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International Colloquium
In Tribute to Ambassador Luiz Alberto Figueiredo do Machado
on
RIO+20 and Biodiversity:

Assessing the Future We Want

Brasilia, 26 April 2013

RIO+20 and Biodiversity: What Next? The International and Brazilian Perspectives
(Inaugural Panel – The Senate Chamber)

Extended Written Remarks of the Oral Panel Presentation by

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It is great honor to be here with you today with today's distinguished panelists as we open this Colloquium. May I commend the Senate and the many organizers of this extraordinary event, and thank them. I congratulate Ambassador Figueiredo on all his brilliant work for protection of the environment and assure him that at the United Nations he will have the full support of the legal experts of the IUCN World Commission on Environmental Law in all his endeavors.

Like many of you, I was privileged to be in Rio de Janeiro in 1992 and again one year ago at Rio+20, where delegates from all nations assembled to reconfirm their commitment to the principles and programmes of sustainable development, set forth in Agenda 21.¹

We do well to recall the opening words of Agenda 21: "Humanity stands at a defining point in its history."¹ This awareness that informed Agenda 21 in 1992 resounds in 2013 with an ever sharper edge. Trends adversely affecting the planet depend world-wide, rather than being alleviated, despite our wonderful efforts to the contrary. The "future we want" beckons to us to redouble our work toward a sustainable future. The Millennium Ecosystem Assessment found that more than half of the world's ecosystems are degraded, and IUCN is now preparing a red list of endangered ecosystems to spur nations to adopt laws for ecosystem stewardship, one step beyond ecosystem management.

¹ See the symposium evaluating Rio+20 in the journal of the International Council of Environmental Law, **Environmental Policy and Law**, vol. 42 (2012).

The foundation of that “future we want” lies in sustaining Earth’s remarkable systems of biodiversity, for today’s generation and for the 2 billion additional humans with whom we soon shall share our planet. We humans are all a part of nature, and depend upon all flora and fauna, all ecological systems, the great hydrologic cycle of the planet Earth – all of these God’s creation. The stewardship of Earth’s natural world is in our human hands. Remember that this image was very symbol of the Earth Summit in 1992.

Nations have begun to heed this mission. Today 147 of the 196 States that are Members of the United Nations provide in their constitutions for a right to the environment, following the leadership of Brazil, whose Constitution in Article 225 is a model for all nations to emulate. The duty to ensure an “ecologically balanced environment” as “an asset for the people’s common use and essential for a healthy life,” is today a fundamental norm of international law. This norm is reflected in the World Charter for Nature, adopted by the UN General Assembly in Resolution 37/7 (28 October 1982). Indeed, the scholarly research which IUCN provided to the UN for the World Charter for Nature became the foundation for the Rio Convention on Biodiversity of 1992. IUCN WCEL had a major role in developing both the World Charter for Nature and the Convention on Biological Diversity.

The Urgency of Being in the Anthropocene Epoch

Yet our remedial efforts to restore the robustness of Earth’s biodiversity face daunting challenges. Our human changes to the planet have been profound. In fact, the International Commission on Stratigraphy is now considering whether the Earth has left the Holocene and entered the Anthropocene epoch.² This Commission is the world’s scientific body that determines the dates for when one era has ended and another begun, such as the end of the last Ice Age. All our civilization today grew during the last 10,000 years of the Holocene epoch. The question is, has this era ended and a new era begun?

Two years ago, the Economist featured “geology’s new age” on the cover of its issue at the end of May, 2011.ⁱⁱ The lead essay, entitled “Welcome to the Anthropocene,” described changes to the Earth’s carbon and nitrogen cycles, reshaping landscapes and eroding soils on a massive and global scale. The expanding harms to ecosystems and the increasing rates of species extinction leave a new fossil record for future generations to study. These are irreversible and geologically significant human changes to Earth. Yet the Economist’s essay only touched the tip of a melting iceberg. Nobel laureate Dr. Paul Crutzen and others,ⁱⁱⁱ whose analysis is being reviewed by the International Commission on Stratigraphy,^{iv} identify a host of further changes, which will be apparent for all time into the future:

The melting of the cryosphere – the last frozen waters on the Earth;

² See endnotes to this paper for references on the Anthropocene.

The rising sea levels and cutbacks in the coastlines of all regions, with new sedimentation patterns in the crust of the earth that will be evident throughout the future;

The introduction of new synthetic and organic chemicals – discarded as waste – now permeate the crust of the planet, marking starkly time before the chemical are and after;

The radioactive markets in the crust of the earth from the atmospheric testing of atomic weapons before 1963 and the Atmospheric Test Ban Treaty;

It is becoming apparent that the Anthropocene, an epoch shaped by man, has succeeded the Holocene, the 10,000 year epoch in which human civilization evolved.

In this new era of the Anthropocene, the Rio+20 vision of a “world we want” must be one that sustains our Earth’s systems of biodiversity. The changes are beyond geology; we already experience new weather patterns, a changed hydrologic cycle, and increasing acidification of the oceans.

How shall we do this? We shall need to affirm old wisdom as new principles of law to guide us through the times ahead. Key among these is the acknowledging and acting upon the Principle of Resilience.

The Principle of Resilience

Ecology teaches us that natural systems have innate resilience, and medical studies indicate that resilience is important in the health of individual human beings. This shared capacity for resilience increasingly is a new legal principle, which our national legislation and our international agreements must magnify and encourage.

Why enhance our laws for resilience? Let me briefly explore how recognizing the resilience as a legal principle will allow us all to cope better in the coming perils of the Anthropocene Epoch. What we humans can learn from understanding ecology in nature will do much to sustain our economy, our society, and indeed our civilization.

If humans and nature are to cope well in the Anthropocene, our treaties, statutes and legal customs, and indeed all cultural systems, will need to cultivate *resilience*. The Courts can formally recognize a Principle of Resilience and bolster it by mandating measures to sustain it. Human society still takes for granted that humans have reliance as one trait of human nature. Since vastly more resilience will be needed amidst the surprises of the Anthropocene Epoch. Today’s neglect of a legal status of resilience needs to be redressed.

The “business as usual” priority for economic efficiency inadvertently leaves many commercial and social systems *less* resilient. For example, companies order components in their supply chain at the last minute in order to avoid costs of stock-piling them. As companies outsource services or manufacturing of components, they lose the internal capacity to meet their

own needs.³ Similarly cities rarely have a reserve of potable water sufficient for their need, and pray that nature will provide. Hospitals keep short supplied of medicines, which become depleted when pharmaceutical companies only meet short-term demands in order to be as profitable as possible.

The Principle of Resilience requires that *states shall sustain and enhance characteristics of resilience within all systems under their jurisdiction or control*. When acknowledging this Principle of Resilience, governments would be obliged to establish and employ environmental managements systems, design redundancy into their operations,⁴ and eschew practices that exhaust natural resources and degrade the environment.⁵ Observing a Principle of Resilience can guide the environmental management systems toward finding sustainability in the Anthropocene Epoch.

Resilience can be enhanced in all spheres. For example, most of the world today lacks any system of casualty insurance. Insurance is needed on a landscape scale, in order to recover from severe storm events, such as witnessed in the Indus River Valley's devastation in 2008 and 2009, or in late 2011 when three typhoons consecutively hit the Philippines and then Southeast Asia. Most communities and enterprises there and elsewhere lack insurance systems. Lacking insurance laws, the burden of financing to rebuild after disasters falls to governments. Governments lack the tax base or resources to engage in widespread rebuilding.

Past and current economic models assume that prior investments in infrastructure afford a basis for further growth; that model is no longer valid. After climate induced catastrophes, it is likely that only the use of insurance systems can enable human settlements to meet the adaptation needs of their community. Insurance builds resilience and provides a self-reliant foundation to sustain cooperation and make room for helping humans and animals alike. Micro-insurance is being explored, for areas here poorer conditions persist. The poor should not be without access to insurance. Insurance builds resilience.

Observing a Principle of Resilience, as a corollary to Environmental Rights, should be a global norm. Every nation should provide systems for honest, transparent, affordable and effective casualty insurance, for *all* sectors of society, rich or poor alike. Universal casualty insurance coverage would make it possible for human societies to respect and sustain Nature in its own sphere. Lacking insurance, humans will exploit nature to recover from disasters. In turn, human and nature will suffer further as a result of subsequent disasters. Acknowledging a Right of Nature could in oblige governments to give priority to establishing casualty and adaption insurance systems. If governments fail to move in this direction, courts could compel the remedy.

³ In 2011 most of the City of Bangkok flooded, after three Typhoons in a row hit Indo- China, and inundated an area the size of Spain.

⁴ Consider the analogy to the Precautionary Principle or the maxim of "saving for a rainy day."

⁵ See, e.g., the Multiple Use, Sustained Yield Act, in the body of US law.

Recognizing and relying on Resilience as a legal principle can stimulate and facilitate law reforms that enable humans, flora and fauna to adapt to the changing conditions of the Anthropocene. In finance law, bankruptcy regimes allow individuals to recover from upsets to their economic lives. Casualty insurance laws provide means for individuals to recover from fires, floods and droughts. Environmental law need to emulate these human regimes and create the legal means to assist flora and fauna and their ecosystems to move on after disruptions. Resilience lends support for enactment of anti-backsliding laws, to avert regressions when proposals are made to repeal environmental stewardship laws. The *Principle of Non-Regression* is integral for furthering resilience, as is the juridical rule of interpretation expressed in the maxim, “*in dubio pro natura.*”⁶ By acknowledging a duty to explore a capacity for resilience, we also must ask how to amend the law in order to *enhance* adaptive sustainability and foster resilience. Acting on the Principle of Resilience helps design safeguards for what we value and build redundancy and buffers to facilitate recover from disruptions.

The study of ecology illustrates the pervasiveness of resilience in nature. Ecological knowledge helps humans understand the integrity of Nature, which environmental rights already embrace. These studies identify for us how to enhance resilience. Courts in many ways already recognize in law the Principle of Resilience. Environmental Law fosters resilience when it protects wetland areas, which absorb flood waters, recharge aquifers, and provide rich habitat for myriad species.⁷ Courts may now consider more explicitly how more holistically to sustain ecological resilience as a legal principle. For example, when resilience is recognized as a key foundation for national wetlands laws, there would be a basis for protecting upland areas and entire watersheds beyond just the area of the protected wetland.

Growing physical dislocations during the current period of the Anthropocene Epoch’s “Great Acceleration,” increasingly will disrupt human society. More than disaster relief or “first aid” is required. Recovery will not be an option when coastal lands are inundated permanently from rising sea levels; adaption is needed. Migration of people and animals has already begun, away from inundated coastal lowlands or floodplains, and to new habitats. Today, the International Committee of the Red Cross makes providing humanitarian relief to environmental “refugees” among its top three priorities; there are more of them than there are refugees from armed conflict today. In all these instances, coping will be enhanced by recognizing the Principle of Resilience.

Further study of the role that resilience plays in evolutionary contexts may further inform how the law might encourage or rely upon this trait. Law embraces a Principle of Resilience deriving it from that trait of human nature, which is to be resilient. As individuals and as a

⁶ When equities or factual findings may appear equally balanced, or any doubts may exist about a decision involving the protection of the environment, this rule of decision would be to always require that a court defer to findings that support environmental integrity, environmental rights, and the stewardship of nature.

⁷ See, e.g., the New York State Tidal and Freshwater wetlands acts, Articles 24 and 25, Environmental Conservation Law of the State of New York. Comparable wetlands laws have been enacted around the world.

species, humans are resilient. Beyond humans, there is resilience in ecosystems. Ecologists and social scientists have identified and elaborated this principle of resilience.⁸ The Intergovernmental Panel on Climate Change defined resilience as the “amount of change a system can undergo without changing state,”⁹ and the UN Development Programme has termed it “a tendency to maintain integrity when subject to disturbance.”¹⁰ Human communities can evidence resilience, just as biological communities do through ecosystems.

Legal and other studies are needed to expand how expanding resilience can become the substance of process of environmental law. Governmentally mandated environmental management systems should explicitly aim to enhance resilience, and metrics to track resilience can be developed. For example, venerable cities that survive and prosper over generations, like London, Rio de Janeiro, Singapore or New York, are said to be resilient. Cities often compare and adopt each others’ winning attributes. The attributes of resilience can be studied and replicated. Institutions with resilience re-invent themselves, such as great cities, universities, or religious orders. After “mega-storm” Hurricane Sandy, New York is redefining its physical and institutional capacity for resilience and recovery. The City already had a sound initial climate change plan (PLANYC), but now it must re-invent its plans in light of the tragic lack of resilience it has experienced in November of 2012. We in New York are relearning how to bolster resilience.

Resilient systems embrace and adapt to changing conditions. *As a society adapts, it learns how to practice adaptation*, which is a characteristic trait of resilience. After the first earthquake, a vase may be placed again on a shelf, but after the second it is placed on the floor. Society’s forget at their peril. In Japan, stone tablets, one meter high, were erected to warn about past, devastating Tsunami wave heights in 1611, but these tablets were ignored in Fukushima as coastal developments were built behind the false security of sea walls erected despite the tablets’ message.¹¹ These tablets survived the Fukushima tsunami of 2011, four centuries later. Resilient systems avert complacency.

As humans plan to adapt to new conditions in the Anthropocene Epoch, they need to facilitate resilience throughout all sectors of human and natural systems alike. Is it not hubris to avoid fostering resilience, just because we may be ignorant about how of resilience works in nature? Aldo Leopold counseled not to discard the parts of the clock just because some seem useless to those with narrow vision.¹² Resilience can benefit all parts of an interdependent system, even do not comprehend. Acting on a Principle of Resilience would prompt rethinking the scope of the Precautionary Principle. Just as we should not act to avert harm simply because

⁸ See B. Walker & D. Salt, *Resilience Thinking*; see also IUCN Commission on Ecosystem Management (CEM), “Building Resilience to Climate Change.” See also the many studies at the University of Stockholm’s Resilience Center.

⁹ Intergovernmental Panel on Climate Change (IPCC), 4th Technical Assessment Report (TAR), 2001.

¹⁰ UNDP (2005).

¹¹ Martin Fackler, “Tsunami Warnings, Written in Stone,” *NY Times*, (April 20, 2011).

¹² Aldo Leopold, *A Sand County Almanac* (Oxford University Press).

we do not yet have full evidence that the harm will arise, so we should not avoid bolstering resilience because we do not see the mediate benefits of doing so. Acting on a Principle of Resilience would strengthen not just the Precautionary Principle, but all the principles of substantive justice associated with environmental rights.

Environmental law also needs to expand beyond spatial planning, such as town & country planning or zoning. Resilience can be a conscious criterion for planning. Beyond the needs of humans, planning should address the needs of ecosystems, plants and animals. How shall human society make space for animals, and broadly for nature? What is ecosystemic or natural integrity?¹³ During rapidly changing physical conditions, it is difficult to know how to define this concept. We may want to provide space for natural systems to evolve and so shape the answer to this inquiry in a natural and organ way, rather than having humans predict and project an unavoidably incomplete answer. Human society needs to ask how it should sustain the evolutionary capacity of all species in the functioning systems and natural “services” of ecosystems. Some voices, in a “business as usual” context, argue for more human controls of “alien” species or for creating “artificial” nature, or for preserving “wild” spaces. But in a rapidly changing Earth, are not all species kindred and none alien? All species are moving from where each seems settled. Wider ecological studies of resilience are required to inform the specific application of the Principle of Resilience.

Before embracing one or another theory of how humans should combat alien species to “preserve” nature, human society should redouble the study of natural systems. Human preferences should be informed by scientific knowledge, in the wake of anticipated or experienced environmental disruptions. We all now need to elaborate what principles guide observing the right to the environment, such as stimulating greater reliance on the legal Principle of Cooperation, to develop collaboration about how humans may co-evolve more sympathetically with other species and ecosystems. The same is true of the Principle of Resilience. Too little is now known about the essential functions or cycles of an ecosystem or its species after disruptions take place. Before acting on one or another vision about what human society wants its nature is to be, should not the as yet unknown complexity and resilience in evolved natural systems be accorded recognition and some deference?

Through the Principle of Resilience, legal steps can be advanced to sustain and enhance biological diversity. Courts can require that parties determine what space and time may be afforded ecosystems to let them evolve? It is the very flexibility of the concept of Resilience that lets it guide society in its relations with nature through the new and unpredictable experiences of the Anthropocene years. Resilience is a natural trait in both people and nature, and is their common bond. It is at the core of the Right of Nature and the correlative world of human environmental rights.

¹³ Nigel Dudley in Authenticity in Nature: Making Choices about the Naturalness of Ecosystems (Earthscan 2011)

I look forward to the debates of this wonderful Colloquium. They will surely contribute to fostering enhanced stewardship of biological diversity, upon which our shared resilience depends. Thank you for your kind attention to these thoughts.

ⁱ Agenda 21, paragraph 1.1, United Nations Conference on Environment and Development, UN Doc. A/CONF.151/26 (four volumes, 1992); see annotated edition, Nicholas A. Robinson (Editor), Agenda 21: Earth's Action Plan (Oceana Publications, 1993).

ⁱⁱ The Economist, vol. 399, no 8735, cover and p. 11 (May 28, 2011).

ⁱⁱⁱ Will Steffen, Paul J. Crutzen, and John R. McNeill, "The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?" Ambio, vol. 36. No 8, Dec. 2007.

^{iv} Anthropocene Working Group of the Subcommittee on Quaternary Stratigraphy of the International Commission on Stratigraphy, www.quaternary.stratigraphy.org.uk .