

Article

Losing the Forest for the Trees: Environmental Reductionism in the Law

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Abstract: Environmental laws and policies have saved some “trees”, but the “forest” is being lost as critical global issues including climate change, biodiversity loss, and our ecological footprint continue to worsen. Existing laws and policies mitigate the ecological damage inflicted by industrial economies and western lifestyles. The article essentially makes the case for a sustainability approach to law that aims for transformation rather than environmental mitigation. Relevant trends in international law and domestic law reflective of a sustainability approach are discussed, and the article describes some contours of “law for sustainability” or “sustainability law”.

Keywords: environmental reductionism; compartmentalization; fragmentation; subject of environmental law; anthropocentrism vs. ecocentrism; sustainability; ecological integrity; sustainability law

1. Introduction

The year 1969, when the US National Environmental Policy Act came into force, is often referred to as a landmark in modern environmental law [1]. Around that year, most industrialized countries had general environmental laws either enacted or planned. How effective have those forty years of environmental protection been? Not very effective, perhaps but not entirely ineffective either.

A good number of *trees* have been saved, literally and metaphorically. Europe, North America and other Western regions have steadily increased their natural reserves and protected areas. Forestry is better managed (hence more trees), rivers and lakes are less polluted. The air in urban environments

is cleaner. Energy efficiency has substantially improved. Renewable energy is on the rise; and eco-friendly products are in high demand. By any means, this is a notable list of achievements.

Yet, there is a huge and ever-widening gap between the promise of environmental protection and ecological realities. Singular successes are vastly outdone by system failures: the world's climate is heading for a tipping-point, icecaps are melting, the stabilizing functions of oceans and rainforests are weakening, fish stocks are disappearing and biodiversity is diminishing. Humanity's ecological-footprint keeps getting bigger without any signs of the reverse. The *forests* are being lost, literally and metaphorically. The integrity of the planet's ecological systems—at local, regional and global levels—is now at risk [2].

Measuring environmental policies and laws by their own intentions and purpose descriptions, they have not achieved much at all. Rather they mitigate the ecological damage inflicted by industrial economies and Western-type lifestyles. For any prospect of real success, the examination of values and principles underpinning the law seems much more relevant than the findings of conventional legal research into the effectiveness of laws. Unless these underpinnings are addressed, no amount of environmental laws will bridge the gap between promise and fulfillment.

This article explores some of the deeper characteristics of legislative failure. Its thesis is that this failure can be overcome by incrementally incorporating sustainability into the interpretation of existing and the design of new laws. However, whether *lege lata* or *lege ferenda*, no law can ever replace or alter the moralities and perceptions that it is guided by. The close nexus between ethics and law is crucial for sustainability to be taken seriously.

In essence, environmental law is hampered by a reductionist approach to its subject, *i.e.*, the environment or more precisely, the human-nature relationship. This relationship is misconceived because of the domination of certain philosophical and cultural traditions in European history. As a consequence, modern legislation to protect the natural environment has developed in a compartmentalized, fragmented, economic, and anthropocentric manner. For environmental legislation to become effective, broader coverage and better enforcement are not enough. The inherent design flaw in these laws is the absence of a fundamental rule prohibiting harm to the integrity of ecosystems. Such a rule requires the acceptance of sustainability as an overarching ethical and legal principle.

To advance the argument, Section 2 of this article will briefly reflect on the specific subject of environmental law and show the conceptual difference between this area and other areas of law. Section 3 will explore the flawed design of modern environmental law in terms of certain ethical deficiencies and historical legacies. These flaws are often hidden as they do not normally feature in public discourses. Their origins have a long history, as indicated, and are rarely detected in the normal process of political and legal decision-making. Ethical and philosophical reflections have yet to inform the legal process. As the sustainability debate is largely ethical in nature, it needs to inform all levels of public discourse, from educational and academic pursuits to the public arena and eventually to politics, law and governance. What this will involve will be discussed in the second part of this article (Sections 4–6). Section 4 identifies some psychological barriers and institutional deficiencies that need to be addressed first. Only then can a dialogue about sustainability be meaningful. How such a dialogue may inform the legal debate and shape the future interpretation and design of law will be the subject of Section 5. This section will also contain instructive examples in domestic and international law.

My overall argument is that the discourse on ecological sustainability, while not providing an easy fix-it-all recipe, can lead us to appreciate our past mistakes and understand how we may be able to overcome them. The promise for the future is nothing less than improving our chances for survival.

2. The Challenge and Dilemma of Environmental Law

2.1. Tragedy of the Commons

The subject of environmental law, whether domestic or international, is the human-nature relationship. This relationship is best described by comparing individual entitlements with their cumulative impacts on nature or the “commons” as Garret Hardin called them in his classic essay, “*The Tragedy of the Commons*” [3]. Although Hardin’s central thesis is well known, it is worth repeating some relevant passages here (see Hardin in [3], p. 1244):

The tragedy of the commons develops in this way. Picture a pasture open to all. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. Such an arrangement may work reasonably satisfactorily for centuries because tribal wars, poaching, and disease keep the numbers of both man and beast well below the carrying capacity of the land. Finally, however, comes the day of reckoning, that is, the day when the long-desired goal of social stability becomes a reality. At this point, the inherent logic of the commons remorselessly generates tragedy.

As a rational being, each herdsman seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks, “What is the utility to me of adding one more animal to my herd?” [T]he rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another... But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy. 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.

At a global scale, Hardin’s pasture includes such commons as the oceans, water, soils, forests, energy, and ultimately the entire planet [4]. No one is denied entry. Anyone may lay claim to the common resources. The tragedy occurs when any concern for the common good slips through the system of individual claims.

The most interesting aspect of Hardin’s essay is the assumed inability of the individual actors to look beyond the here and now. They consider it rational to maximize individual gain and would not question such rationality even if presented with the information that the accumulation of individual pursuits is disastrous for everyone. They are locked into a system of self-destruction. The question is, of course, how rational it really is to maximize individual gain at the expense of others and everything.

As a remedy against such twisted rationality, Hardin recommends that we “legislate temperance” (see Hardin in [3], p. 1245) and he calls for “mutual coercion mutually agreed upon” (see Hardin in [3], p. 1247).

2.2. The Challenge of Environmental Law

Following this recommendation, modern environmental law aims to regulate individuals who act in the Here and Now in order to avoid tragic consequences in the There and Then. The assumption is that human enterprise, as it is, will not change unless coerced by formal legal rules.

To be sure, influencing and changing human conduct is the objective of any set of rules, in fact, of law at large. The law's sole purpose is coercing human conduct where it does not follow socially agreed standards. For example:

- Family law is needed to prevent spouses and parents from escaping their duties, ultimately to protect the family.
- Company law, competition law and consumer law are needed to prevent companies from escaping their duties, ultimately to protect availability of consumer goods.
- Tax laws are needed to prevent citizens from escaping their duties, ultimately to secure budget revenues.
- Human rights are needed to prevent governments from unjustified interference, ultimately to protect individual freedom.
- International law is needed to prevent states from unjustified interference, ultimately to promote peace and justice. And so on.

Each branch of law has a specific objective justified by an assumed social consensus. The same is true for environmental law. It is needed to prevent individuals from overusing the commons, ultimately to protect the environment. Systematically, therefore, environmental law is no different from other branches of law.

Conceptually, however, environmental law is very different. It is not a mere piece of the legal cake, like family law or tax law, but more an ingredient in all of it, adding texture and flavor to the entire legal system. In this regard, environmental law is similar to human rights or international law which have overarching, virtually global, validity.

Further, the subjects of environmental law are all of us, not merely one segment of society. In our various roles as citizens, taxpayers, professionals, producers, consumers, house owners, car drivers, or private persons we are all subject, to varying degrees, to a range of environmental duties. Legal persons, such as companies and states, are affected as well. All have environmental duties to perform and this in turn has follow-on effects for the rights and duties covered by other legal fields. Environmental law, therefore, adds a new dimension to the entire spectrum of legal rights and responsibilities.

Beyond its broad subject matter, the objective of environmental law is also far-reaching. Its goal is to protect both the commons, including natural environments (ecosystems) and human environments (neighborhoods, communities, countries). Ultimately, the commons are the space in which we breathe, produce, consume and sustain ourselves.

Such a broad subject and objective requires, at least, some coordination between environmental law and other legal disciplines. But something more is also required. Environmental law fundamentally differs from the rest of law with its peculiar space and time dimensions [5]. The natural environment is without boundaries, and therefore strangely at odds with legal boundaries. Environmental protection

laws are not consistent among jurisdictions (whether local, national or international). Moreover, unlike any other legal field, environmental law tries to cover long time spans. Activities in the here and now are controlled to achieve something in another time and place [6]. Acceptance of responsibility for time-delayed outcomes is not easy to justify, let alone to demand and enforce. It is especially difficult because the more the laws of nature spread cause and effect out over space and time, the less certain the environmental effects will be. Some will question whether those effects will ever happen and whether adverse environmental effects perceived now were actually caused by activities that took place in distant locations and times.

In sum, at least three unique factors bear upon the design of environmental law: its broad subject (each person), its broad objective (the commons), and its wide space (global) and time horizons (short-term and long-term).

For the purpose of this article, I shall refer to these conditions as the “challenge” of environmental law. On the one hand, we people living today have a right to pursue our own prosperity and well-being [7]. However, in doing so we collectively threaten the commons. The commons demand responsibilities from us now so they will be preserved for the future. In a word, our challenge is to organize our lives in a way that the ecosystems of which we are a part (the ‘commons’) are not threatened either today or in the future. This is the promise of ecological sustainability.

2.3. *The Dilemma of Environmental Law*

In trying to meet the challenge, lawmakers must decide how much protection of the commons will actually be required. This decision is inevitable as it affects the environmental rights and duties of people living today. Fundamentally, only two solutions are available: either protection of the commons must set a benchmark against which all rights and duties are to be measured or environmental protection will be considered as merely relative to competing concerns such as economic prosperity and social equity. This may be seen as the “dilemma” of environmental law. A dilemma [8] is a problem offering two solutions or possibilities, of which none are practically acceptable.

Upon closer examination, however, it appears that the dilemma can be meliorated somewhat. Behind the concern for the commons really lies the concern for protecting characteristics that make their continued (“sustainable”) use possible. There is neither a need nor a practical possibility to protect the commons *in toto* and in their “natural” state, *i.e.*, free from any human intervention. Even though absolute protection may be the purpose of specific laws, such as those that create natural reserves or protect endangered species, typically the commons are areas of human intervention, no matter how intensive (low or high impact) or extensive (local or global) that intervention may be. What really matters, therefore, is the protection of their characteristics as functioning ecosystems. In other words, the health or integrity of ecosystems.

As discussed further below, my contention is that the defining aspect of the dilemma I have described is a predominating perception of “the environment” which is shaped by a reductionist worldview or paradigm. I am not suggesting that changes in the law *per se* can turn things around. Instead, the underpinning social “consciousness” seems a more important factor. Nonetheless, the basic design of environmental law and policy is flawed and in need of an overhaul.

3. The Flawed Design of Environmental Law and Policy

The previous section defined the challenge of environmental law as reconciling the environmental demands of people living today with the environmental demands of people living in the future. It asserted that law makers must decide “how much” environmental protection is presently required. This decision depends on an assessment about the key characteristics and functions of the natural environment (integrity of ecosystems). How the preservation of ecological integrity relates to other (social, economic) demands creates a moral dilemma. This dilemma is inevitable and can only be resolved by way of prioritizing or compromising ecological integrity.

3.1. Lack of Ethical Foundations

Practitioners, politicians and lawmakers are not normally confronted with the philosophical foundations of environmental law. For the most part, environmental issues are seen as factual matters to be dealt with in a practical, “rational” manner. Statutes and cases may raise some deeper questions of interpretation and application but those questions, it is felt, can and must be resolved with legal argument, not ethical reasoning.

On the other hand, students of environmental law are increasingly confronted with ethical and philosophical questions. Many of today’s textbooks of environmental law contain introductory chapters on theoretical foundations. This is certainly the case in Germany or New Zealand, possibly in a number of other countries, but seemingly less so in the UK, Canada or the USA. The leading New Zealand text edited by Derek Nolan [9], for example, describes the ethical debate surrounding anthropocentrism vs. ecocentrism as a key subject-matter of environmental law and with respect to sustainability has this to say: “[The Resource Management Act 1992] provides for sustainability to be the overriding objective, comprehending sustainability of not only humankind but also ecology and biodiversity in all aspects” (see Nolan in [9], p. 92).

Birnie and Boyle’s classic text on international environmental law [10] answers the question, “What is the environment?” by quoting Lynton Caldwell: “It is a term that everyone understands and no one is able to define [11]”. It concludes that “any definition of ‘the environment’ will have the Alice-in-Wonderland-quality of meaning what we want it to mean” (see Birnie and Boyle in [10], p. 5). An important clue perhaps! The first chapter of another classic text by Kiss and Shelton [12] has in-depth discussions on religious roots, anthropocentrism, environmental science and economic rationality to then conclude that “policies emerge from religious and philosophical beliefs but must also be based on scientific and economic realities that require an integrated and interdisciplinary approach.” (see Kiss and Shelton at [12], p. 27).

These few samples indicate the importance of values and worldviews that have shaped modern environmental law. In fact, it seems reasonable to suggest that environmental law scholarship is a journey into the long history of both natural law and positivist traditions that define the relationship between humankind and nature [13].

The question might be asked why lawyers should be concerned with the deeper dimensions of legal constructs when there are more competent experts like philosophers, anthropologists, theologians and so on. Arguably, the issues involved here are still at the periphery of academic training and scholarship. The very fact, that there are environmental philosophers, environmental economists, environmental

lawyers and other “specialists” is a manifestation of reductionism in academia. Environmental lawyers must recognize their subject as interdisciplinary. That such recognition and expertise hardly exists also explains, at least to a certain degree, the flawed design of environmental laws.

The size, severity and urgency of the global environmental crisis makes it imperative to address such questions as:

- What is the value of nature to humanity and how does it relate to our health, culture and social well-being?
- How did we come to this state of mind and affairs and whose interests are being served by maintaining the status quo?
- Why do most people in modern society fail to relate personally or collectively with this unfolding human and environmental tragedy?

This is not the place to consider those questions at length [14]. It is the place to contend, however, that one of the main reasons why current policies and laws are not getting to the bottom of the current crisis is the inappropriate dominance of economic rationality [15].

3.2. Legacy of the European Cosmology

Economic rationality, which has shaped both the capitalist world and the socialist world, has its roots in the project of modernity or, as German philosopher Rudolf Bahro termed it, the “European cosmology [16]”. That cosmology includes a distinctive set of notions which I will explain briefly below, including dualism, anthropocentrism, materialism, atomism, greed, and economism.

Dualism emphasizes the separate rather than the complementary nature of opposing categories. Western dualism manifests itself in many ways, for example in the such commonly drawn distinctions as Good vs. Evil, Reason vs. Emotion, Material vs. Spiritual, Civilized vs. Primitive, Humans vs. Nature, Economy vs. Environment, Individual vs. Community or Rights vs. Duties.

The idea of anthropocentrism posits human beings and human society as separate from, independent of, and above the natural world. Anthropocentrism has deep cultural and historical roots encompassing the Enlightenment and going back to the dominant interpretation of the biblical Genesis [17].

Linked with Descartes’ mind-matter dichotomy, the modern concept of materialism tends to see matter as dead and inert, lacking validity on its own. This view leads to a ‘disenchantment of nature’ [18] and to the belief that humans can control and rearrange the material world purely as a matter of utility, with no moral or ethical constraints, duties or obligations. It is at the root of the equation of the natural environment with ‘natural resources.’

Prevailing in science is an atomistic (or reductionist) worldview that seeks to break complex objects of study into smaller and smaller parts. It makes the assumption that a complex system is nothing but the interaction of these parts. The universe is seen as a “clockwork [19]” and the interaction of billiard ball-like objects [20]. As a consequence,

scientific focus on the whole (the forest) is lost through hyper-specialization within science (which concentrates on the trees).

The Enlightenment's concern with personal autonomy created human rights. However, it also promoted a tendency to favor individualism over community, competition over collaboration and selfishness over altruism. In its radical form individualism can lead to greed, which reduces a sense of responsibility, erodes social ties and citizenship, and inhibits collective action.

Economism refers to the beliefs and myths we collectively hold about the economy. Just as all cultures have myths about nature and the proper human relationship to nature, our capitalist culture has created a mythical belief that the economy matters more than anything else. Economic analysis has a privileged place in society's institutions and in public decision-making. As a consequence, decisions, some with deep moral implications, are now determined primarily by income and prices.

3.3. Manifestations of Environmental Reductionism

These characteristics have, over time, resulted in what I call environmental reductionism: a compartmentalized, fragmented, and anthropocentric idea of the environment.

Each of these six characteristics of modernity described above has had a damaging [21] effect on the ecological notion of interconnectedness. Over time and in combination, anthropocentrism, individualism and economism have reinforced one another, nurturing the idea that a healthy environment is secondary to individual well-being, that the economy is more important than the environment, and that today's "Me-first-as-I-am-special" consumerism is desirable and "cool." In their totality *these notions* have promoted human dominance over, and independence from, nature. Nature has become the inferior "other", merely raw material for economic-technological progress. This mindset has shaped modernity as it matured throughout the 20th century. Not surprisingly, it manifests itself in modern environmental policy, law and governance, which reflects a compartmentalized, fragmented and economically-charged idea of the environment.

3.3.1. Compartmentalization

To get a sense of the modern compartmentalization of the environment, it is instructive to focus on the way in which the media present environmental issues. News stories about the environment make a lot of headlines these days, but more as human hardship stories (storms, floods, droughts) than as political news. Environmental stories are often relegated to the "green pages" of the newspaper and boxed away from the business, lifestyles and world sections. It is fair to say that media attention to issues like climate change, oil and food prices has dramatically increased. However, the links between ecology and economy are only rarely made—usually only in terms of the costs of environmental protection. Typically, the environment is presented as a cost factor for the economy, not as a challenge to the economy itself. Financial markets seem to operate in complete independence from the state of the environment.

The compartmentalized picture that the media delivers is paralleled by the way that governments treat the environment. There are Ministries for the Environment, but it is the Treasuries that determine public policy. There are environmental laws, but they are isolated from commercial laws. And there are Law Schools with environmental law programmes, yet 80% of the curriculum has no environmental component at all.

Moreover, the entire public discourse is compartmentalized. Many, although not all, public leaders perceive the environment as a special interest: very important perhaps, but unrelated to market functions and economic growth. They use the language of economics to hone their arguments on conventional theories of economic security. Small wonder therefore, that environmental laws are written with economic security and competitiveness in mind.

3.3.2. Fragmentation

In contrast with compartmentalization, which refers to the conceptual “boxing-off” of the environment from other policy areas, fragmentation refers to a focus on specific aspects of the environment itself, rather than its value as an integrated whole. Lawmakers do not think of the environment as a whole, but more as a generic word for natural resources (an economic term). The name “Resource Management Act” (RMA) for New Zealand’s general environmental code, for example, reflects a concern for managing natural resources rather protecting them. On the other hand, as discussed further below, the concept of “sustainable management [22],” added to the RMA in the 1990s, was revolutionary by international standards.

What matters in this context is that the RMA did not, in actual fact, revolutionize the way in which administrative agents perceive the environment.

The RMA is not foundational like a constitution that would define the natural world as basis and part of the human condition. Rather, it regulates the use, management and protection of certain elements of the biosphere. For example, the effects of economic activities on the global climate, on fisheries or forests are not covered by the RMA nor are products such as chemicals or energy. The planning and policy-making process is neither guided by a single environmental principle, nor is there sufficient guidance of central government for the implementation of the RMA [23]. The various aspects and functions of the environment are covered by a host of laws each following their own logic. While the RMA is concerned with a relatively wide spectrum of environmental effects, it by no means protects the environment as a whole as a precondition for human activity.

Regrettably, the fragmentation of the environment into individual aspects is a common feature of environmental laws throughout the world. To a degree this is inevitable, as laws need to be specific and enforceable on a case-by-case basis. Nonetheless, the overall lack of a foundational law that holds the environment as the foundation of life and the integrity of the ecological systems as non-negotiable has severe consequences.

Because of fragmentation, there is no rule not to harm the environment. The only rules that exist limit such harm to a certain level. Positively speaking, there is a fundamental human right to use and alter the environment rather than a right to use the environment in a sustainable manner. Whether or not a use is sustainable should be clearly defined by law and not left to an “overall judgment [24]”,

i.e., the traditional viewpoint that juggles environmental, economic and social factors without giving priority to one over the other.

As a result of the fragmented view of the environment, environmental security is only partially noticed and only in competition with economic objectives. This is ecological nonsense of course. Imagine a child protection law that says: “Do not beat your child too often and too much.” Yet, environmental law does just that: “Do not pollute the environment too often and too much.” The flawed thinking behind such reductionism is the assumption that the environmental crisis can be solved within the current economic, political and legal system, without challenging underlying values. Although the law cannot fix this itself, it could better reflect the values that will make our living conditions sustainable. Thus far, the fragmented approach to environmental law described above has prevented this.

3.3.3. Anthropocentric utilitarianism

A final flaw in modern environmental laws is their anthropocentric-utilitarian approach to the environment. Most legal definitions emphasize the utility value of the environment. Typically, this includes natural resources and amenity values such as recreation and beauty.

The RMA stands out as a bit more ambitious in this context. The RMA’s definition of the environment has ecocentric elements (“Ecosystems and their constituent parts, including people and communities [24]” coupled with the notion of “intrinsic values [25]” and the concept of *katiakitanga* [26]), as well as anthropocentric elements (“natural and physical resources *etc.*”). The intention of the Act has been to accommodate both anthropocentric and ecocentric interpretations.

While such ethical pluralism may have seemed sensible at the time, it has turned out to be counterproductive. If this most fundamental ethical stance on the human-nature relationship is left to choice, the old familiar paradigm is likely to prevail. This is what happened: the sustainability component of “sustainable management” has been reduced beyond recognition. The general trend has been to move from initial ecocentrism (“environmental bottom-line approach”) back to the well-trodden anthropocentric path (“overall judgment approach”). However, in the absence of a benchmark of ecological sustainability, the application of the Act fails to promote tangible ‘sustainable’ management, rather than the intangible ‘wise use and management’ of the previous Town and Country Planning Act 1977.

By and large, administrators and judges have applied the RMA in a manner that limits or mitigates ecological damage, but does not prevent it in the first place. This is consistent with environmental laws and their application all around the world.

4. Unraveling the Problem

So what to do? First of all, the compartmentalization, fragmentation and anthropocentrism of environmental law need to be fully recognized. To be sure, the reductionist concept of environmental protection was not without success, as mentioned earlier. A number of *trees* have been saved, but the *forest* is disappearing. The global commons—climate, biodiversity, the oceans—are in rapid decline and the human ecological footprint both in absolute terms and *per capita* is getting larger. To deny

these disastrous trends seems almost incomprehensible and yet our biggest problem at this point in time seems to be denial [27].

According to Sigmund Freud, denial is a defense mechanism in which a person is faced with a fact that is too uncomfortable to accept and rejects it instead, insisting that it is not true despite what may be overwhelming evidence [28]. Experimental research has shown that humans strongly favor avoidance of immediate costs over the risk of less immediate, long-term costs, even if they will be much higher [29]. That seems human, only too human. Denial at collective level, however, can have disastrous effects. While politicians are still preaching some balancing of economic prosperity and environmental sustainability, both are quickly disappearing.

The idea of balancing is politically motivated, of course, but psychologically reveals denial as it suppresses proven reality. The economy and the environment are both in decline for the same reason: organizing the economy within ecological boundaries is too uncomfortable a task.

Unfortunately, not only are most politicians in denial, but so too are many of our social institutions. In 1997, educationalist Chet Bowers wrote a revealing book entitled *“The Culture of Denial”* [30] that examines how Western educational systems reinforce the cultural beliefs that contributed to environmental destruction in the first place. Universities, in particular, provide students with an overly narrow view of life, compartmentalized into various disciplines, that creates a sort of mythic ambiguity around modernist culture. Bowers’ thesis is that the fragmentation of the environmental movement, with all its specialists for everything, repeats itself in the fragmentation of modern academic disciplines. This way the sustainability message falls between the gaps.

However, the problem is not just the institution of the university, perhaps more honestly called a “speciversity”. The culture of denial also sits within environmental academics themselves and it has a long tradition. 60 years ago, Aldo Leopold, the American pioneer of modern environmental ethics, wrote his famous *Sand County Almanac* [31]. In that work, Leopold, a professor of Game Management at the University of Wisconsin-Madison, incisively described what he called “the restraint by an inbound taboo” (see Leopold in [31], p. 153):

“There are men charged with the duty of examining the construction of the plants, animals, and soils which are the instruments of the great orchestra. These men are called professors, each selects one instrument and spends his life taking it apart and describing its strings and sounding boards. The process of dismembering is called research. The place for dismemberment is called a university. A professor may pluck the strings of the instrument, but never that of another, and if he listens for music he must never admit it to his fellows or to his students. For all are restrained by an inbound taboo which decrees that the construction of instruments is the domain of science, while the detection of harmony is the domain of poets.”

That was written 60 years ago, but the taboo has hardly been broken. An ethos of cross-disciplinary research is still in its infancy and degrees in sustainability studies remain few and far between.

The absence of a unifying sustainability paradigm in our educational institutions has dire consequences. It perpetuates the belief that the environment is “the other,” the specialist field that cannot compete with mainstream economics, management, or law. A further consequence may be that the current weakness of environmental law will not disappear anytime soon.

As far as I can see, there is wide agreement among environmental law scholars that environmental laws have not made much of a dent in unsustainable development. On the other hand, there is a growing debate as to the role that environmental law can play in achieving sustainable development [32]. The spectrum reaches from those who say it should play “no role whatsoever” to those who would prefer that it play “a supporting role” (considering the relative importance of law generally) to those who believe it should play “a crucial role” (following more a more positivist perception of law as a vehicle for social control).

5. Sustainability as a Legal Principle

So far, we have seen what can be described as denial strategies in response to the global ecological crisis. The forces of the past have shaped the modern concept of environmental law and continue to impact on the way we think about the environment. On the other hand, not everybody follows environmental reductionism; ecological perceptions are beginning to form and shape environmental decision-making.

During the 1980s, a new concept emerged that was supposed to shift the environment from the periphery into the center of public decision-making. The concept was called sustainable development. The challenge here was to define what exactly needed to be sustained.

Sustainable development is, of course, not legally defined. At present, neither international law nor domestic laws prescribe a way to resolve conflicting priorities. Rather, sustainable development is to be accomplished when everything is taken care of—the environment is protected, the economy is developed and social equity is achieved. This view assumes that the three objectives are not really in conflict with each other and can be achieved simultaneously. Sustainable development resists definition and avoids the hard questions, which is precisely why it has become so popular among governments.

Some commentators see wisdom in this. Dan Tarlock, for example, asserts: “Environmental impact assessment, polluter pays, precaution, and sustainable development are useful starting points but they can only serve as guideposts to structure a dynamic, but inevitably *ad hoc*, decision making process [33].” The widespread belief is, in fact, that environmental decision-making must be subject-specific; that different subjects (air, water, pesticides, energy *etc.*) require different regimes and that the outcomes should always meet the expectations of many, if not all “stakeholders”. Such pragmatism makes it almost impossible to think of a general environmental rule or ecological bottom-lines.

On the other hand however, law and society are not fundamentally opposed to absolutes. Think, for example, of criminal law protecting life, health, well-being, integrity, freedom, property. They are absolutes not to be compromised. One gets punished for harming people or property, but not for harming the environment. Specific laws may prohibit incidents like felling a tree or killing an animal without reason [34], building a house without resource consent, uncontrolled discharge of waste, wastewater or chemicals. But these are exceptions to the basic right of individuals to use natural resources. In their accumulation, these user rights result in large-scale destruction of the global environment.

At present, there is no general environmental rule that limits individual entitlements. Do we need such a rule? Absolutely yes. Can such a rule be defined and written into law? Again yes, as will be shown further below. Would it be socially acceptable? Hopefully. Would it be politically viable? Probably not. Or shall we say, not yet.

We should pause here and consider, for a moment, some possible challenges in the political realm if no ecological bottom-lines are established.

Further progression of the ecological crisis is likely to cause governments to take draconian measures such as severe water restrictions or drastic limitations on peoples' mobility. Increasing scarcities of water, fertile land, food, fish stocks, oil, *etc.* may lead to social unrest to which governments will respond with force. The cause-and-response spiral may eventually reach a point of no return. At that point eco-fascism will rule. This scenario is by no means unlikely when one considers, for example, past responses of the U.S. government to terrorism (Afghanistan, Iraq, Guantanamo and in the U.S. itself) or the treatment of African refugees in Europe. If we only picture the pressures that North America, Europe, Australia and New Zealand will face with ever increasing numbers of environmental refugees, we can imagine the potential scale of human rights violations.

Such bleak prospects aside, there is an alternative to a business-as-usual approach which favors short-term fixes over long-term solutions. It seems possible to fashion a general rule that draws a line in the sand and sets a bottom-line limitation. This rule would apply throughout the system of law and governance and would not be confined to a single Act.

5.1. *The Long Tradition of Ecological Sustainability*

A recent book of mine [35] describes such a rule. It proclaims the principle of sustainability, however, not by decree but by showing its long history, evolving maturity and overall persuasiveness. This is an important premise as the sustainability idea is not new at all, just forgotten and even today not fully understood. Former Vice-President of the International Court of Justice, Judge Christopher J. Weeramantry, formulates the premise in this way (see Bosselmann in [35], Foreword, p. vii):

In an age in which we are denuding the resources of the planet as never before and endangering the very future of humanity, sustainability is the key to human survival. It is a concept which needs to be nourished from every discipline, every culture and every tradition. Unfortunately, these have not been adequately used in strengthening and developing this concept.

If we trace the historical and philosophical foundations of sustainability from their beginnings and relate them to the corresponding developments of legal theory and practice (see Bosselmann in [35], pp. 10-26) we can see an ever-increasing gap between individual entitlement and responsibility for the commons. This can be observed in the way that John Locke's idea of property rights emerged and the modern concept of private property isolated itself from any common property responsibilities [36].

On the other hand, there is a wealth of sustainability wisdom in the history of all cultures [37] and European culture is no exception. The experience of pre-industrial Europe, for example, is worth noting. By the mid 1800s, Europe's forests had all but gone. Deforestation had reached a degree that threatened the entire economy of Europe [38]. This opened up two possibilities for the future. One was to look for a new energy source to refuel the economy, the other to look for an alternative economy. Of course, coal replaced wood and fired up the industrial revolution but the alternative was available too, *i.e.*, the rediscovery of sustainability.

Forest management scholars in Germany proclaimed the wisdom of replacing every tree felled by planting a new one. They cited the medieval land use system ('*Allmende*') as the mother of sustainable

economies. The Allmende system recognized public ownership of the land to guide any form of private land use. That way the substance of the land could be protected from overuse, thereby preserved for future generations. In 1714, this effect was termed “*Nachhaltigkeit*” by German accountant and administrator, Hans Carl von Carlowitz [39]. The first law based on the sustainability principle was the Weimar Forestry Statute of 1775. The term and concept eventually dominated forest economic theory and was exported, for example, to the French Forest Academy where, in 1837, its director, Adolphe Parade, translated it to ‘soutenir’ (showing its Latin roots: ‘sustinere’ = to keep, preserve, sustain). From there it reached the English translation of sustainability. By the mid 1800s the notion ‘living from the yield, not from the substance’ was widespread among forest academies and indeed science faculties throughout Europe. It was state-of-the-art knowledge!

The fact that the industrial revolution ignored this knowledge does not render it useless, obviously. It only meant that the idea of sustainability did not fit the pervasive idea of progress. Essentially, this has not changed until today—except for the fact that the case for sustainability has never been stronger.

5.2. ‘Weak’ vs. ‘Strong’ Sustainability (see Bosselmann in [35], pp. 27 and 32-40)

Modern discourse regarding sustainability began with the Report of the UN Commission for Environment and Development [40] (*Brundtland Report*) that created the composite term “sustainable development.” The famous Brundtland definition of sustainability, “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs,” is incomplete [41]. It leaves open the question of what the needs of future generations might be and what, consequently, will have to be passed on. It is fair to assume that the Brundtland Commission called for a fundamental duty to keep the basic options open for future generations. The only way to keep these options open, however, is to sustain the ecological basis of development. The Commission was quite clear about this. The inaugural meeting of the Commission in October 1984 set out the objective of building “a future which is more prosperous, more just, and more secure because it rests on policies and practices that serve to expand and sustain the ecological basis of development [42].” In many passages the Report emphasized that we are borrowing environmental capital from future generations and that economic growth must be constrained to preserve the Earth’s ecological integrity [43].

Recently, Hans Christian Bugge and Christina Voigt edited a book *Sustainable Development in International and National Law* [44] to mark the 20th anniversary of the *Brundtland Report*. The book’s contributors widely share the view that the Report’s concept of “sustainable development” assumed ecological sustainability at its core. Consequently, if preservation of the Earth’s ecological integrity is the prerequisite for development, it sets limits to both economic and social development. In the literature this interpretation is often referred to as the “strong” approach to sustainable development [45].

The alternative, the so-called “weak” approach, favored by governments and corporations, views ecological sustainability as a concern distinct from social and economic “sustainability (see Bosselmann in [35], p. 1).” To consider the ecological, economic and social dimensions of development simultaneously is important, as mentioned, but this in itself does not make development “sustainable”. The sustainability of ecological systems must be the bottom-line, yardstick

and benchmark. History, science and ethics all point to the same, rather simple idea: any form of development must respect ecological boundaries to avoid decline or collapse.

This idea is so prevalent that we may consider it the common knowledge of humankind. That modern society has ignored this common knowledge cannot change this. Sustainability certainly deserves a status similar to such other guiding ideas as freedom, equity and justice.

5.3. Sustainability in International Soft Law

Looking back over 20 years of international law and policy, there has been increased recognition of the sustainability principle but at the same time, an increased gap between soft law development and hard law. Soft law represents a consensus of the international community of states that is considered legally relevant, although not binding. It must not be forgotten, though, that international environmental law has emerged through the pressures of the environmental movement, to which states have responded. This gives the institutions and groups of civil society special importance. Like human rights, environmental rights are being pushed by civil society, rather than by governments and the same is true for the overarching principle of sustainability.

These rights have only ever been expressed in soft law documents. Like the examples that follow:

Reaffirming the fundamental purposes of the United Nations, in particular the maintenance of international peace and security, the development of friendly relations among nations and the achievement of international co-operation in solving international problems of an economic, social, cultural, technical, intellectual or humanitarian character,

Aware that:

(a) Mankind is a part of nature and life depends on the uninterrupted functioning of natural systems which ensure the supply of energy and nutrients,

(b) Civilization is rooted in nature, which has shaped human culture and influenced all artistic and scientific achievement, and living in harmony with nature gives man the best opportunities for the development of his creativity, and for rest and recreation, ... [46].

...We reaffirm our common fundamental values, including freedom, equality, solidarity, tolerance, respect for all human rights, respect for nature and shared responsibility, are essential to international relations. ... [47]

Soft law references to “uninterrupted functioning of natural systems” and “respect for nature” aim to overcome anthropocentric reductions but they have had little impact on international or national decision-making. States have never acted upon their own soft law promises and, for example, designed free trade regimes within the functioning of natural systems. However, we can also view soft law as a spanner in the works of global governance. Sooner or later, it will have an impact on the international and national laws. This is, at least, within the logic of soft law development. Perhaps we are talking about a profound information and education deficit here.

Compare, for instance, the ecocentric approach of the 2000 Earth Charter [48] with the anthropocentric approach of the 1992 Rio Declaration (Principle 1: “Humans are at the centre of concerns for sustainable development”). The Earth Charter is a declaration of fundamental principles

for building a just, sustainable, and peaceful global society for the 21st century [49]. Created by global civil society, endorsed by thousands of organizations and institutions, the Charter is not only a call to action, but a motivating force inspiring change the world over. It has been endorsed by a number of states, by UNESCO and by the IUCN [50], the world's oldest and largest environmental organization with a membership of 1,200 NGOs and 88 states [51]. The Earth Charter defines the principle of sustainability as preserving the integrity of ecological systems. Ecological integrity is a central category not just of the Earth Charter [52], but of a wide range of disciplines of environmental study including science, public health, philosophy, anthropology and law [53].

5.4. Ecological Integrity as the Core Meaning of Sustainability

In law, the concept of ecological integrity has its origin in the 1972 U.S. Clean Water Act. It has been widely used since then in North America, for example, in the Great Lakes Water Quality Agreement [54] between Canada and the United States. The Preamble to the agreement reads: "The purpose of the Parties is to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Basin Ecosystem ... where the latter is defined as ... the interacting components of air, land, water and living organisms including humans..."

Like the Great Lakes Basin, each ecosystem has certain characteristics. Ecosystems exist in infinite variation. Like snowflakes, no two systems are identical. But, also like snowflakes, all ecosystems have a number of characteristics in common. For example, they:

1. Contain living and non-living elements;
2. Have a measurable degree of diversity (species, genes, chemicals, *etc.*);
3. Have some degree of resilience (defined as the system's ability to maintain relationships between system elements in the presence of disturbances);
4. Have a one-way net flow of energy (from outside to inside);
5. Have a carrying capacity for particular kinds of organisms;
6. Exist in a state of non-equilibrium (*i.e.*, they change through time);
7. Have the characteristic that changes in them are irreversible (*i.e.*, ecosystems do not return to a previous state, but evolve to a new form).

Taken together, these characteristics comprise the integrity of an ecosystem. In biological and ecological sciences, ecological integrity is thus a common and tangible concept [55].

A useful example of the use of this concept is the Canada National Parks Act 2000, which provides as follows [56]:

Definitions

"Ecological integrity" means, with respect to a park, a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes".

Section 8(2)

Maintenance or restoration of ecological integrity, through the protection of natural resources and natural processes, shall be the first priority of the Minister when considering all aspects of the management of parks.

The Minister (of Canadian Heritage) is assisted by an expert *Panel on Ecological Integrity* [57], which has defined ecological integrity as follows:

An ecosystem has integrity when it is deemed characteristic for its natural region, including the composition and abundance of native species and biological communities, rates of change and supporting processes. In plain language, ecosystems have integrity when they have their native components (plants, animals and other organisms) and processes (such as growth and reproduction) intact.

The panel has, among other things, developed a set of indicators to measure the ecological integrity of parks [58]. What is required at this point appears quite simple. First, Canada should expand its sustainability approach beyond the confined space of national parks to include the entire country. Second, other countries should follow the Canadian example.

In the case of New Zealand, the RMA does not expressly refer to ecological integrity, but it does capture its content (see Bosselmann in [35], pp. 64-66). Conceptualizing it as ‘sustainable management’, the RMA defines its purpose as follows:

Section 5(c)

(2) In this Act, ‘sustainable management’ means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while

(a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonable foreseeable needs of future generations; and

(b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and

(c) Avoiding, remedying, or mitigating any adverse effects on activities on the environment [59].

5.4.1. Indifference in environmental jurisprudence

In its environmental jurisprudence, the Environment Court developed two different approaches to interpreting Section 5 of the RMA—the so-called ‘environmental bottom-line approach’ and the ‘overall judgment approach’ [60]. These divergent approaches reflect the two competing concepts of ‘strong’ and ‘weak’ sustainability described above [61].

5.4.2. Incorporation in law

Whether it is used in the interpretation of existing laws or in the design of new ones, the principle of sustainability could quite readily shape all forms of environmental decision-making. Its incorporation

through legislation would not be difficult. Thus, using the example of the New Zealand RMA, an amendment to the Act could read as follows [62]:

“Resource Management (Simplifying and Streamlining) Amendment Bill”

Part I—Purpose and Definitions

Purpose

1. The purpose of this Act is to achieve ecological sustainability in New Zealand.

Meaning of Ecological Sustainability

2. “Ecological sustainability” means the preservation or restoration of the integrity of any ecosystem in the biosphere.

Definitions

3. In this Act,

(...)

“Ecological integrity” means the ability of an ecosystem to recover from disturbance and re-establish its stability, diversity and resilience.

6. Conclusions

Sustainability has to consider three aspects, ecological, economic and social. A corresponding law, therefore, should follow three design criteria:

- Effectiveness for the ecological aspect;
- Efficiency for the economic aspect; and
- Equity for the social aspect.

Obviously, ecological effectiveness is not the sole criterion for achieving sustainability. It must be clear, however, that any prospect for economic efficiency and social equity depends on ecological effectiveness as the overarching concern. At present, as we have seen, environmental law is generally ineffective and inefficient. There is also a growing body of evidence that environmental law fails to prevent inequity. When we think of food prices, for example, the issue of environmental justice becomes ever more urgent. But environmental justice cannot be isolated from ecological justice as the broader concept embracing humans and nature alike [63].

Designing laws around the principle of sustainability, as defined here, would ensure the guidance that decision-makers so desperately need. As we accept the protection of ecological integrity as the core meaning of the sustainability principle, we realize both its clarity and fundamentality. Sustainability aims to preserve the (measurable) integrity of ecosystems while at the same time acknowledging that humans are part of these ecosystems. In pursuing the protection of ecological integrity, sustainability reflects the most basic concern of human existence, namely the desire to live, survive and reproduce.

It would be too presumptuous to think that a fundamental concern such as the one just described has guided the legislators of the New Zealand Resource Management Act, or legislators of equivalent laws

in other countries, or the drafters international documents such as the World Charter for Nature, the Rio Declaration, or even the Earth Charter. More likely, there was no such conscious and coherent effort behind the various approaches to legislate sustainability. However, it would be even more presumptuous to assume that these approaches were guided by merely balancing economic, social and environmental concerns. Surely, such a balancing act would not reflect what most of us feel when we think of the global ecological crisis. This crisis came about because of a profound imbalance of economic, social and environmental dimensions of human activity and not as a technological glitch.

The more appropriate assumption is, therefore, a fairly common acceptance that the ecological basis of human survival is at risk. If, for example, climate change is threatening our life conditions, then any trade-offs and compromises between economic prosperity and ecological sustainability are hard to justify. Today's concerns are either those for ecological sustainability or do not exist at all (favoring a business-as-usual or overly naïve approach to facing the future).

A law based on ecological sustainability will not *per se* set us on a sustainable path. It can, however, provide the direction for such a path. The principle of sustainability would, of course, be further assisted and complemented by legal norms such as the precautionary principle, the polluter pays principle, the principle of common but differentiated responsibility and the concept of intragenerational, intergenerational and interspecies equity. Some of these are accepted principles in law, others are only evolving. In their significance and mutual reinforcement they are most poignantly expressed in the Earth Charter. The Earth Charter should serve, therefore, as the overall ethical framework for the development of sustainability law (see Bosselmann in [35], pp. 79-109).

I am not optimistic for the foreseeable future and I share the widespread belief that things will get a lot worse before they might get better. The environmental reductionism described here is likely to further undermine all efforts to stop the degradation of the commons. At the same time, it seems doubtful that citizens of wealthy countries will uncompromisingly support sustainability. We are presently tangled in a Gordian Knot of consumerism and materialism and we do not know where the ins and outs of this knot are. Nevertheless, we do still have the option of cutting through the knot [64]. This will require a recognition that we cannot continue to live without due regard to the biosphere and atmosphere. Notwithstanding the myth that humans are above and in control of nature, we completely depend upon nature for our continued existence.

Law is culturally determined and it will always reflect what we feel most strongly about. Virtually every thinking person sees the need for dramatic global renewal if humanity is to survive. And, as the greatest thinkers, artists, and spiritual leaders have maintained [65], only a new ethos can inspire the cultural change that we now need. It behooves us, therefore, to reconnect ourselves with nature, understand the human species as part of an evolutionary process, and feel strongly about sustainability.

References and Notes

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2. The Best Source for Assessing the State of the Planet'S Ecological Systems Remains the Un Global Ecosystem Assessment; Available online: <http://www.millenniumassessment.org/en/Index.aspx> (accessed on 25 November 2009).

3. Hardin, G. The Tragedy of the Commons. *Science* **1968**, *162*, 1243-1248; Available online: <http://www.sciencemag.org/cgi/reprint/162/3859/1243.pdf> (accessed on November 25, 2009). The phrase is most commonly attributed to Garrett Hardin. The originator of the phrase is in fact William Forster Lloyd who coined it in 1833 in his *Two Lectures on the Checks to Population*. The idea goes back at least as far as Aristotle who wrote: ‘That which is common to the greatest number has the least care bestowed upon it.’ (*Politics*, 1261 b34).
4. However, George Monbiot has criticized the widespread acceptance of this theorem, observing that Hardin’s thesis ‘only works where there is no ownership’. Giving the example of the world’s oceans: ‘[T]hese are not commons but free-for-alls. In a true commons, everyone watches everyone else, for they know that anyone over-exploiting a resource is exploiting them’. Monbiot, G. The Tragedy of Enclosure. *Sci. Amer.* **1994**, *270*, 159-160; Available online: <http://www.monbiot.com/archives/1994/01/01/the-tragedy-of-enclosure/> (accessed on 30 October 2009). For examples of the unintended consequences of actions based on this assumption see also, Monbiot, G. *No Man’s Land: An Investigative Journey Through Kenya and Tanzania*; Picador: London, UK, 1994. See also, Nobel Laureate Elinor Ostrom’s criticisms in *Governing the Commons: The Evolution of Institutions for Collective Action*; Cambridge University Press: Cambridge, MA, USA, 1990.
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6. Compare that to criminal law where the consequences of wrongdoing are felt instantly and on the spot.
7. For example the ‘right to development’. Proclaimed by the United Nations in 1986 in the “Declaration on the Right to Development” which was adopted by the United Nations General Assembly resolution 41/128. As stated in the preamble: “development is a comprehensive economic, social, cultural and political process, which aims at the constant improvement of the well-being of the entire population and of all individuals on the basis of their active, free and meaningful participation in development and in the fair distribution of benefits resulting there from.” The right has been reiterated in the 1986 African Charter on Human and Peoples’ Rights (Preamble and Article 22); in Principle 2 of the 1992 Rio Declaration on Environment and Development: ‘The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations’; the 1993 Vienna Declaration and Programme of Action (Article 10); and the 2007 Declaration on the Rights of Indigenous Peoples (Article 23).
8. Greek for “double proposition”.
9. *Environmental and Resource Management Law*, 3rd ed.; Nolan, D., Ed.; LexisNexis NZ: Wellington, New Zealand, 2005.
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13. See the excellent treatise on the nature of scholarly investigation into environmental law; Coyle, S.; Marrow, K. *Philosophical Foundations of Environmental Law*; Hart Publishing: Oxford, UK, 2004; pp. 9-58.
14. For an attempt, see, Bosselmann, K. *Im Namen der Natur* [English: *In the Name of Nature: the Concept of Eco Law*]; Scherz: Munich, Germany, 1992; *When Two Worlds Collide: Society and Ecology*; RSVP: Auckland, New Zealand, 1995.
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16. See, Bahro, R. *Avoiding Social and Ecological Disaster: The Politics of World Transformation: An Inquiry into the Foundations of Spiritual and Ecological Politics*; Jenkins, P., Ed.; Clarke, D., Translated; Gateway: Bath, UK, 1994; p. 219.
17. Placing humans at the center of moral consideration as the dominant species to which all other creation is subservient. See, Book of Genesis 1:28: 'And God blessed them, and God said to them, "Be fruitful and multiply, and fill the earth and subdue it; and have dominion over the fish of the sea and over the birds of the air and over every living thing that moves upon the earth."'
18. Horkheimer, M.; Adorno, T. *Dialectic of Enlightenment*; Stanford University Press: Stanford, CA, USA, 2002.
19. In the parlance of Cartesian dualism.
20. As in Newtonian physics. Isaac Newton's *Principia Mathematica* (1687) remains one of the most influential scientific texts ever written and further develops Descartes' idea of a 'clockwork universe'. An ideal statement of this search is Newton's adage: 'Truth is ever to be found in the simplicity, not in the multiplicity and confusion of things.' from "Fragments from a Treatise on Revelation", In Manuel, F.E. *The Religion of Isaac Newton*; Clarendon Press: Oxford, UK, 1974; p. 120.
21. Note that the first letters of the six characteristics form the word "damage".
22. The Resource Management Act 1991 provides for National Policy Statements (NPS) in Section 45. Their purpose is to provide uniform policy in relation to "matters of national significance that are relevant to the purpose of the Act" (RMA, s45(1)). However, there have only been two NPS gazetted as of this date: Coastal Policy (1994) and Electricity Transmission (2008). There is also a *Proposed National Policy Statement for Freshwater Management* released in September 2008, available online: <http://www.mfe.govt.nz/rma/central/nps/freshwater-management.html> (accessed on 30 October 2009). Hearings were held for this NES in mid-2009. See the discussion of the efficacy of National Policy Statements in Bosselmann, K.; Fuller, J.; Salinger, J. *Climate Change in New Zealand: Scientific and Legal Assessments*; New Zealand Centre for Environmental Law: Auckland, New Zealand, 2002; pp. 102-109.

23. See, *North Shore City Council v Auckland Regional Council* [1997] NZRMA 59, 94 in which the Environment Court held that '[t]he method of applying s.5 ... involves an overall broad judgment of whether a proposal would promote the sustainable management of natural and physical resources. That recognizes that the Act has a single purpose... Such a judgment allows for comparison of conflicting considerations and the scale or degree of them, and their relative significance or proportion in the final outcome.' This approach was subsequently affirmed by the New Zealand Court of Appeal in *Watercare Services Ltd v Minhinnick* [1998] NZRMA 113 at 124-125 per Tipping J.
24. New Zealand Resource Management Act 1991, Section 2(1): 'Environment', (a).
25. Ibid. 'Intrinsic values', in relation to ecosystems, means those aspects of ecosystems and their constituent parts which have value in their own right, including: (a) Their biological and genetic diversity; and (b) The essential characteristics that determine an ecosystem's integrity, form, functioning, and resilience.
26. Kaitiakitanga is the Māori word for 'the exercise of guardianship by the tangata whenua of an area in accordance with tikanga Māori (indigenous customary law) in relation to natural and physical resources; and includes the ethic of stewardship.' (Resource Management Act 1991, Section 2(1)). Tangata whenua are the Māori 'people of the land'. This exercise of guardianship/stewardship is usually comprised of at least a duty to consult with the kaitiaki (guardians) of an affected area. 'Guardianship' is by far the most common translation of this legislatively significant term, although kaitiakitanga is more evocatively defined as 'collective custodianship' in clause 18 of the 'Apology' in the preamble to the Ngati Awa Claims Settlement Act 2005. This emphasis on the collective nature of traditional Māori ownership (in common with indigenous peoples around the world) suggests the conceptual shift that is required to overcome the difficulties inherent in the Western conception of individual property rights based on exclusion. For further reading on kaitiakitanga as it applies to ecological ethics see, Tunks, A. Tangata Whenua Ethics and Climate Change. *NZ J. Environ. Law* **1997**, 1, 67-123.
27. On the rise of denialists in the face of increasing evidence of climate change, see www.Monbiot.com (accessed on 2 November 2009).
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37. See e.g., Diamond, J. *Collapse: How Societies Choose to Fail or Succeed*; Viking Books: New York, NY, USA, 2005; Also, Bosselmann in [35], p. 3 with respect to Judge C J Weeramantry’s Separate Opinion in the *Case Concerning the Gabčíkovo-Nagymaros Project (Hungary v Slovakia)* [1997] ICJ Rep 37, reprinted in 37 ILM 162 (1998).
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40. *Our Common Future*; Oxford University Press: Oxford, UK, 1987.
41. “Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs”, [40], p. 8.
42. From the ‘Commission’s Mandate’, officially adopted at its inaugural Meeting in Geneva, 1–3 October, 1984. See UN Doc A/42/427, *Our Common Future, Annex 2: The Commission and its Work*.
43. For example: ‘We borrow environmental capital from future generations with no intention or prospect of repaying. They may damn us for our spendthrift ways, but they can never collect on our debt to them. We act as we do because we can get away with it: future generations do not vote; they have no political or financial power; they cannot challenge our decisions.’ Ibid. ‘From One Earth to One World’, at para 25.
44. *Sustainable Development in International and National Law*; Bugge, H.C., Voigt, C., Eds.; Europa Law Publishing: Groningen, The Netherlands 2008. At the time, Hans Christian Bugge was a personal assistant to Gro Harlem Brundtland and secretary of the Commission.
45. See Bosselmann, K. Strong and Weak Sustainable Development: Making the Difference in the Design of Law. *S. Afr. J. Environ. Law Policy* **2007**, *13*, 14-23.
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48. United Nations General Assembly, 60/1. 2005 World Summit Outcome, in A/Res/60/1 (2005). 5.
49. See, for example, Earth Charter Principle 1: Respect Earth and life in all its diversity.
 - a. Recognize that all beings are interdependent and every form of life has value regardless of its worth to human beings.
 - b. Affirm faith in the inherent dignity of all human beings and in the intellectual, artistic, ethical, and spiritual potential of humanity.
50. The Earth Charter Initiative; Available online: <http://www.earthcharterinaction.org/content/> (accessed on 25 November 2009); Bosselmann, K. Earth Charter. In *Max Planck Encyclopedia of Public International Law*; Wolfrum, R., Ed.; Oxford University Press: Oxford, UK 2009; Available online: <http://www.mpepil.com/> (accessed on 25 November 2009).
51. *The International Union for Conservation of Nature (IUCN) Homepage*. www.iucn.org (accessed on 25 November 2009).
52. Part I (“Respect and care for the community of life”) and Part II (“Ecological Integrity”) represent the first component, the remaining Parts III (“Social and Economic Justice”) and IV (“Democracy, Nonviolence and Peace”) the second component of the Charter’s framework for global governance.
53. See e.g., *Global Ecological Integrity Group Homepage*. www.globalecointegrity.net (accessed on 25 November 2009).
54. Signed in 1978, ratified in 1988. International Joint Commission: Canada and United States, The Great Lakes Water Quality Agreement; Available online: <http://www.ijc.org/en/activities/consultations/glwqa/agreement.php> (accessed on 25 November 2009).
55. The ethical foundations go back to the work of environmental philosopher Laura Westra; they have considerably influenced the interdisciplinary dialogue on measuring ecosystem health. See, for example, the books by members of the Global Ecological Integrity Group, supra note 53.
56. *Canada Gazette Homepage*. <http://www.gazette.gc.ca/index-eng.html> (accessed on 25 November 2009); or Department of Justice, Canada National Parks Act (2000, c. 32), available online: <http://laws.justice.gc.ca/en/N-14.01/> (accessed on 25 November 2009).
57. Created in November 1998 by the Minister of Canadian Heritage, Hon Sheila Copps, to identify issues, examine Parks Canada’s approach for maintaining ecological integrity, and provide recommendations for improvement.
58. See “2005 Report of the Commissioner for the Environment and Sustainable Development”, Chapter 2; Available online: <http://science.jrank.org/pages/2251/Ecological-Integrity-Indicators-ecological-integrity.html> (accessed on 29 November 2009). On indicators for ecological integrity, see more generally available online: <http://science.jrank.org/pages/2251/Ecological-Integrity-Indicators-ecological-integrity.html> (accessed on 29 November 2009).
59. Grinlinton, D. Contemporary Environmental Law in New Zealand. In *Environmental Law in a Sustainable Society*; Bosselmann, K., Grinlinton, D., Eds.; New Zealand Centre of Environmental Law: Auckland, New Zealand, 2002; pp. 19-46, p. 26.
60. For details see Bosselmann, K. Judiciary and Environmental Governance in New Zealand. In *The Role of the Judiciary in Environmental Governance: Comparative Perspectives*; Kotz é L., Paterson, A., Eds.; Kluwer Law International: Alphen aan den Rijn, The Netherlands, 2009; pp. 355-380.

61. See, Sustainable Aotearoa New Zealand (SANZ). *Strong Sustainability for New Zealand: Principles and Scenarios*; Nakedize Publ.: Auckland, New Zealand, 2009; pp. 8-9.
62. See also, Pardy, B. In Search of the Holy Grail of Environmental Law: A Rule to Solve the Problem. *McGill Int. J. Sustain. Dev. Law Policy* 2005, 1, 29-58.
63. Bosselmann, K. Search of Global Law: The Significance of the Earth Charter Worldviews: Environment, Culture, Religion. In *The Earth Charter: A Framework for Global Governance*; Bosselmann, K., Engel, R., Eds.; KIT Publishing: Amsterdam, The Netherlands, 2010.
64. The Gordian Knot of legend was tied around a post set into the ground and was famously 'solved' by Alexander the Great. The most well-known account is that Alexander cut through the knot with a sword but not all commentators agree with this. Plutarch claimed in his *Life of Alexander* that he in fact had the pole which formed the knot's axis pulled from its centre and in this manner produced the required ends. In a similar fashion, by questioning the 'axial' assumptions of Bahro's 'European Cosmology' (see Bahro in [16]), we may be able to deal with previously intractable problems anew when the ontological claims of 'business as usual' (constructing competitive instincts and market solutions as human nature and nature as red in tooth and claw) are recognized as such and disentangled from our appreciation of natural limits and cycles.
65. And also economists, bureaucrats, politicians or lawyers know in their bones.

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