Imperial Ignition: Ecological Debt, Greenhouse Development Rights and Climate Change

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In past decades, the United Nations approved human rights, then civil rights, economic and political rights, and finally a few years ago indigenous rights. In this new century, it is time to debate and discuss the rights of Mother Earth. These include the right to regenerate biocapacity, the right to life without contamination.” - Evo Morales, President of Bolivia, at the People’s World Conference on Climate Change and the Rights of Mother Earth.¹

I. INTRODUCTION

Pauline Whitesinger did not look up to acknowledge the high-tension electric lines swaying overhead as she spoke. She simply clasped her worn hands and covered her palms, tough from the rough rope used to raise the water from the well on the cold high deserts in Northern Arizona. She told me how the government, from the 1970s in the time of Nixon, to the present time of Obama, has tried to move the Diné (Navajo) from their land, how the Bureau of Indian Affairs and the police would not let them fix their homes or care for their sheep on the land, but that, nevertheless, she would continue to resist. Speaking slowly in broken English and then back into Diné as her grandson translated, she said she was a part of this land, that the land was her way of life, and that if she was torn from the land it would destroy the Diné as a definable people. She said that in the past, the water would come up in the spring and there would be plenty for the sheep to drink, but that now the water was low. It did not come in until summer, the sheep suffered and the people went hungry².

The main aquifer that provides water to the high desert of Black Mesa Arizona has been severely depleted. Each day for 30 years until 2005, Peabody Coal pumped 3.9 million gallons of water

¹ People’s World Conference on Climate Change and the Rights of Mother Earth, http://pwecc.wordpress.com/ (Quote from Evo Morales at the UN climate talks in Cancun, December 9, 2010)
² Tammy Gray-Searles, Navajo County Ranks Low In Health, The Tribune-News (April 6th, 2011)
from the Navajo Sandstone Aquifer, 3,000 feet below Black Mesa – to transport 5 million tons of coal 273 miles over to the Mohave generating station near Laughlin, Nevada. The Black Mesa mine provided the cheap coal that powered more than 1.5 million houses in Las Vegas, Nevada, and Southern California. Many of the Diné have consistently fought to resist coal mining and to maintain their land against the federal government’s restrictions, including an order of relocation that they have been defying for more than 30 years.

As Pauline Whitesinger sits outside her hogon, or earthen home, the dust blows our car tracks away from the end of the dirt road and we are alone with the sheep and the silence. Though the high-tension electric lines are always above us in the distance, there is no electricity or running water in her own home. Under our feet the coal and water taken from Black Mesa are piped to provide the indoor air conditioning, manicured golf courses, and bright lights of Los Angeles and Las Vegas.

*   *   *

Three and a half million Indigenous people and two billion desperately impoverished people worldwide are in a similar position to Ms. Whitesinger and are increasingly torn apart by the climate chaos of a rapidly heating planet. Those who receive the least benefit from the energy production that creates the CO2 emissions and drives the atmosphere’s transformation are the most harmed by climate


6 This section is based on author’s interview with Ms. Whitesinger and the author’s reportage. Jonathan Stribling, Black Mesa: The Next Chapter In Forced Relocation, Fault Lines Magazine, June-July 2006, Pg. 9.

7 Hari M. Osofsky, The Inuit Petition As A Bridge? Beyond Dialectics of Climate Change and Indigenous Peoples' Rights, 31 Am. Indian L. Rev. 675 (2007); See also Ruth Gordon, Climate Change and the Poorest Nations: Further Reflections on Global Inequality, 78 U. Colo. L. Rev. 1559 (2007) See also Randall S. Abate, Climate Change, the United States, and the
change. Those who are the least responsible for the creation of industrial pollution are the most harmed by climate change and have no legal recourse. The earth's climate system puts a definite and specific time limit on the possibility to change social behavior before climate change becomes a permanent affliction that impedes human ability to survive in a formerly supportive environment. This time pressure requires that the solutions incorporate the needs of the most impacted people, while creating legal principles that can gain large-scale support and widespread usage across localities and countries.

This comment attempts to articulate effective legal principles that would remedy the harm done to those most affected by climate change. It examines local and state approaches to developing the concept of ecological and climate debt in U.S. law. Ecological debt is a concept that was first developed in 1990 by Latin American scholars associated with the Instituto de Ecología Política, in Santiago, Chile. Ecological debt describes the consumption of resources from within an ecosystem that exceeds that system's regenerative capacity. Internationally, it is relevant to the obligations between industrialized countries and developing countries to compensate the latter for the former's resource plundering, unfair trade, and cost-free occupation of environmental space for waste disposal.  

Part of this paper will address the climate change aspects of ecological debt, which scholars and ecologists refer to as “climate debt.” Climate debt incorporates both the historic and future aspects of debt accumulation. Historic climate debt refers to the past emissions that impact the current emission levels and future climate debt represents the rights of future generations. The paper will also explain the principles of capacity and responsibility, which are the basis of one of the most important proposals to remedy to climate debt – the so-called Greenhouse Development Rights (GDR).
ensuring that both climate justice and society wide agreement are fundamental aspects of all intrastate and international legal remedies to climate change.

Next, the paper will show that the greenhouse development rights framework is the most appropriate and legally effective way to achieve a just climate outcome in the challenging legal and political environments of both global climate negotiations and of U.S. domestic politics and environmental policy. The paper will then conclude with specific suggestions for an effective short-term and long-term strategy to address climate change by implementing local climate justice within a framework of national and international legal climate policy.

II. A BRIEF HISTORY OF GLOBAL GREENHOUSE GAS EMISSIONS

According to the world’s best scientific projections, to avoid catastrophic climate change, which would make Earth inhospitable to humans, we must focus on keeping the planet from warming more than 3 degrees from the current average global temperature.\(^1\) Based on historic, current, and projected emissions, it is necessary to decrease global warming emissions 90% by 2050 in order to achieve the pivotal objective of conserving the planet's temperature.\(^2\) Quite simply, this means drastic cuts in carbon emissions. Of the world's 192 Nation-states, the 39 top industrialized nations are the historic and current greatest emitters — accounting for 70% of historic emissions and 55% percent of current emissions\(^3\).


Increasing carbon emissions has been a byproduct of industrialization. The industrial revolution was fueled by the increasing exploitation of resources from the colonized world. This created not only the particular economic system of capitalism, but also a related and unsustainable ecological system of emissions. As capitalism has expanded globally, the factories, militaries, and transportation of the industrialized nations continue to be the greatest source of carbon dioxide emissions. This process of wealth accumulation, beginning in the nineteenth century and continuing today, has turned the globes natural resources and workers into complex industrial systems that have produced massive wealth for a
small elite, and devastating carbon emissions for the world as a whole.\textsuperscript{15}

Studies of past and present emissions by the Dutch National Institute on Health and the Environment (RIVM) demonstrate that industrialized countries caused about 80\% of all total warming in the period up to 1990 as an outcome of carbon dioxide (CO2) emissions from fossil-fuel combustion and cement production alone\textsuperscript{16}. However, various interpretations are possible, due to differences between the methodologies used to calculate the amount of warming using emission statistics. For example, if carbon emissions from deforestation are included, the ratio changes: the share of industrialized countries’ responsibility decreases to around 70\%, while developing countries are then responsible for approximately 30\% of the warming impact\textsuperscript{17}. If methane and nitrous oxide emissions, primarily from farming and propellants, are also included, then developing nations are responsible for 39\% of the increased warming\textsuperscript{18}.

Emissions originating in developing nations are often created in the process of extracting resources controlled by multinational corporations and consumed by industrialized nations. Greenhouse gas emissions in global South countries such as Nigeria and Venezuela are mostly due to oil production, but nearly two-thirds of the world's oil is consumed in Global North countries, including Europe and the United States\textsuperscript{19}. The same applies for natural gas: a considerable proportion of the energy-intensive mining industry in developing countries caters to the needs of industrialized countries, as more than 80\% of all raw materials produced in the world are consumed in the Global North. In many impoverished global South countries, the single largest source of global warming emissions is

\textsuperscript{15} Andrew Simms, Ecological Debt: Global Warming and the Wealth of Nations, 96 (2009)
\textsuperscript{17} Ibid.
\textsuperscript{18} Ibid.
\textsuperscript{19} Ibid.
deforestation, which is partly caused by the demand for wood in wealthier northern countries. For example, while some 70% of Africa's rainforests have been destroyed, much of the wood is exported by multinational corporations to be consumed by the Global North.

Continuing the pattern, the developed world's vast militaries are an important factor contributing to the current disproportionate emissions — 4.8 times higher per capita — in developed countries (see Table 1). The U.S. military is the world's single biggest consumer of fossil fuels: the Pentagon consumes about 330,000 barrels of oil per day (one barrel contains 42 gallons). If the U.S. military were a Nation-state, it would be ranked 37th in terms of its oil consumption — ahead of the Philippines, Portugal, and Nigeria. Within the U.S. military, the worst polluter is the Air Force, which consumes 2.5 billion gallons of aviation fuel per year and accounts for more than half of the Pentagon’s energy use. Under normal flight conditions, an F-16 fighter jet burns up to 2,000 gallons of fuel per flight hour. The detrimental impact on the Earth’s climate system is much greater per mile traveled in flight than in ground transport due to the height at which military planes fly combined with the mixture of gases and particles they emit.

However, it is not only military planes that cause excessive pollution: more than 70% of

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21 Ibid.
   (A 2010 study by Deloitte, the financial services company, reports that the Pentagon uses 22 gallons of oil per soldier per day deployed in its wars, a figure that is expected to grow 1.5 percent annually though 2017.)
commercial aviation emissions are the responsibility of northern countries. Yet international aviation and shipping corporations pay no taxes on their fuel and their emissions are completely unregulated\(^{27}\). These inequalities and excesses require a legal remedy. However, the present legal frameworks for addressing these problems are inadequate.

### III. WAYS TO JUSTICE: CLIMATE DEBT

#### A. History of the Concept of Ecological Debt

In 1990 the Institute de Ecología Política published “Ecological Debt: A Sociopolitical Perspective”\(^{28}\). The original focus was on ozone depletion and the idea that the costs associated with ozone depletion should be borne by those who had produced and benefited from the substances that deplete the ozone\(^{29}\). The idea was also brought to the World Earth Summit in Rio de Janeiro by twenty non-governmental organizations (NGOs) in 1992\(^{30}\).

A document entitled “External Debt and Ecological Debt,” signed by twenty-one NGO representatives from eight Latin American nations “proposed that external debt be swapped for the region's ecological and social losses derived from colonialism and past exploitative foreign investment.”\(^{31}\) While this concept appears to have had little impact on any governments at the time, the NGO Forum at the Earth Summit was more receptive.\(^{32}\) The NGO forum passed an Alternative Treaty, which recognized “the existence of a planetary ecological debt of the North,” defining it as being


\(^{29}\) Karin Mickelson, Leading Towards a Level Playing Field, Repaying Ecological Debt, or Making Environmental Space, Osgoode Hall L.J., Spring/Summer (2005)

\(^{30}\) Ibid.

\(^{31}\) Id. n.41

\(^{32}\) Id. n.42
“essentially constituted by economic and trade relations based on the indiscriminate exploitation of resources, and its ecological impacts ... including global environmental deterioration, most of which is the responsibility of the North.”\footnote{Id. See also, Paredis et al. The Concept of Ecological Debt: Its Meaning and Applicability in International Policy (2008).} After this success the Colombian lawyer, José Borrero Navia, published a study of the concept in 1994.\footnote{Id.}

The concept of ecological debt is defined by the NGO Friends of the Earth International as “the debt accumulated by industrialized countries towards developing countries on account of resource plundering, unfair trade, environmental damage and the free occupation of environmental space to deposit waste. A particular aspect of ecological debt is carbon debt, as a consequence of greenhouse gas emissions.”\footnote{Climate Debt: Making Historical Responsibility Part of the Solution, Friends of the Earth International, 5 (Dec. 2005).}

Joan Martinez-Alier, an ecological economist who has analyzed and popularized the concept of ecological debt, identifies the two underlying mechanisms of ecological debt as: 1) an ecologically unequal exchange, and 2) the use of a disproportionate amount of environmental space and/or services without payment (i.e., inequitable resource and service use, including waste disposal).\footnote{Ibid.}

Ecological debt implies an understanding of historical accountability for environmental damage. As a multi-authored scientific study carried out by the European Network for the Recognition of Ecological Debt (ENRED),\footnote{This was in turn based on work done by India’s Centre for Science and Environment, Jyoti Parikh, Martinez-Alie} explains:

“... [H]istorical accountability is supported by the principle of equality of opportunity. The natural absorptive capacity of the planet earth that allows for the decay of a certain amount of greenhouse gas emissions belongs to nobody and should therefore be assigned to everybody in an equitable way in order to give everybody the opportunity to benefit from emissions. To account for historical emissions ensures equality of opportunity to use the global resource atmosphere, no matter where or when he or she happens to live. Additionally, it could be argued that the carbon debt is built by borrowing assimilative capacity of the atmosphere from other countries and future generations, the latter through the release of greenhouse gases faster than they can be naturally removed. Just as with a national (financial) debt, borrowing on the carbon
debt has allowed nations to build up their infrastructure and economic wealth faster than would have occurred otherwise. This is confirmed by the observation of a significant relationship between GDP for a country and its relative contribution to the carbon dioxide concentration rise by fossil fuel combustion.

The concept of ecological debt provides an economic framework within which achieving environmental and climate justice is possible.

**B. Environmental Space**

The concept of climate or carbon debt bears a resemblance to the concept of environmental space. A major environmental study published in the late 1990s, “Sharing the World: Sustainable Living & Global Equity in the 21st Century”, defines environmental space as

> [t]he total amount of energy, non-renewable resources, land, water, wood and other resources which can be used globally or regionally 1) without environmental damage, 2) without impinging on the rights of future generations; and 3) within the context of equal rights to resource consumption and concern for the quality of life for all peoples in the world.

Unlike the concept of ecological debt, the concept of environmental space originated in academia. J.B. Opschoor, presently at the Free University of Amsterdam, is generally credited with introducing the term in 1987, albeit in a somewhat expanded version (“environmental utilization space”). The concept was used by Friends of the Earth Netherlands in preparing the *Action Plan for a Sustainable Netherlands*, published in 1990. The concept of environmental space is an approach to understanding land use and economic decisions in light of their environmental impact. The basic idea is that there is a finite amount of space on the Earth and that each ecological or natural process takes up a specific geographic area or “ecological space.” In order for the Earth systems to function in predictably...
reliable ways for societal use, ecological space should not be under- nor over-utilized. Similar to the idea of an “ecological footprint”, the analysis of environmental space accounts for resources that are being underutilized or over-utilized in any particular area. The two main aspects of the concept of environmental space are ecological limits and equity. An ecological limit refers to the finite nature of all ecological processes and equity refers to the principle that all people deserve equal access to Earth's shared resources. Environmental space is important when discussing climate debt because it allows researchers to assess what the capacity of a given geography is and if that geography is being over-utilized or ecologically balanced by the people using it. Researchers can also analyze the benefit of that capacity to the people who are using it. This balancing of use against capacity identifies which nations are “overshooting” their environmental resources and which countries are “lending” their ecological resources to others.

C. Ecological Debt and Climate Change

Climate change is well suited to an ecological debt analysis for a number of reasons. First, scientists have clear climate records that show that current greenhouse gas (GHG) concentrations in the atmosphere are the result of a long process, dating back at least two hundred years (CITE). Second, there is a clear difference in historical level of emissions of GHGs between developed and developing countries. Finally, the international community appears willing to acknowledge this imbalance with respect to climate change, as reflected in the preamble to the United Nation’s Framework Convention on Climate Change (UNFCCC), which notes that:

“[T]he largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs.”

Perhaps most important is the visibility of climate change as a pressing global environmental

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42 Paredis et al., The Concept of Ecological Debt: Its Meaning and Applicability in International Policy (2008)
challenge. Application of ecological debt analysis is thus highly dependent on climate change factors
and this is reflected in the use of such specialized terms as “carbon debt” or “climate debt”.

**D. Understanding Climate Debt**

It is possible to quantify at least two aspects of carbon debt:\(^44\):

First, the impact of fossil fuel combustion, measured in terms of ecological damage caused in countries
and ecosystems beyond the national jurisdiction of the emissions’ source. Second, excessive use of the
sink (carbon absorption) capacities of the atmosphere, measured in current and past greenhouse gas
emissions, and the limiting of others’ opportunities to benefit from the advancements provided by
greenhouse gas emissions. This is a case of exploitation of ecosystems at the expense of other
countries’ or individuals’ right to take advantage of these common resources.

Environmentalists distinguish between two components of carbon debt:

1) The historical carbon debt (HCD), the debt one nation owes another for unequal use of sinks; and 2)
generational carbon debt (GCD), the debt between current and future generations for the damages that
will result from that overuse.

1) Historical carbon debt: the allocation of rights according to climate debt

“The basic idea behind HCD is that countries which have, in the past, emitted levels in excess of
an equal per capita allocation should have less than their equal per capita allocation of emission
rights in the future. This also works in reverse for countries which have, in the past, emitted
levels lower than their equal per capita allocation. Countries with a positive HCD are considered
debtors, while those with a negative HCD are considered creditors. This approach to debt
compensation seems more realistic than targeting financial compensation, as the latter requires
the financial valuation of ecosystem services. Moreover, such an emission rights allocation
system might encourage the participation of developing countries via 'entitlements' that would
allow them to increase their CO2 emissions.\(^45\)”

2) Compensating for generational climate debt: helping future generations deal with the impacts
of climate change

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\(^43\) The United Nations Framework Convention on Climate Change. (May 9,1992) http://www.un-documents.net/unfccc.htm
\(^45\) Id. at 8.
“One way to help future generations cope with the real impacts of climate change could be to establish an intergenerational debt fund, fed by the ‘repayment’ of the GCD. The fund should benefit those directly confronted with the impacts of climate change. Establishing such a fund will raise the difficult question of putting a price on carbon emissions. Different estimates have been presented for the different carbon market segments: For example, according to Paredis, the Belgian climate debt for 1900-2000 falls between 4.2 and 579 billion euros. Depending on the model used, the credit to India amounts to some 505-723 billion euros, and the credit for Congo 27-38 billion euros.”

IV. Global Climate Law

Each breath connects every living person to the carbon cycle. This cycle requires a delicate balance of different gases constantly passing through our limited atmosphere. For all of human history, until the last two hundred years, human activity could not directly influence this global gas exchange. Because of the impossibility of impacting this atmospheric space, people did not view the atmosphere as something that needed to be mediated through a common agreement. It was viewed as something shared by all people as a global commons. By default, each person had an equal right to the use of this shared resource, and the use of the atmosphere was protected so that future generations would have the same rights to its use as the current generation. The need for a legal agreement for the atmosphere is only due to the fact that the burning of carbon-rich fossil fuel has become a basis for so much of human society. Because of this technological and societal reality, it is now conceivable – and increasingly necessary – that such a shared space would need a common agreement or a legal framework to preserve the atmosphere. Massive industry, originating in the Global North, has grown at such a rapid rate that it has effectively occupied the majority of the atmospheric space available for carbon emissions. This has turned what used to be a global commons into an occupied territory. Carbon emissions have effectively turned the atmosphere itself into a carbonic dictatorship, ruled by the elites of the Global North. As a result, the atmosphere now has much less space for the global majority to develop the same industries that have allowed longer life, a cleaner environment, and a higher standard of living for the people of

the Global North. Without payment, agreement or even acknowledgement, Industrialized states have already exploited the atmospheric space that formerly belonged to all people. Social movement and civil society groups have been loudly decrying this injustice for over 25 years, but have encountered few victories in the legal realm.

**A. Multilateral Environmental Agreements and Ecological Debt**

There are no multilateral environmental agreements that have explicitly used the concept of ecological debt or carbon debt. However, there are three articulated international legal concepts that can be extended and intertwined to provide an international legal basis for ecological debt analysis. The strongest support of the concept of ecological debt in international negotiations is from the principle of “common but differentiated responsibilities,” found in the UNFCCC’s Article 3(1), Article 4(1) and Article 10 of the Kyoto Protocol. This was first introduced in the Rio Declaration in 1992 (Principle 7), and the “common but differentiated responsibilities” principle implies that every nation is responsible for protecting the global environment against threats to earth’s systems, but that developed countries have a greater responsibility because they have disproportionately contributed towards worldwide environmental problems. This creates distinct commitments and responsibilities for different states; developed and developing nations are viewed as individual players with discrete roles.

The second established legal principle that can be used to support ecological debt is the ethic of protection of the environment for present and future generations, found in Principle 3 of the Rio Declaration, the preamble to the UNFCCC, and Art. 3(1) of the UNFCCC. Ecological debt is linked with this recognized code of ethics of intra- and intergenerational equity necessary for the sustainable maintenance of the environment for future generations.

Another established international legal concept that is useful for ecological debt is the “polluter pays principle”. First stated in 1972, the recommendation of the Organization for Economic Co-
operation and Development states that “the polluter shall bear the expense of carrying out pollution prevention and control measures decided by public authorities to ensure that the environment is in acceptable state.” It is echoed in the Rio Declaration (Principle 16) and in the policy statement of the UN Environmental Program. It broadly implies that those who are responsible for causing or have caused pollution should pay the cost for, or provide for, restitution to those harmed by this contamination.

The most direct and explicit statement concerning ecological debt in the international legal arena comes from the negotiations for the Adaptation Fund selected at the Conference of the Parties 7 in November 2001, which stated that the agreement for adaptation funds for climate change should be considered the first step towards “repaying a part of the ecological debt.”

**B. Case Law on Ecological Debt**

There is no case law that contains a direct reference to the concept of ecological debt. There are a few specific cases that involve international jurisdiction for individual state responsibility for trans-boundary environmental harm. These cases include the Chorzow Factory case (1928)\(^47\), the Trail Smelter Arbitration (1941)\(^48\), the Corfu Channel case (1949)\(^49\), the Lac Lanoux Arbitration (1957)\(^50\) and the Gabcikovo-Nagymaros case (1997)\(^51\).

This comment will only focus on the Trial Smelter Arbitration because it is the only case in which a tribunal directly analyzed U.S. law. The Trial Smelter Arbitration dealt with trans-boundary damage to U.S. farmers by sulfur dioxide emissions from an industrial smelter in British Columbia, Canada. The tribunal recognized, as a general principle of international law, that "a state owes at all

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\(^47\) Permanent Court of International Justice (PCIJ) Reports Series A, N* 17. (The PCIJ was the predecessor of the current International Court of Justice)
\(^48\) III Reports of International Arbitral Awards (RIAA), 1905.
\(^49\) ICJ Reports 1949, 4
\(^50\) XII RIAA, 281
times a duty to protect other states against injurious acts by individuals from within its jurisdiction".\textsuperscript{52} The tribunal looked at U.S. Supreme Court decisions in disputes between U.S. Domestic States and concluded that “under the principles of international law as well as the law of the of United States, no state has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence."\textsuperscript{53} This decision recognized that the state is responsible for any serious environmental damage caused by companies on its territory to other countries or individuals and that that responsibility need not only stem from states acting to create that harm, but also from states neglecting to act to prevent that harm.

**C. Ecological Debt for a Climate Justice Analysis**

Ecological debt and climate debt are important concepts because they demand an acknowledgment of inter-relational and historical factors and of the fact that privilege and poverty are connected processes.\textsuperscript{54} Furthermore, these concepts of debt offer a better understanding of climate justice not only for all of the planet’s current inhabitants but for future generations as well.

Ecological debt allows for detailed and specific responsibility to be allotted and enlarges the “polluter pays” principle\textsuperscript{55} to account for all ecosystem damage. Gauging ecological debt also allows for an overall understanding of many of the stresses placed on the environmental system by industrialization and land-use changes. At the same time, calculating ecological debt easily extends into assessing climate debt. The two concepts together thus incorporate the new stresses that climate change

\textsuperscript{51} ICJ Reports 1997, 78.
\textsuperscript{52} III RIAA, 1965
\textsuperscript{53} Ibid.
\textsuperscript{54} Richard A. Matthew, Social Responses to Environmental Change, Environmental Change, Adaptation, and Security 17, 21 (S.C. Lonergan ed., 1999). (The world's richest 250 individuals control as much wealth as the world's poorest 2.5 billion. Over a billion people live in absolute poverty (less than a dollar a day); 1.8 billion lack access to health care or safe drinking water; over 2 billion have no sanitation services. And while the global economy has grown faster than world population, the gap between rich and poor countries continues to increase.)
is placing on the Earth system. Also, an ecological debt analysis can provide just solutions to impoverished countries as well as to Indigenous nations that may not be formally recognized and for impoverished peoples within industrialized countries. It expects the parties that profited from pollution to be the parties that are responsible for its remedy. It also quantifies the remedy monetarily, but it is payable in ecosystem remediation, technology transfer, or debt fund creation.

Climate Debt is a concept that allows environmentalists from diverse localities —including the Arctic, the Small Island states, African nations suffering increased flooding —to identify the parties most responsible for environmental harm and provide a coherent path for remuneration and remediation. The concept affords a specific local area with the ability to articulate their diverse ecological stories as well as the larger story of climate change viewed through the concept of ecological debt. Climate debt can encompass all elements of a historical, present day, and future analysis and provides a coherent framework for remunerative justice while actually making each of the responsible parties liable for climate change harm. Climate debt is also something that can encourage individuals to think of human rights as including environmental rights. The concept of climate debt has a nearly 25-year history and has been embraced by more than 242 international organizations and governments, representing millions of people most impacted by Global Warming.

D. Climate Debt and the Rights of Mother Earth: Bolivia's visionary declaration

Bolivia, Malaysia, Paraguay, and Venezuela combined to propose an amendment to the Kyoto protocol at the 2010 Copenhagen Convention on Climate Change that would have changed Kyoto Article 3 to incorporate climate debt. Their amendment, which was not adopted, read:

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“The Parties included in Annex I shall, individually or jointly, ensure that their aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A do not exceed their total assigned amounts, calculated pursuant to their quantified emission reduction commitments inscribed in Annex B and determined by applying the principle of historical responsibility/debt.”

For the international community to reach an understanding of climate debt would be an important step, but other significant proposals exist that would address climate debt, including the application of a few key elements necessary to make climate debt legally cognizable: 1) the international community’s recognition of the equity principle as essential with respect to the use of Earth’s climate system and emission rights; 2) a common understanding of both historic and present responsibilities for climate debt; 3) the establishment of a principle of liability and compensation; and 4) the creation of international Climate Debt Funds (CDFs).

Because of the massive scale of the climate debt crises, industrialized governments must utilize a variety of tools to cultivate the necessary resources to pay for their collective climate debt. Proposals by NGOs include an international tax on shipping, levying charges on international financial transactions, auctions on emissions permits, ending tax evasion, and canceling debt repayments for developing nations. It is estimated that a tax on aviation and shipping alone would generate up to $40 billion a year, while efforts to end tax dodging would net up to $250 billion a year. Another proposal would establish an equitable tax on carbon emissions revenues that would be used to compensate and contribute to finance adaptation and mitigation to the impacts of global warming. This is not,
however, a substitute for repayment of already accumulated climate debt. In order to avoid market-based inequality this compensation and funding are designed to be unconditional and free of market mechanisms and private financial institutions.

Ecological debt, broadly – and climate debt specifically – can turn the horror of climate change into a historic opportunity to address both poverty and climate change, while ensuring greater fairness, safety, equality and productivity for future generations. Many worthy proposals address climate debt, and some, like the “Declaration of Mother Earth,” envision a new global declaration similar to the “Declaration of Human Rights.” However, the key to any proposal will be worldwide political acceptance and effective implementation; these are often the greatest difficulty for the execution of proposed solutions to climate debt.

E. The Weakness of Climate Debt

Obstacles to the acceptance of climate debt are both political and practical. While it remains an essential educational framework, it has yet to be incorporated into agreements at the UN. The largest and most powerful states, most critically the US, have refused to consider it, specifically stating that it is “off the table” for discussion. Because the climate is rapidly deteriorating and there continues to be little consensus on how to curb global warming, the time needed to negotiate a new global treaty would be better spent implementing a stronger, more specific version of the principles for which a consensus

62 Declaration of the Rights of Mother Earth http://pwccc.wordpress.com/programa/ (last visited May 23th, 2011
63 U.S., Byrd-Hagel Resolution, 105th Cong. (1997), The National Center for Public Policy Research, http://www.nationalcenter.org/KyotoSenate.html (last visited May 23rd, 2011) (The “Byrd-Hagel Resolution,” passed by the US senate by a vote of 95 to 0, notes the rapid increase of GHG emissions by Developing Country Parties, and asserts that “the exemption for Developing Country Parties is inconsistent with the need for global action on climate change and is environmentally flawed,” and expressed the strong belief of the Senate “that the proposals under negotiation, because of the disparity of treatment between Annex I Parties and Developing Countries and the level of required emission reductions, could result in serious harm to the United States economy.” It went on to convey the sense of the Senate that the United States should not be a signatory to any agreement that would: (A) mandate new commitments to limit or reduce greenhouse gas emissions for the [developed country parties], unless the protocol or other agreement also mandates new specific scheduled commitments to limit or reduce greenhouse gas emissions for Developing Country Parties within the same
already exists.

A related difficulty with climate debt is that social movement’s demand for reparations for the peoples of the southern hemisphere; the creditors to whom the debt is owed. While the demand is just, it is currently not strategic for the climate debt agenda. The UNFCCC has already agreed to the principle of "common but differentiated responsibilities and capabilities," which is a legal basis for climate debt analysis. To demand that the UNFCCC rewrite much of its “principle” statements and introduce a new concept into its framework that has already been consistently rejected by the delegates to the world body is an overreaching request — particularly when it would be easier and more likely to create effective outcomes for social movements and NGOs to simply demand that the UNFCCC commit more fully and clearly to its own articulated principles of fairness. As economist Robin Hahnel argues, “It is also far from obvious that the concept of ‘reparations’ is superior on moral or ideological grounds. Is petitioning for debts owed better than insisting on one's right to be treated fairly?”

On a global level, any local solution that addresses the issues of justice and global warming will need to respond to, if not abide by, the basic principles and frameworks already agreed upon in the Kyoto Protocol. Although the frameworks of climate justice and climate debt are the most accurate descriptors and offer the most just solutions, their basis in international agreements is slim and their political liabilities are grave. The call for climate debt repayment on an international scale widens the field of debate and invites the international community to recognize the depth of injustice concerning climate change. However, the current strategy for implementation of climate debt reparations is not an effective one. There is little time and many rapidly worsening global climate problems urgently need to

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be addressed by a comprehensive, enforceable, effective, and just global treaty. A framework for this more substantial treaty exists in the architecture of the Kyoto Protocol. The Protocol has already been negotiated and signed by nearly all of the world's countries (with the United States as a major exception). In the buildup convention to Kyoto, the UNFCCC contained important language in Section 4 that addressed climate responsibility and “common but differentiated responsibilities” as key objectives of the treaty. Successful political strategy to achieve legal recognition for climate debt in the long-term requires that the objective be built in to current political organizing, without compromising the enduring legal goals. As a solution, the greenhouse development rights framework provides an adequate response at this current juncture.

V. Greenhouse Development Rights

Greenhouse Development Rights (GDR) starts with a principle already articulated in the UN’s Framework Convention on Climate Change, where states commit themselves to “protect the climate system ... on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities.” GDR develops this principle into a nuanced, specific, and comprehensive plan for sustainable development that addresses many of the concerns raised by climate debt analysis.

The GDR framework aims to identify the right to sustainable development for all. It recognizes this right through a collective effort-sharing scheme. The two key principles of the effort-sharing scheme are capacity and responsibility. Capacity is broadly defined as the ability to pay for mitigation and adaptation to global warming, without sacrificing necessities. Responsibility is defined as historic contributions to greenhouse gas pollution, excluding emissions associated with meeting basic  

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necessities.\textsuperscript{69}

GDR bases the level of income where capacity and responsibility begin on the income levels of the individuals within a given country – in a manner that takes explicit account of the unequal distribution of income within that country. This is opposed to most proposals that rely on the national per capita averages. The acknowledgment of the impact of class within all countries allows a differentiation between luxury consumption and the consumption of necessities. The GDR framework captures the extent of inequality between Global North and South by encouraging the inclusion of an income threshold, below which there is no responsibility or capacity, to address the issue of climate change. This designates that a wealthy citizen of the global South would not be allowed to hide behind a poor majority to avoid responsibility or capacity to mitigate climate change; conversely, the most severely impoverished minorities in wealthy Global North countries would not be forced to take on any responsibility for climate change, which the impoverished have no capacity to solve. The negotiable global poverty line decided on by the report “The Greenhouse Development Rights Framework: The Right to Development in a Climate Constrained World” is $7500 per year\textsuperscript{70}. Any individual making less than $7500 per year in income is not counted towards a given country’s expected contribution to a global climate adaptation and mitigation fund. National shares of the total contribution into a global climate adaptation and mitigation fund are determined by looking at individuals with incomes above $7500. Each nation must contribute to the costs of global climate mitigation and adaptation policy according to its capacity (the total number of individuals with income over the threshold) and responsibility (cumulative carbon dioxide emissions since 1990, excluding emissions corresponding to

\textsuperscript{68} UNFCCC, Section 4: Commitments. http://unfccc.int/essential_background/convention/background/items/1362.php
consumption below the threshold).  

GDR provides a way to strengthen and work within the framework agreed upon by the state signatories of the Kyoto Protocol, while achieving concrete gains toward climate justice. GDR also overcomes the U.S. Senate's primary reason for refusing to sign on to the Kyoto Protocol. The fact that China, India, and all developing Annex 2 countries were not required to reduce their emissions under the Kyoto Protocol allowed politicians in the US to claim that the Protocol was sacrificing American businesses while allowing countries with some of the highest gross output of pollution to avoid any sanctions. GDR allows for a just balancing between responsibility and capacity, while strengthening the analysis of, and remedies for, the harm of CO2 pollution.

The U.S. has the largest share of global capacity and responsibility for climate change, which justifies assigning it the chief portion of accountability on a combined Responsibility and Capacity Index. Any framework that hopes to incorporate the UNFCCC principle of “common but differentiated responsibilities” will find that the United States must pay the largest share of the global climate effort. The GDR framework also shows that the U.S. and other high-capacity, high-responsibility countries have to go beyond their own domestic reductions and also include significant foreign adaptation assistance. This is a fundamental problem that requires large-scale educational, organizing, and policymaking between legal organizations and civil society groups that the U.S.-American climate movement has seriously neglected.

As the authors of the GDR framework put it:

http://www.ecoequity.org/docs/TheGDRsFramework.pdf

71 Robin Hahnel, Has The Left Missed The Boat On Climate Change?, Znet (December 25, 2009)
http://www.zcommunications.org/has-the-left-missed-the-boat-on-climate-change-by-robin-hahnel-1
73 Paul Baer, Tom Athanasiou, Sivan Kartha, and Eric Kemp-Benedict, Publication The Greenhouse Development Rights Framework: The right to development in a climate constrained world, A report by Series on Ecology – Volume 1,
“Despite the fact that the American people have come to accept the need for concerted action to stabilize the climate, and despite the inclusion of small amounts of foreign adaptation assistance in draft US climate legislation – climate action is still conceived in almost entirely domestic terms. As our analysis underscores, the United States has a “dual obligation,” one that has both a domestic and an international side. Indeed, it must be said that, with regard to preparing the ground for a future in which the United States meets its international obligations, the American climate movement has largely failed. The same, perhaps to a slightly lesser degree, is true of Europe as well, and this is a very serious – potentially fatal – problem.”

A. Weaknesses of the Greenhouse Development Rights Framework

Despite its great promise, the greenhouse development rights framework is weak in a number of ways. First, GDR begins its tabulation of climate debt in 1990. Second, GDR risks encouraging unsustainable development because it lacks the historical, ecological, and educational components of a climate-debt analysis. Third, because it defines responsibility and capacity by data on income, it camouflages real wealth, which includes access to capital, property, and credit.

That tabulation of carbon dioxide omissions does not begin until 1990 undervalues responsibility for climate change because carbon dioxide has been present in the atmosphere for approximately 150 years. By starting in 1990, the GDR analysis allows Global North countries 150 years of unrecognized climate pollution. It is not technically difficult to determine how to quantify the emissions between 1861 and 2011; however, it would require a significant renegotiation of the principles outlined in the Kyoto protocol and the UN framework convention on climate change. The 1990 figure is often justified on the grounds that industrialized countries didn't know about the damaging effects of carbon dioxide emissions until late in the 20th century, and thus should not be responsible for harm they did not know they were causing. However, the Swedish chemist, Savta

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In the U.S., the Johnson Administration recognized the impacts of carbon dioxide emissions as the cause of global warming in studies as early as the 1960s.

Second, GDR risks encouraging unsustainable development. If GDR principles were adopted without educational campaigns about sustainable development, ecological debt, and climate debt, then it is hard to imagine these principles being effective. Third, though the differences in responsibility and capacity between the working classes and the middle classes becomes clear both between nations and within nations in a GDR framework, the differences between the middle classes and the wealthiest one percent is more difficult to see because those people whose real wealth is far greater than their yearly income will not be visible in a framework that defines class through yearly income.

B. Implementing GDR in US Local and State Government Policy.

In the U.S., global warming demands a solution from the federal government. However, given the current political climate it seems unlikely that a legislative solution will come in the next 2 to 6 years, which points instead to the need to focus action on the sub-national level. While there are significant disadvantages to creating policy on the local and state level before the implementation of a federal standard, there are also some important benefits. The main structural disadvantages to a lack of

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77 Cap-and-trade legislation (Waxman-Markey) was passed by the house in June 2009, albeit with too weak a 2020 target and other problematic provisions that included subsidies for coal. The Senate has been unable to finalize its own legislation, and the direction has been toward a set of policies even weaker than passed by the House.
federal-level action on global warming are market inefficiencies, free-riding, holdouts, leakage, and the fact that sub-federal actions may be inefficient and inconsequential.

Nonetheless, state and local action is important irrespective of the benefits of action at the federal level. The key to effective state and local action will be in crafting policy to anticipate global problems, identifying and compensating for federal strengths and weaknesses to the degree possible, as well as identifying and acting upon state and local strengths, weaknesses, and opportunities. U.S. states are among the largest contributors to carbon dioxide emissions and the problem of global warming. For example, the state of Texas alone releases more carbon dioxide annually than Germany, a country that ranks seventh in terms of the world's largest national carbon dioxide emitters.

In addition, many solutions are already in place on state levels. Currently, seventeen U.S. states have enacted statewide greenhouse gas-reduction targets including half of the US population, covering half the US Gross Domestic Product (GDP), 30 percent of US current greenhouse gas emissions, and 6.5 percent of global GHG.

An under-appreciated advantage of focusing on a local and state-level policy may be the positive impact of participation and education of large communities of people in physically demonstrating

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78 The "free rider incentive problem" in economic theory predicts that it is only in the self-interest of a country, individual state, or municipality to reduce its own emissions by the amount needed if the country can be assured that other similar groups will do likewise
79 Wold, Hunter, Powers, Climate Change and the Law, 828 (2009)
80 Wold, Hunter, Powers, Climate Change and the Law, 827 (2009)
practical and concrete green alternatives. Engaging local communities in the short and long-term work of physically creating new energy infrastructure is a vital first step in a worldwide energy revolution. The work of engaging hearts and minds is the key factor in the effort to create the massive attitude and behavioral change necessary to stop global warming. This inspiration is most genuinely found in the engagement of hundreds of thousands of people taking their own future and the future of the planet into their own hands with local and state initiatives. An economy run on carbon-free green energy will require thousands more jobs than are available in the current U.S. energy infrastructure. Renewable energy offers a single elegant solution to the problems of economy and ecology. Renewable energy can create local jobs and require a larger workforce; local success may also inspire larger-scale political engagement.

Community organizing campaigns that create successful legal strategies to implement GDR could be a key way to show the importance of local or state action. After addressing concerns found in measured local implementation it is possible to efficiently scale up effective legal and economic regimes. Every successful local or state regulation creates models for the federal government to adopt a more rapid and stringent remedy to ecological debt and climate injustice. States have traditionally acted as a laboratory for new federal policies and tested successes and failures on a smaller scale. Also, state and local governments are closer to those they represent and can ideally respond more quickly to their needs. When states act before the federal government they gain expertise as regulators where the federal government has yet to regulate.

There is another advantage to states and localities taking the lead. To attempt stringent federal regulation without a track record of local and state successes is much less effective, and could be

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84 Wold, Hunter, Powers, *Climate Change and the Law* (2009), See also New State Ice Co. v. Liebmann, 285 U.S. 262, 311 (1932) (Justice Brandies writing on the widely recognized benefit of federalism promoting state laboratories for innovation)
downright destructive. To learn that a federal law assumed to be effective at addressing some aspect of climate justice is instead imperfectly drafted and difficult to implement would be worse than creating a patchwork of legally effective local action that would become further legitimated and strengthened through federal legislation.

Achieving legal policy change by state and local legislation offers possibilities for creating remedies for ecological injustice and climate debt, while avoiding constraints at the federal government level. Among the constraints are several overarching federal legal limitations on state action. The following section addresses the specific conflicts that local or state initiatives need to avoid. First, the state policy must not violate the commerce clause by discriminating against or unduly burdening interstate commerce. Second, state policy cannot violate the Dormant Commerce Clause by discriminating against other states to protect local interests. Third, the legal scheme cannot violate the compacts clause of the Constitution which reserves formal interstate and international agreements to the treaty making power of the federal government.

C. Constitutional Hurdles to State GDR

1. The Commerce Clause

Implementation of any given state law is first contingent on ensuring that the law does not usurp Constitutional exercise of Congress's commerce power. Article I, § 8, clause 3, of the Constitution authorizes Congress to regulate commerce among the several states. The Supreme Court has interpreted the commerce clause as empowering Congress to regulate the channels of interstate commerce; the instrumentalities of, or people or things in, interstate commerce; or activities that have a “substantial effect” on interstate commerce. It is likely that any substantial application of the GDR principles of responsibility and capacity by state governments could “substantially affect interstate commerce.”

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85 “The Congress shall have power to...regulate commerce...among the several states.” U.S. CONST. art. I § 8.
commerce. Interstate compacts could face scrutiny under the commerce power, especially the Dormant Commerce Clause.

2. The Dormant Commerce Clause

The Supreme Court has interpreted Congress’s power to regulate interstate commerce as implying a broad prohibition against state interference with interstate commerce. The resulting doctrine is known as the “dormant” commerce clause doctrine. Dormant Commerce Clause analysis is triggered by state laws that discriminate against interstate commerce, or out-of-state economic interests, or that burden interstate commerce. State laws found to have a protectionist purpose are on their face unconstitutional. State laws that have a permissible goal, but that overtly discriminate against interstate commerce or out-of-state economic interests (statutes that facially classify on that basis) are subject to almost certain invalidity. To overcome this risk of invalidation, the state must make a compelling showing that its statute is necessary to achieve a legitimate, neutral, non-protectionist state goal and that no less discriminatory means are available. Facially neutral state laws that have a discriminatory effect on interstate commerce may be sustained if the state demonstrates that it has a legitimate, non-protectionist state goal, that is rationally advanced by the state law, and that the state interest advanced by the statute outweighs the burden imposed upon interstate commerce and/or out-of-state economic interests.

88 “A state law that discriminates explicitly ("on its face," lawyers are fond of saying) is almost always invalid under the Supreme Court's commerce jurisprudence” Baude v. Heath, 538 F.3d 608, 611 (7th Cir. 2008).
At this last step in the analysis, the Court will consider whether the state could achieve its purpose through less discriminatory or burdensome means. The “market participant doctrine” is an important exception to dormant commerce clause analysis with implications for the implementation of GDR. When a state acts as a "market participant" -- as opposed to a "market regulator" -- the strictures of the dormant commerce clause do not apply. A state is a market participant when it purchases, sells, or engages in commercial activity in a manner comparable to a private economic actor. However, if a state attempts to use its economic power to impose conditions or restrictions “downstream” from its own transaction, a court may conclude that the state is acting as a market regulator, and is subject to dormant commerce clause invalidation.

3. The Compacts Clause

The federal government has exclusive power over foreign affairs, because of the requirements of the constitutional compacts clause. This means that states and local governments cannot enter agreements with foreign nations that have the “indices of a formal compact.” However, local governments and NGOs can agree to a Memorandum of Understanding (MOU), which creates ties to organizations, corporations, and governments in foreign or indigenous nations to mitigate climate change in a direct way. These MOUs must not create a joint organization or body established to regulate the agreement or for any other purpose. Voluntary unions are not considered a compact and are currently used to make climate agreements; these could become effort-sharing agreements on the basis of capacity and responsibility.

D. Programs to advance Greenhouse Developmental Rights

A successful state or local policy to mitigate climate change and advance GDR must avoid the

91 “No State shall, without the Consent of Congress, lay any Duty of Tonnage, keep Troops, or Ships of War in time of Peace, enter into any Agreement or Compact with another State.” U.S. Const. art. I, § 10, cl. 3
various prohibitions outlined by federal constitutional law. Such a policy must also be based as much as possible on well-established local or state laws and economic realities. This section examines how states could use the GDR principles of responsibility and capacity to create statewide climate mitigation and adaptation policies and funds. Specifically, it asks how the framework for GDR can be used on a local level in the U.S. and which legal strategies could best implement the GDR framework on a local/state level.

1. Guaranteed rates

Guaranteed rate programs could be used to implement GDR on a local or state level. To take into account the GDR framework, guaranteed rates (also called feed-in tariffs) for renewable energy would need to be implemented with a baseline of free electricity for individuals at the global poverty line. Guaranteed rate programs could be set up on a state level and could work as part of a GDR framework. Guaranteed rate programs require utilities to purchase renewable power at a fixed rate for more than ten years. Electricity customers pay a fixed rate for the amount of power each customer uses. The rates are negotiated beforehand and guaranteed by the government. The individual customers get a guaranteed supply of renewable energy, and though they may pay a small amount more in the present they are better protected against future increase in electricity costs. For a renewable energy producer guaranteed rates insure a continuing revenue stream that makes it easier for producers to get loans and attract investors. The individual rates are adjusted to allow for the cost of the different renewable energy systems. Vermont has the best articulated guaranteed rate program in the US. Vermont guarantees the rates for large wind turbines at $.14 per kilowatt-hour, while small residential turbines are $.20 per kilowatt-hour and photovoltaic panels get $.30 per kilowatt-hour. This guaranteed rate system allows small and medium-sized producers, including local or state governments, to create income as they convert their electricity systems to renewables. For example, when a town in Vermont

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92 Jerry Jenkins, *Climate Change in the Adirondacks: the Path to Sustainability*, 157 (2010).
buys a .5 MW turbine for 1 million and generates about 1.3 million kilowatt-hours a year with it, the local area will be guaranteed an income of about $160,000 after operating expenses\textsuperscript{93}. Most of those operating expenses will likely provide local jobs and the community can then borrow against this income, repay the loan in ten years, and conceivably generate substantial profits in the range of $1 million in the following ten years\textsuperscript{94}.

These sorts of state initiatives can both provide direct mitigation of climate harms while being part of a policy package that implements GDR on a state level before the federal government attempts to make nationwide or worldwide policy. One way to expand and encourage these programs would be to include them as part of state-level renewable portfolio standards (RPS). RPS requirements that force states to include renewables could motivate states to remove the specific focus on market-based mechanisms in their renewable portfolio standards and could even encourage states to include guaranteed rates when establishing region-wide cap-and-trade programs such as Regional Greenhouse Gas Initiatives\textsuperscript{95}.

2. Possible Ways to Use Property Law to Support GDR

(i) Law of Zoning: how it can be used for environmental protection\textsuperscript{96}

A focus on changing zoning laws would be a useful way to use property law to directly educate people about the importance of a responsibility and capacity analysis on a local level. Zoning is a very powerful force; the state authorities are given wide discretion for their interpretation of what sort of zoning promotes the general welfare. Zoning relies on the authority of the police power of the state for its legitimacy. For example, New York State has statewide powers to zone, but there are state enabling acts that allow municipal zoning. Zoning is often used as nuisance control. Local zoning boards could use nuisance law principals to stop exploration, transport, or production of dirty energy. Pollution can

\textsuperscript{93} Jerry Jenkins, Climate Change in the Adirondacks: the Path to Sustainability, 157 (2010).
\textsuperscript{94} Jerry Jenkins, Climate change in the Adirondack: the Path to Sustainability, 157 (2010).
\textsuperscript{95} Wold, Hunter, Powers, Climate Change and the Law (2009)
be defined as a nuisance by a zoning board, and that definition could be expanded to include GHG emissions by a local zoning board. In *Hadacheck v. Sebastian*, the Supreme Court allowed for “takings” for nuisance control in the local area. This holding has recently been criticized, but it could be expanded to include takings of unregulated carbon emissions, or even the prohibition of the destruction of carbon sinks (i.e., forests) by local zoning ordinance.

(ii) Law of Servitudes: easements and negative easements: 

Advocates for implementation of GDR could use litigation to argue for the creation of implied negative easements on all state- or town-owned land regulating or prohibiting carbon dioxide emissions. Easements are non-possessory rights in property. An easement must run between a dominant and subordinate tenant. Because of the easement, one property is benefited (dominant) and the other is burdened (subordinate). Easements can be negative, prohibiting conduct, or affirmative, supporting conduct. For their use in implementing GDR negative easements are the most interesting. Negative easements involve rights of the dominant owner to stop the servient owner from doing something on servient land. The category of recognized common law prohibitory easements including blocking access to light, interfering with air flow, removing the support of neighbors buildings (usually by excavation), and the interference of the flow of water in an artificial stream could reasonably be expanded to include climate harm and carbon dioxide emissions as a negative impact on a neighbor’s property.

97 Hadacheck v. Sebastian, 239 U.S. 394 (1915)
(iii) Conservation easements:

Conservation easements could be used to create a legally enforceable land preservation agreement between a landowner and a government agency (municipality, county, state, federal) or a qualified land protection organization (often called a "land trust"), for the purposes of fulfilling state or individual commitments under a GDR. Conservation easements could be used to restrict real estate development, commercial and industrial uses, and GHG emissions on a property. Conservation easements are perpetual in duration, are transferable, and the IRS allows for tax deductions for donation of interest in development. Under the federal Uniform Conservation Easement Act (UCEA) of 1981, the total acreage protected by state and local land trusts holding conservation easements (rather than alternatives such as fee ownership) is larger than Vermont. Local and state land trusts held conservation easements protecting over 6.2 million acres in 2005 (or over half of the total acreage protected by local and state land trusts), up from roughly 2.5 million acres in 2000 and 450,000 acres in 1990.

Another type of land protection involves environmental covenants. Environmental covenants impose activity and use restrictions on contaminated land and permit the contaminated land to be developed within the limits imposed by these restrictions. In 2003, the Uniform Environmental Covenants Act (UECA), was completed by the National Conference on Uniform State Laws and is being implemented on a state by state basis. UECA facilitates the use of environmental covenants such as, agreements between parties responsible for environmental clean-up projects. By expanding definitions of contaminated land and cleanup to include responsibility for larger climate harm and implementing a capacities-and-

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responsibility analysis as part of general environmental cleanup activities, these acts could authorize the use of local conservation easements to implement GDR.

3. Should the Climate have Standing?105

One of the more visionary proposals would be to allow the climate to have standing, to be given legal voice and status, in suits and judicial actions relating to the climate as a whole. In Christopher Stone’s “Should Trees have Standing?” he argues that the estates of deceased persons, corporations, and governments are all nonhuman entities that regularly appear in litigation. In *Loggerhead Turtle v County Council of Volusia County* a nonhuman loggerhead turtle succeeded in litigation before the 11th Circuit Court106. Climate Justice advocates could seek to persuade state level judges in key jurisdictions to allow the climate itself to be represented by a designated legal guardian in the courts. These legal guardians could then implement a GDR framework.

4. Immigrant Rights as Greenhouse Development Rights

A possible application of the greenhouse development rights framework that would be practical and important would be to create and expand state and local implementation of the “sanctuary city movement” for non-status immigrants107. The Sanctuary Movement was a social movement in the 1980s where community groups and churches provided Central American refugees social services and advocacy support as well as engaging actively in efforts to change federal immigration policy which refuse many Central American immigrants asylum. Climate Justice Citywide sanctuary city programs

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105 Christopher D. Stone, Should Trees Have Standing? (2010)
106 Christopher D. Stone, Should Trees Have Standing? 161(2010)
107 Joseph Huston, Sanctuary Cities: A Constitutional Primer, http://www.dartmouthlawjournal.org/articles/211-216.pdf, See also The New Sanctuary Movement, http://www.newsanctuarymovement.org, (In the early 1980's, thousands of Central American refugees poured into the United States, fleeing life-threatening repression and extensive human rights violations by their governments. At the time, federal immigration policy would have denied the majority political asylum simply because their governments were allies of the U.S. Many community groups and churches responded positively to the refugees plight -- offering these refugees social services and advocacy support as well as engaging actively in efforts to change federal immigration policy. These groups united under the banner of the Sanctuary Movement. The Sanctuary Movement was ultimately successful both in changing national asylum policy and in protecting tens of thousands of individuals and families.)

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could provide state and city services to non-status immigrants and refuse to comply with federal
deportation of non-status immigrants from specific countries in the global South as part of GDR
implementation. This could be implemented and justified on the basis of taking responsibility for a
locality’s or state's share of climate debt and be pegged to each specific locality’s responsibility for
GHD emissions after 1990 and its income-based capacity to address the harm of climate change while
still providing for necessities. This proposal would take a lot of political will and might raise some
significant legal concerns, including federal preemption. However, this could provide a very practical
yet visionary way to join environmental and human rights concerns, strengthening both social
movements understanding and analysis. Such an initiative would provide concrete services to some of
the most impoverished people in the Global North and allow for direct mitigation in the form of direct
services and funding sent back to more impacted global South countries. Use of the sanctuary concept
seems to be one of the more useful ways in which a GDR framework can be made part of a larger
environmental justice analysis in US-American communities. It would also contribute to educating
people in the U.S. about climate debt and the need to actively support global climate justice.

VI. Conclusion

It is beneficial for all industrialized nations, in particular the US, to accede to global South
demands around climate debt as soon as possible, because industrialized nations will face less stringent
emission scenarios by their significant early involvement. Ideally, industrial nation’s early involvement
in a GDR framework, will ensure a more stable, less dangerous, wealthier world for all. This will allow
industrialized nations longer-term prosperity without remorse, or the threat of catastrophic climate
change. The recent trade policy pursued by much of the Global North has shipped much of the
industrialized world’s industrial capacity abroad. The US specifically, and most of the industrialized
world in general, is very vulnerable to disruption of the now global industrial supply chain, either
because of increasingly chaotic weather or an increasingly active\textsuperscript{108} industrial workforce that is predominantly located in the global South. Willful ignorance of the chain of events perpetuated by the current system underscores industrialized nations’ diminishing willingness to broker mutually supportive relationships with the world’s poorest countries who provide the majority of raw materials and labor for the survival of the wealthier global citizens. However, the use of force by the powerful against the impoverished is losing its ability to discipline, indoctrinate, or intimidate, as is evidenced by the number of failed military operations\textsuperscript{109} the success of citizen uprisings\textsuperscript{110} and the reaction of the world to these related events. Global warming is an undeniable reality, and any nation, like the U.S., that builds its economy on finite resources from countries to whom it owes a climate debt, will sooner or later hear the global winds of change rattling their windows and banging down their doors.

\textsuperscript{108} \url{http://www.nytimes.com/2010/06/02/business/global/02strike.html} (For examples of what this might look see the News on the Recent Chinese Worker’s strikes) \url{http://venezuelanalysis.com/news/5504} (Or the Venezuela's workers movement)
