol need not filter down to the project-specific level. While a mitigation ratio greater than 1:1 may be employed with validity, not all nations are bound by the Kyoto goals, although they may have expressed general support of such reductions.[204] Furthermore, attainment of the Kyoto goals is itself a national outcome, which blends emissions increases and decreases from multiple sources. It is only important that proposed action analyzed under EIA avoid significant environmental impacts *as compared to baseline conditions*, and must analyze their cumulative impact as a "threshold" rate of change which would impair other initiatives from having a meaningful impact on managing climate change.[205]

However, some projects or undertakings may be hard-pressed to identify and quantify a reasonable emissions figure. Without other action, such agencies and/or applicants run the risk of being taken to task over minor discrepancies in data or methodology assumptions. This may be particularly true of projects with indirect impacts. For example, a runway extension at a busy airport may substantially increase flights. However, it would be difficult or impossible to prove that this increase would result in a specific, predictable quantification of GHG emissions because the precise origin and length of such flights are not known. This unpredictability invites litigation challenging data methods. For projects in which the reasonable quantification of GHG emissions is not possible, an agency is free to substitute an alternative modeling method or simply make a finding of significance or non-significance without the benefit of a precise quantification. However, in so doing, an agency forsakes the numeric certainty offered by the earlier quantification model, and risks litigation if a proposed mitigation action is clearly unresponsive to the impact. It is important that EIA continue to offer agencies both discretion and flexibility in designing their own stewardship solutions. While undoubtedly many decision-makers will treat EIA like a rote exercise or litigation defense, it is equally probable that at least some decision-makers will utilize EIA to invent new solutions to climate change.

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203. *Id.*
204. *Mitigation*, *supra* note 195, at 773–74.
205. ECON. & TRADE BRANCH, *supra* note 21, at 106.

D. EIA as a Tool to Evaluate Climate Change Impacts of a Project

The evolving science and complex ecosystems prevent specific or certain predictions. For example, a development project in a coastal area may be unable to state with certainty the precise impacts of sea level rise or associated flooding. For projects where impacts may pose a substantive change in the surrounding environment, potential climate change scenarios are best described in the affected environment baseline description and then analyzed in the decision-making portion of the EIA. Climate change impacts may best be discussed in other EIA topic areas, including economic impact or alternatives analysis. Due to the considerable judicial discretion typically afforded lead agencies during the EIA process, and the uncertainty of precise predictions, the level or methodology of EIA analysis of climate change impacts falls on agencies.

1. As Applied: Realistic Use of EIA to Address Climate Change

It is likely that much of the resistance to the use of EIA as a means to address climate change is the "shock of the new."[206] Administrative skepticism may arise because climate change is not localized and is unfamiliar to many EIA practitioners, not because of the goals of the application. However, with the development of case studies and technical guidance, such an application becomes little different than any other EIA study area. The following hypothetical examples, while only a cursory treatment of the subject, nonetheless demonstrate the relative ease in which the topic of climate change can be successfully integrated into EIA projects.

2. Large-Scale Urban/Suburban Commercial Development

An EIA study for large-scale urban or suburban development could readily incorporate climate change into its analysis. For example, a commercial development would substantially increase the number of automobile visits, presuming that the commercial development took place on either a "greenfield" or a site with a previous, less-intensive use. It is likely that an EIA for this project would analyze the impact of increased

206. The term "shock of the new" refers to initial confusion and social resistance regarding the modern art movement in the early to mid-twentieth century. The term was coined by cultural historian Robert Hughes during the 1970s in reference to both his documentaries and scholarship chronicling this phenomenon. *See generally* BBC Four, Documentaries, The Shock of the New Episode Guide, http://www.bbc.co.uk/bbcfour/documentaries/features/shock-new-eps.shtml (last visited Apr. 30, 2008).

Vehicle Miles Traveled (VMT).[207] The VMT analysis can be used as a means to estimate the extent of GHG increases. Assuming that few or no GHG emissions were associated with the previously undeveloped parcel, it is likely that this project would have a substantial increase in the rate of GHG emissions. In addition, if the county where the project is located has a comprehensive plan that includes a broad statement on climate change, such an increase will frustrate local efforts to manage climate change. An EIA study undertaken by or on behalf of a developer will demonstrate a variety of environmental impacts often associated with new development—including the climate change impacts. Accordingly, the proposed project will have a significant cumulative impact; combined with other similar development actions across the world, it will contribute to a worsening of climate change.

One potential alternative or mitigation measure for new development is the construction of "mixed use developments" whereby both commercial and residential units are included in a consolidated area. Presumably this planning tool will lower the VMT and thereby reduce a development's contribution to GHG emissions. Rather than risk stalling the project in a complex debate about climate impacts, the developer redesigns his final proposal to include "mixed use" construction, and thus mitigates the significant impact. The developer also finds this analysis useful in other EIA study categories, such as visual design.

3. Agency Regulatory Analysis

Assume a federal forestry agency under their rulemaking authority opens up certain tracts of land for sustainable timber harvest. Knowing that its actions will release a substantial amount of CO_2, the agency carefully undertakes an analysis of the rate of CO_2 release and recapture as part of its EIA study. The EIA study indicates that the rate at which the agency has defined timber harvesting and replenishment will have an increase in CO_2 recapture. Therefore, the agency concludes that the project will have no significant impact in regards to climate change. In meeting with environmental opponents of the rule, the agency is able to inform the environmentalists that they need not have concerns regarding climate change; the proposed project will not have a meaningful impact upon climate change. The minimal increase in GHG emissions will be more than

207. VMT is a predictive calculation factoring in square footage and category of commercial attractions, different attracted populations, and distance from the development.

compensated for by an unrelated state effort to utilize renewable wind energy.

4. Regional Transportation Improvement

A state transportation agency has decided to participate in the development of a large-scale infrastructure improvement to a medium-sized urban area. During its EIA study, the agency notes that the region is on the verge of becoming a non-attainment area under the Clean Air Act with regard to criteria pollutants related to automobiles. The agency uses the EIA process to examine multiple alternatives, ranging from the preferred alternative—a highway widening to reduce traffic congestion and idling emissions—to light rail and bus rapid transit. The EIA study concludes that the bus rapid transit option will be the most cost-effective means to improve traffic congestion and emissions. However, the study is reviewed by groups concerned about additional bus emissions. The EIA study also indicates that even though this is the most effective means of avoiding a non-attainment designation, there will still be a meaningful, cumulative rise in the rate of CO_2 emissions. Accordingly, the EIA employs a range of mitigation options, including a partial fleet of low-emissions busses, additional incentive funding for local governments to switch to low-emissions "hybrid" cars for municipal employees, and a small reforestation project in a former agricultural area elsewhere in the state. Together, these strategies ensure that the transportation project will move forward without frustrating national strategies to develop new technology to reduce GHG emissions; even though CO_2 emissions will rise, the significant impact has been both addressed and reduced.

E. Strategic Policy Behind EIA and Climate Change

EIA is most often applied to projects at the end of the decision pipeline, it has not successfully been applied at a broader policy level. As a reactive mechanism, it is unlikely to serve a primary role in addressing global climate change problems. However, the use of EIA to discuss climate change holds several strategic advantages, and should not continue to be ignored merely because it fails to present a systematic approach to GHGs.

EIA as applied to climate change is readily achievable. EIA was intended to address a broad array of environmental issues, few of which were explicitly defined at its creation.[208] As a legal tool intended to induce a conflict-resolution process, rather than a specific technical limitation or

208. ECON. & TRADE BRANCH, *supra* note 21, at 103.

resource-specific outcome, EIA has the necessary flexibility to include climate change under its broad umbrella of environmental and social issues. The advantages in utilizing an existing legal framework to discuss climate change, at least as an interim strategy, are nearly obvious—a new legal framework subject to inevitable political compromise and judicial challenges. New legislation may be helpful as it can be closely tailored to address the unique challenges of climate change; however, such legislation is not required to introduce climate change into the federal legislative lexicon.

In addition, an EIA process which includes climate change is both compatible with future legislative initiatives, and also assists those initiatives by formally introducing climate change into government policy and decision-making. An EIA process that discusses climate change and affords agencies flexibility would fit in easily with future legal or regulatory initiatives for GHGs. The introduction and integration of GHG analysis would erode the opposition by the regulatory community. The EIA process is one which, while sometimes dreaded by sponsoring agencies or applicants, is familiar and more predictable than an unknown regulatory environment. As future restrictions are introduced which have firm caps and more specific procedures, these future regulations will buttress EIA's overarching framework of environmental stewardship.

The experiential opportunities afforded by a climate-change sensitive EIA process may help reformulate future, and more specific, climate change regulation. Once written, environmental laws may take on a life of their own and subsequent amendment may be difficult despite recognized flaws. The use of EIA to discuss climate change issues provides an overlooked regulatory proving ground. Even if it remains an imperfect process in its practice, it nonetheless offers "the art of the possible"[209] as it can readily introduce GHG emissions into practical and project-specific decision-making.[210]

One commentator notes that the EIA process "typically focuses slavishly on individual projects and thus shortchanges evaluation of cumulative impacts" and that such a "fragmented approach" would be unable to effectively address the "comprehensive evaluation" apparently

209. A phrase referring to political feasibility and the necessity of compromise generally attributed to the nineteenth-century Prussian statesman Otto von Bismark, who oversaw the modern unification of Germany. Columbia World of Quotations (1996), http://www.bartleby.com/66/31/7331.html [hereinafter Bismark] (last visited Apr. 30, 2008).

210. ECON. & TRADE BRANCH, *supra* note 21, at 103.

needed to solve the climate change puzzle.[211] According to the commentator, should EIA documents even attempt to incorporate climate change concerns, the "the track record of environmental assessment is less than reassuring, even absent the complications posed by climate adaptation."[212] However, the fragmented approach of the EIA process, while unable to provide a single, unified analysis, is its greatest asset. A fragmented approach is redundant between multiple, concurrent projects thus ensuring that even if one analysis is flawed, that such flaws are limited only to a single EIA document. The global failure to develop a successful climate change tool is largely the result of a mismatch between "slavish" individual projects, which result in GHG increases and broad policy statements. Even if the EIA process has failed to protect the environment, its flaws are in its execution due to agencies' willingness to use it as a legal defense, rather than as an active decision-making tool. However flawed the EIA process, it nonetheless can immediately address climate change on a project-specific basis without waiting for the slow wheels of diplomatic politics. In that sense, the application of climate change to the EIA process is truly "the art of the possible."[213]

CONCLUSION

A "Standards-Based" Approach to International Environmental Law

The calls of the Pacific island nation ambassadors before the United Nations Security Council did not go unnoticed. Five months later, on August 1, 2007, the United Nations General Assembly held for the first time an informal thematic debate on climate change. While many ambassadors presented statements expressing the need for GHG reductions, the debate was short on solutions or means of implementation. However, the Asian-African Legal Consultative Organization (AALCO), an NGO with permanent United Nations observer status, noted the urgent need to move beyond political rhetoric and toward domestic implementation of international agreements. Without such legal tools, climate change impacts will only worsen. Specifically, the AALCO noted the underutilized potential of EIA as a primary domestic tool to address climate change, stating that "from the perspective of intergenerational equity, this is a moral

211. Matthew D. Zinn, *Adapting to Climate Change: Environmental Law in a Warmer World*, 34 ECOLOGY L.Q. 61, 85 (2007).

212. *Id.*

213. Bismark, *supra* note 209.

as well as a financial, ecological or developmental matter."[214] Without serious domestic implementation, climate change will continue to remain, in the words of Ambassador Colin Beck of the Solomon Islands, "a comet" discussed faithfully every few years, but lacking result-oriented action.[215]

EIA is a broad problem-solving tool available to many governments around the world. By investigating and weighing a broad series of potential impacts, EIA can serve as an innovation lab and proving ground for new climate change strategies. EIA can draw on existing experience and guidance regarding the evaluation of climate change issues. EIA statutes are generally well-poised to evaluate complex and cumulative impacts. Local urban planners are just awakening to the linkage between localized laws or decision-tools (such as EIA, zoning codes, urban design, and building codes) and global climate change policy. While noteable efforts have been made, local efforts are merely anecdotal barring some form of a global report or other information-sharing tool.[216]

Both international experience and test applications evidence that the complex problem of climate change can be successfully broken down to much smaller pieces and analyzed in concert with other project considerations. EIA is limited as a tool to address climate change issues and its application is often frustrated by efforts to seize bureaucratic loopholes or short-circuit meaningful participation. It can only address new developments or proposed increases in GHG emissions rather than lowering existing levels. Despite its limitations, EIA has the potential to serve as an effective bridge between distant global aspirations and the local decisions needed to change theory into reality. As the bedrock of the development process, EIA can calm the simmering tension between the economic growth needed to support a burgeoning global population desperate to crawl out of the depths of poverty and the moral imperative of reduced GHG emissions.

The unraveling of international law from the knot of formal treaties into the existing laws and customs of domestic municipal governments, may yet prove to be the very answer to the complex problem of implementing

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214. Nicholas A. Robinson, Legal Advisor, Statement at Informal Thematic Debate of U.N. General Assembly (Aug. 1, 2007), *available at* http://digitalcommons.pace.edu/cgi/viewcontent.cgi?article=1404&context=lawfaculty.

215. U.N. SCOR, 62d Sess., 5663d mtg. at 13, U.N. Doc. S/PV.5663 (Apr. 17, 2007).

216. Jim Hecimovich, *Britain Goes Into High Gear*, PLANNING, Sept. 2007, at 52–53. The Royal Town Planning Institute in England is planning a variety of measures to link climate change analysis into localized planning decisions. *See also* Frank et al., *The Urban Form and Climate Change Gamble*, PLANNING, Sept. 2007, at 18–23 (noting King County, Washington's HealthScape project, a detailed technical study between land use patterns and GHG emissions "creating more neighborhoods like Queen Anne [a neighborhood where residents often walked or utilized mass transit] could have a tangible impact on carbon dioxide emissions and vehicle demand").

multilateral environmental agreements. On an international level, it is very difficult to get 192 nations, with diverse viewpoints and strategic interests, to agree on specific action items that are theoretically binding. When agreement is achieved, it is often accomplished using very diluted or vague language, and it may be difficult to translate such broad and distant goals into local action. Even when specific obligations are detailed, as they were in the Kyoto Protocol, it is difficult to bridge the gap between a diplomat's assurance and the domestic compliance of parties whose interests were not represented in the crafting of the solution now imposed upon them. Traditional international law, which focuses on signed international agreements, may not necessarily be an effective avenue to pursue immediate climate change objectives. Therefore, it is useful to have a secondary or interim approach which utilizes an existing and familiar framework to address climate change questions.

A draft model United Nations General Assembly resolution, which is both weighty and symbolic, is included in Appendix II as an example of a way to both recognize global agreements, but seek unique, national approaches under a broad EIA umbrella. EIA offers a streamlined and sparse notion of international law, in which nations are able to agree upon overarching standards and draw upon local expertise to create a specialized approach to implementation. While the pursuit of a singular "Holy Grail"[217] global agreement is admirable, it ignores the persistent political reality that national interest in competitive economic development will serve as an incentive for poor implementation and enforcement of GHG reduction policies. Furthermore, the utilization of EIA facilitates the domestic implementation of international climate change agreements. It helps to achieve international goals in the context of local participation and decision-making, as well as ensures that population growth and development do not erode or completely contradict ongoing and future strategies to address climate change. Finally, the EIA process can respond and reflect future changes to both the regulatory and scientific treatment of climate change.

The underutilized potential of EIA to bridge international and local spheres has not gone entirely unnoticed. In 1998, the U.N. Environment Programme (UNEP) noted that EIA was a useful strategy to increase the involvement of local parties otherwise excluded from international decision-making, stating that "[f]urther consideration needs to be given to how cumulative, global and strategic environmental issues should be considered in an assessment of local projects, and how non-local

217. Monty Python and the Holy Grail, *supra* note 5.

stakeholders should be involved."[218] UNEP further estimated that at least 100 nations had unilaterally adopted EIA regulations or laws.[219] Noting further that, in nations with a federal structure, many regions or municipalities had also adopted independent EIA structures; UNEP estimated the total global number of EIA programs to be at least 200.[220] Recent trends over the past decade include a strong surge in EIA adoption by developing nations and the corporate adoption of EIA strategies within corporate environmental management systems.[221] Regrettably, little, if any, work has been accomplished to follow up the earlier 1998 UNEP study, and there is not a comprehensive list of EIA laws.

EIA has tremendous potential for reshaping global strategies for climate change. It may utilize existing laws or processes to allow local populations and regional government entities a foothold in global debates otherwise far removed. As evidence of its localized character, EIA need not rely upon back-room, high-level political deals to incorporate climate change, but only upon the will and demand of the civil society. EIA takes climate change debates out of the staid halls of diplomacy, and into the voices of the public citizenry and project designers, who together must decide by what means they will attempt to fulfill a growing generational debt.

218. UNEP, EIA for Industry: STATUS REPORT ON UNEP TIE INITIATIVE TO IMPROVE INDUSTRIAL PROJECT PLANNING 18 (1999), *available at* http://www.uneptie.org/pc/pc/tools/pdfs/EIA2-rpt.pdf.

219. *Id.* at 5.

220. *Id.*

221. *Id.* at 6.

APPENDIX I

SEQRA Regulations Addition

The following italicized text represents proposed regulatory additions to SEQRA, the New York State EIA law; although climate change issues could be considered under the existing law, these additions provide more specific guidance for the consideration of GHG emissions.

§ 617.4 TYPE I ACTIONS

The purpose of the list of Type I actions in this section is to identify, for agencies, project sponsors and the public, those actions and projects that are more likely to require the preparation of an EIS than Unlisted actions. All agencies are subject to this Type I list.

The following actions are Type I if they are to be directly undertaken, funded or approved by an agency:

(10) any Unlisted action, that would produce at least 10,000 tons of unmitigated carbon dioxide emissions,[1] *and that would exceed a 15% increase in greenhouse gas emissions rate, over a 10 year period, as compared to existing emissions levels associated with a no-action alternative (see section 617.9(b)(5)(v) of this Part); and inclusive of any Unlisted action which otherwise will lead to a significant increase in the rate of such emissions (see section 617.7(c)(1) of this Part);*

§ 617.7 DETERMINING SIGNIFICANCE.

(c) Criteria for determining significance.

(1) To determine whether a proposed Type I or Unlisted action may have a significant adverse impact on the environment, the impacts that may be reasonably expected to result from the proposed action must be compared against the criteria in this subdivision. The following list is illustrative, not exhaustive. These criteria are considered indicators of significant adverse impacts on the environment:

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1. Note that in its regulation of power plant emissions, the State of Massachusetts defines eligible offset projects as those which would produce at least 5000 tons of CO_2 over a ten year period. FINAL MODIFICATIONS TO 310 CMR 7.00, app. B(1)(e)(3), att. A (2006), *available at* http://www.mass.gov/dep/air/laws/ghgappb.pdf. In addition, per capita CO_2 emissions within the United States are estimated at approximately twenty-two tons per person; the global average is four tons per person. *See* JAMES D. KERSETTER, GREENHOUSE GAS EMISSION IN WASHINGTON STATE: SOURCES AND TRENDS (1999), *available at* http://www.cted.wa.gov/energy/archive/papers/wa-ghg99.pdf.

(xii) a substantial increase in the rate of greenhouse gas emissions, to the degree at which the rate of increase would impair the effectiveness of other climate change planning or regulatory initiatives, and would thus pose a cumulative and significant impact to the environment.

APPENDIX II

UNITED NATIONS DRAFT RESOLUTION

General Assembly Draft Resolution _____:
Mainstreaming Climate Change and Project Decision-making

The General Assembly,

Recalling its resolution 54/222 of 22 December 1999, its decision 55/443 of 20 December 2000 and its resolutions 56/199 of 21 December 2001, 57/257 of 20 December 2002, 58/243 of 23 December 2003 and 59/234 of 22 December 2004 and 60/197 of 22 December 2005, 61/201 of 20 December 2006, and other resolutions relating to the protection of the global climate for present and future generations of mankind, and *Recalling* Agenda 21 of the 1992 United Nations Conference on Environment and Development (Earth Summit) and the Espoo Convention on Transboundary Environmental Impact Assessment.

Recognizes the inherent responsibilities of each generation as trustee of the environment for succeeding generations; [Note – This statement comes directly from Section 101 of NEPA]

Recalling also the Johannesburg Declaration on Sustainable Development,[1] the Plan of Implementation of the World Summit on Sustainable Development ("Johannesburg Plan of Implementation"),[2] the Delhi Ministerial Declaration on Climate Change and Sustainable Development, adopted by the Conference of the Parties to the United Nations Framework Convention on Climate Change at its eighth session, held in New Delhi from 23 October to 1 November 2002,[3] the outcome of the ninth session of the Conference of the Parties held in Milan, Italy, from 1 to 12 December 2003,[4] the outcome of the tenth session of the Conference

1. Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August–4 September 2002, chap. I, resolution 1, U.N. Doc. A/Conf.199/20, *available at* http://www.unmillenniumproject.org/documents/131302_wssd_report_reissued.pdf.

2. *Id.* at resolution 2.

3. U.N. Framework Convention on Climate Change, U.N. Doc. FCCC/CP/2002/7/Add.1, decision 1/CP.8 (Mar. 28, 2003), *available at* http://unfccc.int/resource/docs/cop8/07a01.pdf.

4. U.N. Framework Convention on Climate Change, U.N. Doc. FCCC/CP/2003/6/Add.1 and 2 (Apr. 22, 2004), *available at* http://unfccc.int/resource/docs/cop9/06a01.pdf.

of the Parties, held in Buenos Aires from 6 to 18 December 2004,[5] the outcomes of the eleventh session of the Conference of the Parties and the first session of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol, both held in Montreal from 28 November to 10 December 2005 and outcomes of Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol, held in Nairobi from 6 November to 17 November 2006.

Recalling also the provisions of the United Nations Framework Convention on Climate Change,[6] including the acknowledgement that the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions,

Recognizing the widely-shared practices of Environmental Impact Assessment (EIA) as a domestic regulatory process which, on a programme- or project- specific basis, identifies potential significant environmental impacts and recognizes the balance of environmental stewardship with development goals, and *recognizing* that certain other laws, regulations or policies may encourage a similar decision-making process prior to certain government approvals;

Recognizing also that over 100 member nations, as well as international financial organizations, have unilaterally adopted and implemented laws, regulations or policies which promote or require the undertaking of EIA reports in relation to certain types of government actions, approvals, policies, programmes or public development projects, and *further recognizing* that certain other laws, regulations or policies encourage a similar decision-making process prior to certain localized or programmatic government approvals;

Remaining deeply concerned that all countries, in particular developing countries, including the least developed countries and small island developing states, face increased economic, political and social risks from the negative ecological effects of climate change;

Notes the effort of certain member states in the unilateral establishment of technical guidance or draft guidance regarding the use of EIA as a means of addressing climate change;

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5. U.N. Framework Convention on Climate Change, U.N. Doc. FCCC/CP/2004/10/Add.1 and 2 (Apr. 19, 2005) *available at* http://unfccc.int/resource/docs/cop10/10a01.pdf.

6. United Nations Framework Convention on Climate Change, *opened for signature* May 9, 1992, 1771 U.N.T.S. 107 (*entered into force* Mar. 21, 1994).

OP1. *Invites* the Secretary General, including the joint efforts of the United Nations Environment Programme and the United Nations Development Programme, to report to the General Assembly at its sixty-fourth session, regarding the potential usefulness and feasibility of EIA, and similar land-use decision-making procedures, as a secondary means of addressing climate change issues, while also incorporating shared but differentiated responsibilities of developing nations;

OP2. *Invites* the Secretariat of the United Nations Framework Convention on Climate Change to participate in the creation of this report;

OP3. *Encourages* the participation of the relevant domestic agencies of all member nations with EIA laws, regulations or policies, or similar project-specific land-use decision-making procedures, to contribute to the development of the Secretary General's report;

OP4. *Encourages* the participation of intergovernmental organizations and relevant private-sector interests with interests and expertise in climate change issues in regards to the development of the Secretary General's report;

OP5. *Encourages* the participation of non-governmental and professional organizations, with special expertise in the conduct and application of domestic EIA laws and regulations, to contribute to the development of the Secretary General's report;

OP6. *Recognizes* that EIA is only one potential method by which to help manage future GHG emissions, that EIA is unable to address existing GHG levels, and that a variety of domestic and international solutions may be employed to address climate change;

OP7. *Urges* all member nations to continue progress in further defining international agreements, as well as domestic, regional and global strategies, which address climate change, and incorporate climate change into decision-making.

CLIMATE CHANGE, INTERGENERATIONAL EQUITY, AND INTERNATIONAL LAW[†]

Edith Brown Weiss*

INTRODUCTION

Climate change is an inherently intergenerational problem with extremely serious implications for equity between ourselves and future generations and among communities in the present and the future. More than twenty years ago I wrote an article entitled *Climate Change, Intergenerational Equity and International Law*. The basic issues and the analysis remain the same, though a number of international agreements relevant to climate change have been concluded since then.

At the time the Article was drafted, there was still considerable scientific uncertainty as to whether global warming was occurring, when it would occur, and with what effects within geographic regions. In an effort to address these uncertainties, the United Nations Environment Programme, the World Meteorological Organization, and the International Council of Scientific Unions jointly held the First World Climate Conference in 1979. Other international meetings focused on climate and carbon dioxide followed, culminating in a meeting of experts in 1985 in Villach, Austria, where an international consensus was achieved for the first time on the importance of the problem. The Article reprinted here was prepared as a Background Paper for the Villach Conference (Villach Article).

Three years later, in 1988, thirty-five countries founded the Intergovernmental Panel on Climate Change (IPCC), which produced its First Assessment of climate change and its effects in 1991. The IPCC is the most far-reaching international effort to ensure that authoritative scientific

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† The *Vermont Journal of Environmental Law* is reprinting this Article, which was originally published by Transnational Publishers, Inc., as Appendix D in EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS: INTERNATIONAL LAW, COMMON PATRIMONY, AND INTERGENERATIONAL EQUITY 345–51 (1989). The introduction for this reprinted edition has been newly added by the author.

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assessments are placed before the international community. In 2007, the IPCC produced its Fourth, and most recent, Assessment. The IPCC concluded that "[w]arming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level."[1] It further concluded that "[m]ost of the observed increase in globally-averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic GHG [Green House Gas] concentrations."[2]

The impacts from warming are predicted to be long-term, widespread, and severe. Even if a few countries may experience more favorable local climate in the near term, they are likely to suffer in the long term because of potentially devastating consequences elsewhere that will affect their own economic and social conditions. Developing countries will very likely suffer the worst effects from climate change because they have the least resilience and capacity to adapt.

No longer can we ignore the fact that climate change is an intergenerational problem and that the well-being of future generations depends upon actions that we take today. The Villach Article was included as an appendix to the 1989 book *In Fairness to Future Generations*. This book defines a theory of intergenerational equity, proposes principles of intergenerational equity, and sets forth both rights and obligations of future generations for the robustness and integrity of the Earth and its natural resources and for cultural resources.

The basic concept is that all generations are partners caring for and using the Earth. Every generation needs to pass the Earth and our natural and cultural resources on in at least as good condition as we received them. This leads to three principles of intergenerational equity: options, quality, and access. The first, comparable options, means conserving the diversity of the natural resource base so that future generations can use it to satisfy their own values. The second principle, comparable quality, means ensuring the quality of the environment on balance is comparable between generations. The third one, comparable access, means non-discriminatory access among generations to the Earth and its resources.

These principles satisfy the basic criteria of balance, flexibility, cultural acceptability, and clarity. One criterion is to balance the needs of future

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1. U.N. Env't Programme and World Meteorological Org., Intergovernmental Panel on Climate Change [IPCC], *IPCC Fourth Assessment Report, Climate Change 2007: The Physical Science Basis (Summary for Policymakers)* 5 (Susan Solomon et al. eds., 2007), *available at* http://ipcc-wg1.ucar.edu/wg1/ Report/AR4WG1_Print_SPM.pdf (contribution of Working Group I).

2. *Id.* at 10 (citation omitted).

generations with those of the present, neither licensing the present generation to consume without attention to the interests of future generations or requiring it to sacrifice unreasonably to meet indeterminate future needs. Since we cannot predict the values of future generations, we also have to provide them with the options and quality to satisfy their own values and needs. In addition, the principles need to be generally acceptable to the many different cultures in the world, and finally they have to be reasonably clear so that they can be implemented and applied.

Despite subsequent relevant legal developments, the intergenerational issues raised in the Villach Article remain. In 1985, States concluded a framework agreement to protect the ozone layer, The Vienna Convention for the Protection of the Ozone Layer, and two years later the Montreal Protocol on Substances that Deplete the Ozone Layer. Some of the chemicals controlled in this Protocol also are greenhouse gases, and the Protocol has made a useful contribution to limiting these greenhouse gas emissions.

In 1992, after eighteen months of negotiation, countries finalized the United Nations Framework Convention on Climate Change and opened it for signature at the Rio Conference on Environment and Development. Notably, the Convention does not contain explicit targets and timetables for stabilizing atmospheric concentrations of greenhouse gases. However, it does obligate States party to provide national inventories of sources and sinks of greenhouse gases, regular national reports on policies, and measures that limit emissions of greenhouse gases and enhance the sinks for them. As of April 1, 2008, 192 countries are parties to the Convention.

At the first meeting of the Conference of the Parties to the UNFCC, countries agreed to a mandate to negotiate a new binding instrument to apply to the period beyond the year 2000 and to consider quantified targets and timetables for controlling greenhouse gas emissions. The Kyoto Protocol to the Convention was concluded in 1997, although it entered into force only in 2005. As of January 15, 2008, 178 countries are parties to the Protocol, but not the United States. The Kyoto Protocol has had only limited effect. States are now looking to negotiate new arrangements to govern the post-Kyoto commitment period, which ends in 2012.

Recently, systems for trading in greenhouse gas emissions as a means to control emissions have emerged in Europe and North America. These include the European Union Emissions Trading Scheme (EU ETS), the voluntary U.S.-based Chicago Climate Exchange (CCX), the Chicago Climate Futures Exchange (CCFE), and a new Montréal Climate Exchange (MCeX). The last is a joint venture of the Montréal Exchange (MX) and

the Chicago Climate Exchange, which is expected to be launched at the end of May 2008.

The Villach Article refers to international environmental agreements in other areas. In the past twenty years, there have been significant developments in agreements to control pollution and protect ecosystems in regional seas, in the marine environment, in the atmosphere, and in fresh water. Indeed as of 2000, there were well over 1000 international legal instruments that were either partially or fully concerned with protection of the environment. Many more have been added since then. But despite these developments, we do not yet have international agreements that address climate change effectively, and they do not yet address the intergenerational dimensions of climate change.

The Villach Article proposes a global strategy for climate change, which respects principles of intergenerational equity and a declaration as an initial step. Since then, UNESCO adopted in 1997 a Declaration on the Responsibilities of the Present Generations Toward Future Generations, which focuses on our obligations to future generations (but not their rights). At the end of March 2008, the Human Rights Council adopted a resolution on Human Rights and Climate Change, which requests the Office of the United Nations High Commissioner for Human Rights to conduct "a detailed analytical study of the relationship between climate change and human rights" for submission prior to the Council's tenth session.[3]

Climate change is expected to have the most harmful impacts on impoverished regions and communities, in part because they are most vulnerable to changes in climate and because they have the least capacity to adapt. Intergenerational equity and intragenerational equity are linked in this context. In the present generation, one cannot expect people to fulfill obligations to future generations if they are not able to satisfy their basic needs. As future generations become living generations, they inherit the intergenerational obligations to conserve options, quality, and access in relationship to other members of the present generation.

As reports have indicated, climate change is likely to produce profound effects on the way we live, now and in the future. The article written for the Villach Conference twenty years ago identifies some of the pressing issues in ensuring intergenerational equity. We can choose to leave an impoverished legacy to future generations and to increase the inequalities

3. Laura MacInnis, *U.N. Human Rights Body Turns to Climate Change*, REUTERS, Mar. 28, 2008, http://www.reuters.com/article/environmentNews/idUSL2778449820080328. *See generally* U.N. Human Rights Council, *Promotion and Protection of All Human Rights, Civil, Political, Economic, Social and Cultural Rights, Including the Right to Development*, U.N. Doc. A/HRC/7/L.21/Rev.1 (Mar. 26, 2008) (recognizing climate change as a threat to peoples and communities).

among peoples today, or we can try to address the poverty issues today and to leave the Earth at least in no worse condition than we received it for future generations. If we have only obligations to future generations, we may act from a sense of noblesse oblige toward them. If, on the other hand, future generations have rights, people living today must consider their interests, examined from their perspective, in the actions we take today.

My congratulations to the *Vermont Journal of Environmental Law* and the *Vermont Law Review* for organizing this symposium on climate change and intergenerational equity and for contributing to an understanding of the issues.

Edith Brown Weiss, April 2008

APPENDIX D

CLIMATE CHANGE, INTERGENERATIONAL EQUITY AND INTERNATIONAL LAW*

by Dr. Edith Brown Weiss

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Global climate change induced partly by human activities raises serious issues of justice between the present generation and future generations, and between communities within future generations. In using the planet's resources for our own benefit, we may pass many of the costs to future generations in the form of climate change and the need to adapt to such change.

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Traditionally people have attributed climate to God, other deities, or the vagaries of nature. At least until recently they have not attributed it to human activities. As a corollary they have not considered that they had any obligation to compensate others for harsh climate conditions. But this assumption may falter. It may now be possible at the planetary level to hold one generation responsible for triggering global climate changes for future generations. While it may still be impossible to pinpoint particular countries as responsible for specific climate changes, it is increasingly possible to identify the global cumulative effects of our activities on future climate. We can also identify certain kinds of activities, such as fossil fuel consumption, as contributing significantly to an increase in temperature.

We have certain obligations to future generations which must guide the strategies that we adopt to address issues of global climate change. Unless we recognize this, we will benefit ourselves at the expense of the welfare of future generations. We will also proceed on the unwritten assumption that we must do everything we can to preserve the status quo in climate and prevent change. But change may not necessarily be more harmful to future generations if we can take steps to ensure that the rate of change is slow, that direct damage from change is minimized, and that future generations receive the tools and resources with which to adapt to climate change.

As a first step in addressing our obligation to future generations, we need to identify potential problems of intergenerational equity, develop normative principles to guide us in addressing these problems, and translate these into specific policies and enforceable agreements.

I. PROBLEMS OF INTERGENERATIONAL EQUITY

Problems of equity arise both between the present generation (defined as people living today) and future generations, and between different communities within future generations. Some problems relate to the condition of the natural environment future generations will receive; others to the resources they will inherit for adapting to a changed natural environment.

A. Changes in the Natural Environment

Global climate change directly affects the natural environment, although the precise effects and distribution of these effects remains uncertain. If projected temperature increases occur, coastal areas will flood, precipitation patterns will shift, and weather fluctuations may become more frequent and extreme. Depending upon the rate of change, this may lead to

degradation in the quality of the climate in major parts of the earth and decreased diversity in the natural resource base.

Degradation in the quality of the environment for future generations may arise at the global level and at regional and local levels. Many present centers of population may have climates that are regarded as less desirable than today. These will have significant societal impacts, such as population migrations and economic dislocations which can be costly for future generations. At the national level, coastlines may flood, causing members of future generations to abandon properties, to clean up polluted areas, and even to relocate urban areas. If coastlines flood in the future, the present generation will have reaped the benefits of coastal development and cheap waste disposal and inflicted potentially large costs on members of future generations.

Harsher climate conditions may also lead to depletion of the diversity of the natural resource base through the loss of existing species of flora and fauna unable to withstand the changes in temperature and precipitation or extreme fluctuations in weather. Advances in agriculture have led to the widespread adoption of crop strains which, while more productive, are also more vulnerable to climatic change. Many wild cultivars, useful in adapting to climate change, are being eliminated.

The depletion of the diversity of the natural resource base raises serious problems of equity for future generations because it narrows the range of options available to them in addressing their own problems and satisfying their needs.

Climate change will also raise significant equity concerns between communities within future generations because the changes will likely produce more favorable climates in a few parts of the world and less favorable in many others. Arguably those who will be better off should then help those who are worse off to share the burden. But those with relatively good climates today have been markedly reluctant to assist those with poorer climates, and such assistance as has been rendered, has not been viewed as compensatory for unfavorable climate conditions.

B. Access to Resources for Adapting to Global Change

The effects of global climate change upon the welfare of future generations depends upon the rate of climate change. The faster the rate, the heavier the costs are likely to be for future generations. While climate has always changed, the rate of change is unprecedented. While some of the changes in climate may objectively produce better conditions for human

habitation in certain areas, all peoples will suffer unless they are able to adapt quickly and effectively to the changed conditions.

We may classify countries according to their level of economic development today and the climate conditions that are projected within the next century. The level of economic development can be used as a guide to a country's ability to adapt to changed climate conditions. The higher the level of economic development, the more likely it is that the country will have resources with which to adapt to global climate change.

The matrix outlined here yields, for simplicity, four basic groups: developed countries expecting possibly better climate conditions (such as Canada), developed countries expecting worse climate conditions (such as the United States and countries in Europe), developing countries expecting better climate conditions, and developing countries expecting worse climate conditions. Of these groups, those countries that are now poor and will suffer worse climate conditions in the future suffer the greatest burden from climate change, for they have the least capacity to adapt to climate change.

In terms of intergenerational equity, the matrix reveals that we can expect not only problems of equity between generations but serious problems of equity between members of any given future generation. In some instances, such as for those poor countries whose climate worsens, the burdens will exacerbate existing inequities in the international community. In other instances, such for those developing countries potentially receiving better climate conditions, the climatic inequities may be alleviated, but other inequities will not be unless the resources and skills for adapting to changed climate conditions are available and can be effectively utilized. Otherwise, climate change will strengthen the economic divisions which already exist between countries, since some countries will have a greater capacity to adapt than will others.

II. THE THEORY OF INTERGENERATIONAL EQUITY

Before developing strategies for managing global climate change, it is important to define our obligations to future generations. For this, we adopt the perspective of a generation which is placed somewhere on the spectrum of time, but does not know in advance where.[1] Such a generation would want to receive the planet in at least as good condition as every other generation receives it and to be able to use it for its own benefit. This requires that each generation pass on the planet in no worse condition than

1. *See* J. Rawls, *A Theory of Justice* (1971).

received and have equitable access to its resources. From this we can formulate principles of intergenerational equity. As proposed in detail elsewhere, these principles would call for conservation of options (defined as conserving the diversity of the natural and cultural resources base), conservation of quality (defined as leaving the planet no worse off than received), and conservation of access (defined as equitable access to the use and benefits of the legacy).[2]

In the context of global climate change, implementation of these principles of intergenerational equity calls for measures to prevent rapid changes in climate, measures to prevent or mitigate damage from climate change, and measures to assist countries in adapting to climate change.

A strategy to prevent rapid climate change has been discussed by others. It includes such components as controlling the use of fuels rich in carbon, preventing deforestation and the misuse of soils, controlling the release of fluorochlorocarbons and other elements which destroy the ozone layer, and monitoring nitrogen fertilizer use. To fulfill our obligation to future generations, we need to evaluate these strategies against the normative goals of ensuring that our descendants have access to a planet with diversity and quality comparable to prior generations.

Strategies to minimize damage from anticipated climate change include many actions which we ought to take now for the welfare of our own and future generations, but which become more urgent in the face of global climate change. These include gathering and conserving germplasm for additional crops that are now neglected, and conserving the knowledge of traditional peoples of the utility of certain plants and animals, of ecosystems, and of practices adapted to harsh climate conditions. Many strategies to mitigate damage are appropriately implemented at the national and local levels. These include coastal zone management, particularly the siting of hazardous waste disposal facilities and nuclear power plants.

Strategies for adapting to climate change will involve research directed at anticipating changes, monitoring to detect changes, conservation of knowledge about how societies have adapted to climate changes in the past, development and maintenance of gene banks to assist in agricultural adaptations, planning for alternative water supplies, changes in land use, incentives to encourage or discourage population migrations as appropriate, and other measures. Some of these measures must be designed to assist

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2. *See*, E. Brown Weiss, *In Fairness to Future Generations: International Law, Common Patrimony, and Intergenerational Equity* (Transnational, 1989). *See also* E. Brown Weiss, "The Planetary Trust: Conservation and Intergenerational Equity," 11 *Ecology L. Q.* 295 (1984).

communities during the transition stage to a new climate; others should have a longer-range focus.

Unless the present generation is willing to undertake such measures, it is reaping the benefits of its activities but passing the very substantial costs to future generations to bear.

III. THE ROLE OF INTERNATIONAL LAW

In order to implement a strategy for managing global climate change, it will be necessary to develop enforceable norms of behavior as the international, national, and local level.

International law, which dates to the early 17th century and the rise of the sovereign nation-states, has been spatially oriented. To the extent that it considers the temporal dimension, it focuses mainly on the relationship of the present to the past. Problems of global climate change, which focus on the relationship of the present to the future, demand that it turn to the future. As set forth elsewhere, it would be useful to have a Declaration of the Planetary Rights and Obligations to Future Generations which would set forth principles of intergenerational equity to guide specific normative and policy developments in areas such as global climate change.[3] As an initial step, such a Declaration could be drafted for the specific context of global climate change.

In developing a strategy for global climate change, there are already certain existing agreements which can be drawn upon to address specific aspects of the problem. Most of these agreements are intended to control pollution. They include the Vienna Convention for the Protection of the Ozone Layer, the Montreal Protocol on Substances that Deplete the Ozone Layer, the Economic Commission of Europe (ECE) Convention on Long-Range Transboundary Air Pollution, the Protocol to reduce sulphur emissions by 30 percent, the draft Protocol on controlling nitrogen oxides, and the European Economic Community (EEC) directives and regulations on specific pollutants.[4]

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3. *See supra* note 2; E Brown Weiss, "Intergenerational Justice and International Law," unpublished manuscript, presented to the Conference on Human Rights, Oxford University, May 1987.

4. Vienna Convention for the Protection of the Ozone Layer, March 22, 1985, 26 *I.L.M.* 1516 (1987); Montreal Protocol on Substances That Deplete the Ozone Layer, Sept. 1987, [Reference File] Int'l Env't Rep. (BNA) 21:3151; Convention on Long-Range Transboundary Air Pollution, Nov. 13, 1979, 18 *I.L.M.* 1440 (1979), T.I.A.S. No. 10541; Protocol on the Reduction of Sulphur Emissions or Their Transboundary Fluxes by At Least 30 Per Cent, July 6, 1985, [Reference File] Int'l Env't Rep. (BNA) 21:3021; Protocol on the Control of Emissions of Nitrogen Oxides (revised draft), 17 *Envt'l*

Many countries have national legislation controlling the emission of air pollutants to various degrees, which could be extended to controlling emissions of chlorofluorocarbons, nitrous oxides, and perhaps carbon dioxide. Some countries have legislation mandating standards of energy efficiency (which cuts down on fuel or gasoline consumption) or providing incentives to use certain fuels rather than others. Such national legislation could be used to lower carbon dioxide emissions.

There are few international agreements to date which can be viewed as minimizing the direct effects of global climate change, such as coastal flooding and water contamination. International agreements controlling marine pollution offer useful precedents. These include the London Ocean Dumping Convention, the Law of the Sea Convention, the many regional seas conventions, and the recent convention controlling the disposal of wastes in the South Pacific.[5] At the national level, some countries have enacted coastal zone management legislation, which could be useful in developing responses to projected coastal damage from global climate change.[6] In the United States, state and local land use regulations play a critical role.

There are no international agreements to date directed to adapting to climate change. Those agreements providing for the monitoring and exchange of climate data are, of course, relevant to any adaptation strategy. Once there is agreement on what adaptation requires, however, international agreements to facilitate this policy will be needed.

IV. SCIENTIFIC UNCERTAINTY AND INTERNATIONAL LAW

Planning for global climate change inherently involves large scientific uncertainties. As our understanding of how the climate system works, of how human activities affect the system, and of the impacts of global climate change upon the natural and cultural environment increases, it must be incorporated into our laws and institutions. In international law, this means

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Pol'y & L. 259 (1987); EEC Directive on Air Quality Standards for Nitrogen Dioxide, March 7, 1985, 28 *O.J.Eur.Comm.* 1 (1985).

5. Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter [London Ocean Dumping Convention], Dec. 29, 1972, T.I.A.S. No. 8165; U.N. Convention of the Law of the Sea, Dec. 10, 1982, 21 *I.L.M.* 1261 (1982); Convention for the Protection of the Natural Resources and Environment of the South Pacific Region, Nov. 25, 1986, 26 *I.L.M.* 38 (1987).

6. *See* U.S. Coastal Zone Management Act of 1972, 1985 ed. & 1987 pocket. 16 U.S.C.A. 1451-64; *Environmental Protection of Coastal Zone Management in Asia & Pacific* (I. Kato *et. al.* eds. 1986).

drafting agreements in such a way that they can respond to changes in scientific knowledge.

There are several devices already in use in various international agreements for doing so, albeit they may not be adequate. One of the most common is the use of protocols and annexes to implement agreements and to regulate additional activities as scientific understanding advances. The Montreal Protocol on chlorofluorocarbons to the Vienna Convention on Protecting the Ozone Layer, the Protocol on sulphur emission and the draft Protocol on nitrogen oxides to the Convention on Long-Range Transboundary Air Pollution, the annexes to the Great Lakes Water Quality Agreement, the annex to the Convention on the Conservation of Antarctic Seals, and the protocols to many of the regional seas conventions, illustrate these.[7]

International agreements have also used appendices or lists of regulated items effectively. In some instances the appendices set forth scientific criteria for placing items on the list. These agreements include the Great Lakes Water Quality Agreement between Canada and the United States, which lists hazardous and potentially hazardous pollutants in appendices, the London Ocean Dumping Convention, the Rhine Convention Against Pollution by Chlorides, the Convention on the Conservation of Migratory Species of Wild Animals, and the Convention on International Trade in Endangered Species of Wild Fauna and Flora.[8]

One of the most promising approaches is the use of scientific advisory boards which are established as part of the Conventions. These boards are usually authorized to advise on issues relevant to implementing the conventions. For example, the Migratory Species Scientific Council, attached to the Convention on the Conservation of Migratory Species of Wild Animals, is to provide scientific advice to the parties, recommend and evaluate relevant research, recommend migratory species for inclusion in

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7. Montreal Protocol, *supra* note 4; Protocol on the Reduction of Sulphur Emissions, *supra* note 4; Protocol on the Control of Nitrogen Oxides, *supra* note 4; Great Lakes Water Quality Agreement, Nov. 22, 1978, T.I.A.S. No. 9257 and Protocol Amending the 1978 Agreement, signed Nov. 18, 1987; Convention on the Conservation of Antarctic Seals, June 1, 1972, T.I.A.S. No. 8826, and as an example of protocols to regional sea conventions, Protocol Concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency, Feb. 16, 1967, 15 *I.L.M.* 306 (1976).

8. Great Lakes Water Quality Agreement, *supra* note 7; London Ocean Dumping Convention, *supra* note 5; Rhine Convention Against Pollution by Chlorides, Dec. 3, 1976, 16 *I.L.M.* 265 (1976); Convention on the Conservation of Migratory Species of Wild Animals, June 23, 1979 19 *I.L.M.* 11 (1976); Convention on International Trade in Endangered Species of Wild Fauna and Flora, March 3, 1979, T.I.A.S. No. 8249.

the agreement, and suggest conservation measures.[9] Similarly, the Great Lakes Water Quality Agreement establishes a Science Advisory Board to assist the Water Quality Board and members of the International Joint Commission, and ultimately the parties in implementing the Agreement.[10] The Montreal Protocol on Substances That Deplete the Ozone Layer, the Convention on the Conservation of Antarctic Marine Living Resources, the Convention for the Conservation of Antarctic Seals, and the recent Convention on Antarctic Mineral Resources also provide for scientific advisory councils.[11] In the context of global climate change, serious consideration should be given to include scientific advisory units in international agreements addressed to aspects of climate change.

V. CONCLUSIONS

We must recognize that global climate change caused in part by human activities raises serious problems of justice between our generation and future generations, and among communities within these future generations. To fulfill our responsibility to future generations we must respect principles of intergenerational equity. We need a Global Strategy for Climate Change, which reflects principles of intergenerational equity. The strategy should include measures to slow the rate of change, to minimize direct damage from change, and to transfer the resources and tools necessary to adapt to climate change. Elements of such a strategy must be translated into enforceable norms at the international, national, and local levels. As an initial step, we should consider a Declaration of Planetary Rights and Obligations addressed to issues of global change. Only by addressing issues of intergenerational equity now can we ensure that we are passing a planetary legacy to future generations which is no worse than we received it.

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9. Art. VIII, Convention on Conservation of Migratory Species of Wild Animals, *supra* note 8.

10. Art. VIII, Great Lakes Water Quality Agreement, *supra* note 7.

11. Migratory Species Convention, *supra* note 8; Great Lakes Water Quality Agreement, *supra* note 7; Montreal Protocol, *supra* note 4; the Conservation of Antarctic Marine Living Resources, May 20, 1980, T.I.A.S. No. 10240; Convention for the Conservation of Antarctic Seals, June 1, 1972, *supra* note 7; Convention on the Regulation of Antarctic Mineral Resource Activities, June 2, 1988, 27 *I.L.M.* 859 (1988).

BOOK REVIEW: THE SUNNYSIDE OF CLIMATE CHANGE

Bjørn Lomborg, *Cool It: The Skeptical Environmentalist's Guide to Global Warming* (Alfred Knopf, N.Y., New York 2007), 253 pp.

Mark Latham*

Bjørn Lomborg, an adjunct professor at the Copenhagen Business School, has a doctorate in political science, and he is also the founder and director of the Copenhagen Consensus Centre, which is affiliated with the Copenhagen Business School. The Copenhagen Consensus has undertaken the ambitious but some what vague and circular objective of "making decisions on the prioritization of the efforts to solve the major challenges of the world through the means of initiating, organizing and developing the Copenhagen Consensus Process."[1] This Copenhagen Consensus Process apparently entails an annual meeting where economists and others rank the ills of the world and then propose an allocation of funds on the basis of "Where do extra resources do the most good first?"[2] Put another way, the members of the Copenhagen Consensus apply a cost–benefit approach in analyzing a variety of global problems and then rank the results in order of "biggest bang for the buck."[3] It is this cost–benefit approach that Dr. Lomborg applies with a vengeance to the important global problem of climate change in his latest book *Cool It: The Skeptical Environmentalist's Guide to Global Warming*.

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1. Copenhagen Consensus Ctr., By-laws for the Copenhagen Consensus Center, § 2 (in effect Jan. 1, 2006) (Den.), *available at* http://www.copenhagenconsensus.com/Default.aspx?ID=756.

2. BJØRN LOMBORG, COOL IT: THE SKEPTICAL ENVIRONMENTALIST'S GUIDE TO GLOBAL WARMING 42 (2007) [hereinafter COOL IT].

3. *See* Copenhagen Consensus Ctr., http://www.copenhagenconsensus.com/Default.aspx?ID=755 (last visited Apr. 30, 2008) ("In particular we focus on the international community's effort to solve the world's biggest challenges and on how to do this in the most cost-efficient manner. The idea is simple, yet often neglected; when financial resources are limited, you need to prioritize the effort.").

Dr. Lomborg's previous work in the environmental field includes *The Skeptical Environmentalist*,[4] which to put it mildly was subject to harsh criticism for its overly cheerful assessment of an array of global environmental issues ranging from human health to natural resources to pollution to biodiversity to climate change. As but one example of the criticism heaped on Dr. Lomborg arising from *The Skeptical Environmentalist*, renowned biologist E.O. Wilson took Dr. Lomborg to task for his optimistic estimates of species extinction rates, and in a particularly harsh opening paragraph E.O. Wilson remarked:

> My greatest regret about the Lomborg scam is the extraordinary amount of scientific talent that has to be expended to combat it in the media. We will always have contrarians like Lomborg whose sallies are characterized by willful ignorance, selective quotations, disregard for communication with genuine experts, and destructive campaigning to attract the attention of the media rather than scientists. They are the parasite load on scholars who earn success through the slow process of peer review and approval. The question is: How much load should be tolerated before a response is necessary? Lomborg is evidently over the threshold.[5]

Following his sunny assessment of the state of the world's environment in *The Skeptical Environmentalist*, Dr. Lomborg proceeds to offer a similarly cheerful view of climate change. He does not dispute that climate change is occurring, and Dr. Lomborg, unlike many climate change naysayers, readily admits that climate change is occurring as a result of human activity.[6] He also readily acknowledges that "[i]t will have a serious impact on humans and the environment toward the end of this century."[7]

Nonetheless, despite the admission that climate change will have a perilous impact, according to Dr. Lomborg that position reflects the pessimist's "the glass is half empty" view of climate change. A substantial part of Dr. Lomborg's presentation in *Cool It* is the optimist's "the glass is half full" position that this latter view has been missing from the climate

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4. BJØRN LOMBORG, THE SKEPTICAL ENVIRONMENTALIST: MEASURING THE REAL STATE OF THE WORLD (Hugh Matthews trans., Cambridge Univ. Press 2001) (1998) [hereinafter SKEPTICAL ENVIRONMENTALIST].

5. E.O. Wilson, *Vanishing Point: On Lomborg and Extinction*, GRIST ENVTL. NEWS & COMMENTARY, Dec. 12, 2001, http://www.grist.org/advice/books/2001/12/12/point.

6. COOL IT, *supra* note 2, at 8.

7. *Id*.

change debate and compels that we give serious consideration to the benefits attendant to a warmer planet.

As a starting point for his thesis in *Cool It*, Dr. Lomborg takes on those who focus on the negative impacts that climate change will have upon polar bears and their icy habitat. Dr. Lomborg, consistent with his cheerful focus on the positive aspects of climate change, does not accept the view that the melting Arctic region will result in the eventual extinction of the polar bear due to the loss of habitat. The stated purpose of this introductory exercise is to demonstrate the "vastly exaggerated and emotional claims"[8] that appear in the media to hype the impact that climate change will likely have on the planet and its species. With respect to polar bears, Dr. Lomborg asserts that for forty years the number of polar bears has increased; and he rather cavalierly states that the melting ice does not foretell the impending doom of the species, but merely means that polar bears will "take up a lifestyle similar to that of brown bears, from which they evolved."[9] How long this will take and how many polar bears will perish during Dr. Lomborg's predicted evolutionary journey towards the adaptation of brown bear behavior is not among the abundant statistics provided in *Cool It*.

Of course, those who have experienced life in the Arctic region and have studied the effects of climate change do not share Dr. Lomborg's sunny prediction of an evolutionary alteration saving the polar bear from the effects of climate change. Not too long ago Paul Nicklen, a lifelong Arctic resident, for example, wrote about his observed changes in the region in *National Geographic Magazine*:

> Scarcely ten years later, things have changed. The Poles are melting at an alarming rate; as warming grinds on, the possibility of an ice-free Arctic, at least during the summer, creeps closer each day. . . . Some scientists even believe the Arctic will be void of summer ice, dooming polar bears to extinction. This is one of the most disturbing predictions I've heard.[10]

Mr. Nicklen's observations of the effect climate change is exacting on the Arctic is a far cry from Dr. Lomborg's predicted polar bear adaptation through evolution.

With respect to other Arctic species, Dr. Lomborg simply asserts that the changing climate does not mean extinction of species, but an increase in

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8. *Id*. at 6.
9. *Id*. at 6–7.
10. Paul Nicklen, *Life at the Edge*, NAT'L GEOGRAPHIC MAG., June 2007, at 32, 40.

species diversity and "higher ecosystem productivity,"[11] but what precisely this later phrase means is not clear. Yes, in response to changing weather patterns, different species likely will appear as new inhabitants in regions of the world where they were never found before. What happens, though, to existing species dependent upon a certain habitat that vanishes as a consequence of a hotter planet? Extinction, and perhaps mass extinction, is the troubling predicted answer to that question.[12]

What effects will climate change have upon the human species according to Dr. Lomborg? Here, too, we are not to worry. Why this lack of concern? Well, put simply, a warmer planet means fewer deaths.

Specifically, Dr. Lomborg claims that as a result of climate change the number of cold-related deaths will dramatically decline with no appreciable increase in heat-related deaths. Focusing on Europe, for instance, Dr. Lomborg claims that annually 200,000 people die from heat-related causes each year, but that roughly seven times as many—1.5 million—deaths are caused by the cold.[13] Turn the planet thermostat up a few degrees and, as noted by Dr. Lomborg, the cold-related deaths decline drastically, which is a positive benefit of climate change that we must consider to fully appreciate the true impact of climate change:

> How will heat and cold deaths change over the coming century? Let us for the moment assume—very unrealistically—that we will not adapt at all to the future heat. Still the biggest cold and heat study from Europe concludes that for an increase of 3.6 F, . . . any increases in mortality due to increased temperatures would be outweighed by much larger short-term declines in cold-related mortalities. For Britain, it is estimated that a 3.6 F increase will mean two thousand more heat deaths but twenty thousand fewer cold deaths.[14]

This short quote is reflective of one of the major difficulties with Dr. Lomborg's approach to the subject of climate change and its purported benefits. Although he provides a lengthy seventy-seven page list of source notes and references at the end of *Cool It* to substantiate his assertions, it is

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11. COOL IT, *supra* note 2, at 7.

12. *See, e.g.*, Jay R. Malcom et al., *Global Warming and Extinctions of Endemic Species from Biodiversity Hotspots*, 20 CONSERVATION BIOLOGY 538, 544 (2006) (concluding that the effects of climate change could result in the loss of as many as 56,000 plant species and 3700 vertebrate species throughout the world).

13. COOL IT, *supra* note 2, at 17.

14. *Id*.

quite difficult to match the sources with the assertions. Thus, the multitude of statistics that Dr. Lomborg causally throws at the reader, such as those regarding the number of cold- and heat-related deaths in Europe, are practically impossible to verify. Verification is critical if one of his goals in writing the book was to get those interested in climate change to rethink their viewpoints concerning the challenges that climate change presents and the solutions that policy makers should consider.

His use of figures is also problematic because Dr. Lomborg is sloppy at best, and at worst, misleading with exactly what his numbers tend to support. He relies on figures to assert, for example, that heat deaths will not dramatically rise as a result of climate change. He fails to note, however, that the study he relies on to support that claim concludes that the offset in the number of warm weather deaths by fewer cold weather deaths will occur only over the *short term*. More important, with respect to climate change, is the question of what are the long-term implications of a 3.6 F or higher rise global temperatures? The answer to that critical question is not one that Dr. Lomborg specifically addresses in his discussion of heat-related deaths associated with climate change.

The brief heat wave that struck Chicago for several days in the summer of 1995 might prove instructive of what could occur as a result of increased, prolonged temperatures attendant to climate change in cities around the world. During the mid-1990s Chicago faced a heat wave with ambient temperatures during the day well into the 90s and on some days above 100 F. This period of intense warmth also coincided with a period of high humidity, so that the actual impact of the hot weather was even more acute. Based on data supplied by the Cook County Medical Examiner's office to the Centers for Disease Control and Prevention (CDC), the Chicago heat wave resulted in over 700 excess deaths and 485 deaths directly related to heat.[15] Important for climate change impact is that in its analysis of heat-related deaths, the CDC arrived at the conclusion that "[h]eat-related morbidity and mortality could increase with periods of extreme heat."[16]

Based on the death toll that occurred in Chicago during the 1995 heat wave alone, the assertion by Dr. Lomborg that a decrease in cold weather deaths will offset the expected rise in heat-related deaths seems dubious, at least in the United States. Dr. Lomborg's claim is all the more questionable since, according to the CDC, the total annual cold weather deaths in the

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15. Ctr. for Disease Control & Prevention, MMRW (Morbidity & Mortality Weekly Report), Heat-Related Deaths—Chicago, Illinois, 1996–2001, and United States, 1979–1999 (July 4, 2003), *available at* http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5226a2.htm.

16. *Id.*

entire United States is typically in the range of 700,[17] which is fewer than the total excess heat deaths that occurred in Chicago during the 1995 heat wave and strongly suggests that Dr. Lomborg's predicted offset between heat-related and cold-related death is not a terribly likely scenario if the Earth reaches the predicted, unprecedented, and sustained warmer temperatures resulting from climate change.

Other aspects of his discussion regarding the effect of a warmer planet on human health also raise doubts. In the United States, he asserts that heat-related deaths in the largest cities have "dropped in general because of better health care."[18] Perhaps that is true for those who are fortunate to have access to health insurance in the United States. But there are tens of millions of individuals without health insurance in the United States, most of whom are poor, unemployed, or the working poor whose employers do not provide health insurance as a benefit. They thus have limited or no access to this purported "better health care."

Additionally, Dr. Lomborg's view concerning access to better health care is a rather parochial one since it concerns only the United States. My guess is that billions of people in the world have limited or no access to health insurance, let alone actual health care. How will these people fare as the Earth's temperature rises and cities throughout the world become warmer? Again, the 1995 Chicago heat wave may prove highly illustrative of the fate many will face.

Another questionable aspect of *Cool It* is the position that we have and will continue to adapt to warmer temperatures and, in particular, the claim that "[o]ne of the main reasons for the lowered heat susceptibility is likely increased access to air conditioning."[19] This is an especially ironic assertion since the increased need for air conditioning, both because warmer temperatures will strike sooner and result in longer, hotter summers, will result in increased electricity demands, much of it supplied by coal-fired power plants. This will lead to increased emissions of the main heat trapping gas, carbon dioxide, with associated increases in other pollutants as well, which will further increase global temperatures. Dr. Lomborg apparently fails to see the irony of this specific position. But there is still no need to worry about higher urban temperatures, because an "almost comically straightforward"[20] solution is readily available: we can simply, as he points out toward the end of his discussion of temperature-

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17. Ctr. for Disease Control & Prevention, *Fact Sheet: Hypothermia-Related Deaths—United States, 2003–2004* (Feb. 24, 2005), *available at* http://www.cdc.gov/od/oc/media/pressrel/fs050224.htm.

18. COOL IT, *supra* note 2, at 18.

19. *Id*.

20. *Id*. at 21.

related deaths, using Los Angeles as an example, reflect heat with light colored pavement and roofs and plant millions of trees.[21] These steps, according to Dr. Lomborg, will provide a host of financial benefits and, importantly, lower temperatures by 5°F, which is the estimated rise expected as a result of climate change.[22] Ah, if the answers to climate change were only as simple as painting the town white!

Since his approach to climate change relies heavily on cost–benefit analysis, a substantial portion of *Cool It* focuses on the costs of complying with the carbon reduction requirements of the Kyoto Protocol, which he believes are vastly disproportionate to the meager human health benefits that will occur as a result of reducing global carbon emissions. In his view, the funds necessary to achieve compliance with the Kyoto Protocol's very modest carbon reduction goals are by far better spent, and will have a far greater positive impact on humanity, on current scourges such as AIDS, malnutrition, malaria, and contaminated drinking water.[23] Surely addressing these issues through well-funded, effective programs would result in enormous global societal benefit. To focus on these issues, however, to the near exclusion of climate change, misses the mark because Dr. Lomborg does not adequately confront the fact of the widely anticipated exacerbation that will occur with the problems he believes we should devote most resources to in lieu of combating climate change through aggressively reducing carbon emissions.

According to the *Fourth Assessment Report* of the Intergovernmental Panel on Climate Change, it is "very likely" that the effect climate change will have on human health includes an increased risk of infectious diseases.[24] Consider higher rates of infectious diseases, coupled with the regional anticipated effects of climate change, such as less water for between 75 and 250 million Africans, with an associated potential decrease of 50% in crop yields, and with a similar scenario expected in Latin America in terms of reduced food production, and one can only conclude that the human health toll around the world, particularly in the developing world, will be dramatic.[25] It is simply common sense that the anticipated negative consequences that climate change will have on food production worldwide will significantly exacerbate the current health problems that Dr.

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21. *Id*.

22. *Id*.

23. *Id*. at 41–52, 164.

24. U.N. Env't Programme and World Meteorological Org., Intergovernmental Panel on Climate Change, *IPCC Fourth Assessment Report, Climate Change 2007: Synthesis Report (Summary for Policymakers)* 13 tbl.SPM.3 (2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf.

25. *Id*. at 11–12 tbl.SPM.2.

Lomborg believes we should focus on to the virtual exclusion of major reductions in carbon emissions.

But here too, Dr. Lomborg counsels readers that there is little need to worry about the predicted ravages of climate change upon humanity, particularly in developing countries. This may seem counterintuitive, since one can reasonably surmise that the poorer countries of the world are likely to face the greatest adverse consequences of climate change. Dr. Lomborg notes, based on an unclear source, that at the turn of this century

> when many of warming's problems will be felt in earnest, the average person in the developing world is expected to make about one hundred thousand dollars (in present value) each year. . . . [T]he average person in the third world will be as rich as a present-day Portuguese or Greek or richer than most West Europeans in 1980. Much more likely, he or she will be richer than today's average American, Dane, or Australian. This richness will of course enable these countries to better handle outside shocks, whether they come from climate change or any of the other major challenges the future undoubtedly will deal us.[26]

There are several difficulties with his assertion that we can, therefore, simply spend our way out of the harsh effects that scientists anticipate will occur as a result of climate change. First, it is not clear where or how he arrived at the astronomical economic growth that he predicts will occur in developing countries. An associated difficulty is that it is far from clear which are the specific "developing countries" that will, over the course of less than a century, become economic powers on par with 1980 Western Europe. Second, based on current evidence, in most impoverished countries Dr. Lomborg's predicted climb out of poverty does not appear likely by the end of this century.

Yes, rapid, unprecedented economic growth is occurring in China and India, but is the same occurring in Sub-Saharan Africa or in Haiti? I do not believe anyone can make a credible case that those regions of the world are on the sound path of economic development on scale predicted by Dr. Lomborg. Third, even if he is correct that incomes in developing countries will soar to the astronomical levels he cites, will not a corresponding dramatic rise in the price of basic life necessities also occur, so that only marginal reductions in poverty will have occurred in the developing countries he references? Fourth, will not such new found wealth also result

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26. COOL IT, *supra* note 2, at 48.

in behavior that further contributes to substantial increases in worldwide carbon emissions due to the purchases of middle class necessities, including automobiles, air conditioning, and other appliances powered by fossil fuels? Finally, rather than using this burgeoning new-found worldwide wealth to adapt to the harmful effects of climate change, it would seem to make more sense to consider this increased income in the true cost of taking aggressive action to reduce carbon emissions. This Dr. Lomborg does not do in his rushed conclusion that compliance with the Kyoto Protocol is too expensive.

Flooding, another anticipated negative consequence of climate change, he addresses in similar fashion. All we need to do throughout the world to protect populations susceptible to the ravages of flooding caused by rising sea levels, according to Dr. Lomborg, is to build barriers, dikes, and levees. "If we invest smartly," he writes, "we will essentially have no people flooded by 2085, simply because we are richer and can afford greater protection."[27] As I recall, this exact proposed solution—the construction of barriers, dikes, and levees—was supposed to protect low-lying New Orleans from the waters of the Mississippi River, various and sundry canals, and the Gulf of Mexico. We are, of course, acutely aware of the havoc that Hurricane Katrina wreaked upon the Crescent City the day that the levees failed. Nonetheless, despite the enormous costs associated with such constructed barriers and the fact that a certain number will undoubtedly fail over time, or simply prove ineffective, Dr. Lomborg advocates for their widespread use on a global basis as the answer to rising sea levels.

In the end, the cost–benefit arguments set forth in *Cool It* are best summarized as curiously contradictory. That is, regarding the costs associated with climate change, Dr. Lomborg cannot have it both ways. On the one hand, the modest carbon reductions that the Kyoto Protocol mandates are too expensive; but on the other hand, as global incomes rise, even developing countries will have the financial wherewithal necessary to adapt and combat the range of negative consequences brought to bear by a hotter planet. I find this financial sleight of hand by Dr. Lomborg simply unpersuasive.

While pitched on the inside cover as a "groundbreaking book," *Cool It* is far from a revolutionary work. Much of what is presented in *Cool It* is in actuality a repackaging of the views on climate change presented several years earlier by Dr. Lomborg in *The Skeptical Environmentalist*. In that Pollyanna perspective of the state of the global environment, he presented

27. *Id*. at 68.

many of the same arguments that underlie much of *Cool It*. In *The Skeptical Environmentalist*, Dr. Lomborg concluded his discussion on climate change by stating that "[g]lobal warming will not decrease food production, it will not probably increase storminess or the frequency of hurricanes, it will not increase the impact of malaria or cause more deaths," nor will it result in catastrophic floods.[28] Why not? Because, of course, "a much richer world will protect itself better."[29]

If that refrain is a very familiar one, it is because the sum and substance of the *The Skeptical Environmentalist*'s primary argument has been merely repackaged and updated in Dr. Lomborg's latest book, *Cool It*. One is only left to surmise that Dr. Lomborg cooked up what amounts to a leftover, already-served meal of a book, not in an effort to educate and add to the serious debate concerning what steps to take to effectively address what is perhaps one of the greatest challenges facing humanity, but as a cynical effort to capitalize on the attention climate change is receiving by selling a not particularly compelling book.

28. SKEPTICAL ENVIRONMENTALIST, *supra* note 4, at 317.
29. *Id*.