

The Case against Private Property in Carbon Assets:

Why property rights in the carbon cycle

are causing carbon policies to fail

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Abstract

It is claimed that private property rights in carbon assets will both reduce carbon emissions and will increase investment in sequestration activities, thereby mitigating the effects of or solving climate change. Supposedly, property rights acting in a carbon market will assist emitters in transitioning to lower-emissions technology while creating an incentive for land managers to engage in rights-creating sequestration activities. This thesis focuses on biological sequestration and shows that property rights in carbon assets will hinder, rather than facilitate, carbon policy success.

This thesis begins with an examination of whether it is appropriate to assign property rights to a natural cycle. Because of the physical, legal, and moral inability to exclude others from the carbon cycle, this thesis rejects private property rights in carbon assets, which represent a portion of the carbon cycle. However, as regulators desire to actively manage the carbon cycle, the common justifications of private property are reviewed to determine whether any of these property theories can justify the creation of private property in carbon assets. Private property rights in carbon assets are rejected as the rights, and the consequences of the rights, are contrary to society's social, legal, administrative, and environmental goals. Ultimately, carbon policies are more likely to be successful when carbon assets are held publicly rather than privately.

The conclusion of this thesis is significant as numerous governments have considered, or are considering, the creation of private property rights in carbon assets. Further, it is not evident that an academic analysis has previously been undertaken to determine whether creating property rights in the carbon cycle is appropriate or whether a property approach will reduce atmospheric carbon concentrations. The analysis in this thesis can play a role in creating successful and sustainable carbon policies.

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CHAPTER 1: AN INTRODUCTION TO CARBON ASSETS AND THE CASE FOR PROPERTY RIGHTS IN CARBON ASSETS

1.0 Introduction

Climate change is, at its essence, an environmental problem; an excess of atmospheric greenhouse gases has led to the global temperature rising and the global temperature is predicted to continue to rise with current or increasing concentrations of greenhouse gases.¹ Although an environmental problem, mitigating and / or solving climate change requires more than a consideration of environmental issues. Climate change is a massive, international issue. It is the consequence of a history of environmentally destructive behaviours which have become engrained in society.² Solving climate change will require a coordinated, multifaceted approach which results in all of the players in carbon change, the emitters, who have and are releasing harmful greenhouse gases into the atmosphere, the sequesterers, who store atmospheric greenhouse gases and reduce the atmospheric concentration of GHGs, and society generally, which bears the consequences of emission and sequestration activities, routinely practicing environmentally sustainable behaviours.

Property rights³ in carbon assets⁴ have been proposed as a way to inconspicuously and positively change the relationship between society and carbon. Policy makers are creating private property in a portion of the carbon cycle in a hope that property rights operating in offset markets will discourage emitters from emitting and entice sequesterers into engaging in sequestration activities.⁵ However, it is not evident that an academic analysis has been undertaken to determine

¹ United Nations, Framework Convention on Climate Change, “Feeling the Heat: Climate Science and the Basis of the Convention” (2012), online: <http://unfccc.int/essential_background/the_science/items/6064.php>.

² For example, driving personal vehicles rather than using public transportation or walking and society’s current norm of “consumerism”.

³ “Property” does not mean ownership, although “ownership” may be significant. This thesis defines property as the relationships between individuals stemming from the rights and obligations derived from an interest in a *res*. This definition of property encompasses the ownership, bundle of rights, and relationship models of property. See, for example, Felix Cohen, “Dialogue on Private Property” (1954) 9 *Rutgers L. Rev.* 357 at 378 and Kevin Gray & Susan Francis Gray, “The Idea of Property in Land” in Susan Bright and John Dewar, eds. *Land Law: Themes and Perspectives* (Oxford: Oxford University Press, 1998) at 15.

⁴ A term used by Steven A. Kennett, Arlene J. Kwasniak and Alastair R. Lucas, “Property Rights and the Legal Framework for Carbon Sequestration on Agricultural Land” (2005-06) 37 *Ottawa L. Rev.* 171 to describe “sequestration potential, carbon sinks, sequestered carbon and sinks-based offsets”.

⁵ See Bruce Ziff, *Principles of Property Law* (Toronto: Carswell, c. 2010) at 77 for a discussion on how property can be used for social engineering.

whether private property rights⁶ in carbon assets are appropriate or whether a property approach can successfully reduce atmospheric carbon concentrations. Private property in carbon assets was promoted as a potential solution to climate change prior to a complete examination of property theory and sustainable carbon policy. It is curious that this should have happened.

The creation of private property in carbon assets is based on two propositions: the first from economic theory, that market forces will achieve least-cost reductions in emissions and increases in sequestration;⁷ and the second being the property theory principle that people cannot transfer property rights which they do not own.⁸ By locating private property in carbon assets, property interests can be created, bought, sold, banked, cashed in, destroyed through use, and retired.⁹ The presumption is that property rights in carbon assets, capable of being created by entrepreneurs and transferable in a market, will encourage investment and locate the property interest in the person willing to pay the most for the interest. For example, if land managers¹⁰ can create economically valuable “carbon credits” from sequestering carbon, land managers will have an incentive to engage in activities which sequester carbon. Further, if carbon dioxide emitters are legally required to either reduce emissions or purchase carbon credits to offset emissions, emitters will govern themselves in the most economically efficient way while incidentally reducing carbon emissions or supporting carbon sequestration activities.

⁶ Private property organizes property rights around the idea of individual ownership (Jeremy Waldron, *The Right to Private Property* (Oxford: Clarendon Press, 1988) at 38). Ownership presumes that most uses of property are self-regarding, or that no one other than the owner has a legitimate claim to the control of the property (Joseph Singer, *Entitlement: The Paradoxes of Property* (New Haven: Yale University Press, 2000) at 3-4). The bundle of rights model, however, tempers the ownership model’s approach to private property and allows each right associated with a resource to be held by a different individual. Pursuant to the bundle of rights approach, the private property rights-holder may, as allowed by her right, do with her right as she pleases to the full exclusion of all others.

If carbon assets are held as private property, property rights in carbon would be assigned to a right-holder. The right-holder could sequester, release, and emit carbon, and buy, sell, bank, cash in, retire, destroy, or abandon carbon rights as allowed by her property right and as may be restricted by the rights of others. No definite actualization of private property in carbon assets can be provided as an example, although most are currently in the form of a recognized carbon credit or equivalent. This thesis will not analyze the possible property rights regimes for sequestration transactions. Numerous theorists have already looked at how common law and statutes could be used should property in carbon exist. See, for example, Kennett et al., *supra* note 4 and Kenneth L. Rosenbaum, Dieter Schoene and Ali Mekouar, *Climate Change and the Forest Sector: Possible National and Subnational Legislation* (Rome: Food and Agriculture Agency of the United Nations, 2004), online:

<<ftp://ftp.fao.org/docrep/fao/007/y5647e/y5647e00.pdf>>.

⁷ Ronald Coase, *The Firm, the Market and the Law* (University of Chicago Press: Chicago, 1988).

⁸ Kennett, *supra* note 4 at 176.

⁹ See, for example, Heather Hager, PhD, “Carbon Sequestration and Carbon Credits, *Top Crop Manager*, online: <<http://www.topcropmanager.com/content/view/4240/>> which describes how three aggregators purchased offsets from individual farmers who participated in reduced-tillage projects and sold these offsets to industries in Alberta, “much like a grain elevator buys and sells grain”.

¹⁰ “Land managers” is used throughout this thesis to refer to the persons who make land management decisions, and thus are in control of the land’s sequestration potential, carbon sinks, and sequestered carbon.

As will be shown, the desire to use market forces to achieve carbon emission reduction and climate change mitigation goals is motivating the creation of private property in carbon assets both domestically and internationally.¹¹ Yet, property theory finds that private property in carbon assets is inappropriate. Forcing carbon assets into the private property framework, rather than allowing them to function as non-property or common property, is causing the property rights in carbon assets to behave in an unpredictable manner in the market. Private property rights in carbon offsets are failing. Legislators continue, however, to create private property rights in carbon assets to function in carbon markets.

1.1 The Use of Property Rights in Climate Change Strategies

There is a fear that current global efforts are not capable of adequately addressing climate change.¹² For example, the Intergovernmental Panel on Climate Change (“IPCC”) estimated that

¹¹ See, for example, jurisdictions such as Alberta (*Climate Change and Emissions Management Act*, 2003, cC-16.7, s. 9) and Australia (Samantha Hepburn, “Carbon Rights as a New Property: Towards a Uniform Framework” *Sydney Law Review*, forthcoming, online: <law.anu.edu.au/news/Hepburnseminarpaper.doc>). See also the Clean Development Mechanism [“CDM”], at Article 12, IPCC (2007) and the Seventh Conference of the Parties to the United Nations Framework Convention on Climate Change [“Marrakesh Accord”], United Nations Framework Convention on Climate Change, Report of the Conference of the Parties, 7th Sess., Addendum, Part Two: action Taken by the Conference of the Parties, Volume 1, Decision 11/CP.7, UN Doc. FCCP/CP/2001/13/Add.1, online: United Nations <<http://unfccc.int/resource/docs/cop7/13a01.pdf>>, allowing Annex 1 countries to include carbon fluxes that resulted from revegetation, cropland management and grazing land management when calculating their net greenhouse gas emissions pursuant to Article 3(4) of the Kyoto Protocol [“Kyoto”], Kyoto Protocol to the United Nations Framework Convention on Climate Change, UN Doc FCCC/CP/1997/7/Add.1, Dec. 10, 1997; 37 ILM 22 (1998).

There are two main forms of carbon trading markets: “cap and trade” and “offsetting” (Tamra Gilbertson and Oscar Reyes, “Carbon Trading: How it works and why it fails” (November 2009) 7 *Critical Currents*, online: Dag Hammarskjöld Foundation <<http://www.tni.org/sites/www.tni.org/files/download/carbon-trading-booklet.pdf>> at 9-11). In cap and trade, permits to emit to a certain prescribed level are created by the state and distributed to industry. Normally, the industry is assigned a maximum emissions limit, and each producer in that industry is allocated its own specific maximum limit. Emitters who emit less carbon than allowed by regulation and/or the emission permits they possess are able to trade their created or unused permits to those emitters who expect to emit more than allowed by regulation and/or the permits they possess. So permits are treated as commercial property rights by their holders and others in that industry. Environmental success under the cap and trade market occurs when the emissions cap is reduced, signalling a reduction in total emissions.

The premise of offsetting is very similar to cap and trade, but permits can be created from emissions-saving and emissions-mitigating projects, such as revegetation, cropland management and grazing land management, to offset emissions and reach emission obligations (Gilbertson, *ibid.* at 9-11. See also Kennett, *supra* note 4 at 173). Biotic carbon assets will not be relevant in a cap and trade market because emissions may not be offset in this market. However, biotic carbon assets may be integrated into a carbon offset market.

¹² This thesis is not intended to be a broad debate about global warming. As such, I set out the propositions about the science of carbon which I accept without further examination.

1. Climate change is a consequence of an excess concentration of atmospheric Green House Gases [“GHGs”].
2. Forestry, revegetation, cropland management and grazing land management are activities that have the potential to sequester carbon;
3. Biotic carbon sequestration reduces the level of atmospheric GHGs and should be encouraged;

there would need to be a rapid 50 to 70 percent reduction in emissions to avert devastating climate change.¹³ The IPCC figures are considered by some to be an underestimate.¹⁴ Another study concludes that “30 Kyotos”¹⁵ would be required to stabilize the concentration of carbon dioxide in the atmosphere.¹⁶

Although the obvious solution to climate change is “[f]oregoing excessive use of fossil fuels”,¹⁷ most likely through prohibitive regulation, this strategy is not desirable to many.¹⁸ Market-based approaches, a more popular option for dealing with climate change,¹⁹ have been advanced in an effort to continue current consumption while simultaneously reducing reliance on fossil fuels. Stern, a proponent of the use of market instruments to address climate change, submits that climate change has occurred because the market does not put a price on carbon, thus carbon is not taken into account when persons make economic decisions. The failure to include the costs of climate change in market transactions is “the greatest market failure the world has ever seen”.²⁰ To rectify the market failure, Stern recommends creating a price for carbon through tax, trading or regulation.²¹

Market-based approaches, with their associated property rights, do not immediately halt behaviours which are connected to climate change. Instead, they attempt to limit the severity of

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4. The environmental benefits of biotic carbon are located in carbon sequestration potential, carbon sequestration, and the retention of carbon reservoirs; and,
 5. Plant biomass and soil organic matter constitute a part of the carbon cycle feasible for contemplating property rights. While some ideas presented in this thesis may be relevant to carbon at other stages of the carbon cycle, the intention of this thesis is to only deal with property rights in carbon assets, being sequestration potential, carbon sinks, sequestered carbon and sink-based offsets.

¹³ Intergovernmental Panel on Climate Change, *IPCC Second Assessment: Climate Change 1995*, IPCC, Geneva, 1995.

¹⁴ James Hanse, Makiko Sato, Pushker Kharecha, David Beerling, Robert Berner, Valerie Masson-Delmotte, Mark Pagani, Maureen Raymo, Dana L. Royer, James C. Zachos, “Target atmospheric CO₂: Where should humanity aim?”(2008) 2 *Open Atmos. Sci. J.* 217.

¹⁵ Kyoto Protocol to the United Nations Framework Convention on Climate Change, UN Doc FCCC/CP/1997/7/Add.1, Dec. 10, 1997; 37 ILM 22 (1998) [“Kyoto”].

¹⁶ David Malakoff, “Thirty Kyotos Needed to Control Global Warming” (Dec 19, 1997) 278(2) *Science* 2048.

¹⁷ Gilbertson, *supra* note 11 at 8.

¹⁸ *Ibid.*

¹⁹ *Ibid.*

²⁰ Nicholas Stern, *Stern Review on the Economics of Climate Change* (HM Treasury: London, 2006) online: National Archives <http://webarchive.nationalarchives.gov.uk/+http://www.hm-treasury.gov.uk/sternreview_index.htm> at viii.

²¹ *Ibid.* at viii. Contrary to Stern, who advocates for the use of market instruments which puts a price on carbon to deal with climate change, Jim Watson argues a market price for carbon “is a very poor weapon in what is supposed to be a war to save humanity” (Gilbertson, *supra* note 11 at 12). As a reference, the increase in the price of oil in the 1970s did little to discourage industry from using oil (Gilbertson, *ibid.* at 12). Instead, industry passed the increased costs onto the consumer. The use of oil did not decrease, thus the environment did not benefit from increased oil prices.

climate change by allowing or promoting only those behaviours which are deemed by the market, and any accompanying legislation, as being worthwhile and/or significantly discouraging those that are not. For example, putting a price on carbon through the use of tradable carbon permits has the potential to spur beneficial efficiencies. If legislation requires a person to possess a carbon permit to produce, distribute or consume fossil fuels, and these permits can be bought and sold, those who would benefit from producing, distributing, or consuming fossil fuels at a higher carbon-price would purchase carbon permits to allow them to engage in their activity while those who would not benefit at the higher carbon-price would not undertake their activities. Those who choose to emit at a higher carbon price would also have the ability to adopt lower emissions technology to reduce their reliance on carbon credits. By making fossil fuels more expensive, carbon permits are expected to reduce the use of fossil fuels and promote the transition to energy efficient practices, or so is the presumption.

Prior to the use of market instruments to address climate change concerns, private property did not exist in carbon assets. Private property rights in carbon assets are now being created for use in carbon markets as part of legislators' climate change policies. Carbon trading, rather than reliance on any other market or regulatory instrument, such as carbon taxes, is a popular policy choice: "Carbon trading lies at the centre of global climate policy and is projected to become one of the world's largest commodities markets".²² For carbon trading to take place, market instruments, as well as economic theory generally, require that private property be held somewhere, and that this property be capable of being transferred. Hepburn states: "Climate change is a market failure without parallel, on the 'greatest scale the world has seen', so it is not surprising that the [emissions trading scheme] created to address it should eventually be seen as representing the world's greatest ever privatization of a natural asset".²³

The failings of carbon markets have been well documented, yet policy analysts and legislators accept carbon markets and private property in carbon assets as the correct response to climate change.²⁴ To date, three carbon markets have been prominent: the European Union's Emissions Trading System ("EU-ETS"), the New South Wales Greenhouse Gas Abatement

²² Gilbertson, *ibid.* at 103.

²³ Cameron Hepburn "Carbon Trading: A Review of the Kyoto Mechanisms" (November, 2007), 32 *Annual Review of Environment and Resources* 375 at 389.

²⁴ As seen in chapter 2, Canada, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario and Quebec have all created or examined the creation of private property rights in carbon assets and the use of carbon markets to control emissions.

Scheme (“GGAS”), and the Chicago Climate Exchange (“CCX”). As explored further in chapter 3, each of these markets, as well as numerous other environmental markets, has “failed” in some way. Even though carbon markets are not meeting societal goals, regulators are attempting to identify and fix problems with carbon markets rather than abandon carbon markets in their entirety.²⁵

Assumptions are being made that carbon markets are failing because the terms of the program or market have been badly designed or have been badly implemented. For example, Kennett et al. advocated for certainty of rights relatively early in the international community’s interest in carbon markets²⁶ and described the scientific, technical, economic, legal and institutional challenges associated with carbon assets as including “issues such as project design, measurement and verification of carbon fluxes, direct and opportunity costs of sequestration projects, monitoring and enforcement of sequestration agreements, risk management, project ‘leakage’ and transaction costs”.²⁷ Boydell et al. subsequently identified “the tension between the legal and economic interpretation of real property rights” as being the reason Australian property rights in carbon have not succeeded and proposed “a reconstitution of [carbon] property as a ‘web of interests’”.²⁸ In November, 2009, Gilbertson and Reyes held carbon market failure, specifically the failure of the European Union’s Emissions Trading System, was associated “with a complex interaction of state and corporate power, where those with the loudest voices in the process push for offsetting as a means to escape their responsibility to change industrial practices and the means of power production domestically.”²⁹

Although Kennett et al., Boydell et al., and Gilbertson and Reyes make compelling arguments, these theorists do not address the real problem. It is not uncertainty of program terms,³⁰ the description of carbon property as a *profit à prendre*,³¹ or the unjustifiable influence

²⁵ Nicholas Linacre, Alexandre Kossoy and Phillippe Ambrosi, “State and Trends of the Carbon Market” *Carbon Finance at the World Bank* (Environment Department: Washington DC, June 2011), online: <http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/State_and_Trends_Updated_June_2011.pdf> at 9.

²⁶ Kennett, *supra* note 4.

²⁷ *Ibid.* at 174.

²⁸ Spike Boydell, John Sheehan, & Jason Prior, “Carbon Property Rights in Context” (2009) 11 *Environmental Practice* 105.

²⁹ Gilbertson, *supra* note 11 at 89.

³⁰ Kennett, *supra* note 4 at 174

³¹ Boydell, *supra* note 28.

of government actors and market proponents that are causing carbon markets to fail.³² Instead, as this thesis will show, carbon markets and current carbon policies are not working because carbon assets are not the proper subject of property. As natural cycles are not the proper subjects of property, any private property rights erroneously assigned to natural cycles will not act in a predictable or sustainable manner. Further, private property rights in carbon assets distort what are and are not relevant interests and issues. Describing carbon dioxide emission-driven climate change as a “market problem” or a “property problem” ignores the need for structural and behavioural changes. Clarifying program terms, re-characterizing carbon property, and preventing undue influence will not fix the problems experienced by the markets. Carbon-focused environmental policies will not be successful as long as carbon is associated with legal property rights.

Prior to examining whether it is appropriate to create private property rights in carbon assets, the terms of the debate, namely “carbon assets”, must be defined. The term “carbon assets” is rarely used and does not have a generally accepted definition, rendering it meaningless out of context. As is seen below, because of the numerous ways the carbon cycle and property can be linked, having a basis of reference is essential.

1.2 What are Carbon Assets?

This thesis focuses on carbon assets related to biological sequestration,³³ being sequestration potential,³⁴ carbon sinks,³⁵ sequestered carbon,³⁶ and sinks-based offsets.³⁷ Defining sequestration potential, carbon sinks, sequestered carbon, and sinks-based offsets as

³² Gilbertson, *supra* note 11 at 89.

³³ “Sequestration - The process of increasing the carbon content of a carbon *reservoir* other than the *atmosphere*. Biological approaches to sequestration include direct removal of *carbon dioxide* from the atmosphere through *land-use change*, *afforestation*, *reforestation*, and practices that enhance soil carbon in agriculture.” International Panel on Climate Change, *Glossary of Terms used in the IPCC Third Assessment Report*, online: Intergovernmental Panel on Climate Change <<http://www.ipcc.ch/pdf/glossary/tar-ipcc-terms-en.pdf>> [“Third Assessment”].

³⁴ Kennett, *supra* note 4 at 178 defines sequestration potential as “the ability of soil and vegetation that can be grown on the land to absorb and retain atmospheric carbon”.

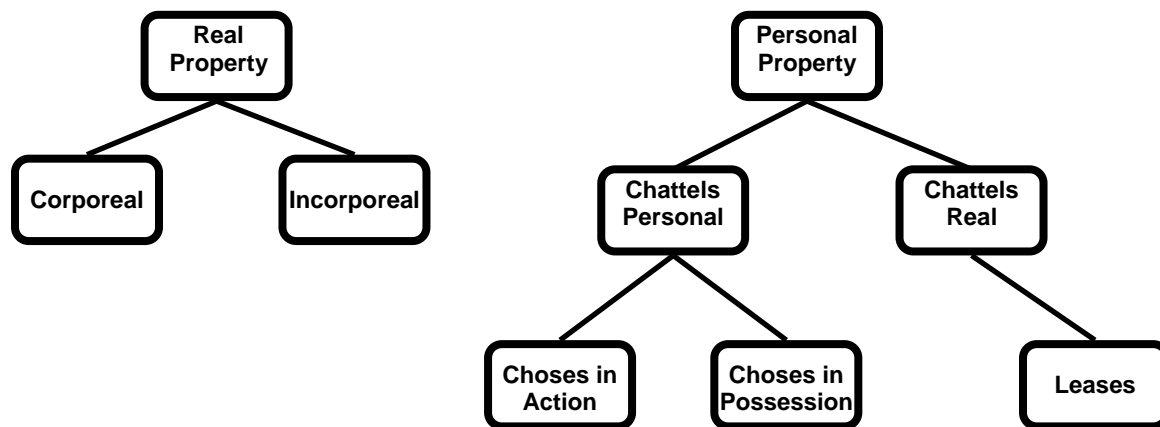
³⁵ “Sink - Any process, activity or mechanism that removes a greenhouse gas, an aerosol, or a precursor of a greenhouse gas or aerosol from the atmosphere.” Third Assessment, *supra* note 33 [emphasis removed].

³⁶ Kennett, *supra* note 4 at 178 defines sequestered carbon as “carbon actually retained by the soil and its vegetation.”

³⁷ The World Bank describes offsets as: “Offsets designate the emission reductions from project-based activities that can be used to meet compliance—or corporate citizenship—objectives vis-à-vis greenhouse gas mitigation.” Linacre, *supra* note 25 at 77. Continuing this line of thought, a sinks-based offset would be a designated credit created from sequestration project-based activities that can be used to meet compliance objectives.

“assets” is a legal fiction. However, similar to recognizing a business’s goodwill as an asset, there may be reasons why intangibles should be distinct from other closely-connected property interests. In the case of carbon, on one hand, biotic carbon is so closely connected to property rights in land and vegetation that the economic value of carbon – a component element – is difficult to separate.³⁸ On the other hand, Coase³⁹ and Stern⁴⁰ both argue that a price must be put on carbon to combat climate change. Putting a price on carbon sinks requires the ability to separate the value of the sinks from the distinct value of the trees which form the sinks. As the goal of current carbon offset markets is to promote investment in carbon sinks, rather than to promote investment in trees, this thesis accepts that sequestration potential, carbon sinks, sequestered carbon and sinks-based offsets can be considered “assets”. The question, however, is should these assets be given or treated as having “property”.

There is no settled legal classification of what property rights in the “carbon asset” portion of the carbon cycle would resemble.⁴¹ The following diagram sets out the possible classifications of property interests in carbon:⁴²



Briefly explaining this chart, property interests are either real property or personal property. Real property is a right in land.⁴³ Real property interests are either corporeal, interests capable of possession such as freehold estates, or incorporeal, interests which are non-possessory in nature such as easements or *profits à prendre*. Personal property is an interest in a thing other

³⁸ Generally, one cannot separate rights in the plastic in a basketball from the rights in the basketball in its entirety.

³⁹ Coase, *supra* note 7.

⁴⁰ Stern, *supra* note 20.

⁴¹ See chapter 2 for further information on the carbon cycle.

⁴² See, for more information, Ziff, *supra* note 5 at 77.

⁴³ *Ibid.* at 74.

than land.⁴⁴ Personal property can either be chattels real, contracts regarding leasehold interests, or chattels personal. Tangible chattels personal are described as choses in possession and intangibles are choses in action. As property rights in carbon assets are still in their infancy, the remainder of this section examines what the nature of property rights in carbon assets could be.

Answering the question of whether real or personal property should exist in carbon assets depends on the part of the carbon cycle the legislator is trying to promote, protect, or exclude others from. It is a decision about whether society is interested in encouraging the process of sequestering carbon or the product of the sequestered carbon. The process and product of carbon sequestration are interconnected, yet attract different property rights. This would be similar to intellectual property law in patents where a process may qualify for patent law rights and protection, while the resultant product is governed by other property law.

Property in the sequestration process need not necessarily be an interest in land. In Alberta, the sequestration activity, not the product, is being recognized by the creation of personal property in carbon offsets.⁴⁵ If a land manager plants seedlings, the process of sequestering carbon (the planting) is separate from the product of sequestering carbon (the tree). Consequently, the personal property offset created to recognize the efforts of a land manager in planting seedlings does not prevent the land manager from clearing the land the next year by burning the young trees or otherwise from managing the property rights in the trees as he pleases. Since the property interest in the offset is separated from the vegetation and biomass in

⁴⁴ *Ibid.* at 74.

⁴⁵ Alberta's Compliance Carbon Offset Market creates private property in Offsets, rather than an interest in land or in tangible property. As such, I would classify the property right in the Offset as a chose in action. The following is a short explanation on the creation and transfer of Offsets:

All projects registered on the registry must be third party verified by a chartered accountant or professional engineer with relevant expertise in the project area. The third party verifier will issue a verification report including a signed statement of verification, statement of qualifications and conflict of interest checklist, which must be submitted to the registry as part of the supporting documentation for the offset project. The registry will perform a completeness check on all documents submitted, and may request clarification or corrections if errors are detected. Once all supporting documents and payment are received, the registry will issue unique serial numbers for the verified emission reductions and/or removals.

Offset credit transactions occur outside the registry and are done through contractual agreement between the buyer and seller. Transfer of ownership of serialized credits is tracked by the registry and will be submitted to Alberta Environment upon request to support offset credit reviews as part of the regulated facility compliance reviews...

Alberta Environment, *Technical Guidance for Offset Project Developers* (January 2011), online: <<http://environment.gov.ab.ca/info/library/7915.pdf>> at 12.

which carbon is stored, it does not protect the product of sequestration and may not be capable of “offsetting” emissions, as intended.⁴⁶

If property rights in carbon are created to promote the products of carbon sequestration, an interest in land can serve as the indestructible “host” of the carbon.⁴⁷ For climate change mitigation purposes, the value of a carbon sink is in its physical existence, not in the protection of a legal fiction represented by a piece of paper, the piece of paper most likely being an offset credit. Environmental benefits are only achieved if carbon sinks remain once created. If a real property interest is not created in a carbon sink, i.e. the interest is created through a contract, a land manager may sell the land on which the sink is based and the new land manager may destroy the sink. The sink owner might then be compensated by the person who was in breach of the contract by economic damages,⁴⁸ but the environmental benefit is lost without any other environmental compensation. By not creating real property in carbon assets, the true purpose of the creation of the sink is being ignored and left to be easily defeated.

Some governments, such as British Columbia, Alberta, Saskatchewan, and Ontario, seem to be attempting to take control of carbon markets and are defining property in carbon assets through legislation and / or program criteria. However, the current state of property rights in carbon assets in Canada is a disorganized hodge-podge of far-from-clear property rights. Thus, this thesis identifies possible carbon property rights in carbon as either:

- 1) connected only to the sink, likely as an incorporeal right, a chose in possession right, or a chose in action right;
- 2) connected only to the sinks-based offset, likely as a chose in action right, and therefore separate and distinct from the carbon sink; or
- 3) an incorporeal right, a chose in action right, or a chose in possession right and an additional chose in action right created in the same sequestration activity (thus the sink-based offset could be destroyed without affecting the property right in the carbon sink, or vice versa).

⁴⁶ For further discussion on this point, see section 3.3 of this thesis.

⁴⁷ See, for example, the Australian states of New South Wales, Queensland, and Tasmania who have created real property interests in carbon.

⁴⁸ If carbon is considered personal property that is not affixed to the land, the property could be protected by the torts of conversion and trespass, the criminal laws of trespass and mischief, and contract law.

This thesis will attempt to distinguish, whenever possible, between the three ways property rights in carbon can be held. However, imitating legislators and other theorists, particularly in theoretical discussions, property rights are discussed in abstract, rather than classified.

1.3 Outline

Private property rights in carbon assets are not appropriate and are causing carbon markets to fail. To come to this conclusion, this thesis shows in chapter 2 that it is not proper to create property in a natural cycle. Although the thesis determines that the carbon cycle cannot be physically, legally, or morally excluded, thus is not the proper subject of property, regulators have created property rights in the carbon cycle anyway. Thus, chapter 3 canvasses property theory to determine whether any influential justifications of private property can provide validity to the creation of property rights in carbon assets. Because private property in carbon assets is rejected based on market failures, chapter 4 explores whether private property rights in carbon assets could be successful even in a perfect market. As chapter 4 concludes that private property in carbon assets is not legitimate and must be abandoned to achieve legal, administrative, environmental, and social goals, chapter 5 provides alternatives to private property in carbon assets that can be used to realize the climate change goals of promoting and protecting carbon sinks.

1.4 Conclusion

Some policy strategists support the use of market forces to create incentives for participation in sequestration activities⁴⁹ and prospectors see carbon trading as an economic opportunity.⁵⁰ Currently, the market approach, which requires some form of carbon property right capable of being held by a private person, is not meeting resistance from society or

⁴⁹ Ingrid Liepa of Alberta's Climate Change Central identified three possible models of markets:

1. Private Model – owner of facilities subject to GHG emission limits purchase offsets that meet government criteria from parties that have sequestration capacity or that act as intermediaries in offset transactions;
2. Trust Model – facility owners pay a set amount of money for each ton of emissions to be offset to a trust organization that is established to find and manage offset projects;
3. Emissions Trading Model – government establishes a GHG emissions trading system for the purchase and sale of carbon credits in a transparent market.

Ingrid Liepa, *Greenhouse Gas Offsets: An Introduction to Core Elements of an Offset Rule* (Calgary: Climate Change Central, 2002) at s. 3.0, App. A, online:

<http://www.climatechangecentral.com/resources/discussion_papers/GHG_offsets.pdf>.

⁵⁰ Hager, *supra* note 9.

governments, and is, in Canada, generally the policy choice for carbon management.⁵¹ Thus, understanding the connection between carbon sequestration strategies and property rights is necessary.

The present alternative of creating private property in carbon assets is not consistent with models of property theory, and traditional ideas of property are not capable of promoting carbon sequestration and sink retention to the extent believed to be required to mitigate or solve global warming. Private property rights in carbon assets as the basis of offset markets are causing offset markets to fail, to the detriment of societal goals.

⁵¹ See for example the Marrakesh Accord, *supra* note 11, where Annex 1 countries may include carbon fluxes that resulted from revegetation, cropland management and grazing land management when calculating their net greenhouse gas emissions pursuant to Article 3(4) of Kyoto, *supra* note 15. See also Environment Canada, *Climate Change Plan for Canada* (Ottawa: Government of Canada, 2002) at 39-40. See also Alberta Environment, *Albertans and Climate Change: Taking Action* (Edmonton: Alberta Environment, 2002) at 35-37, online: <<http://www3gov.ab.ca/env/climate/docs/takingaction.pdf>>.

CHAPTER 2: NATURAL CYCLES ARE NOT RIGHTLY PROPERTIZED

2.0 Introduction

Carbon markets and carbon policies are not achieving society's environmental and related legal, social, and administrative goals because natural cycles—carbon assets representing one segment of the carbon cycle⁵²—are not the proper subject of property, whether it be private property, common property,⁵³ collective property⁵⁴ or some mixture thereof.⁵⁵ Achieving the intended goals of carbon policies depends on correctly characterizing carbon assets as non-property.

An example of the way in which incorrectly advanced property rights can prevent society from achieving success is seen by the Jamestown Settlement. The Jamestown Settlement, the site of the first English settlement in America, was organized around a common garden. The common garden, as common property, was intended to feed the Settlement, but failed in this function. In May of 1611, when the colonists should have been planting the garden, the newly appointed governor of the Jamestown Settlement arrived to find nothing planted except for

⁵² For a further explanation of the science of carbon, see section 2.1.2 of this thesis.

⁵³ In a common property regime everyone who stands in relation to the common resource has a right to use the resource and no one has a right to exclude other individuals of the group from the resource (Michael A. Heller, “The Tragedy of the Anticommons: Property in Transition from Marx to Markets” (1998) 111(3) *Harv. L. Rev.* 621 at 622). Neither the interests of a particular individual in the group nor the interests of the group as a whole stand in a privileged position in common property (Waldron, *supra* note 6 at 41). Instead, “rules governing access to and control of material resources are organized on the basis that each resource is in principle available for the use of every member alike” (Waldron, *supra* note 6 at 41).

Common property differs from non-property as in common property the resource is identifiable to a particular group. In non-property, which is occasionally referred to as open access property, everyone has the right to use the resource.

Common property in carbon would resemble the treatment of carbon prior to carbon emission credits becoming of interest – Canadians would not be able to exclude other Canadians from releasing or sequestering carbon within Canada, but could claim some sort of right internationally to carbon within Canada.

⁵⁴ In collective property, a type of common property, the needs and purposes of the whole are taken into consideration in the management and use of a resource. The interests of the whole take priority over the needs and interests of individuals (Waldron, *supra* note 6 at 40). The difference between common property and collective property is the management of the property. In common property, all members of the society are allowed to use the resource. In collective property, a management team decides the best use of the resource. For example, on Indian Reserves, the Band Council or elders come together to decide how reserve land is to be used.

In collective property, the government would determine access to and use of carbon, including the sequestration and the release of carbon. The government could control carbon through incentive programs or subsidies, regulation, carbon taxes, or a deposit system. Collective property would make the public responsible for the costs of investing in carbon sinks, but the collective would receive both the environmental and economic benefits of any sequestration or decreased emission which occurs.

⁵⁵ For example, corporations and partnerships have elements of both common and private property, and land trusts and conservation easements are a mix of all three types of property.

“some few seeds put into a private garden or two” and “their daily and usuall [sic] workers, bowling in the streets”.⁵⁶ The workers were content to spend their days bowling while they faced the imminent danger of starving to death. Only after the common garden was divided into small private gardens did the settlers begin actively pursuing the production of food. Thus, only when divided into private property interests did the garden function to meet its intended goals. Incorrectly described property rights in the garden caused the Settlement to fail, as will inappropriately described private property rights in carbon assets cause carbon policies to fail.

2.1 The Carbon Cycle is not a Proper Subject of Property

2.1.1 Locke

As early as 1690, Locke held that it was without dispute that natural cycles cannot be owned.⁵⁷ Moreover, the common law states there can be no “absolute permanent property” in fire, light, and air,⁵⁸ which, although not biogeochemical cycles, are analogous to the carbon cycle. An underpinning concept of property theory is that the “spontaneous hand of nature” is non-property.⁵⁹

Pursuant to Locke’s theory, a tree can be owned as the tree is the product of the “spontaneous hand of nature”. The tree is property as a tree; the carbon in the tree is an essential component element of the tree, but not distinct property from the tree. The sequestration potential of the tree and the carbon sink the tree creates, however, are a part of a natural carbon cycle, thus not capable of garnering property rights separate and distinct from the *res* which they form.

This idea is further explored by Kwasniak and Hursh in relation to the water, or hydrological, cycle.⁶⁰ A clear distinction is made between the potential property rights in the

⁵⁶ See Edmund S. Morgan, *American Slavery, American Freedom* (New York: W.W. Norton and Company, 1975), online: Northwest Arkansas Community College <<http://faculty.nwacc.edu/abrown/WesternCiv/Articles%5Cjamestownfiasco.pdf>>.

⁵⁷ John Locke, “Of Property,” *Second Treatise on Government*, Chapter 5, in *John Locke: Two Treatises of Government, edited with notes and introduction by Peter Laslett*, (New York: Cambridge University Press, 1988) 285 at 286-7:

And though all the Fruits it naturally produces, and Beasts it feeds, belong to Mankind in common, as they are produced by the spontaneous hand of Nature; and no body has originally a private Dominion, exclusive of the rest of Mankind in any of them, as they are thus in their natural state.

⁵⁸ Kevin Gray, “Property in Thin Air” (1991) 50(2) *The Cambridge Law Journal* 252 at 257.

⁵⁹ Locke, *supra* note 57 at 286-7.

⁶⁰ Arlene J. Kwasniak & Daniel R. Hursch, “Right to Rainwater – A Cloudy Issue”, 26 *Windsor Rev. Legal & Soc.* 105.

hydrological cycle and collected rainwater, a product of the hydrological cycle. Kwasniak and Hursh do not recognize property rights in falling rain and are inconclusive about whether there are private property rights in rainwater once collected.⁶¹ In any event, the authors argue that governments should override any claims of private property rights to the products of the hydrological cycle due to the potential consequences of altering the hydrological cycle.⁶² Natural cycles, as per Locke's theory, are meant to remain available for the commons and not reserved to and controlled by private individuals.

2.1.2 *Wilberforce*

In *National Provincial Bank Ltd. v. Ainsworth*, Lord Wilberforce stated that before a right or interest can be admitted into the "category of property, or of a right affecting property", it must be "definable, identifiable by third parties, capable of its nature of assumption by third parties, and have some degree of permanence or stability".⁶³ The following description of the science of the carbon cycle demonstrates how this cycle lacks permanence, as well as the ability to be defined, identified, and assumed. As a result, any property rights corresponding to a portion of the carbon cycle will also suffer from these same defects.

Carbon, a key component element from which all life is based, is found on Earth in five "storage" forms: dissolved in the ocean, as gas in the atmosphere, as organic molecules in organisms, as organic matter in soil, and as fossil fuels and sedimentary rock.⁶⁴ Carbon exists in a cycle, being released from and stored in its five forms through numerous mechanisms. For example, carbon can leave the ecosphere through decomposition of organic soil matter or through respiration, in which the carbon-based molecules are broken down into carbon dioxide by organisms. Carbon can leave the atmosphere through diffusion from the atmosphere into the oceans and through autotrophic⁶⁵ organisms converting carbon dioxide into carbon-based sugar molecules that are stored in the organism or are passed down the food chain to heterotrophic⁶⁶ organisms. Carbon can be released from the lithosphere by actions of volcanoes but, as a miniscule amount of carbon is released by volcanic action, the natural exchange of carbon

⁶¹ *Ibid.*

⁶² *Ibid.*

⁶³ *National Provincial Bank Ltd. v. Ainsworth* (HL) [1965] AC 1175 at 1247-8.

⁶⁴ Michael Pidwirny, "Carbon Cycle" (May 31, 2010) *The Encyclopedia of Earth*, online: <http://www.eoearth.org/article/Carbon_cycle>.

⁶⁵ Organisms, such as green plants, capable of making nutrients from inorganic materials.

⁶⁶ Organisms who obtain food by digesting plant or animal matter, as opposed to making their own nutrients.

between the lithosphere and the atmosphere is virtually nonexistent. Humans, however, through the production and burning of fossil fuels, unnaturally release carbon into the atmosphere that should be, and otherwise would be, locked in the lithosphere, thus disrupting the natural balance of the carbon cycle.⁶⁷

Disrupting the carbon cycle is proving to have disastrous consequences. The Earth's temperature is correlated with the concentration of greenhouse gases ("GHG"), carbon dioxide being a primary GHG, in the atmosphere; as the concentration of atmospheric greenhouse gases rise, so does the global temperature.⁶⁸ The global temperature has increased by 0.74°C since the late 1800s and is expected to rise by another 1.8°C to 4°C by the year 2100.⁶⁹ The effects of Earth's warming are projected to be devastating; as just one example, if the global temperature rises by more than 1.5°C to 2.5°C it is anticipated that 20-30 percent of plant and animal species are at risk of extinction.⁷⁰ Although climate change is an environmental issue, it impacts all spheres of human life, including poverty, economic development, population growth, sustainable development, and resource management.⁷¹ In an attempt to mitigate or avoid the consequences of climate change, efforts are being made to restore some of the carbon which was unnaturally emitted into the atmosphere through carbon sequestration activities.

Carbon assets, being carbon potential, carbon sinks, sequestered carbon and sinks-based offsets, are the portion of the carbon cycle where carbon is stored as organic molecules in organisms and as organic matter in soil.⁷² An increase in the amount of carbon stored in organisms and soils correspondingly decreases the amount of carbon located elsewhere in the cycle. There is great potential to store atmospheric carbon in biotic carbon sinks. For example, the amount of carbon currently locked in forest ecosystems is larger than the amount of carbon in

⁶⁷ Pidwirny, *supra* note 64. It is this excess carbon dioxide, an atmospheric greenhouse gas, that is linked to global warming.

⁶⁸ *Supra* note 1.

⁶⁹ *Ibid.*

⁷⁰ *Ibid.*

⁷¹ United Nations, Framework Convention on Climate Change, "Background on the UNFCCC: The International Response to Climate Change" (2012) online: <http://unfccc.int/essential_background/items/6031.php>.

⁷² This thesis only addresses biological sequestration that occurs through a process called photosynthesis. In photosynthesis, a plant converts water and carbon dioxide into oxygen, which the plant releases, and carbon-based sugars, which the plant stores in its tissue. The carbon that is stored in the plant is said to be in a "reservoir", as it is removed from the atmosphere until the plant is harvested and its carbon released once again. Further, given the right circumstances, the carbon content of the soil is increased when plant biomass is incorporated into the organic matter of the soil when a plant dies ("Biomass - The total mass of living organisms in a given area or volume; recently dead plant material is often included as dead biomass." Third Assessment, *supra* note 33.

the atmosphere.⁷³ Given the severity of climate change and the potential of carbon sinks to sequester carbon which would otherwise be located in the atmosphere, it is evident why an interest has been taken in using carbon sequestration as an interim strategy for climate change.

By and large, it will be the land management decisions of the 240,000 Canadian agricultural producers, as well as the land management decisions of numerous other public and private land managers, which will dictate Canada's ability to use biotic carbon sequestration to mitigate the effects of atmospheric carbon dioxide.⁷⁴ Thus, legislators are creating and / or allowing private property in carbon assets for use in offset markets to provide an incentive for individual land managers to engage in carbon sequestration practices and projects, even though this creation of private property in a natural cycle is contrary to the legal principles espoused by Locke and Wilberforce.

But there may be private property rights in rain, once collected, rain being part of the water cycle.⁷⁵ A person who puts out a barrel and collects rain as it falls is likely to have private property rights in the rain water collected, unless otherwise reserved for the government or the commons by the laws of the nation. Why, then, is it not also legitimate for persons to have property rights in the carbon assets they collect?

The short answer to this question is that property exists in the rainwater, not in the component elements – hydrogen and oxygen. Persons, similarly, already have property rights to the *res*⁷⁶ in which the carbon is located; if an individual grows a tree, she has property rights in that tree. Both the collected rainwater and the tree are the products of nature, which Locke recognizes as being capable of garnering property rights⁷⁷ and the rights to which Wilberforce would classify as being definable, identifiable, assumable, and stable, and not merely components of a natural cycle. The cycle itself, as further explored by Gray,⁷⁸ cannot be owned; collecting rain does not give the collector any rights to precipitation generally nor to the hydrogen in the barrel as a separate and distinct property right from the water. Nor should sequestering carbon give the land manager any property rights in the sequestration process or the carbon in the sink as a separate and distinct property right from the vegetation or biomass. The

⁷³ Stern, *supra* note 20 at 537.

⁷⁴ Canada: Working Group on Offsets, *Offset System Discussion Paper* (Ottawa: Environment Canada, 2003) at 41.

⁷⁵ Kwasniak, *supra* note 60.

⁷⁶ The term “*res*” refers to the thing, object, or matter which is the subject of the property relationship.

⁷⁷ Locke, *supra* note 57 at 285-6.

⁷⁸ Gray, *supra* note 58.

value of the collected barrel of rain is in the water, not in artificially altering the water cycle and not in its component elements. The collector wants the rain, not to alter the water cycle. The sequesterer of carbon, on the other hand, if property rights are granted, is primarily interested in altering the carbon cycle, rather than possessing the carbon.

The collected water property rights example can be further distinguished from property rights in the carbon cycle. First, the property owner of the water intends to exercise control over the water and derive individual benefit from this control. In contradiction, a land manager is not able to accurately measure and exercise significant control over the carbon stored in sinks on her land. For example, a land manager cannot control the carbon dioxide released from carbon sinks through plant respiration and plant decomposition. Further, in water, the collected water, by the collector's design, provides no benefits to anyone other than the collector, whereas in carbon assets, the sequestration of carbon is intended to provide a secondary, arguably greater, benefit to society than to the monetarily compensated individual sequesterer by reducing atmospheric carbon dioxide.

How would the above analysis be altered if the water was collected in a reservoir behind a dam, rather than in a rain barrel? Would the collector still possess private property rights to the collected water? Some collected water can provide broader, public benefits—as in reservoirs created behind dammed rivers; but in these cases, the rivers, dams, and reservoirs are not privately owned. Following Gray's analysis, and with reference to riparian property rights, this water is not privately owned because it is not reasonable to exclude others from its benefits. The owner of the dam and/or those who have otherwise acquired riparian rights may have a right to use the water, but no "fee simple" type ownership of the water itself.⁷⁹

2.1.3 Gray

Gray sees a common feature of those resources which do not constitute property as being the inability to physically, legally, or morally exclude others from the resource.⁸⁰ Failure to achieve any one of these requirements makes propertization unfeasible.

When resources are physically available for use and exploitation by all, they remain unpropertized.⁸¹ Gray finds that for physical excludability to be present, it must be "feasible for a

⁷⁹ Kwasniak, *supra* note 60 at 112.

⁸⁰ Gray, *supra* note 58 at 268-9.

legal person to exercise regulatory control over the access of strangers to the various benefits inherent in the resource.”⁸² A light thrown out by a lighthouse, for example, is not property as, once the light is on, no person is able to control access to the benefits of the light.⁸³ While there is property in the lighthouse and the light-switch, so that a stranger may be prevented from entering the lighthouse to control the operation of the light, there is no property in the beam of light as the benefits of the light are distributed indiscriminately. The ability of the lighthouse owner to manipulate the direction and intensity of the light beam does not sufficiently physically exclude others’ access to the beam to justify the creation of property in the beam.⁸⁴

Similarly, it is not possible to physically exclude others from the environmental benefits derived from carbon sequestration and the retention of carbon sinks. Pursuant to Gray: “[n]o one can claim ‘property’ in a resource in relation to which it is physically unrealistic to control, consistently over prolonged periods, the access of strangers.”⁸⁵ In this way, the benefits of carbon assets can be analogized to *Victoria Park Racing and Recreation Grounds Co. Ltd. v. Taylor*.⁸⁶ Although Victoria Park Racing had benefits stemming from its property rights in the racetrack, it did not have property in the spectacle of horseracing as any attempt to exclude strangers from the spectacle of horseracing could be frustrated by potential spectators increasing the height of any broadcasting tower.⁸⁷

Individuals need not take any active measures to enjoy the benefits achieved from the sequestration of atmospheric carbon. The reduction of the concentration of atmospheric carbon prevents the global temperature from rising as quickly as it otherwise would, thereby mitigating the potentially devastating effects of climate change. Thus, pursuant to Gray’s theory of physical excludability, the physical paper on which the offset credit is recorded may be physically excludable as the piece of paper can be protected from strangers. However, exclusion from the paper record of the credit is not the same as the exclusion from the asset or its real, environmental benefits.⁸⁸ The real benefits of carbon sequestration potential, carbon sinks, and

⁸¹ *Ibid.* at 268.

⁸² *Ibid.* at 268.

⁸³ *Ibid.* at 268-9.

⁸⁴ *Ibid.* at 268-9.

⁸⁵ *Ibid.* at 270.

⁸⁶ *Victoria Park Racing and Recreation Grounds Co. Ltd. v. Taylor*, (1937) 58 C.L.R. 479 and Gray, *supra* note 58 at 269-70.

⁸⁷ *Victoria Park*, *supra* note 86 and Gray, *supra* note 58 at 269-70.

⁸⁸ See, for example, the discussion of the Acid Rain Program at the end of this section.

sequestered carbon are not capable of being excludable, thus these assets are rightly non-property.

In law, excludability occurs when a resource is protectable against strangers by legal means.⁸⁹ Legal ability to exclude is not as simple to determine as physical ability to exclude. Gray, for example, states that where one fails to use a means to legally exclude strangers from the benefits of a resource, and those strangers succeed in gaining access to the benefits of the resource, he has failed to stake out his claim to the resource.⁹⁰ An argument can be made that property rights in carbon assets are not legally excludable because legislators are unable to prevent the human population from “trespassing” on these property rights by enjoying the benefits of this resource. As seen by the lighthouse beam, the law cannot provide a means to deny others the benefits of the light beam. This is opposed to property rights in a public mall as the owner of the mall is able to dictate when shoppers may or may not use the premises. Like the lighthouse beam and unlike mall, legal control is not available to a carbon asset rights holder. Similarly, as land use and land-use change is a net sink,⁹¹ biological sequestration above equilibrium reduces the concentration of atmospheric carbon, thereby lessening the urgency of the implementation of emission regulations. Thus, emitters not already subject to emissions regulation have and are gaining access to the benefits of carbon sequestered in carbon sinks, while those emitters who are subject to regulation benefit from less stringent regulation than otherwise required. It can be argued that emitters are thus “trespassing” on the benefits attained from sequestered carbon.

As seen in chapter 1, legislators are attempting to assign carbon rights⁹² into traditional categories of property, such as incorporeal real interests or choses in possession, categories which, in other cases of private property, signify the existence of legal exclusion. But, defining a resource as being legally excludable and the resource actually being legally excludable are two different things. The question is whether property rights can be assigned biotic sequestration portion of the carbon cycle in a way which creates legal excludability for the rights holder. It is not possible to legally exclude a natural cycle, its constant fluctuations being spontaneous,

⁸⁹ Gray, *supra* note 58 at 273.

⁹⁰ *Ibid.* at 273-4.

⁹¹ Environment Canada, “Canada’s 2008 Greenhouse Gas Inventory: A Summary of Trends: 1990-2008”, May 26, 2010, online: Government of Canada <<http://www.ec.gc.ca/ges-ghg/0590640B-87F7-449A-AA8F-D5674A7BAC57/2010%20Annual%20Summary%20of%20Trends.pdf>>.

⁹² “Carbon right” is an encompassing term to describe any benefit obtained from sequestration potential, carbon sinks, sequestered carbon, and / or sink-based offsets.

global, and uncontrollable, and the cycle itself not capable of possession. Thus, it is unlikely that property rights can be structured in a way that prevents strangers from gaining access to the benefits of the resource. Centuries of the absence of any such property right prior to the advent of carbon assets lends support to this conclusion.

Even though the carbon cycle is not physically or legally excludable, it is relevant to examine whether the cycle is morally excludable. Morally, “there are certain resources which are simply perceived to be so central or intrinsic to constructive human coexistence that it would be severely anti-social that these resources should be removed from the commons.”⁹³ Where “intolerable consequences” would result from one person controlling access to the benefits of a resource, this resource is best held as non-property. For example, Rose argues that some resources should be non-property for public benefit.⁹⁴ Hepburn notes that there are already concerns about the commoditization of the atmosphere; should carbon trading expand, these concerns will become more intense.⁹⁵ To provide an example supporting Hepburn’s fear of the consequences of environmental commoditization, everyone needs to breathe oxygen to survive; taking the assignment of property rights to the atmosphere to a logical extreme, assigning private property rights to oxygen in the oxygen cycle and creating oxygen markets to promote cost-effective uses of oxygen would be detrimental to every individual and to society.

Another moral excludability argument against creating private property in carbon assets is that each land manager’s choices relating to carbon sinks will affect the environment, and possibly the health of all Canadians. If the rights, interests, and obligation of individual land managers and the public do not align, non-property makes it easier for governments to make decisions on how to best balance the resultant conflicts with regard to human dependence on the carbon cycle and a sustainable atmosphere for life.

Apart from the moral inability to exclude individuals from the carbon cycle, it is also morally improper to attempt to exclude when private property rights are being created in the carbon cycle without any real expectation that these rights will continue, or continue to have value. For example, since value in carbon assets depends on governments creating emission standards, which emitters could meet through the purchase of carbon assets, success of the

⁹³ Gray, *supra* note 58 at 280.

⁹⁴ Carol Rose, “The Comedy of the Commons: Custom, Commerce, and Inherently Public Property” in *Property and Persuasion: Essays on the History, Theory, and Rhetoric of Ownership* (Boulder: Westview Press, 1994) at 143.

⁹⁵ Cameron Hepburn, *supra* note 23 at 390.

policy, resulting in governments eliminating tradable carbon offset, may be seen as an expropriation of property rights in carbon assets, specifically carbon sinks and carbon sequestration potential.⁹⁶ Success of carbon policies will be achieved when emitters meet standards without the use of offsets, thus property rights in carbon assets becoming irrelevant. The government could also abandon the use of the sinks-based offsets in the market, also diminishing the value of carbon property. Further, by creating property in a natural cycle, subsequently enacting environmental regulations for the benefit of all in a way which offends private property rights previously allocated in the natural cycle could constitute a trespass or taking of property;⁹⁷ theorists have already begun to examine “whether the imposition of extensive environmental regulations can ever constitute an acquisition or taking of ‘property’ from the citizens which requires the payment of publically-funded compensation.”⁹⁸ Morally, the carbon cycle is not excludable because society should be able to alter its carbon policy and regulate in relation to environmental well-being without being compelled to compensate persons for a loss of property rights.

According to Gray’s theory of excludability, physical, legal, and moral excludability must be present for property to exist in a resource. Since carbon assets, as opposed to the physical assets of which carbon is a key component, are not physically, legally, or morally excludable, the portion of the carbon cycle represented by carbon sequestration potential, carbon sinks, sequestered carbon, and carbon offsets is not the legitimate subject of property.

Gray’s theory does not, however, prevent the creation of property in offsets which are not sinks-based. For example, pursuant to Gray’s theory, it was reasonable and legitimate for the United States to create property rights in government generated acid rain credits operating in a market in the Acid Rain Program.⁹⁹ The Acid Rain Program’s creation of allowance credits is very distinct from the current attempt to create property in the carbon cycle. Acid rain credits

⁹⁶ Some countries, such as the courts in the United States, have explored whether environmental regulations could ever constitute an offence against a property right.

⁹⁷ Although “taking” is an American concept, and it is not clear that this area of the law has any direct application to Canadian expropriation doctrine, the idea of whether environmental regulations could ever constitute an offence against a property right is still very interesting to examine. For example, if the *Species at Risk Act*, S.C. 2002, c. 29, prevented commercial development on a reserve because the development would kill, harm, or harass an extirpated, endangered, or threatened species, would this be a taking of, an expropriation of, or a trespass on the band’s property rights as it could not make use of its rights in reserve land?

⁹⁸ Gray, *supra* note 3 at 45.

⁹⁹ United States Environmental Protection Agency “Acid Rain” (24 March, 2011) online: U.S. EPA <<http://www.epa.gov/acidrain/>>. See also, Cameron Hepburn, *supra* note 23 at 389.

were physically excludable as they were government allowances not connected to the physical existence of sulphur or nitrogen, they were legally excludable as strangers were unable to benefit from the use of the credits, and they were morally excludable as they did not create property in a natural cycle. The Acid Rain Program did not create property rights in sulfur dioxide or nitrogen oxides; property rights were created in an allowance to pollute.

2.2 Further Analysis Required

Although the works of Locke, Wilberforce, and Gray lead to the conclusion that property rights are not able exist in the carbon cycle, significant societal changes since the above theories were advanced requires that this thesis re-examines whether property rights can and should exist in natural cycles. Global warming is an environmental condition unlike no other the world has ever seen, caused by humans managing and altering the natural carbon cycle. Further, creative policies are required to mitigate the effects of global warming. As such, this thesis points to humans actively managing the carbon cycle, the desire to manipulate the carbon cycle, and the current existence of private property rights in carbon assets as reasons for this thesis to further explore whether private property rights in carbon assets can be justified.

2.2.1 Managing the Cycle

The appropriateness of private property rights in carbon assets requires further exploration as, to some extent, humans are actively managing the carbon cycle. For example, because of the unnatural release of carbon into the atmosphere from the lithosphere through the use of fossil fuels and because humans are widely disbursed throughout nature and dictate the use of a large portion of the world's land surface, including whether sequestration activities occur, it is without question that human activities have interfered with the natural balance of the carbon cycle. The carbon cycle is no longer exclusively the "spontaneous hand of nature";¹⁰⁰ carbon sinks are created and destroyed through human choice, preventing the cycle from existing as it would apart from human intervention. Given the management of the carbon cycle and the evolution of science and technology allowing the cycle to be controlled, it may be argued that a natural carbon cycle no longer exists.

¹⁰⁰ Locke, *supra* note 57 at 286-7.

2.2.2 *Desire to Manipulate the Carbon Cycle*

Excess atmospheric carbon dioxide is connected to climate change, the consequences of which are undesirable.¹⁰¹ The accepted solution for rebalancing the carbon cycle, from a scientific perspective, is to reduce and reverse the trend of carbon exiting the lithosphere and entering the atmosphere – i.e. reducing existing carbon emissions and promoting and protecting carbon sinks. In the purported implementation of this solution, legislators and policy analysts have, contrary to Locke, Wilberforce, and Gray, accepted private property in a portion of the carbon cycle for use in offset markets.

Legislators are relying on the economic theory ideal that, by creating private property rights in carbon assets the market should, hypothetically, allow emitters creativity in meeting emission targets and create an economic value for, and thus an incentives for land managers to engage in, sequestration activities, consequently manipulating the carbon cycle. For example, a coal burning factory which emits one tonne of carbon dioxide, but pays a farmer to convert two acres of his farmland to no-till seeding, offsets its emissions and encourages the land manger to undertake carbon sequestration activities.¹⁰² Theoretically, this relationship should result in a net zero increase of atmospheric carbon dioxide, whereas a net increase of carbon dioxide would have occurred without the offset.¹⁰³

Economic theorists contend that humans are motivated by self interest.¹⁰⁴ Using the assumption that a person is a rational maximizer of his or her satisfaction and economic well-being, economic analysis proposes that wealth maximization in a society will occur if preference is given to the individual who is willing to pay the most for a preference. This theory suggests that “once property rights are established, a free and notionally costless series of transactions will inevitably produce maximum efficiency.”¹⁰⁵

There is a limited amount of money available for carbon emissions reduction and climate change mitigation. This money should be put to its best use to maximize environmental and

¹⁰¹ The IPCC Fourth Assessment Report describes the evidence of climate change as “unequivocal”. Intergovernmental Panel on Climate Change *Summary for Policy Makers of the Synthesis Report of the IPCC Fourth Assessment Report* (IPCC: Geneva, November 2007) at 1 [“Fourth Assessment”].

¹⁰² CCX recognized 0.5 tons CO₂ sequestered/acre for no-till farming (see: Illinois Climate Change Advisory Group, online: Illinois Environmental Protection Agency <<http://www.epa.state.il.us/air/climatechange/documents/subgroups/cia/no-till.pdf>>).

¹⁰³ As seen in chapter 3, however, offset often result in a net increase of carbon dioxide.

¹⁰⁴ Harold Demsetz, “Towards a Theory of Property Rights” (1967) 57(2) *Amer. Econ. Rev.* 347.

¹⁰⁵ J.W. Harris, *Legal Philosophies* (London: Butterworths, 1980) at 44.

economic returns. The economic theory argument is that actors in the market are in the best position to decide how to maximize their personal economic returns – whether it is through creating carbon property, reducing emissions by discontinuing production or adopting lower-emissions technology, or purchasing offsets.

Yet, the original proponents of cap-and-trade markets being used to combat other environmental issues are very much opposed to the use of cap-and-trade to regulate carbon.¹⁰⁶ They argue that the carbon issue is too large and complex for the carbon market and that markets do not allow the flexibility needed to ensure emission limits correspond to scientific knowledge and discoveries on climate change.¹⁰⁷ Further, society is not attempting to “maximize personal economic returns” through the creation of property rights in carbon, we are interested in achieving the greatest environmental success from the lowest resource expenditure. Nevertheless, legislators continue to support carbon markets as they are presented as a relatively simple, resource-moderate solution to climate change.¹⁰⁸

2.2.3 Private Property Rights have been Created

Property rights currently exist in carbon assets in formal law. Canada, Alberta, Saskatchewan, Manitoba, British Columbia, Ontario and Quebec have all created or have shown interest in creating private property rights in carbon assets.¹⁰⁹

¹⁰⁶ Jon Hilsenrath, “Cap-and-Trade’s Unlikely Critics: Its Creators”, *Wall Street Journal* (August 14, 2009), online: <<http://online.wsj.com/article/SB125011380094927137.html>>. Thomas Crocker, who proposed the idea of cap-and-trade in 1966, as well as John Dales who published a book entitled “Pollution, Property and Prices” in 1968 and David Montgomery who examined cap-and-trade in the 1970s all argue against the creation of carbon markets. Crocker and Montgomery, instead, prefer creating a carbon tax to regulate carbon.

¹⁰⁷ *Ibid.*

¹⁰⁸ *Ibid.*

¹⁰⁹ There is uncertainty regarding which level of government in Canada has the jurisdiction to define property rights in carbon. The provinces have legislative power for property and civil rights in the province under subsection 92(13) of the *Constitution Act, 1867* (*Constitution Act, 1867* (U.K.), 30 & 31 Vict., c. 3, reprinted in R.S.C. 1985, App. II, No. 5). The provinces also have authority for the management and sale of the public lands belonging to the provinces and the timber and wood on that land (ss. 92(5)), local works and undertakings (ss. 92(10)), all matters of a merely local or private nature in the province (ss. 92(16)), and all lands, mines, minerals, and royalties (s. 109. See also the Natural Resources Transfer Agreements of 1930). The federal government, on the other hand, has exclusive legislative authority for the regulation of trade and commerce (ss. 91(2)), and authority to make laws for peace, order and good government under the residual/emergency power that legitimizes action on the environment (s. 91). This thesis does not explore or decide jurisdictional issues.

a. *Canada*

Canada has not created property rights in carbon assets. Canada has, however, thoroughly examined the creation of property rights in carbon assets and domestic emissions trading, beginning with the historic *Climate Change Plan for Canada*¹¹⁰ (“*Climate Change Plan*”), released by the then Liberal Government in 2002, that proposed a dual common property and private property regime for carbon offsets, and possibly sequestered carbon.¹¹¹ The most recent communication from the Government of Canada regarding its position on property rights in carbon is seen in 2008’s *Turning the Corner: An Action Plan to Reduce Greenhouse Gases and Air Pollution*¹¹² and related document *Turning the Corner: Canada’s Offset System for Greenhouse Gases* (collectively “*Turning the Corner*”).¹¹³

Turning the Corner proposes a voluntary off-set program designed and operated by the federal government. The purpose of the Offset System is to “encourage cost-effective domestic reductions or removals in activities that are not expected to be covered by proposed industrial air emissions regulations. Projects, such as afforestation/reforestation and soil management projects, that meet the eligibility criteria can generate offset credits that can be sold in the market.”¹¹⁴ *Turning the Corner* suggests that sequesterors have private property rights in the carbon they sequester in biological sinks, as represented by an offset credit, provided they voluntarily register their offset activities.¹¹⁵ No voluntary offset program has been, to date, created by the federal government.

¹¹⁰ *Climate Change Plan for Canada*, *supra* note 51.

¹¹¹ In Step I, or action prior to 2002, Canada reserved for itself credit for offsets created from agriculture, forestry, and landfill management; in step II, or new action after 2002, the government received credit for sequestration that resulted from business-as-usual activities, but carbon sequestered from above business-as-usual projects could be sold to industry through domestic emissions trading. *Ibid.* at 11.

¹¹² Government of Canada “Turning the Corner: An Action Plan to Reduce Greenhouse Gases and Air Pollution” (26 April 2007). This document is no longer available on Environment Canada’s website. The Globe and Mail examines the reasons why the link from the Turning the Corner icon has become unavailable in B. Curry “Readers turned away from Turning the Corner” *The Globe and Mail* (26 March 2009) online: The Globe and Mail Inc. <<http://www.theglobeandmail.com/news/politics/ottawa-notebook/readers-turned-away-from-turning-the-corner/article977084/>>.

¹¹³ Environment Canada, “Turning the Corner: Canada’s Offset System for Greenhouse Gases” (7 March 2008) online: Government of Canada <http://www.ec.gc.ca/doc/virage-corner/2008-03/526_eng.htm>.

¹¹⁴ *Ibid.* at para 1.

¹¹⁵ *Ibid.*

b. *Alberta*

Section 9 of Alberta's *Climate Change and Emissions Management Act* states that: "a sink right is a property right".¹¹⁶ Subsection 1(f) defines "sink right" as "the legal interest, and any commercial or other interest, in a sink".¹¹⁷ The *Act*, however, does not define the nature of the property right or the benefits and obligations associated with that right.

In 2007, the *Climate Change and Emissions Management Act*¹¹⁸ was amended to create North America's first compliance offset carbon market.¹¹⁹ Producers with an emission intensity of more than 100 kt Equivalent Carbon Dioxide ("CO₂e") per year are required to reduce their emissions by 12 percent from their baseline.¹²⁰ Emitters unable to meet their reduction target are given the option of obtaining Emission Performance Credits from other regulated producers that reduced their emissions more than required, purchasing Technology Fund Credits by paying into the Climate Change and Emissions Management Fund \$15/tonne CO₂e, or purchasing Emission Offsets from approved offset projects.¹²¹ Offset projects do not have to be located in Alberta. For example, the "Quantification Protocol for Tillage System Management" allows any annual crop grown throughout Canada to be eligible for approval.¹²² Alberta's intention in the *Climate Change and Emissions Management Act* appears to be the use of carbon property rights in offset markets as well as the protection of private individual's property rights in carbon sinks.

c. *Saskatchewan*

Like Alberta, Saskatchewan is interested in creating private property rights in carbon assets both to acknowledge that carbon rights can be held by private persons and for use of property rights in an offset market. Saskatchewan's *Energy and Climate Change Plan* noted "several thousand Saskatchewan Farmers are selling credits for sequestered carbon dioxide that

¹¹⁶ *Climate Change and Emissions Management Act*, SA 2003, c C-16.7 at s. 9.

¹¹⁷ *Ibid.* at ss. 1(f).

¹¹⁸ *Ibid.*

¹¹⁹ Tom Goddard, Karen Haugen-Kozyra, & Andy Ridge, "Alberta: North America's First Compliance Offset Carbon Market" online, Food and Agriculture Organization of the United Nations <<http://www.fao.org/ag/ca/Carbon%20Offset%20Consultation/CARBONMEETING/3FULLPAPERSBYCONSULTATIONSPEAKERS/PAPERGODDARD.pdf>>.

¹²⁰ Goddard, *ibid.* See also Alberta Environment, "Technical Guidance Document for Baseline Emissions Intensity" (18 July 2007), online: Government of Alberta <<http://www.environment.gov.ab.ca/info/library/7811.pdf>>, and Alberta Environment, "Climate Change" online: Government of Alberta <<http://www.environment.alberta.ca/01855.html>>.

¹²¹ Alberta Environment, *ibid.*

¹²² Alberta Environment, "Qualification Protocol for Tillage System Management" (February 2009), online: Government of Alberta <<http://environment.gov.ab.ca/info/library/7918.pdf>> at 1.

are traded on an American exchange” and the *Plan* “assumes an emissions credit trading system will be established in Canada”.¹²³ Further, through *The Management and Reduction of Greenhouse Gases Act*,¹²⁴ Saskatchewan appears to be pursuing mandatory GHG reductions and an offset system. This *Act* defines “offset credit” as “...a credit for any prescribed activity that...sequesters greenhouse gas”. As of March 9, 2012, *The Management and Reduction of Greenhouse Gases Act* had not been proclaimed.¹²⁵

d. *Manitoba*

Manitoba has committed to the International Carbon Action Partnership [ICAP].¹²⁶ ICAP is a partnership for regions interested in pursuing the development of a global carbon market through the implementation of mandatory cap and trade systems.¹²⁷ Manitoba, however, has indicated that it has not yet decided whether private or common property exist in carbon assets.¹²⁸

e. *British Columbia*

Through the *Greenhouse Gas Reduction Targets Act*,¹²⁹ British Columbia appears to have created private property in carbon. Subsection 12(g) of the *Act* gives the Lieutenant Governor in Council the ability to make regulations concerning emissions offsets, including which projects or actions constitute offsets. Section 1 of the accompanying *Regulations* states: “Ownership, in relation to a greenhouse gas reduction, includes an established right to claim legal or commercial benefits arising from the achievement of the reduction.” Section 3 defined the *Regulations* as being applicable to “controlled sources, sinks or reservoirs in British Columbia.”

¹²³ Government of Saskatchewan, *Energy and Climate Change Plan 2007* (Government of Saskatchewan, 2007) at 13.

¹²⁴ *The Management and Reduction of Greenhouse Gases Act*, 2010 S.S. c. M-2.01.

¹²⁵ The Saskatchewan Gazette, No. 10, March 9, 2012.

¹²⁶ British Columbia, Ontario, and Quebec have also committed to ICAP.

¹²⁷ International Carbon Action Partnership, online: International Carbon Action Partnership <<http://www.icapcarbonaction.com/>>.

¹²⁸ For example, Manitoba’s link on ICAP redirecting the browser to “Climate and Green Initiatives” and rather than using carbon markets to subsidize sequestration activities, Manitoba has supported incentive programs, such as Beneficial Management Practices, to encourage farmers to adopt more environmentally friendly management practices. The application for this Program does, however, suggest carbon sequestered other than for this Program could possibly be the private property of the producer: Manitoba Agriculture, Food and Rural Initiatives, “Growing Forward Program Application”, online: Government of Manitoba <http://www.gov.mb.ca/agriculture/growingforward/gf_programs/pdf/aaa19s15a.pdf>.

¹²⁹ *Greenhouse Gas Reduction Targets Act*, SBC 2007, c-42.

Although British Columbia is part of ICAP, which suggests this province is interested in a global carbon market, British Columbia's carbon strategy in the last couple of years seems focused on taxation, such as amending the *Motor Fuel Tax Act* and creating a carbon tax with the *Carbon Tax Act*.¹³⁰ The failure of this government to follow through with the creation of a carbon market may reflect a recognition that the carbon market will not achieve the Province's current goals.

f. *Ontario*

In both *Go Green: Ontario's Action Plan on Climate Change*¹³¹ and *Climate Change Action Plan: Creating our Sustainable Future*,¹³² Ontario shows its intention to create private property rights in carbon assets to support emissions trading in that province. In 2009, in further support of the creation of private property rights in carbon assets in Ontario, the *Environmental Protection Amendment Act (Greenhouse Gas Emissions Trading)* was passed.¹³³

g. *Quebec*

In June 2009, Quebec passed Bill 42, amending the *Environment Quality Act* and creating the framework for a cap and trade system.¹³⁴ The sections dealing with a cap-and-trade system are not yet in force. However, Quebec's Environment Minister, Pierre Arcand, announced in December, 2011 that, as of January 1, 2013, companies which emit more than 25,000 tonnes of greenhouse gases annually will be regulated, with emissions standards to be met through a cap-and-trade program.¹³⁵ At this time, it does not appear that offsets can be created from biotic sequestration in the proposed cap-and-trade system and it is unlikely that Quebec will create property in carbon through its cap-and-trade program.

¹³⁰ See, for example, *Motor Fuel Tax Act*, R.S.B.C. 1996, c. 317, *Carbon Tax Act*, S.B.C. 2008, c. 40 and Ministry of Finance, "Tax Bulletin" (July 2010), online: Government of British Columbia <http://www.sbr.gov.bc.ca/documents_library/bulletins/mft-ct_001.pdf>.

¹³¹ Government of Ontario, *Go Green: Ontario's Action Plan on Climate Change* (Government of Ontario, 2007), online: Government of Ontario <<http://www.gogreenontario.ca/docs/actionplanonclimatechange.pdf>> at 24.

¹³² Government of Ontario, *Ontario's Climate Change Action Plan: Creating our Sustainable Future* (Government of Ontario, December 2008), online: Government of Ontario <http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/std01_079174.pdf>.

¹³³ "An Act to amend the Environmental Protection Act with respect to greenhouse gas emissions trading and other economic and financial instruments and market-based approaches", 2009 c. 27, online: Government of Ontario <http://www.e-laws.gov.on.ca/html/source/statutes/english/2009/elaws_src_s09027_e.htm>.

¹³⁴ Environment Quality Act, R.S.Q. c. Q-2.

¹³⁵ "Carbon Trading Coming to Quebec" *CTV Montreal* (December 15, 2011), online: CTV <http://montreal.ctv.ca/servlet/an/local/CTVNews/20111215/mtl_greenhouse_111215/>.

h. Individuals

Individuals are currently entering into contracts for the lease or sale of sequestered carbon.¹³⁶ The sale or lease of carbon and / or carbon offsets are taking place without interference from any level of government. Because governments are not preventing private individuals from entering into contracts concerning sequestration activities on private land, it is assumed that governments, both provincial and federal, are consenting to some kind of private property rights existing in sequestered carbon.

2.3 Conclusion

Locke's theory, that the "spontaneous hand of nature" is properly non-property, can be seen in the past nonexistence of property rights in the carbon cycle (the "hand of nature") and the recognition of property rights in a tree (the product of the natural cycle). Concluding the carbon cycle is properly non-property is further supported by the case law of Wilberforce. For a property right in carbon assets to be legally acceptable, that right must be "definable, identifiable by third parties, capable of its nature of assumption by third parties, and have some degree of permanence or stability".¹³⁷ Because the carbon cycle lacks permanence, as well as the ability to be defined, identified, and assumed, the associated property rights will possess the same defects.

While Wilberforce looks at the legitimacy of property rights, Gray examines the legitimacy of excluding a resource from the public domain. Applying Gray's analysis to the carbon cycle, it is evident that carbon assets are not the proper subject of property as the carbon cycle is not able to be physically, legally, or morally excluded. The environmental services provided by land managers, while valuable, do not constitute the creation of private property because of the physical, legal, and moral inability of the land manager to exclude others from accessing the benefits of the environmental services.

However, human interference with the carbon cycle prevents the carbon cycle from existing in its natural form. Legislators desire, through encouraging above business-as-usual carbon sequestration, to further alter the natural cycle in a premeditated way to achieve climate

¹³⁶ See, for example, Chicago Climate Exchange, online: ICE OTC: Chicago Climate Exchange <<http://www.chicagoclimatex.com>>.

¹³⁷ *National Provincial Bank Ltd. v. Ainsworth*, *supra* note 63 at 1247-8. I note that, using the *National Provincial Bank Ltd. v. Ainsworth* test, Jolene Lin "Private Actors in International and Domestic Emissions Trading Schemes" in *Legal Aspects of Carbon Trading: Kyoto, Copenhagen, and Beyond*, eds. David Freestone and Charlotte Streck (Oxford: Oxford University Press, 2009) makes a convincing argument for the creation of private property rights in Certified Emissions Reductions.

change mitigation. Legislation has been created to this effect. Human interference with the carbon cycle and the use of private property rights in carbon policies requires that this thesis re-examine the appropriateness of private property rights in the carbon cycle by exploring whether any of the common justification of private property are able to justify private property rights in carbon assets.

CHAPTER 3: PROPERTY THEORY IS UNABLE TO JUSTIFY PRIVATE PROPERTY IN CARBON ASSETS

3.0 Introduction

In spite of the analysis in chapter 2, private property in carbon assets has been accepted by both legislators and reflected in carbon markets throughout the world. In light of the creation of private property rights in carbon assets, and because of human management of the carbon cycle, it is appropriate to reassess whether carbon assets as private property can be justified by any of the various theories that justify private property. This chapter will show that property theory is unable to justify private property in carbon assets. Chapter 4 will confirm that it is carbon property rights, rather than deficiencies of the market, that are causing carbon markets to fail.

To determine whether private property rights in carbon assets are appropriate, this chapter examines the various justifications of private property, being: utilitarian, personal self-assertion, special rights, economic and rights-based theories. With reference to the characteristics of carbon assets and to the use of carbon assets in environmental markets, this chapter will only accept private property rights in carbon assets if these rights are justified pursuant to any one of the property theories identified above. This thesis uses a low threshold to justify private property in carbon assets by design.

3.1 Utilitarian Theory

Utilitarian property theorists justify private property when the total or average happiness of society is greater or the general welfare is better served under a private property regime than under some other property regime.¹³⁸ Private property is justified in a resource when this form of property, as compared to other forms of property, maximizes society's preferences. Aristotle, for example, although in favour of communal use of resources,¹³⁹ used utilitarian theory to justify private property since private property encourages care of resources: "What is common to the greatest number gets the least amount of care. Men pay most attention to what is their own: they care less for what is common".¹⁴⁰ Pursuant to Aristotle's utilitarian argument, investment in

¹³⁸ Waldron, *supra* note 6 at 6.

¹³⁹ *Ibid.* at 7.

¹⁴⁰ Aristotle, *Politics*, 1262^b (trans. Baker, p. 44) in Waldron, *supra* note 6 at 6-7.

private carbon assets by property “owners” should increase the welfare of the community as a whole since the carbon assets are put to their best use. Society would be best served by numerous land managers investing in carbon sinks as their investment should consequently rebalance the carbon cycle by storing carbon in biomass. Private property in carbon assets is justified pursuant to utilitarian theory when private property rights, rather than non-property, common, property, or collective property, best meets the goals of society.

The utilitarian justification of property is not without criticism. This thesis observes utilitarian theory to be deficient for two main reasons. First, maximizing the happiness of a society as a whole can result in the intense suffering of a few—utilitarian theory does not consider values such as social justice and equity.¹⁴¹ Second, utilitarian theory takes the preferences of a population as a given and attempts to maximize the preference.¹⁴² Waldron uses the example of persecution in a society. If one group takes pleasure in persecuting another group, utilitarian theory may suggest social protection not be extended to the persecuted group.¹⁴³ Also of note is the difficulty in choosing a society’s favoured preference if popular preferences are in conflict—for example, it is difficult to choose between the environment, social relations, and economic well-being when they are competing values.

This thesis rejects the use of utilitarian theory to justify private property in carbon assets as it is unable to advance a sustainable approach to environmental conservation. There is no sweeping, single solution to a complex problem such as climate change. Environmental conservation requires a community-focused approach which is tailored to respond to a community’s unique issues, goals, and culturally acceptable rules. An example of the way in which the utilitarian justification of private property in carbon assets prevents a sustainable approach to environmental conservation is seen in the conversion of forest land to agriculture land in Africa. Economic theorists, such as Stern, argue that society must change the structure of economic incentives in relation to carbon in a way which protects existing forests and encourages afforestation and reforestation,¹⁴⁴ and thereby incidentally reducing atmospheric carbon for the benefit of all. Private property in carbon assets, pursuant to Stern’s model, would function in an international market so as to promote and finance widespread carbon sequestration

¹⁴¹ Waldron, *supra* note 6 at 12.

¹⁴² *Ibid.* at 12.

¹⁴³ *Ibid.* at 12.

¹⁴⁴ Stern, *supra* note 20.

activities, including in economically poor regions in Africa.¹⁴⁵ However, private property rights in carbon assets, with its “one-size-fits-all” approach, can jeopardize a community’s subsistence and threaten the security of other legal rights or social benefits.

Africa is identified as an area which is vulnerable to deforestation.¹⁴⁶ For the most part, the individuals responsible for the deforestation in Africa are small-scale subsistence farmers.¹⁴⁷ It is short-sighted to solely concentrate on how to create financial instruments which make the retention of forests more economically valuable than the cultivation of the land for agriculture. It is similarly detrimental to focus on protecting an individual carbon right holder’s entitlement above all other considerations, including the production of food locally.

To determine the best use of land in Africa, the debate should include an examination of the quantity and type of food required to sustain the community, whether current agricultural land is being used efficiently, ways in which biodiversity and water quality can be maintained or improved, and the role of forestry and agriculture in the community’s culture and economy. Although the international carbon market may prefer the flexibility offsets provide to emitters in achieving emission targets by creating carbon property in Africa, managing conflict over land use and environmental conservation is about more than just property rights in carbon assets. As per Ostrom “Policy analysts who would recommend a single prescription for commons problems have paid little attention to how diverse institutional arrangements operate in practice.”¹⁴⁸ A holistic, community approach must be taken to achieve environmental success. Based on utilitarian theory’s inability to protect social rights, and its failure to understand the nuances of environmental issues, as well as the carbon market’s preference to achieve economic goals over environmental goals, utilitarian theory must be rejected as a justification of private property rights in carbon assets because utilitarian theory is unable to demonstrate how private property in carbon assets better serves society than some other form of property.

However, utilitarian theory is rarely presented as a standalone justification of private property. Little weight is given to the argument that “society is best served by private property because it just is”. Instead, the utilitarian justification is usually linked to other justifications of

¹⁴⁵ For example, the Clean Development Mechanism, as defined in Article 12 of the Kyoto Protocol, allows countries to implement emission-reduction projects in developing countries to earn certified emission reductions. These certified emission reductions can be used to meet Kyoto targets.

¹⁴⁶ Stern, *supra* note 20 at 539.

¹⁴⁷ *Ibid.* at 539.

¹⁴⁸ Elinor Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge: Cambridge University Press, 1990).

private property; utilitarian arguments can be linked to a rights-based theory to show that private property increases individual rights, to a personality theory to show that private property increases human development, or to an economic theory to show private property increases wealth. This thesis now turns to these other justifications of private property to examine how they may justify private property in carbon assets.

3.2 *Personal Self Assertion*

Numerous theorists, such as Hegel, Ahrens, and Lorimer, propose that personal self-assertion in the external world must occur for individuals to reach “personhood”, or a full and proper human life. This self-assertion occurs through individuals having rights in property.¹⁴⁹ Hegel, for example, concluded social institutions are shaped by property and property defines the way in which people fit into social institutions. Hegel justifies private property because every individual needs some control over resources in the external environment to participate in social institutions and reach personhood.¹⁵⁰

Hegel’s personality theory states that private property is closely connected to the personality of an individual and that through an individual’s property he develops reason, will, personality, and individuality.¹⁵¹ Since carbon, as opposed to land, is not viewed as being closely connected to one’s sense of self, and property in carbon has not previously been held as private property, one can reasonably conclude that recognizing carbon as private property will not greatly influence an individual’s ability to develop reason, will, personality, and individuality.

Instead, property rights in carbon have the potential to disrupt self-assertion through complicating land tenure, changing established rights in real property, and dictating a land manager’s use of her land.¹⁵² Land is thought of as being closely and strongly connected to personality. For example, numerous wars and other conflicts have been commenced to assert sovereignty over land. Ellickson writes “[b]eyond dispute, botched land policies have been the chief domestic source of human woe during the past century.”¹⁵³ Pursuant to personal self-assertion theories, private property in carbon should not be created since carbon rights have the

¹⁴⁹ Morris Raphael Cohen, “Property and Sovereignty” in John Arthur and William Shaw, eds., *Readings in the Philosophy of Law* (Upper Saddle River, N.J.: Pearson/Prentice Hall, c2006) at 468.

¹⁵⁰ Hegel at 50A in Waldron, *supra* note 6 at 386.

¹⁵¹ See Peter G. Stillman, “Property, Freedom, and Individuality in Hegel’s and Marx’s Political Thought”, J.R. Pennock and J.W. Chapman, eds., *Property: Nomos XII* (New York: New York U.P., 1980).

¹⁵² See the discussion in sections 4.1.1 (a) and (b).

¹⁵³ Robert C. Ellickson, “Property in Land” (1993) 102 *Yale L.J.* 1315-1400 at 1318.

potential to interfere with the use and enjoyment of land, which is intimately connected to the personality of those with an interest therein.

3.3 *Economic Theory*

Economic theorists rarely attempt to justify private property.¹⁵⁴ Instead, economic theorists generally begin with the presumptions that private property is beneficial and that all resources can be privately held.¹⁵⁵ Posner, however, points to competition for scarce resources and encouraging investment when justifying private property:¹⁵⁶

What cannot be ignored is why property rights are granted—what social functions they serve. Two are paramount. First, without exclusive rights to the use of tracts of land or other valuable physical objects, these properties would be overused—if anyone has the right to graze his cattle on a pasture, the pasture will be overgrazed and hence depleted prematurely, because each cattle owner will tend to ignore the costs that the grazing by his cattle imposes on the other users of the pasture. Second, without exclusive rights, there will be insufficient incentives to invest in improving property: if you cannot be assured of being able to reap what you have sown, you won't sow, and the land will lie fallow.

Posner's first point is that property rights protect valuable resources from competitive use and overuse. Once a resource becomes valuable, laws and / or the market are needed to govern the management and use of the resource.¹⁵⁷ Posner writes "the moment [a resource] became scarce... it became the subject of property rights in law."¹⁵⁸ Privatizing scarce resources is one way to avoid a tragedy of the commons.¹⁵⁹

Hardin creates a hypothetical common pasture to explain the tragedy of the commons.¹⁶⁰ All members of the community are entitled to graze their cattle on the pasture. As the cost of grazing livestock is externalized on the pasture and the benefits of selling livestock remains internalized, community members will increase the size of their herds to maximize individual profits. By not considering the health of the pasture when deciding the number of cattle to graze

¹⁵⁴ Roy J. Ruffin & Paul R. Gregory, *Principles of Microeconomics* (New York, NY: HarperCollins College Publishers, 1993) at 62.

¹⁵⁵ *Ibid.* at 62.

¹⁵⁶ Richard A Posner, "Intellectual Property" in John Arthur and William Shaw, eds., *Readings in the Philosophy of Law* (Upper Saddle River, N.J.: Pearson/Prentice Hall, c2006) at 473.

¹⁵⁷ Anthony Scott, "The Fishery: The Objectives of Sole Ownership" (1955) 63(2) *J. of Pol. Econ.* 116 at 116.

¹⁵⁸ *Ibid.* at 116.

¹⁵⁹ The other way to avoid tragedy of the commons is through regulations.

¹⁶⁰ Garrett Hardin, "The Tragedy of the Commons" (1968) 162 (3859) *Science* 1243.

and by attempting to maximize personal gains by grazing as many cattle as possible, self-interested community members will deplete the common resource to the point of ruin.

The current state of atmospheric carbon is analogous to Hardin's pasture: there is no incentive to invest, there is no incentive to postpone use, there is an exploitation way of thinking (in that emitters disregard the harms caused by their emissions), and emitters are able to externalize costs while internalizing gains. For example, there is no rational economic reason for an emitter to evolve from high emissions technology to low emissions technology if that low emissions technology is more costly. Thus, in order to end the tragedy of the commons for atmospheric carbon dioxide, Hardin would suggest that either privatization of carbon emissions or the creation of regulations to govern the use of the atmosphere must occur.¹⁶¹

However, while atmospheric carbon may be "tragic", there is evidence that Hardin's tragedy of the commons is not present in biotic carbon sinks in Canada, particularly in relation to agricultural lands. Carbon stored in agricultural sinks is not in jeopardy because it is recognized as a type of property other than private property. In 2008, agricultural soils, managed forests, managed wetlands, and land-use change were a net sink of 13Mt CO₂e.¹⁶² Although 13Mt CO₂e sequestered through land use and land-use change does little to offset the 734 Mt CO₂e emitted in Canada in 2008, land use and land-use change is part of the solution to climate change, not the problem.

A Parliamentary Research Branch report for the Government of Canada entitled "Carbon Sequestration by Agricultural Soil" held that carbon captured by plants and the carbon returned to the atmosphere from the soils was balanced in 2001:¹⁶³ "emissions from agricultural soils decreased from 7.7 million tonnes in 1981 to 1.8 million tonnes in 1996; they are believed to be virtually zero today."¹⁶⁴ In 2008, croplands were a net sink of 4.4 Mt CO₂e, a figure which includes the impact of converting forest and grassland to cropland.¹⁶⁵ The reason cultivated soils behave like carbon sinks is because of the adoption of no-till and reduced tillage practices and

¹⁶¹ *Ibid.*

¹⁶² Canada's 2008 Greenhouse Gas Inventory, *supra* note 91.

¹⁶³ Frédéric Forge, Science and Technology Division, Parliamentary Research Branch "Carbon Sequestration by Agricultural Soil", 30 January 2001, online: <<http://dsp-psd.pwgsc.gc.ca/Collection-R/LoPBdP/BP/prb0038-e.htm>>.

¹⁶⁴ *Ibid.*

¹⁶⁵ Canada's 2008 Greenhouse Gas Inventory, *supra* note 91 at 5.

the reduction of the use of summer fallow, both of which promote carbon sequestration in soil biomass.¹⁶⁶

Carbon sinks on agricultural land are not tragic as they are indirectly protected through best land management practices, practices which increase a land manager’s economic returns by increasing soil health and increasing crop yield. If carbon sinks on agricultural land are not tragic, there is no reason to create private property in carbon assets associated with agricultural land to avoid Hardin’s tragedy of the commons. Creating property in carbon to prevent tragedy of the commons on agricultural land is an unnecessary creation of property that will serve no benefit in this instance.

Moreover, carbon is not scarce.¹⁶⁷ There are billions of tons of carbon sequestered in terrestrial plants and soil organic matter.¹⁶⁸ There is also the potential to sequester billions of additional metric tonnes in soil organic matter or terrestrial plants. Thus, as seen by the failure of the Chicago Climate Exchange,¹⁶⁹ artificial scarcity, such as that derived from state regulation, must be created for private property in carbon assets associated with agricultural land or any other biotic sink to exist.

The Chicago Climate Exchange (“CCX”) was a voluntary, legally-binding greenhouse gas trading system operating in North America and Brazil which traded greenhouse gas allowances from 2003-2010.¹⁷⁰ The Exchange ended in 2010 because of lack of legislative

¹⁶⁶ *Ibid.* at 5.

¹⁶⁷ Pidwirny, *supra* note 64.

¹⁶⁸ *Ibid.*

Estimated major stores of carbon on the Earth.	
Sink	Amount in Billions of Metric Tons
Atmosphere	578 (as of 1700) – 766 (as of 1999)
Soil Organic Matter	1500 to 1600
Ocean	38,000 to 40,000
Marine Sediments and Sedimentary Rocks	66,000,000 to 100,000,000
Terrestrial Plants	540 to 610
Fossil Fuel Deposits	4000

¹⁶⁹ Aaron Smith, “Chicago Climate Exchange to Shut Down Emissions Trading” *CNN Money* (November 17, 2010), online: CNN Money <http://money.cnn.com/2010/11/17/news/economy/climate_exchange/index.htm>.

¹⁷⁰ Chicago Climate Exchange, “Markets” (2011), online: ICE OTC: Chicago Climate Exchange <<https://www.theice.com/ccx.jhtml>>.

interest in the United States.¹⁷¹ In April, 2010, Intercontinental Exchange Inc. (“ICE”) purchased CCX. ICE reportedly planned to lay off approximately half of the CCX staff, citing lack of U.S. action on climate change.¹⁷² In August, 2011, ICE announced it would close its U.S. emissions derivatives platform after the first quarter of 2012.¹⁷³ Low exchange volumes and the Exchange operating at a loss were the reasons given by ICE for the closure.¹⁷⁴ Without governments creating artificial scarcity, there is no interest in the purchase of greenhouse gas allowances. Ultimately, because there was no demand for allowances, the value of the carbon exchanges was not sufficiently high to cover the administrative costs incurred by the CCX, resulting in the closure.

When private property possesses no economic value, Posner’s first point is irrelevant – there is no competition to use the resource. The abundance of supply of carbon offsets and the lack of demand for offsets led to the closure of the CCX market, resulting in carbon credits in North America being economically valueless (unless the carbon credits possessed value under another program, such as Alberta’s Emissions Regulation and Offset System). In the case of the CCX, the free market corrected the inappropriate awarding of private property rights carbon assets and continued as if no property rights existed in the resource.

Posner’s second point, that property is justified as it encourages investment, provides that an individual will be more likely to invest in property when he receives a return upon his investment. This is a valid point; an individual is less likely to engage in a carbon sequestration project if he does not know whether he will economically benefit from his investment. However, as seen from the discussion above, the question remains: from where are the returns which are to encourage investment derived? Further, are private property rights used in carbon markets encouraging environmentally beneficial investment? Economic theory advances that property rights derive economic benefits from market transactions. However, by creating market value in carbon offsets, as will be shown below and in section 4.3, the economic theory justification in private property is forcing society to choose between economic success and environmental success.

¹⁷¹ Smith, *supra* note 169.

¹⁷² Michael Szabo, “ICE Cuts Staff at Chicago Climate Exchange—Sources” (August 12, 2010), online: Reuters <<http://www.reuters.com/article/idUSLDE6791WI20100812>>.

¹⁷³ Jacob Bunge, “ICE to Close Chicago Climate Futures Exchange” *The Wall Street Journal* (August 6, 2011), online: WSJ.com <<http://online.wsj.com/article/SB10001424053111903366504576490492412808226.html>>.

¹⁷⁴ *Ibid.*

Although using offsets from biotic sequestration activities as part of the market approach increases the flexibility of market players and rewards investors for engaging in sequestration activities, offsets not only decrease the chance of a market-based approach being environmentally successful, but may cause environmental harm. Definitions of “offsets” foreshadow the inability of offsets to achieve environmental benefits. The World Bank describes offsets as: “Offsets designate the emission reductions from project-based activities that can be used to meet compliance—or corporate citizenship—objectives vis-à-vis greenhouse gas mitigation.”¹⁷⁵ In *State and Trends of the Carbon Market 2011*, the World Bank’s opinion was that “the CDM¹⁷⁶ is simply not designed to drive the structural transformation of industry in developing countries that the transition to a low-carbon economy requires. By definition, offset mechanisms such as the CDM cannot reduce global emissions in net terms...”¹⁷⁷

Welch takes a more critical approach and defines offsets as an “imaginary commodity created by deducting what you hope happens from what you guess would have happened.”¹⁷⁸ According to Welch, this means that emissions reductions in one location can be avoided “with a set of stories about what would have happened in an imagined future elsewhere”.¹⁷⁹ Thus, it has been argued that offsets, as allowed by the United Nations Clean Development Mechanism, are environmentally undesirable as they are being used to avoid emission reductions.¹⁸⁰ Emitters can purchase property rights in carbon assets created by others who have sequestered carbon or reduced emissions, decreasing the urgency of emitters to adopt technological changes that would reduce carbon emissions.

Instead of achieving environmental success, in an offset trading market “the net result tends to be an increase in greenhouse gas emissions.”¹⁸¹ Three reasons can be offered to explain this result. First, there is the potential for offsets to overestimate the environmental benefits of carbon sequestration or emissions reductions projects. For example, there are numerous issues

¹⁷⁵ Linacre, *supra* note 25 at 77.

¹⁷⁶ The Clean Development Mechanism (“CDM”), as defined in Article 12 of the Kyoto Protocol, allows countries to implement emission-reduction projects in developing countries to earn certified emission reductions. These certified emission reductions can be used to meet Kyoto targets.

¹⁷⁷ Linacre, *supra* note 25 at 15.

¹⁷⁸ Dan Welch, “A Buyer’s Guide to Offsets” (May/June 2007) 106 *Ethical Consumer*.

¹⁷⁹ Gilbertson, *supra* note 11 at 11.

¹⁸⁰ *Ibid.* at 53

¹⁸¹ *Ibid.* at 11.

with accurately measuring and verifying carbon sequestration and emissions,¹⁸² leading to the over-estimation of the amount of carbon sequestered, thus property created.

Second, insect infestation, forest fires, and any other destruction of the sink will negate any carbon “savings” from revegetation. Carbon assets appear to be misleading as they can be twice destroyed – once through the sale to and use of the carbon right by a purchaser for the right to emit, i.e. the consumption of the offset benefit, and a second time by the actual destruction of the sink.¹⁸³ To put it another way, it is as if a baker (land manager) is selling his property right in a loaf of bread (carbon sink or sequestration activity) to a consumer (emitter). The consumer may eat the bread (emit emissions), but the baker still has the loaf which he can destroy. The bread is thus a tangible chose in possession with a second artificial existence as a chose in action! The emitter is not motivated to reduce its emissions, but rather to purchase an artificially-created property interest so as to “justify” its current and future emissions. Thus, contrary to the goals of environmental policies on carbon sequestration, a potential net increase in atmospheric carbon will result from emissions “offset” by offset projects when the project is destroyed, whether the project is destroyed through human choice or natural causes.

Third, offsets may reward sequestration efforts which would have occurred even without offsets being available. Market mechanisms cannot distinguish between environmental practices and carbon sinks that need promotion or protection and those which do not.¹⁸⁴ As will be shown in the theory of labour section, offsets are thus allowing emissions above regulations while rewarding project proponents for engaging in business-as-usual activities to “offset” the excess emissions.

Because scarcity does not exist in carbon assets to encourage competition for control or possession of carbon assets or carbon property rights, because there is no innate value in carbon assets in the free market (and the creation of artificial value is environmentally detrimental), and

¹⁸² Kennett, *supra* note 4 at 174.

¹⁸³ Depending on the market framework and whether insurance of credits are available, this does not always need to be the case.

¹⁸⁴ As seen by Costa Rica’s Payments for Environmental Services, market mechanisms are unable to distinguish between forests in need of protection and those which would be maintained even without market payment. The CCX also failed to distinguish between farmers who would have practiced no-till farming techniques without property rights and those who switched to no-till to receive offsets. Since no-till is arguably the least expensive and, in some instances, the most agriculturally-sound way to seed agricultural land, few, if any, farmers who created offsets from engaging in no-till practices sequestered more carbon than they otherwise would have if offsets were not available.

because offsets are resulting in environmental damage rather than environmental investment, Posner's economic theory is not a justification of private property in carbon assets.

3.4 *Positivism/Special Rights*

Special right arguments,¹⁸⁵ such as those advanced by Nozick, hold that specified individuals should have particular entitlement to certain resources based on historical entitlement.¹⁸⁶ For example, opposition to health care reform in the United States may be based on the argument that health care should continue to remain private because individuals currently have private property rights, such as private property rights in hospitals. Special rights arguments would advocate for these private property rights not being confiscated or interfered with through the rights becoming collective property or by creating new collective property rights in direct competition to the private property rights.

Nozick's special rights theory does not justify private property, but justifies maintaining whatever property rights in carbon which may have already existed.¹⁸⁷ Until approximately 10 years ago, prior to the carbon market's interest in carbon assets, biological carbon assets were either considered common property or non-property. Thus, based on historical entitlement, special rights theories would either justify common property or non-property in carbon assets.

3.5 *Rights-Based Theories*

Rights-based theories, or the theories of natural law, labour, possession, and occupation, justify private property when private property protects an individual's rights and entitlements.

¹⁸⁵ Special rights are advanced by H. L. A. Hart in "Are There Any Natural Rights?", (April, 1955) 64 *The Philosophical Review* 175: "When rights arise out of special transactions between individuals or out of some special relationship in which they stand to each other, both the persons who have the right and those who have the corresponding obligation are limited to the parties to the special transaction or relationship. I call such rights special rights to distinguish them from those moral rights which are thought of as rights against (i.e. as imposing obligations upon) everyone".

¹⁸⁶ Robert Nozick, *Anarchy, State, and Utopia* (New York: Basic Books, 1974).

¹⁸⁷ Waldron, *supra* note 6 at 289.

3.5.1 *Natural Law*

Unlike positive law, which is man-made and only enforceable in the enacting jurisdiction, natural rights-based theorists argue that property is a natural right,¹⁸⁸ set by nature and recognized as valid by moral and rational people everywhere.¹⁸⁹ Waldron also proposes private property rights may be natural because property rights are connected to the nature of human beings; humans are entitled to private property rights simply by virtue of their existence.¹⁹⁰

Locke presents two natural-right theories which are relevant to the justification of private property. Locke's first natural-rights theory is that Man has a natural right to his preservation. Private property rights protect an individual's right to survival as private property rights ensure security. For example, without private property rights in the food in one's pantry, one could not be sure that he will have food to eat for supper. Private property rights allow an individual to say "this is my bagel, and you may not eat it". Locke's second natural-rights theory, discussed in more detail in the labour section below, is that Man has a right to his labour.¹⁹¹

Examining Locke's first natural-rights theory, that Man has a natural right to his preservation, private property rights in carbon are unlikely to, on their own, ensure an individual's preservation. As shown in the next paragraph, it is improbable that a forest land manager will be able to survive on the proceeds he receives from the sale of property rights in the carbon assets he creates; he will have to supplement his income through the sale of timber or other goods and services.

The disconnect between private property rights in carbon assets and human preservation is demonstrated by one of the early criticisms of Alberta's Emissions Regulation and Offset System. Because of the low price of carbon assets and the inability of agricultural soils to sequester large amounts of carbon, agricultural producers have little incentive to report their carbon activities for program approval.¹⁹² Thus, agricultural producers are simply not bothering

¹⁸⁸ The idea of what constitutes a natural right is unclear (Bentham as referenced in Waldron, *ibid.* at 19). The starting point is a natural right is a right that exists in the state of nature even when it is not enforced by government or society as a whole.

¹⁸⁹ Waldron, *ibid.* at 19. See also D'Entrèves, *Natural Law*, Chapters 2-3.

¹⁹⁰ Waldron, *ibid.* at 19. See also D'Entrèves, *Natural Law*, Chapters 2-3.

¹⁹¹ Locke, *supra* note 57 at 285.

¹⁹² Doug Currie, Cynthia Edwards, Murray Fulton, Jeff Gross, Dennis Haak, Edgar Hammermeister, Adam Harnett, Norm Henderson, Lynette Keyowski, Guy Lafond, Kathy Larson, Blair McClinton, Doug McKell, Celia Olver, Terry Scott, Ron Zukowsky, "Emissions Trading/Offset Credits – A Market Based Instrument" (December 24, 2008), online: University of Saskatchewan

to apply for approval for their carbon sequestration projects. If recognition of private property rights in carbon assets is connected to the preservation of agricultural producers, participation in the System should be maximized. Alberta producers show that it is not.

Natural law arguments can, alternatively, make an argument that carbon should be something other than private property as the creation of private property rights in carbon may restrict a land manager's use of his land. For example, a land manager may be prevented from breaking soil in pursuit of a livelihood or in pursuit of food production if she interferes with another's property interests, such as through incidentally releasing carbon sequestered pursuant to a conservation easement granted in the same land. Also, the creation of private property rights in offsets, which provide emitters the right to release carbon, may interfere with the natural right of all individuals to have an atmosphere and environment capable of sustaining human life.

3.5.2 Possession at Common Law and First Occupancy

The common law doctrine of possession is often used interchangeably with the academic property theory of first occupancy.¹⁹³ As such, I set out the distinction between the two concepts, but analyze whether the theories collectively are able to justify private property rights in carbon assets.

First occupancy holds that the first in time to occupy a *res* is the first in right.¹⁹⁴ The doctrine of possession accepts that property rights are acquired through physical control over a *res*¹⁹⁵ and an intention to control the *res*.¹⁹⁶ The doctrine of possession and first occupancy are primarily theories of allocation which cannot, on their own, justify property.¹⁹⁷ However, when the doctrine of possession and first occupancy are connected to labour theory, personality theory, expectation, or societal recognition, the theories may be a justification of property.

<https://wiki.usask.ca/kis/index.php/Section_3:_Emissions_Trading/Offset_Credits_%E2%80%93_A_Market_Based_Instrument>.

¹⁹³ Ziff, *supra* note 5 at 77.

¹⁹³ *Ibid.* at 43.

¹⁹⁴ *Ibid.* at 77.

¹⁹⁴ *Ibid.* at 43.

¹⁹⁵ See, for example, *The Tubantia*, [1924] All ER 615 (Pr & Ad. Div.), *Brumagim v. Bradshaw*, 39 Cal. 24, 46 (1870), *Young v. Hichens*, 6 Q.B. 606 (1844), *Pierson v. Post*, Supreme Court of New York, 3 Cal. R. 175, 2 Am. Dec 264 (1805), and *Case of Swans*, 1592 (7 Co. Rep 156 at 176).

¹⁹⁶ See, for example, *Young v. Hichens*, *ibid.*, and *Pierson v. Post*, *ibid.*

¹⁹⁷ Ziff, *supra* note 5 at 77.

¹⁹⁷ *Ibid.* at 43.

Labour: The common law doctrine of possession originally focused on wild animal cases, such as *Pierson v. Post*,¹⁹⁸ but has been analogized to other areas of property law, such as oil and gas, ground water, and space on the spectrum of radio frequencies.¹⁹⁹ Pursuant to the doctrine of possession and to the theory of labour, a possessor of a fugitive resource is rewarded with ownership of the resource because he is able capture and to put the resource to good use. Theoretically, resources under human control will be put to better use than if the resource is left in the wild. It can be reasonably argued that a land manager who is able to sequester carbon that would otherwise remain in the atmosphere should be granted property rights to that carbon pursuant to the doctrine of possession. Although this doctrine favors property in sequestered carbon it is dependant upon a specific intent to sequester carbon. Therefore, incidentally sequestered carbon would not be assigned property rights. Justifying private property in carbon assets based on the theory of labour will be further explored in section 3.5.3.

Personality Theory: Hegel's personality theory states that private property is closely aligned to the personality of an individual and that it is through an individual's property that he develops reason, will, personality, and individuality.²⁰⁰ Hegel argues that an individual must put his will into a resource to make it his property. The first individual who inserts his will into a resource will be granted the initial allocation of this resource.²⁰¹ Allowing a second individual to take possession of something already claimed causes great confusion and prevents man from living a full life of reason.²⁰² However, carbon sinks have been possessed and abandoned by the sale of land or vegetation by land managers many times in the past without the loss of possessory rights to carbon negatively affecting the personality of the land manager. Thus, possession based on personality theory cannot justify private property in carbon assets.

Expectation: Hume and Bentham argue that a resource should be allocated to the first person who takes possession of or occupies the resource because the possessing individual has the natural expectation that he will be able to possess, use, and enjoy the resource in his possession.²⁰³ Ryan comments on first possessors being justified in their takings by stating: "the question we ask is negative, not positive, namely whether the thing is already occupied by a will

¹⁹⁸ *Pierson v. Post*, *supra* note 195.

¹⁹⁹ *Ibid.* and Carol Rose, "Possession as the Origin of Property" in *Property and Persuasion: Essays on the History, Theory, and Rhetoric of Ownership* (Boulder: Westview Press, 1994) at 12.

²⁰⁰ See Stillman, *supra* note 151.

²⁰¹ Hegel at 50 in Waldron, *supra* note 6 at 386.

²⁰² Hegel at 50 in Waldron, *ibid.* at 386.

²⁰³ See Jeremy Bentham, 'Principles of the Civil Code'; See also Hume, *Treatise*, Bk. III, Ch. II.

which demands greater respect.”²⁰⁴ But, having an expectation of property rights is not a justification of property rights in that resource. An individual who steals a vehicle would, for example, be incorrect in believing she has any property rights in that vehicle.²⁰⁵ In any event, given the historic treatment of carbon in the past as common property or non-property, and the ambiguity surrounding the current state of property rights in carbon assets, persons who possess carbon would seem unlikely to have a legitimate expectation of property rights.

Societal Recognition: The doctrine of possession depends on societal recognition of an individual’s property rights. Possession at common law for Rose “seems to amount to something like yelling loudly enough to all who may be interested. The first to say, ‘This is mine,’ in a way that the public understands, gets the prize, and the law will help him keep it against someone else who says, ‘no, it is mine’.”²⁰⁶ Therefore, it is society’s recognition of a property right in carbon assets that makes the property right just, rather than the possession itself. Thus possession in carbon assets (which the next paragraphs shows is not possible to achieve) in combination with societal recognition could justify private property rights in carbon assets.

However, application of the *Pierson v. Post* test, which determines when resources are considered to be “possessed”, shows possession is not capable of justifying property in carbon. *Pierson v. Post* identified two reasons why possession should be recognized as the origin of property: 1) possession can only occur when notice is given to the world through a clear act, and thus consent of society is demanded and conceded; and, 2) possession can only occur when one “mixes in his labour”, and thus possession rewards useful labour.²⁰⁷ In relation to the first prong of the justification, Kennett et al. point out there are an overwhelming number of scientific, technical, economic, legal and institutional challenges related to carbon which prevents notice being given through a clear act.²⁰⁸ For example, it is not possible to precisely measure how much carbon a land manager sequesters and releases from a carbon sink over a certain time period. In relation to the second prong of the test, a portion of carbon sinks may be created through the

²⁰⁴ Alan Ryan, *Property and Political Theory* (Oxford: Basil Blackwell, 1984) at 122. The word “will” is connected to Hegel’s thought that a person “has as his substantive end the right of putting his will into any and every thing and thereby making it his’ property (44). A property is a thing that contains a person’s will.” See Stillman, *supra* note 151 at 133.

²⁰⁵ As per the Supreme Court of Canada in *Marsh v. Kulchar*, [1952] 1 D.L.R. 593 at 595, “[w]hen a motor car is stolen from the owner, the thief takes actual physical possession, and thus takes it out of the possession of the owner, although the right to possession remains with the latter.”

²⁰⁶ Rose, *supra* note 94 at 16.

²⁰⁷ *Pierson v. Post*, Supreme Court of New York, 3 Cal. R. 175, 2 Am. Dec 264 (1805).

²⁰⁸ Kennett, *supra* note 4.

labour of previous land managers or created naturally, thus without the labour of the possessing land manager. Further, as examined below, even when labour is present, the creation of private property rights must be balanced against other considerations.

The theory of first occupancy and possession at common law are useful allocation theories. However, they provide weak arguments for the creation of private property in carbon assets. Consent of the commons that ownership of the resource is valid must exist before the rights in the resource can be allocated pursuant to these theories. For example, just because I am in possession of an animal defined as “wildlife” under *The Wildlife Act, 1998* does not mean property exists in that wildlife or that I have any right or property in that wildlife—legislation prevents me from acquiring property rights in that wildlife.²⁰⁹ Instead, if my possession contravenes the *Act*,²¹⁰ I have not only committed a regulatory offence, but any interest I may have may be forfeited to the Crown. It is society’s beliefs, as set out in *The Wildlife Act, 1998*, rather than possession, which dictate when property rights can be created in wildlife. The theory of first occupancy and possession at common law are unable to justify the creation of private property rights in carbon assets as they are unable to provide a case for the ownership of carbon assets.

3.5.3 Labour

Encouraging labour increases productivity.²¹¹ Based on the theory of labour, the creation of private property rights in carbon assets should increase investment in carbon sequestration above land best management practices since private land managers would be entitled to the property rights in the products of their labour. If land managers who sequester carbon are rewarded for their efforts with private property, they will have an incentive to engage in sequestration activities they otherwise would not have, thereby increasing the amount of carbon sequestered. If numerous land managers sequester carbon above equilibrium, carbon stored in biomass should reduce the level of carbon that would otherwise be stored in the atmosphere, and thus mitigate the effects of excessive carbon dioxide in the atmosphere.

²⁰⁹ *The Wildlife Act, 1998*, S.S. 1998, c. W-13.12.

²¹⁰ For example, I do not have a licence to possess the wildlife.

²¹¹ Cohen, *supra* note 149 at 468. See also Locke.

The theory of labour is based on Locke's influential theory of initial ownership and justification of private property.²¹² The theory of labour holds that it is morally right that an individual who uses his labour to produce should be entitled to the products of his labour. Intuitively, it seems unfair that an individual who labours could be forced to share the products of that labour with individuals who do not expend their labour. In *Second Treatise on Government*, Locke starts with the proposition that the world belongs to no one.²¹³ Man, however, owns property in his person and has the ability to combine human labour with elements of nature to create property in which the entrepreneur has sole rights:²¹⁴ "The Labour of his Body, and the Work of his Hands, we may say, are properly his. Whatsoever then he removes out of the State that Nature hath provided, and left it in, he hath mixed his Labour with, and joynd to it something that is his own, and thereby makes it his Property."²¹⁵ Once property is created and allocated by the theory of labour, property rights to that *res* can be transferred by sale, gift, or other means.²¹⁶

While, theoretically, private property rights increase investment in a resource, it is interesting to explore whether, given the characteristics of carbon assets and the nature of the carbon market, private property in carbon assets justified pursuant to the theory of labour increases carbon sequestration and carbon sink retention. This thesis examines whether private property in carbon assets is able to encourage labour generally and, as desired by legislators using private property in carbon assets in carbon policy, encourage labour above business-as-usual.

First, we explore whether private property in carbon assets is able to encourage labour. Costa Rica's *pagos por servicios ambientales* [Payments for Environmental Services] was not able to encourage investment in carbon assets as the market was not able to distinguish between forests which were and were not in need of protection.

The first carbon market, Costa Rica's Payments for Environmental Services, rewarded land managers in the 1990s for protecting forests.²¹⁷ Farmers were given the opportunity to sell carbon storage capacity of forests on their land through a national program aimed at preserving

²¹² Rose, *supra* note 199 at 11.

²¹³ Locke, *supra* note 57 at 285-6.

²¹⁴ *Ibid.* at 285-6.

²¹⁵ *Ibid.* at 287-8.

²¹⁶ A feature commonly connected to ownership. See, for example, Hornoré in Waldron, *supra* note 6 at 49.

²¹⁷ Gilbertson, *supra* note 11 at 25.

forests and reforesting ‘degraded’ land.²¹⁸ The Program was administered by Fondo Nacional de Financiamiento Forestal, a public forestry-financing agency created under Costa Rican law, and paid for through a consumer tax on fossil fuels and a \$2 million (US) sale to Norway of 200 million tonnes of carbon sequestration.²¹⁹ Costa Rica recognized private property rights in carbon storage capacity, and redistributed money to its land managers to promote the health of forests. The program attempted to induce the labour of current and future land managers through easements registered against land in order to promote the desired environmental benefits.

Pfaff et al. show that the Program had little effect on forest preservation during the years they examined, from 1997-2000.²²⁰ One of the reasons for the lack of efficiency was that the Program enrolled lands which would have remained forested even without payments.²²¹ Those interested in retaining forests applied for compensation while those with plans to remove timber from their lands did not. There was no way to force those land managers who intended to deforest to subscribe to the program. Pfaff et al. conclude that the Program would have been more successful had it targeted at-risk areas.²²² The inability of the Program to distinguish between land managers who expended labour to protect forested land and land managers who maintained the status quo showed that markets are unable to induce labour in areas where deforestation was preferred by land managers, and wasted administrative resources in rewarding business as usual.

The next question is whether the creation of private property in carbon will encourage labour that results in environmental benefits. The New South Wales Greenhouse Gas Abatement Scheme suggests that the market may not be able to encourage above business-as-usual entrepreneurial sequestration activities.

The New South Wales (“NSW”) Greenhouse Gas Abatement Scheme is a mandatory emissions trading scheme created on January 1, 2003 aimed at reducing emissions associated

²¹⁸ *Ibid.* at 25.

²¹⁹ *Ibid.* at 25.

²²⁰ Alexander Pfaff, Juan Andres Pobalino, and G. Arturo Sanchez-Azofeifa, “Payments for Environmental Services: Empirical Analysis for Costa Rica” Working Papers Series SAN08-05 Terry Sanford Institute of Public Policy, Duke, (March, 2008), online: <<http://sanford.duke.edu/research/papers/SAN08-05.pdf>>.

²²¹ *Ibid.* The lack of success of the Program was also attributed to the country already having a low national rate of deforestation and the Program’s goal of compensating landowners for the environmental services they provided, rather than protecting at-risk forests.

²²² *Ibid.*

with the production and use of electricity.²²³ Energy retailers are required to meet targets based on their share of the energy market.²²⁴ NSW Greenhouse Gas Abatement Certificates (“NGAC”), which represent one tonne of CO₂e of avoided emissions, can be surrendered by energy retailers to meet targets. These Certificates can be created through low-emission generation, activities involving waste methane, demand-side activities, and sequestration activities. These Certificates serve to create property interests in promoted activities.

Passey, MacGill, and Outhred analyzed the Scheme for the 2003, 2004, and 2005 compliance years to assess the Scheme’s performance.²²⁵ Passey et al. determined that, in addition to the Scheme not promoting reductions in emissions as claimed and NGAC cash flow being concentrated with select sequestration participants, the Scheme was being funded by electricity consumers who paid participants “not actually undertaking genuine, non-BAU [business-as-usual], abatement activities”.²²⁶ Participants were being rewarded for maintaining the status quo, although the status quo did not produce emissions savings, as was the intention of the Scheme. Thus, the Scheme failed to produce the desired environmental benefits (but may have increased electricity costs to consumers). These issues are not isolated to the NSW Gas Abatement Scheme. Passey et al. noted that many of the problems encountered are “inherent in a baseline and credit scheme”,²²⁷ meaning offsets are unable to distinguish between business-as-usual activities, which would have occurred without the existence of the property rights, and legitimate sequestration projects.

Apart from the NSW market failure explored above, academic analysis suggests that private property rights in carbon assets will be unable to encourage labour above business-as-usual. Skole, Smalligan and Samek find that market prices are not high enough to promote significant investment in carbon sequestration projects on agricultural land. Professor Skole et al. concluded that for it to be economical to replace corn production land with forest land under a cap and trade offset program, conservative estimates indicate that carbon prices would have to be as high as \$78-\$122 per ton CO₂e to compete with the current market value of corn (not

²²³ Greenhouse Gas Reduction Scheme, “Greenhouse Gas Reduction Scheme”, online: Government of New South Wales GGAS <<http://greenhousegas.nsw.gov.au/>>.

²²⁴ *Ibid.*

²²⁵ Rob Passey, Iain MacGill, Hugh Outhred, “The NSW Greenhouse Gas Reduction Scheme: An analysis of the NGAC Registry for the 2003, 2004 and 2005 Compliance Periods” (August 2007), online: Centre for Energy and Environmental Markets <http://www.ceem.unsw.edu.au/content/userDocs/CEEM_DP_070827_000.pdf>.

²²⁶ *Ibid.* at 30-31.

²²⁷ *Ibid.* at 30. In the baseline and credit approach, firms earn credits for emissions below their baseline.

including the cost of land conversion, the cost of carbon measurement and verification, or the future discontinuance of revenue when tree growth stabilizes in 15-30 years).²²⁸ Stavins and Richards estimated the cost of carbon sequestration, rather than the cost of land-use changes as determined by Skole et al., by examining 11 previous analyses of carbon sequestration costs in the United States. Stavins and Richards found the cost of carbon sequestration ranges from US \$7.50 - \$22.50 per metric ton of CO₂e.²²⁹ As seen in the next paragraph, current economic returns are insufficient to induce the desired labour.

Even when land is already suitable for sequestration projects, and there is no land-use change involved, it is unlikely the price of carbon credits will be high enough to influence land management decisions. The price of carbon credits may not even be high enough to entice land managers into applying for a recognition of their sequestration activities.²³⁰ As a reference, the Chicago Climate Exchange market price per metric ton of CO₂e in January 2009 ranged from \$1.65 to \$2.15²³¹ and Alberta's carbon offset credits are currently \$15 per tonne of CO₂e.²³² Based on the experiences of the NSW Greenhouse Gas Abatement Scheme rewarding business-as-usual activities, of producers not applying for recognition of carbon credits in Alberta's Emissions Regulation and Offset System, and the high costs of achieving sequestration through land use changes, the economic returns are insufficient to entice the desired labour. Therefore, creating property rights in carbon assets pursuant to the labour theory justification will not encourage useful labour above that already being engaged in as business-as-usual.

Because of the lack of the requisite conditions for a perfect carbon market²³³ and the existence of the conditions for market failure,²³⁴ this section rejects private property as justified

²²⁸ David Skole, Mike Smalligan & Jay Samek, "An Analysis on the Effect of an Offset Program on Conversion of Cropland to Forest Land" (4 August, 2009), online: Carbon2Markets <<http://www.carbon2markets.org/uploads/AtIssuecropsvsforests.pdf>>.

²²⁹ Robert N. Stavins & Kenneth R. Richards, "The Cost of U.S. forest-based carbon sequestration" (January 2005), online: PEW Center on Global Climate Change <http://www.pewclimate.org/docUploads/Sequest_Final.pdf> at 12.

²³⁰ Currie, *supra* note 192.

²³¹ Chicago Climate Exchange, "Markets" online: ICE OTC: Chicago Climate Exchange <http://www.chicagoclimatex.com/docs/offsets/Reports/CCX_Offsets_Report_V1No1_Jan09.pdf>.

²³² Agriculture and Rural Development, "Agricultural Carbon Offsets: Information for Alberta's Offset Market" (September, 2007, updated December 2, 2011), online: Government of Alberta <[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/cl11618](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/cl11618)>. In the future, the market price of offset credits will be based on the willingness to pay for offset credits. As the Market allows emitters to pay \$15/tonne CO₂e to meet emissions targets, it is unlikely the market price of offset credits will be greater than \$15.

²³³ The perfect market is dependent on the existence of several conditions, known collectively as perfect competition:

1. There are many firms, each of which has an insubstantial share of the market.

by the theory of labour. The perfect market does not exist at this time for carbon assets. The only purchasers of property rights in carbon assets are those who have been legislated to do so under legislation, a small and select group. As seen by the NSW Greenhouse Gas Abatement Scheme, these purchasers are likely to purchase offsets from sequestration participants who are connected to the purchaser in some way.²³⁵ The product created by the sequestration participants, although homogeneous, is widely available as it can be created by land managers engaging in business-as-usual best management practices.²³⁶ Thus, demand is low, supply is high, and purchases are not always at arms-length. Further, the real prices are not related to the ideal prices. The cost to sequester one ton of above business-as-usual CO₂e is much higher than the cost to purchase an offset credit representing the sequestration of ton CO₂e.²³⁷ Thus, minimal investment projects will be pursued as genuine expenditures of labour, although possibly more environmentally beneficial, will be onerous by comparison to business as usual activities. For example, a farmer will not operate at an economic loss by expending \$78-\$122 per ton CO₂e produced to convert his land from profitable corn production to forest when he can supplement his current income by claiming credit for the no-till activities in which he already engages.

When a market failure occurs, such as the one seen in carbon assets, the accepted solution is to rearrange the property right.²³⁸ Coase, for example, argues that appropriately designed

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2. There is free entry into the market. No barriers exist to prevent entry.
 3. There is a homogeneous product. All firms in the industry produce exactly the same product.
 4. There is perfect factor mobility. The factors of production (that is, capital and labor) are free to move between the industry and one or more other industries.
 5. There is perfect information in the sense that all participants in the market are fully informed about its price and about its profit opportunities.

Andrew Schotter, *Microeconomics: A Modern Approach* (New York, NY: HarperCollins College Publishers, 1994) at 378.

²³⁴ Market failure can be described as being the result of four sources:

1. Imperfect competition;
2. Imperfect information;
3. Externalities; and,
4. Public goods.

Joseph E. Stiglitz & Carl E. Walsh, *Principles of Microeconomics* (New York, NY: W.W. Norton, 2006) at 378.

²³⁵ Passey, *supra* note 225 at 30-31.

²³⁶ See, for example, the CCX: Bunge, *supra* note 173.

²³⁷ Skole, *supra* note 228.

²³⁸ Stiglitz, *supra* note 234 at 409.

property rights can internalize externalities without government intervention.²³⁹ Coase, obviously, is advocating for the reallocation of private property rights. As an example, when there is a conflict over whether cigarette smoking is or is not allowed in a room, the conflict is determined based on who is willing to pay the most for the benefit; if the value of fresh air to the non-smoker exceed the value of smoking to the smoker, then the non-smoker could compensate the smoker for loss of the ability to smoke, and vice versa.²⁴⁰

However, private property rights to the environment cannot be rearranged to “take care of externalities without direct government intervention”.²⁴¹ The environment does not have the ability to hold property or purchase benefits, as seen in the purchasing the option to smoke example above. Thus, in a market, environmental protection requires either government intervention or property-owning individuals to advocate for the environment. Because the basics of the competitive market are rational, self-interested consumers and rational, profit-maximizing firms,²⁴² both consumers and firms have the ability to exploit carbon credits for financial gain, and in the process may exploit the environment. Who, in this scenario, is advocating for the environment?

Rose examines this issue. She describes market failure as occurring “where Adam Smith’s invisible hand fails to guide privately owned resources to their socially optimal uses, most often because some individuals have interests that are left out of the market transactions.”²⁴³ Market failures will result in instances where preferences are not expressed completely through market transactions, where a natural monopoly is ideal, or where investment is unattractive to private individuals because non-investing users cannot be excluded from enjoying the benefits of the investment.²⁴⁴ The inability of the environment to be included in market transactions without government intervention or government ownership of property rights indicates that, as explored further in chapter 4, legislators should have scrutinized private property rights in carbon assets prior to their creation as these property rights, in a free-market, will result in market failure.

²³⁹ *Ibid.* at 409.

²⁴⁰ *Ibid.* at 409.

²⁴¹ *Ibid.* at 409.

²⁴² Stiglitz, *supra* note 234 at 29.

²⁴³ Rose, *supra* note 94 at 109.

²⁴⁴ *Ibid.*

3.6 *Conclusion*

Private property in carbon assets is not justified by property theory. As seen in this chapter, when private property rights in carbon assets are used in the carbon market, they pervert the market, preventing the market from achieving desired outcomes. Policies which advance unjustified property rights or inaccurately describe property rights will not be successful as the property rights will not function as predicted and desired.

Utilitarian arguments which justify private property are not able to do so for carbon. Utilitarian arguments are unable to demonstrate how private property in carbon assets will achieve the greatest good. These arguments fail to take into account the numerous reasons for the existence of climate change and the need for a locational and land manager focused approach to encouraging sustainable investment in carbon sequestration. There is no one-size-fits-all scheme which will mitigate the effects of climate change: a program which successfully encourages investment in carbon sequestration on agricultural land in Saskatchewan will not be useful to promote forest retention in Africa.

Both the personal self-assertion and special rights theories of property justify the holding of carbon assets as something other than private property. Personal self-assertion rejects private property rights in carbon assets because of the potential for these rights to interfere with land rights, land rights being connected to human development and the achievement of personhood. Special rights theories justify either non-property or common property in carbon assets, as this is the way in which carbon assets have historically been held.

Economic theory justifies private property rights in a resource to protect the resource from competition and to encourage investment in the resource. As carbon assets are not scarce, there is no reason to protect this resource from competition. If anything, society wants to encourage as many people as possible to take advantage of the process of photosynthesis to sequester atmospheric carbon. Further, the economic theory for justifying private property rights is unable to encourage investment in the resource as there is little inherent value in carbon as mere carbon compared to carbon as a component of a marketable commodity, such as lumber.

The rights-based doctrine of first occupancy and the common law of first possession are unable to justify property rights in any type of resource, including carbon assets, as they are in essence theories of allocation. The rights-based theory of labour, however, gives us reason to pause. Some aspects of justifying private property in carbon assets based on the labour theory

seem to work; private property rights (with associated economic value) create an incentive for private persons to invest in carbon sinks on privately held land. Private property rights in carbon assets also encourage land managers to consider the consequences of their land management decisions on the carbon cycle. Market failures, however, have created a situation in which business-as-usual activities are able to create private property in carbon assets, thus a windfall for persons awarded carbon property rights at the expense of the success of carbon policies.

Yet, even with property theory unable to provide any sound justification for property rights in carbon assets, legislators have and are creating property rights in carbon assets to be used in a carbon market. These carbon markets are, as property theory predicts, failing. Instead of abandoning the idea of private property in carbon assets, legislators are attempting to solve the problems the markets are experiencing while retaining private property in carbon assets. Chapter 4 will show that carbon markets using property rights in carbon assets cannot be repaired as the property on which these markets are based is flawed.

CHAPTER 4: PROPERTY RIGHTS DISTORT THE ISSUES

4.0 Introduction

This thesis has found that the creation of private property rights in natural cycles, including the carbon cycle, is inappropriate. However, because human interference prevents the carbon cycle from existing naturally and because legislators desire to manipulate the carbon cycle to achieve climate change goals, this thesis re-examines whether there is a justification of private property which is capable of justifying private property rights in carbon assets. Every justification of private property is rejected except the rights-based theory of labour, which, in principle, shows promise. The theory of labour is ultimately rejected as a justification of private property in carbon assets because of documented offset market failures. Chapter 4 now questions whether, if the perfect market existed, private property rights in carbon assets would be acceptable. This chapter concludes that it is not the market that prevents legitimacy of property rights in carbon assets, but that it is the property rights themselves that are flawed.

Economists occasionally consider the role of property in achieving perfect competition. Rittenberg and Tregarthen, for example, identify the required characteristics of property rights in a market as:²⁴⁵

1. Property rights must be exclusive (or, the owner of a property right must have the ability to prevent others from using the property right); and,
2. Property rights must be transferable.

Yet, economists do not question the existence or legitimacy of private property. Instead, economic theory presumes that every resource can be the subject of private property rights.²⁴⁶ Private property rights in a resource are only controversial when there is a market failure,²⁴⁷ which, as shown in chapter 3, exists in the case of carbon assets. This thesis rejects the presumption that property can exist in any resource – property rights are only acceptable when legitimate.

Determining the legitimacy of private property rights in a resource is separate and distinct from whether a perfect market can and/or does exist in a resource. More explicitly, just because

²⁴⁵ Libby Rittenberg and Timothy Tregarthen, *Principles of Microeconomics* (Nyack, NY: Flat World Knowledge, 2008) at 150.

²⁴⁶ Ruffin, *supra* note 154 at 62.

²⁴⁷ Rose, *supra* note 94.

property can theoretically be created in any resource does not mean that property should be created in every resource and/or that property rights are sustainable in every resource. As already explored in chapter 2, the property rights must be definable, identifiable, assumable and controllable for the property rights to exist.²⁴⁸ Further, the subject of those property rights must be physically, legally and morally excludable.²⁴⁹

An extreme example of an instance where property rights are not appropriate, even when every condition of a perfect market exists, is property rights in kidnapped children. It is conceivable that a market in kidnapped children could be created which allows for perfect competition, no externalities, no information asymmetries, and no public goods, yet it would be morally outrageous to allow this property to be created. Apart from the issues of recognizing property rights in humans, parents would live in constant fear that their child would be kidnapped and sold to individuals who desire a child for any variety of reasons, such as inexpensive labour or human affection. In this market, kidnappers would personally profit from their morally reprehensible actions and the most successful kidnappers would be those that could identify and obtain prized characteristics in children, a weird test for success as defined by the market.

In the case of private property rights in carbon assets, analogous to property rights in kidnapped children, it is the recognition of the property rights, rather than the existence or non-existence of the conditions for a perfect market, that is the problem. To prove this statement, this chapter begins by examining the legal effectiveness of private property rights in carbon assets. The chapter also looks at how property in carbon assets distorts issues and relationships, whether property rights can accomplish the multiple, competing objectives they have been created to achieve, how the inherent rigidity and boundaries of property law will harm carbon policies, and the inability of legislators to control carbon policies which rely on a carbon offset market.

Theorists and economists are examining how carbon markets using private property in carbon assets can be “tinkered with” in a way which will result in their success.²⁵⁰ This chapter will show that success of carbon markets and carbon policies will not be achieved by restructuring markets relying on private property in carbon assets. Instead, offset markets relying

²⁴⁸ *National Provincial Bank Ltd. v. Ainsworth*, *supra* note 63.

²⁴⁹ Gray, *supra* note 58.

²⁵⁰ See, for example, Kennett, *supra* note 4 at 174, Boydell, *supra* note 28, and Gilbertson, *supra* note 11 at 89.

on private property in carbon must be wholly abandoned and resources redistributed for society's climate change policies to be successful.

4.1 Legitimacy of Property Rights

Using Bentham's subordinate ends of subsistence, equality, abundance, and security, this section demonstrates why property theory is unable to justify the creation of private property rights in carbon assets; these property rights are contrary to society's social, legal, administrative, and environmental goals. Property rights in carbon assets jeopardize security of food and food production, complicate land tenure, and are administratively wasteful. Ultimately, success is more likely to occur when carbon assets are held publically rather than privately.

This section looks at whether, in a way which promotes subsistence, equality, abundance, and security, a private property distribution of rights and obligations in carbon assets is able to achieve:

- the social goal of not threatening security or abundance of food and food production;
- the legal goal of not complicating land tenure;
- the administrative goal of receiving a satisfactory return on society's financial investment; and,
- the environmental goal of increasing the amount of carbon sequestered in biomass and soil organic content.

In addition to the environmental, social, legal, and administrative goals identified above, there are many other societal goals which could be examined to determine whether the existence of private property in carbon assets is justified. For example, instead of exploring the legal goal of not complicating land tenure, this thesis could have chosen to explore whether property rights in carbon assets can be integrated with existing laws and policies, whether carbon property is accessible, whether property rights in carbon assets are of a nature that they can be sufficiently legally protected, and whether, because of the assumed *sui generis* nature of carbon assets, the rights can be implemented rapidly enough to meet the environmental goals of society. Security of food, not complicating land tenure, receiving a satisfactory return on society's financial investments, and increasing the amount of carbon sequestered in biomass are among some of the most significant concerns we should have when considering whether private property in carbon

assets is justifiable. As seen below, the goals chosen for analysis are also a good starting point to the discussion of the practical implications of creating private property rights in carbon assets.

This thesis uses the work of Bentham to set out an objective standard against which to evaluate the appropriateness of private property rights in carbon assets. Bentham's work is considered influential as he recognized that legal effectiveness, rather than divine commandments, societal mores, or human rights, is the foundation of all laws. This thesis takes the same approach: for a policy or law to achieve social, administrative, and environmental goals, that policy or law must foremost be able to achieve its intended results.

4.1.1 Bentham

Bentham held that legislators' goal should be "the greatest happiness of the greatest number of the individuals belonging to the community in question".²⁵¹ As Bentham found the "greatest happiness" to be indeterminable, he proposed the happiness of the commons is to be advanced by the subordinate ends of subsistence, abundance, equality, and security.²⁵² Bentham's subordinate ends are not equal; security is the pre-eminent object because subsistence, abundance, and equality are all measured in the present moment whereas security takes into account the present as well as the future.²⁵³ Further, Bentham holds equity to be less favoured than subsistence and abundance.²⁵⁴

Subsistence is achieved when citizens possess at least the minimum necessities for survival. Bentham asks what the law can do for subsistence, and answers: "Nothing directly. All it can do is to create motives, that is, punishments or rewards, by the force of which men may be led to provide subsistence for themselves."²⁵⁵ Abundance is the acquisition of goods above the level of subsistence. Bentham held that laws do not have to be made requiring individuals to strive for property greater than subsistence, but instead abundance will occur if the government does nothing except provide protection for private property and industry.²⁵⁶

²⁵¹ Jeremy Bentham, "Pannomial Fragments" in Mary Peter Mack, ed., *A Bentham Reader* (New York: Pegasus, 1969).

²⁵² Jeremy Bentham, "Security and Equality of Property" as excerpted in C.B. MacPherson, *Property: Mainstream and Critical Positions* (Toronto: University of Toronto Press, 1978) at 41.

²⁵³ *Ibid.* at 42.

²⁵⁴ *Ibid.* at 43.

²⁵⁵ *Ibid.* at 44 [emphasis removed].

²⁵⁶ James Steintrager, "Bentham" (London: Allen & Unwin, 1977) at 72.

Law creates security. Security is the protection of life and property by the law. In reference to Bentham's ideas on security, Steintrager states: "the principal task of government is to see that individuals do not threaten each other's life or invade each other's property; and government itself must not take any unwarranted action which would threaten life or property."²⁵⁷ Security must be the utmost goal as subsistence and abundance cannot exist without security: "Law does not say to man, *Labour, and I will reward you*; but it says: *Labour, and I will assure you the enjoyment of the fruits of your labour – that natural and sufficient recompense which without me you cannot preserve; I will insure it by arresting the hand which may seek to ravish it from you.*"²⁵⁸ Equality is also connected to security: "the only equality which can exist in a [state without law] is an equality of misery".²⁵⁹

This thesis uses Bentham's subordinate ends as a reference for what legislative or public policy concerns should be in relation to property in carbon assets, but does not advance the views of Bentham as a whole. For example, Bentham attempts to show in various writings that protecting limitless private property and a free market results in the greatest happiness.²⁶⁰ Yet, this thesis finds that private property is not appropriate for carbon assets. Thus, while equality, subsistence, abundance and security will be recurring themes throughout this chapter, the conclusion ultimately reached does not necessarily conform to Bentham's ultimate opinion that limitless private property and a free market is best for society.

a. *Security of Food*

As seen in the rights-based sections, rights-based theorists strongly argue that legal rules must exist which ensure that individuals can access the resources needed for their survival. Some theorists even contend that individuals have the right to those resources needed for survival.²⁶¹ In any case, legislators must always be aware of how policies influence the ability of the earth's seven billion individuals to attain at least the minimum necessities for subsistence.²⁶² As carbon

²⁵⁷ *Ibid.* at 68.

²⁵⁸ Bentham, *supra* note 252 at 50 [emphasis in original].

²⁵⁹ Bentham, *supra* note 252 at 49.

²⁶⁰ Steintrager, *supra* note 256 at 66-67, 72.

²⁶¹ See, for example, the work of Marx, Aristotle, Plato, Harsanyi, Bergson, Samuelson, originalist Christian theorists, and welfare economic theorists.

²⁶² Department of Economic and Social Affairs, "World to Welcome Seven Billionth Citizens" (New York, October 31, 2011), online: United Nations <<http://www.un.org/en/development/desa/news/population/world-to-welcome-seven-billionth-citizen.html>>.

sequestration policies influence the use of scarce arable land, the legal framework associated with carbon assets must balance food production with carbon sequestration goals.

The Food and Agriculture Organization of the United Nations recognizes that agroforestry tends to sequester greater quantities of carbon than agricultural production.²⁶³ Although there are valuable incidental benefits of agriforestry, such as improved farm family livelihoods and climate change adaptation,²⁶⁴ agriforestry can and does remove land from food production. For example, the Food and Agriculture Organization notes that there are, at present, several examples of private companies investing in agroforestry on private land in exchange for carbon benefits.²⁶⁵ Encouraging agroforestry will impact the amount of arable land remaining for agriculture.²⁶⁶

Arable land is a finite resource which must be put to its best use to support the world's population. When carbon assets are privatized, the market will continue to determine how scarce land will be used, usually with reference to what is most economically advantageous. If agroforestry becomes more profitable than growing corn because of the existence of carbon offsets, arable land will be removed from food production because most land managers will maximize their economic return.²⁶⁷ Care must be taken that "economic productivity", as influenced by sale of property rights in carbon, does not interfere with the best use of land (from an overall, societal perspective).

In addition to the amount of land available for crop production, carbon sequestration may also dictate a land manager's use of her land. An argument has been made that property rights in carbon will act like an agricultural or agroforestry subsidy and be economically profitable to land managers.²⁶⁸ However, assigning property rights to carbon to empower land managers creates immediate economic benefits for land managers, but has the potential to result in long term

²⁶³ Platform for Agrobiodiversity Research, "Biodiversity for Food and Agriculture: Contributing to food security and sustainability in a changing world" (2011), online: Food and Agriculture Organization of the United Nations and the Platform for Agrobiodiversity Research <http://agrobiodiversityplatform.org/files/2011/04/PAR-FAO-book_lr.pdf> at 34.

²⁶⁴ *Ibid.* at 34.

²⁶⁵ *Ibid.* at 34.

²⁶⁶ Currently, 30 percent of the world's surface is covered by forests, compared to 50 percent 8,000 years ago. Previously forested land is assumed to be suitable for return to agroforestry (Stern, *supra* note 20 at 544).

²⁶⁷ An argument can be made that if land is used for agroforestry, the price of corn will rise and a balance will be reached, maximizing the beneficial use of the land. This argument is valid, and could potentially prevent access to corn as food because of the increase in price. See section 4.1.1 (a) of this thesis for a further discussion of this issue.

²⁶⁸ Hager, *supra* note 9.

oppression.²⁶⁹ The short-term economic agricultural subsidy obtained from entering into conservation easements or selling property rights in carbon sinks may result in long-term obligations which create inequality between the land manager and the holder of the carbon right and potentially threaten that land manager's subsistence. For example, once the land manager transfers her carbon rights, the purchaser of the new carbon rights holder may have the ability to dictate the land manager's use of her land. A producer that converts cropland to perennial cover to obtain carbon credits (or another form of recognition of her interest in carbon property) and who subsequently sells these carbon credits may be forced to retain the perennial cover under the sales agreement even though returning the land to crop would be more economically advantageous.²⁷⁰ Further, if the obligation to retain perennial cover runs with the land, the new owner of the land will also be burdened.

Because of carbon property rights encouraging the removal of arable land from agricultural production, and because carbon rights have the potential to interfere with land managers' use of their land, carbon property has the potential to influence the price of food. Carbon rights may increase the price of food, thereby increasing the amount of money an individual requires to meet her basic needs. As seen by the demand for corn for ethanol production, the price of corn in the United States rose by more than 50 percent between April 2007 and April 2008.²⁷¹ The increase in the price of corn consequently increased the demand for cropland and the price of animal feed. In turn, the price increase of many farm commodities in the United States, such as soybeans, meat, poultry, and dairy products, were directly linked to the use of corn for ethanol production.²⁷² Land previously used to grow soybeans was used to produce corn for ethanol production instead.²⁷³ Further, as corn can be used to feed animals, animal producers had to secure another type of animal feed or compete with ethanol producers to obtain corn.²⁷⁴ The same outcome may be predicted for carbon. If agricultural land is converted to agroforestry land because pursuing carbon rights is more economically efficient than

²⁶⁹ See, for example, Margaret Jane Radin, "Market Inalienability" (1987) 100 *Harv. L. Rev.* 1849.

²⁷⁰ It appears at this time that a landowner that sells carbon credits is required to maintain the carbon sink through the term of the project, grant a conservation easement over the land, and/or transfer the land to a public trust. See, for example, the Chicago Climate Exchange, *supra* note 136.

²⁷¹ Congressional Budget Office, "The Impact of Ethanol Use on Food Prices and Greenhouse-Gas Emissions" (April 1, 2009), online: <<http://www.cbo.gov/ftpdocs/100xx/doc10057/04-08-Ethanol.pdf>>.

²⁷² *Ibid.*

²⁷³ *Ibid.*

²⁷⁴ *Ibid.*

producing food, the reduction in food production will consequently decrease the supply of food and increase its cost.²⁷⁵

Private property rights in carbon assets have the potential to interfere with the land available on which to produce food, the price of food, and the land management activities of food producers. The question asked in this section is whether commoditization of carbon assets is worth jeopardizing subsistence and security of food. In the case of carbon assets, this risk is unjustifiable. Further, as seen later in this chapter, environmental success will likely be greater if private property rights do not exist in carbon assets.

b. Private Property in Carbon will Complicate Land Tenure

Takacs argues that for forest carbon projects to be effective, the associated property rights must run with the land.²⁷⁶ However, property rights in carbon which run with the land will only be accepted if they do not excessively offend security of land tenure.

Incorporeal property rights in carbon assets give the rights holder some control over land use decisions,²⁷⁷ allowing the rights holder to manage the land in or on which the carbon sink is located to maximize the legal, environmental, and economic benefits of the carbon property right. For example, the Australian state of New South Wales created a *profit à prendre* in forestry rights, which may mean “a carbon sequestration right in respect of the land”, which can be registered on both freehold land²⁷⁸ and leasehold land²⁷⁹ entitling the interest holder:

- (i) to enter the land and establish, maintain and harvest (or to maintain and harvest) a crop of trees on the land, or
- (ii) to enter the land and establish, maintain and harvest (or to maintain and harvest) a crop of trees on the land and to construct and use such buildings, works and facilities as may be necessary or convenient to enable the person to establish, maintain and harvest the crop, ...²⁸⁰

Interests in real property and other interests registerable on land title have the potential to complicate land tenure and threaten security of land use. Yet, registering carbon property rights in land registry systems is required to provide security of legal rights and environmental benefits.

²⁷⁵ This statement is based upon the simple economic theory of price being a factor of supply and demand.

²⁷⁶ David Takacs, “Forest Carbon: Law & Property Rights” (Conservation International: Arlington, 2009) at 8.

²⁷⁷ *Ibid.* at 8.

²⁷⁸ Land owned by persons outright.

²⁷⁹ Land persons lease from the government.

²⁸⁰ *Conveyancing Act 1919* (N.S.W.), s. 87A.

For example, in relation to New South Wales' property rights in carbon examined above, since Australian law presumes those who own land also own all resources on it, including soil and trees, registration is necessary to separate property rights in carbon assets from property rights in land.²⁸¹ Further, the New South Wales' carbon rights holder will have, through registration, clearly defined and announced to the world her carbon rights, providing protection against subsequent land owners from encroaching on her rights. In addition to registered incorporeal rights in carbon assets providing security to carbon rights holders, real property interests in carbon assets promote environmental subsistence; once an interest is created in a carbon sink, should the land be sold, the new land owner would be required to respect the interest.

Although the categories of interests in land are not closed, the creation of new interests in land is carefully controlled by the courts.²⁸² In 1834, *Keppel v. Bailey* ruled against the development of new and unusual estates in, and burdens upon, land.²⁸³ The Court held: "great detriment would arise and much confusion of rights [would ensue] if parties were allowed to invent new modes of holding and enjoying real property."²⁸⁴ Instead, courts recognize a limited number of carefully regulated interests in land pursuant to the doctrine of *numerous clausus*, Latin for "closed number".²⁸⁵ A modern day example of the court continuing to limit interests which burden land is *Durham Condominium Corporation No. 123 v. Amberwood Investments Ltd.*²⁸⁶ The Ontario Court of Appeal held that positive covenants contained in reciprocal easements and cost sharing agreements are unenforceable when the ownership of land changes.²⁸⁷

If property rights in carbon assets are to run with the land, they will likely be in the form of a *sui generis* interest.²⁸⁸ For example, although the Australian states of South Wales, South

²⁸¹ Takacs, *supra* note 276 at 29.

²⁸² Ziff, *supra* note 5 at 77.

²⁸² *Ibid.* at 53.

²⁸³ *Keppel v. Bailey* (1834), 2 MyL. & K. 517, 39 E.R. 1042 (Ch.D.).

²⁸⁴ *Ibid.*

²⁸⁵ Ziff, *supra* note 5 at 77.

²⁸⁵ *Ibid.* at 53-54.

²⁸⁶ *Durham Condominium Corporation No. 123 v. Amberwood Investments Ltd.* (2002), 58 O.R. (3rd) 471.

²⁸⁷ Negative or "restrictive" covenants are, however, accepted by Canadian law.

²⁸⁸ Hepburn, *supra* note 11. Hepburn defines "carbon right" as "a new and unique form of land interest that confers upon the holder a right to the incorporeal benefit of carbon sequestration on a piece of forested land." Hepburn notes that while Australia has taken innovative legislative approaches to separate the benefits of carbon sequestration from rights flowing from land ownership, there is "the perceived need to connect carbon rights to the institutional common law framework." Hepburn quickly dismisses appropriateness of the three forms of incorporeal land interests, easements, profits à prendre, and covenants, to describe the nature of a carbon right. For example, carbon

Australia, Tansmania, and Queensland categorize a right to sequestered carbon as a *profit à prendre*, using this common law concept is inaccurate. While a *profit à prendre* gives a rights holder the right to take something from another's land, such as crops, timber, soil, minerals or animals on the land, sequestration involves putting carbon into the land.²⁸⁹ Whatever form the *sui generis* carbon property interest takes, the interest must not offend the rational for the *numerous clauses* principle: 1) that the new interest does not increase information costs, including those associated with the acquisition of real property; and, 2) that the new interest does not create an anticommons problem, where the existence of numerous right-holders in the same *res* prevents the efficient use of the *res*.²⁹⁰ Ziff also suggests a further rational for the *numerous clauses* principle is that property rights are difficult to abolish once created.²⁹¹

In the tragedy of the anticommons,²⁹² too many property interests in land can fracture property right entitlements and can paralyze the use of the land. As seen by the splintering of property rights in post-communist Moscow, storefronts remained empty while street kiosks were abundant.²⁹³ So many individuals had property rights in each storefront that a transactional gridlock occurred.²⁹⁴ No one person could control the use of the asset or resource, preventing its efficient use or any use at all. Thus, while right holders bickered about the way in which the asset/resource would be used, it remained unused even though the storefronts were in great demand. One need not be very imaginative to analogize the creation of additional carbon-based property rights in land with the storefront anticommons. Should carbon property run with the land, the property rights holder has the ability to permanently hinder or even separate the land

rights are not profits à prendre as, contrary to the traditional concept, carbon rights are not about taking, but storage and commercial benefits flowing from such storage. Easements are inaccurate to describe carbon rights as they are "an incorporeal interest which is attached to the land but separate from it."

²⁸⁹ Australian Greenhouse Office, "Planning Forest Sink Project: A Guide to Legal, Taxation and Contractual Issues" (2005), online: Commonwealth of Australia <<http://www.climatechange.gov.au/land/forestsinks-planning.html>>.

²⁹⁰ Ziff, *supra* note 5 at 77.

²⁹⁰ *Ibid.* at 53-54.

²⁹¹ *Ibid.* at 77.

²⁹¹ *Ibid.* at 19.

²⁹² The tragedy of the anticommons is a play on Garrett Hardin's Tragedy of the Commons. While property failure occurs in the tragedy of the anticommons from too many private property interests in the same resource, property failure occurs in the tragedy of the commons when there are insufficient private property rights holders or insufficient regulation in common property resources.

²⁹³ Ziff, *supra* note 5 at 77.

²⁹³ *Ibid.* at 19.

²⁹⁴ *Ibid.* at 77.

²⁹⁴ *Ibid.* at 19.

manager from land management decisions. When a forest matures, and thus does not have the ability to sequester further carbon or create further carbon credits, the land manager will not be able to generate income from carbon credits and, as restricted by carbon rights, may not be able to otherwise deal with the land. Unless the land manager holds the carbon property rights in the forest or the carbon rights holder allows her property rights to be purchased or destroyed, the land manager will have no options – he cannot use the forest in a way which damages the carbon property rights, thus may not sell timber from the land or put the land to alternate use. Further, it is unlikely the land manager will be able to sell unprofitable land. Thus, the land manager will be required to pay property taxes on land for which the use and the prospect for development remain frozen.

Yet, conservation easements,²⁹⁵ which can be described as being positive covenants which fracture land rights, are currently accepted in nine of Canada’s ten provinces.²⁹⁶ Under the bundle-of-rights theory, numerous persons can have different rights in the same object of property, in this case land.²⁹⁷ The existence of conservation easements demonstrate that environmental encumbrances can be registered against real property in a way which does not always prevent security of land rights.

As the conservation easement is able to protect, conserve, and enhance the environment,²⁹⁸ a similar, *sui generis*, property interest would be appropriate to protect carbon projects. Thus, while incorporeal rights in carbon assets may complicate land tenure, they need not threaten security of land rights to any greater extent than conservation easements. Security of land rights is not always put into risk by the creation of private property in carbon assets.

²⁹⁵ Arlene J. Kwasniak, “Conservation Easements: Pluses and Pitfalls, Generally and for Municipalities” 46(3) *Alta. L. Rev.* 651 at 655. Generally, conservation easements in Canada have the following features:

- The right of a landowner (the “grantor”) to grant an interest in all or part of their property to specified qualified holders (the “grantee”) for purposes set out in the legislation.
- The express removal of all or many of the common law requirements and limitations noted above for similar partial interests in land, such as restrictive covenants and easements.
- Provisions stating that the interest runs with the land and accordingly binds future owners, and may be terminated only in specified circumstances.
- The anticipation or requirement that the interest be registered at the appropriate land titles or land registry office.

²⁹⁶ *Land Title Act*, R.S.B.C. 1996, c. 250 at s. 219(3); *Environmental Protection and Enhancement Act*, R.S.A. 2000, c. E-12 at ss. 22-24; *Conservation Easements Act*, S.S. 1996, c. C-27.01; *The Conservation Agreement Act*, C.C.S.M. c. C173; *Conservation Land Act*, R.S.O. 1990, c. C28; *Natural Heritage Conservation Act*, R.S.Q. c. C-61.01; *Conservation Easement Act*, S.N.B. 1998, c. C-16.3; *Conservation Easements Act*, S.N.S. 2001, c. 28; *Natural Areas Protection Act*, R.S.P.E.I. 1988, c. N-2; *Environment Act*, R.S.Y. 2002, c. 76, ss. 76-80.

²⁹⁷ Singer, *supra* note 6 at 10.

²⁹⁸ *Environmental Protection and Enhancement Act*, R.S.A. 2000, c. E-12.

c. *Not achieving administrative goals*

Resources earmarked for environmental projects are limited. As such, those resources must be used in such a way as to achieve optimum results. Administrative goals in relation to private property in carbon assets will only be achieved when society receives a satisfactory return on its financial investment.²⁹⁹

Creating private property in carbon assets will, if the property is to be recognized and have value, require the creation of a regulatory system for administration and enforcement. Regulatory systems generate costs, which require the expenditure of resources. In most cases, regulatory systems governing market transactions are state sponsored.³⁰⁰ For example, even where some transaction costs are borne by individuals, criminal laws guard against theft and fraud and civil courts enforce contracts. An additional administrative burden facing property in carbon which is not experienced by other resources is the necessity for government intervention to occur to artificially create scarcity and value in carbon, as previously discussed.

It is difficult to predict the cost of a private property regulatory scheme in carbon assets. However, by examining other regulatory systems which currently exist in Canada, it is easy to come to the conclusion that governments must be willing to expend significant resources to recognize and administer private property in carbon assets.

A relatively simple registry system, the Alberta land titles system, costs about \$15 million per year to administer.³⁰¹ This figure would be lower than the costs of administering a carbon scheme. First, the \$15 million per year figure provided only takes into account the costs of administrative operating expenses. The amount does not include the costs of establishing standards or enforcing property rights. Second, the Alberta land registration system has existed since 1910,³⁰² and thus has had over a hundred years to evolve to maximize efficiency; land in the province has been previously surveyed and well defined rules exist. Finally, compared to a carbon property scheme, the land titles system is relatively easy to administer. A carbon

²⁹⁹ See, for example, Ronald Coase, "The Problem of Social Cost" (October, 1960) 3 *Journal of Law and Economics* 1. Private property is only created when justified by a cost-benefit analysis.

³⁰⁰ Ziff, *supra* note 5 at 77.

³⁰⁰ *Ibid.* at 16.

³⁰¹ *Service Alberta 2007-8 Annual Report* (Edmonton: Queen's Printer, 2008), online: <http://www.servicealberta.ca/pdf/annual/SA_Annual_Report_07-08.pdf> at 70.

³⁰² Alberta Land Surveyors' Association, "Alberta's Land Surveying History: 1905 – The Birth of Alberta", online: <http://www.landsurveyinghistory.ab.ca/alsastory/Association_Story-1905.htm>.

regulatory system will be more complicated as uncertainty will exist in the creation, quantification, continuance, transfer and enforcement of carbon rights. As just one example, the amount of sequestration which occurs in an agroforestry project depends on the density of vegetation, age and type of the trees, and the type of soils – none of which are relevant in a land titles system.³⁰³

The Government of Canada's Long-Gun Registry is also informative of the possible cost of a carbon property scheme. The long-gun program is intended to control the acquisition, possession and ownership of firearms, regulate certain types of firearms, prevent the misuse of firearms, and help law enforcement agencies prevent and investigate firearm crimes.³⁰⁴ When introduced in 1995, the Liberal government projected a long-gun registry would involve a net cost of \$2 million.³⁰⁵ In 2001, the program cost \$200 million annually to administer.³⁰⁶ By the summer of 2006, the costs of the registry exceeded \$1 billion.³⁰⁷ The \$1 billion figure does not include the costs of provincial enforcement or the costs of firearms owners and businesses to comply with the legislation.³⁰⁸ Like the long-gun registry and all new registries, the implementation of a carbon property scheme would require a negotiation for the assignment of rights, the creation of appropriate standards and institutions, costs for initial documentation, and costs related to compliance and enforcement.

Compared to the annual investment government would be required to make in administering private property in carbon, public resources may be better used in a one-time contribution to a lasting, scientifically-directed project. For example, the \$74 million program investment the Government of Canada made in the Permanent Cover Program, described further in chapter 5 as an alternative to the creation of private property in carbon assets, not only achieved numerous environmental goals, but returned carbon benefits with an estimated value of \$72 - \$362 million.³⁰⁹

³⁰³ Stern, *supra* note 20 at 548.

³⁰⁴ Public Safety Canada, *The Long-Gun Registry: Costs and Crime Statistics*, November 16, 2007, online: Government of Canada <<http://www.publicsafety.gc.ca/media/nr/2007/nr20071116-2-eng.aspx>>.

³⁰⁵ *Auditor General's Report 2002* (December 03, 2002), online: Office of the Auditor General of Canada <http://www.oag-bvg.gc.ca/internet/English/parl_oag_200212_e_1130.html> at Chapter 10.

³⁰⁶ Public Safety Canada, *supra* note 304.

³⁰⁷ *Auditor General's Report 2006*, (May 16, 2006), online: Office of the Auditor General of Canada <http://www.oag-bvg.gc.ca/internet/English/parl_oag_200605_04_e_14961.html> at Chapter 4.

³⁰⁸ Public Safety Canada, *supra* note 304.

³⁰⁹ G.M. Luciuk, M.A. Bonneau, D.M. Boyle and E. Viberg, Agriculture and Agri-Food Canada, "Carbon Sequestration – Additional Environmental Benefits of Forages in the Prairie Farm Rehabilitation Administration

In addition, it is anticipated that the transaction costs associated with carbon assets will be high relative to the value of the sequestered carbon.³¹⁰ For example, apart from the costs of the regulatory system, IntercontinentalExchange, which currently conducts about 90 percent of the world's on-exchange emission trading, charges €3.50 per trade for the most common emissions contract.³¹¹ Environmental or economic results from private property in carbon assets will be required to justify the regulatory system and transactional costs. However, as seen in the next section, private property in carbon assets is unable to achieve the environmental results we require. Therefore, the money directed towards administering private property in carbon assets, which could be better used, will be misspent.

d. Not Achieving Environmental Goals

An examination of environmental degradation in the Western United States shows that privatization of carbon may not be the answer to promoting, conserving, or rehabilitating carbon assets. Distributing property rights in a way which encourages beneficial, rather than destructive, labour consequently promotes environmental subsistence and abundance. Researchers found that publically owned property best achieves environmental subsistence and abundance; private property owners were more likely to damage and less likely to promote recovery of the environment than public management because private property owners were more concerned about profits than environmental sustainability.³¹²

The American West is an interesting case study. Pasture lands cover several hundred million acres and, therefore, considerable potential exists for the generation of wealth from livestock farming. When the West was being settled, American governments had two options: 1) giving or selling the public range to private individuals; or, 2) retaining the range as federal property.³¹³

Permanent Cover Program" (August, 2007), online: Government of Canada <<http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1187979341393&lang=eng>>.

³¹⁰ Kennett, *supra* note 4 at 193. See also the CCX.

³¹¹ "Carbon Market: there's still time" *Financial Times* (February 14, 2012), online: The Globe and Mail <<http://www.theglobeandmail.com/report-on-business/international-news/global-exchange/financial-times/carbon-market-theres-still-time/article2337453/>>.

³¹² Donald Worster, "Cowboy Ecology," in *Under Western Skies: Nature and History in the American West* (Oxford: Oxford University Press, 1992) at 34-52.

³¹³ I note that the American government outright rejected the tradition of Old World pastoralism.

Those who supported the privatization of the American West argued that privatization would avoid the irresponsible free-for-all of the 1880s and would give landowners the incentive to better manage the land, particularly by building fences. It was claimed that fences were vital to environment sustainability as fences would keep livestock out of areas that needed to recover, and would reduce erosion, depletion, and weedy invasion. Privatization, it was thought, would yield a higher economic return from the land while simultaneously leaving the environment healthier and more productive.³¹⁴

Those who supported the rangeland being held by the government felt that the commons had a right to hold this land collectively. They argued that the land had been acquired at the price of considerable blood money by the federal government on behalf of all the American people, and thus should remain public. Further, public ownership would ensure the greatest return for the greatest number of people. Those who argued for the land to remain collective property foreshadowed Worster's conclusions: "the private entrepreneur simply could not be trusted to look out for the long-term ecological health of the range resource. He would tend to exploit rather than conserve it; making the pastures private would not be a reliable way to protect them for posterity. A better solution would be to create a centralized bureaucracy of disinterested, scientifically trained professionals to oversee the public range."³¹⁵

A combination of property ownership was created in the American West in which the government and private individuals owned different portions of the land. Generally, settlers chose the best land for their homesteads and the remainder, being the poor land, was left to public ownership. Worster cited a Michael Loring and John Workman study which compared range conditions on private and public land in a northeastern county of Utah. They found that 13 percent of Forest Service acres were in excellent condition, compared to 4 percent of Bureau of Land Management Lands, and only 2 percent of private lands.³¹⁶ They also found that 29 percent of non-federal lands were classified as poor, compared with only 14 percent of Forest Service lands and 16 percent of Bureau of Land Management lands.³¹⁷ Worster concluded that scientifically-trained, disinterested supervisors and public land tenure generally provided for

³¹⁴ Worster, *supra* note 312 at 42-3.

³¹⁵ *Ibid.* at 43.

³¹⁶ *Ibid.* at 49.

³¹⁷ *Ibid.* at 49.

better protection of the range environment than private ownership.³¹⁸ “The completely laissez-faire economy, the system in which private property is regarded as a moral absolute and individual greed is allowed to go unchecked, has amply demonstrated its destructive energies.”³¹⁹

Worster’s analysis of the American West found that the private individual is unwilling to allow for healing of lands as rehabilitation or reclamation efforts often decrease profits in the short-term. Ziff sets out additional reasons for why environmental policy requires a collaborative approach:³²⁰

the internalization of environmental burdens is rarely, if ever, perfect. That is because the boundaries of privately owned lands cannot track perfectly all of the ecosystems within that physical space. A given landowner might wish to clear land for cultivation; all of the neighbouring owners might choose to do the same. Everyone might be perfectly entitled to do so, even though the upshot may be the destruction of a rich wildlife habitat, parcel-by-parcel. Without a coordinated approach, the natural environment is at the mercy of a large number of individual, self-interested, wealth-maximizing preference-seekers.

The United States government had the knowledge and financial security to prevent degradation and allow recovery of stressed lands. Carbon, like the American West, is a resource that requires a long-term plan and proper management. As such, because carbon sinks can be located on private land, a co-ordinated, scientifically promoted approach must be taken to ensure the environmental success of any carbon asset strategy.

Land owners would likely resist any direct interference with land management decisions; however, as explored further in chapter 5, education and incentive programs, such as the Permanent Cover Program, as well as making government programs such as Agrastability and advance payments under the *Agricultural Marketing Programs Act* dependent on implementing best management practices, are indirect ways for society to promote and protect carbon sinks on private land. Indirect ways to encourage carbon sequestration must be explored as creating private property in carbon is not encouraging environmental security.

³¹⁸ *Ibid.* at 49.

³¹⁹ *Ibid.* at 51.

³²⁰ Ziff, *supra* note 5 at 77.

³²⁰ *Ibid.* at 18.

4.2 *Property in Carbon Assets Distorts Relationships*

Property in carbon assets distorts issues and relationships. Instead of climate change being an environmental problem, the creation of private property in carbon assets makes climate change a property problem concerned primarily with the rights and obligations of property interest holders.

Issues are perceived and resolved on the basis of associated legal rights. For example, in *International News Service v. Associated Press*, the United States Supreme Court was asked to decide whether there was property in news.³²¹ International News Services obtained news stories collected by Associated Press and published these stories without attribution. In determining the question of whether news could be taken for use by another once appropriated, the Court first had to decide whether property should exist in news. The Court did this by assessing how property rules would influence legal relationships. On one hand, an individual who “has gathered general information or news at pains and expense” should have rights and entitlements.³²² On the other hand, “information respecting current events...is not the creation of the writer, but is a report of matters that ordinarily are *publici juris*”.³²³

Property creates rights and entitlements. Thus, if Associated Press was given property in the news, Associated Press could exclude others from its property and prevent the spread of knowledge of news.³²⁴ Contrarily, non-property in news allows everyone to become informed of current events.³²⁵ Ultimately, the Court decided that access to knowledge of current events is essential, and thus found that news was not an appropriate subject of property.³²⁶ A monopoly on a news event would restrict society’s access to information, and was thus deemed detrimental.³²⁷

If property is created in carbon assets, an emitter is able to legitimize her emissions by purchasing carbon offsets, changing the relationship between society and the emitter from disapproval to either neutrality or something even positive. Instead of focusing on the negative consequences of emissions, private property in carbon offsets alters societal thinking. Societal approval is given to those emitters who do not adopt lower-emissions technology, but who instead purchase offsets, whether or not the offsets have been created from business-as-usual

³²¹ *International News Service v. Associated Press* (1918), 248 U.S. 215.

³²² *Ibid.* at 248.

³²³ *Ibid.* at 247.

³²⁴ *Ibid.*

³²⁵ *Ibid.*

³²⁶ *Ibid.*

³²⁷ *Ibid.*

activities, as the emitter is seen as acting in an environmentally sustainable manner. Offsets also create a relationship between emitters and sequesters where one traditionally did not exist. This relationship, depending on the rights granted by the sequesterer, may be one of oppression if it interferes with land management decisions. Further, offsets have the potential to turn sequesterers into the “bad guys” of climate change. Should carbon credit contracts be breached because of a pest infestation or a forest fire, and carbon which was to be stored in the biotic sink is released, the responsibility for the increase in atmospheric carbon resides with the land manager who was unable to ensure the continued existence of the carbon sink.

But, most importantly, private property rights in carbon offsets change the way society views climate change. Climate change is not a property problem. Climate change will not be resolved or worsened depending on whether property interests in carbon assets are defined as *profits à prendre* or as easements. Viewing climate change as a property problem ignores the need for society to make structural and behavioural changes.

Property rights in carbon assets distract society from the real issues—how carbon emissions can be reduced and how climate change can be mitigated. Once property is created in carbon assets, disputes are resolved pursuant to property rules rather than sound environmental policy. Previously established property law – not designed for environmental concerns – has the potential to create perverse results such as legitimizing emissions and oppressing land managers who have previously engaged in sequestration activity. As in *International News Service v. Associated Press*, entitlements in carbon derived from property rights must be rejected to create the outcomes society desires – outcomes focused on environmental success rather than property rights.

4.3 Multiple, Competing Objectives

The creation of private property in carbon assets attempts to tackle three very different environmental issues and two different economic issues. The first environmental objective private property rights are attempting to achieve is the reduction and offsetting of emissions. As seen in section 3.3, offsets, however, are operating in a way which has the potential to allow for a net-increase in emissions. The second environmental objective is to create an incentive for land managers to invest in carbon sequestration. Yet, as seen in section 3.5.3, private property is more likely to reward business-as-usual activities than genuine sequestration projects as the price of

carbon is not high enough to result in land use change. Finally, the third environmental objective is the protection of carbon sinks. Prior to the creation of an offset market with associated rights in carbon assets, land use and land-use change in Canada was a net sink.³²⁸ This indicates that the business-as-usual activities of land managers are capable of protecting carbon sinks without property rights being created in carbon assets. Further, depending on the way property rights in carbon assets are structured, the purposeful destruction of sinks may allow entrepreneurs to benefit from the destruction of sinks and the creation of new sinks.

Apart from environmental benefits, one goal of the carbon markets may be to act as an economic stimulus while another may be to reduce the financial impact of environmental regulations on emitters. Carbon markets could be acting as an economic stimulus. In 2011, the total value of the global carbon market was estimated to be \$142 billion and the trading of carbon credits garnered returns for the individuals associated.³²⁹ This \$142 billion carbon market would not exist without the creation of private property rights in carbon assets. Further, an argument has been made that property rights in carbon could act like an agricultural or agroforestry subsidy and be economically profitable to land managers.³³⁰ The second economic goal, reducing the economic impact of environmental regulations, is also likely being achieved. For example, when President George H.W. Bush signed amendments to the *Clean Air Act* in 1990 to allow for the trading of credits, economists estimated it saved sulfur dioxide emitters billions of dollars while allowing them to meet their emissions targets.³³¹

It is interesting that the creation of private property in carbon assets may be meeting society's economic goals, while failing to achieve society's environmental goals. This is likely because environment and economic goals are in conflict. Climate change is the result of the market not internalizing the cost of environmental consequences in the price of transactions³³²—coal is used in production instead of wind-generated energy when coal is less expensive, even though coal causes greater environmental degradation than wind-generated energy. It is curious that global warming is described as “the greatest market failure the world has ever seen”,³³³ yet the approach to correcting this market failure is the creation of property rights in the carbon cycle

³²⁸ Canada's 2008 Greenhouse Gas Inventory, *supra* note 91 at 5.

³²⁹ Linacre, *supra* note 25 at 9.

³³⁰ Hager, *supra* note 9.

³³¹ Hilsenrath, *supra* note 106.

³³² Stern, *supra* note 20 at viii.

³³³ *Ibid.* at viii.

for use in the market. If economic values took precedence over environmental values to create climate change, it is unlikely the free-market will suddenly change its priorities to value environmental goals over economic goals. As seen by the European Union's Carbon Emissions Trading Market discussed later in this chapter, markets are primarily concerned with maximizing the economic returns of its participants, even when the result is to the detriment of the environment.

Taking the conflict between economic and environmental goals out of the mix, creating private property in carbon assets will not be able to attain all of the environmental goals it purports to be able to achieve. Protecting carbon sinks requires a different instrument than promoting carbon sequestration. Likewise, promoting carbon sequestration requires a different tool than reducing emissions.

While both protecting existing carbon sinks and encouraging carbon sequestration requires land managers to actively support whatever scheme is implemented, a different strategy is needed to protect carbon sinks than to encourage carbon sinks. This is because encouraging carbon sinks required promoting active labour whereas protecting carbon sinks, normally, requires maintaining the status quo. Stern, for example, advocates for a non-private property solution to the protection of forest sinks:³³⁴

forest conservation and management projects, to be successful, need to be part of a much wider, integrated resource management programme. Many countries have national forest management programmes in place that increasingly take a broad inter-sectoral approach to the management and conservation of forests. They espouse a participatory approach to policy formation and planning, involving stakeholders at the local, sub-national and national levels. The more developed of these programmes are closely linked to higher level policy and planning frameworks, such as poverty reduction strategies, and provide a focus for directing development assistance. Such programmes can be amended so that, in a more targeted and effective way, they can tackle the main drivers to deforestation and unsustainable land use.

While Stern promotes an integrated resource management program for sink retention, he supports "Market based instruments ... used alongside agricultural extension activity to encourage biological carbon sequestration."³³⁵ Although not all market based instruments depend on the creation of private property rights in carbon, Stern does recognize carbon trading, such as

³³⁴ *Ibid.* at 540.

³³⁵ *Ibid.* at 545.

that on the Chicago Climate Exchange, as being capable of promoting carbon sequestration.³³⁶ While I do not agree with Stern, an economist, that private property carbon assets are legitimate, his distinguishing between the best solutions for protecting sinks and encouraging carbon sequestration highlights the need for different approaches to solving different environmental problems or implementing different solutions.

In examining the use of carbon markets to achieve reduced emissions while encouraging carbon sequestration, it is evident why sequestration and emission policies are in conflict. Under the carbon markets being proposed in Canada, for sequestration policies to be successful, emissions policies would be unsuccessful, and vice versa. This is because emissions above regulation motivate and finance investment in sequestration activities. Offsets, which compensate land managers for engaging in sequestration activities, are only required when emitters are unable to achieve their emissions standards, thus when society is not achieving its emissions goals. Conversely, if all emitters in an offset market convert to low-emissions technology and are able to meet their emission standards, there will be no demand to purchase property rights in carbon assets, thus no incentive for land managers to sequester.³³⁷

Markets are being implemented to achieve numerous environmental goals; yet, markets may not be the best approach to achieving any of these goals. Protecting carbon sinks requires an integrated resource management program. Encouraging carbon sinks above best management practices requires an economic incentive for land managers. And, although this thesis does not examine the best way to control emissions, Thomas Crocker, the first individual to present cap-and-trade as a solution to certain environmental problems, advocates for an outright tax on carbon emission to reduce emissions.³³⁸ Each climate change goal requires a different tool to best meet the goal. It is unrealistic to believe property in carbon can achieve all of society's carbon policy goals, particularly because success in relation to one particular strategy could hinder the success of a different carbon strategy. A simple one-tool approach is not suited to solving a multi-faceted global problem.

³³⁶ *Ibid.* at 545.

³³⁷ As seen by the failure of the CCX, there is no inherent value in carbon assets.

³³⁸ Hilsenrath, *supra* note 106. Crocker argues that a tax would be easier to enforce and would provide the needed flexibility to deal with carbon emissions.

4.4 *Inherent Rigidity and Boundaries of Property Law*

Once property rights are created in carbon assets, historic property rules determine what rights and relationships are associated with carbon assets. Deciding environmental issues based on private property rights should be a concern when one considers traditional property rules have not been significantly changed for over a hundred years—when the global temperature was 0.74°C cooler.³³⁹ Social issues can change quickly; property rules do not, or only do so slowly and for property-related reasons. Thus property rules are not capable of being moulded to deal with current environmental issues. For example, by creating property rights in carbon, Sir William Blackstone’s property theory from 1766 is suddenly relevant: property becomes “that sole and despotic dominion which one man claims and exercises over the external things of the world, in total exclusion of the right of any other individual in the universe.”³⁴⁰ The local, owner-centric nature of the ownership model of property is incompatible with the global, environment-centric nature of solutions to climate change. It is individuals putting personal gain and benefits over environmental protection which has caused climate change. Creating self-regarding property in carbon assets is unlikely to change this human behaviour.³⁴¹

The argument of advocates of the offset market approach is that property in carbon will manipulate individuals into behaving in an environmentally responsible manner. Economic theorists contend that, through the creation of private property in carbon, individuals engaging in self-serving activities, such as purchasing offsets to emit carbon or sequestering carbon for payment, will benefit, rather than harm, the environment.

Ziff states the “lure of property can serve as a vehicle for social engineering”, or legislators can entice individuals to act in a certain manner through property rules.³⁴² For example, settlement in the Prairies was promoted through homesteading incentives.³⁴³ However, in the case of property in carbon, legislators and policy-makers are confusing the use of existing

³³⁹ United Nations, *supra* note 1.

³⁴⁰ Singer, *supra* note 6 at 3. Theorists argue that Blackstone was trying to create a useful starting point for a debate when he wrote these words and that he did not actually believe this quotation to be true.

³⁴¹ The ownership model of property describes property as self-regarding, or that the owner is the only person with a legitimate interest in the property. Cohen, *supra* note 149 at 470.

³⁴² Ziff, *supra* note 5 at 77.

³⁴³ *Ibid.* at 48.

³⁴³ *Ibid.* at 77.

³⁴³ *Ibid.* at 48.

property to give effect to a public initiative with the questionable creation of new property to give effect to a public initiative.

Property law was not designed to deal with nature’s response to human activity. The functions of modern property law can be said to be the creation of order out of chaos by allocating and protecting rights and entitlements between individuals who may have conflicting claims³⁴⁴ and the promotion of commerce.³⁴⁵ Neither function of property is relevant to the carbon cycle. Property in carbon assets does not achieve the modern function of property law, and chapter 2 has found that creating property in natural cycles is inappropriate, thus private property in carbon assets cannot “serve as a vehicle for social engineering” on which to base the environmental goal of mitigating the effects of climate change.³⁴⁶

Through property rights functioning in the carbon market, and as examined in the section on how property rights change relationships, we are restructuring the problem of climate change to fit property rules rather than creating or adapting legal mechanisms to fit the problem of climate change. As examples: the price of carbon as private property is connected to supply-and-demand, rather than from quantifying the economic damage of climate change; and, the ability to use land hosting a carbon sink is dictated by the registered property interest or the sales contract, rather than by community and environmental needs. Forcing a modern-day issue into a historically-created system for deciding legal property disputes is obstructing, rather than facilitating, our desired relationships and outcomes.

4.5 *Legislators Should Dictate Carbon Policy*

Once property is created in carbon assets for operation in a market, the property will take on a life of its own within the narrowly-focused market regime. Markets operate in such a way as to move towards maximizing profits or efficiency. Should property in carbon evolve in a way which prevents environmental goals from being achieved, it is very difficult for government to interfere in the operation of the market. For example, there is no government institution which can enforce property rights and obligations in another country. If the carbon market allows an emitter in Country A to receive credit for a carbon sequestration project located in Country B,

³⁴⁴ *Ibid.* at 77.

³⁴⁴ *Ibid.* at 47.

³⁴⁵ *Ibid.* at 77.

³⁴⁵ *Ibid.* at 47.

³⁴⁶ As seen in chapter 5, land may be property from which carbon sequestration “social engineering” is possible.

Country A is not able to force its property rights on the project proponent in Country B to ensure the sequestration project complies with Country A's standards. The market, and not regulators, will determine what are and are not sequestration projects and what rights and entitlements are associated with those sequestration projects.

It is unlikely that governments will be able to guide the evolution of carbon property rights. Ellickson's efficiency theory suggests that, should carbon property be inefficient, it will either not survive or will evolve to increase efficiency.³⁴⁷ The CCX is an example of the market extinguishing inefficient property rights. The EU Market, on the other hand, is an example of the market evolving to increase efficiency. As seen by the European Union's Carbon Emissions Trading Market, which regulators are desperately attempting to control,³⁴⁸ the market is evolving to maximize economic benefits to market participants rather than providing environmental benefits.

The European Union's Carbon Emissions Trading Market, the largest carbon market in the world, evolved to maximize economic efficiency of the market participants in a way which did not meet the original environmental goals of the market creators. The Market, launched on January 1, 2005 and involving 25 European Union countries, is intended to be the primary mechanism for achieving the Kyoto target of a collective 8 percent reduction in emissions.³⁴⁹ It distributes tradable instruments (chosen in action) called "European Union Allowances" to firms according to National Allocation Plans.³⁵⁰ The Market does not allow offsets created from biotic carbon sequestration at this time.³⁵¹

The market participants, in pursuit of economic gains, were active participants in the numerous issues experienced by the European Union's Carbon Emissions Trading Market. Some of the issues which can be directly related to participants pursuing self-interest include: as allowances were distributed for free in the first stages of the markets, firms increased their emissions to ensure receiving larger allocations in the future; firms lobbied, and continue to lobby, for more generous allowances and a looser cap; emitters transitioned to inexpensive coal fired energy when over-allocation of carbon quotas caused the carbon price to drop; some

³⁴⁷ Ellickson, *supra* note 153 at 1358.

³⁴⁸ Linacre, *supra* 25.

³⁴⁹ Cameron Hepburn, *supra* note 23. There is a "burden sharing" arrangement among the EU countries which reflect wider emissions targets from a 28% reduction by Luxembourg to a 27% increase by Portugal.

³⁵⁰ *Ibid.* at 381.

³⁵¹ *Ibid.* at 381.

emitters received windfalls from the initial allocation of allowances; when the recession reduced demand for production, and consequently emissions, emitters sold their credits for profit;³⁵² the system is acting as a front for money laundering;³⁵³ and, fraud and cyber-theft are prevalent.³⁵⁴

Even if the market puts a price on carbon, prompting market participants to consider carbon in their economic decisions, the creation of private property in carbon assets simply changes the constitution of resources which have been privatized in the incompletely privatized environment. By privatizing carbon, interests still exist that are being left out of market transactions.³⁵⁵ Although the impact of climate change may be reduced, it may be at the cost of other environmental products, such as biodiversity.³⁵⁶ Now that private property has been created in carbon assets, unless governments are willing to pay market prices for an option, governments have generally lost the ability to guide carbon assets to their socially optimal uses.³⁵⁷ Since carbon markets left to their own devices are unlikely to evolve to maximize environmental efficiency, an analysis of why Adam Smith's invisible hand is not guiding resources to their socially optimal uses must still be undertaken.³⁵⁸ It seems contrary to regulating the environment that governments would willingly give up the limited control they have over natural cycles to the market, with little expectation that they will be able to fully control the market or that the market is capable of meeting environmental goals – even assuming, likely incorrectly, that the market participants all share those environmental goals.

4.6 Conclusion

Property rights in carbon assets, rather than the terms and conditions of offset markets, are causing carbon policies to fail. Private property rights in carbon assets are not functioning within carbon policies in a predictable or sustainable way because these property rights are not legally effective. The property rights threaten security of food, are administratively burdensome, and do not achieve the environmental benefited desired by legislators.

³⁵² Gilbertson, *supra* note 11.

³⁵³ Cameron Hepburn, *supra* note 23 at 381-4 and Gilbertson, *supra* note 11.

³⁵⁴ Linacre, *supra* note 25 at 10 and 41.

³⁵⁵ Rose, *supra* note 94 at 109.

³⁵⁶ For example, certain varieties of trees sequester more carbon than others. Tree varieties which sequester larger amounts of carbon will be planted while other varieties will be rejected.

³⁵⁷ For example, it will be difficult for governments to encourage food production if the production of carbon credits is more economically valuable.

³⁵⁸ Rose, *supra* note 94 at 109.

Property rights may, instead of being a tool for climate change mitigation, prevent society achieving climate change successes. It has not been shown how ineffective private property rights in carbon assets can reduce the concentration of carbon in the atmosphere. For climate change to be remedied, human attitudes and practices must be changed. Property, however, shifts the focus of carbon policy from environmental sustainability to the rights and entitlements promoted by the self-regarding nature of property. This is flawed.

Property law is not designed or capable of responding to a complex, global problem caused by nature's response to detrimental human activities. While property has, in the past, been successfully used for social engineering, in the case of carbon assets, property is not legitimate, thus unpredictable and unsustainable in carbon policies. There is a difference between using legitimate property rights for social engineering and creating illegitimate property rights for social engineering. The latter will not be successful as the property rights will not be successful.

Private property in carbon assets is not appropriate. Thus, private property rights in carbon assets should be abandoned. Yet, encouraging the creation of and protecting carbon sinks will be an element of climate change policy as carbon sequestration has great potential to reduce the concentration of atmospheric carbon and mitigate the effects of climate change. Therefore, chapter 5 examines some options for encouraging the creation and protection of carbon sinks which do not require the creation of property in carbon assets.

CHAPTER 5: THERE ARE BETTER WAYS TO ENCOURAGE BIOTIC SEQUESTRATION

Land managers are environmental stewards. These environmental stewards protect the health of the environment for the public's benefit. As such, it is appropriate that land managers be compensated for the environmental services they provide. It may even be considered a public responsibility to support programs which assist land managers with environmental conservation. In any event, when society has a specific environmental goal, such as increasing biotic sequestration, it is justifiable to use public money to achieve the mandate.

However, the creation of private property rights in carbon assets for use in an offset market is not the proper approach to encouraging land managers to engage in sequestration activities. For the reasons discussed throughout this thesis, greater environmental benefits will be attained by redirecting resources allocated to the creation of private property rights and carbon offset markets.

This chapter identifies approaches which show promise in protecting existing carbon sinks and encouraging carbon sequestration. Options which should be further explored in the face of the failure of private property in carbon assets and carbon markets include:

- investing in scientific research;
- creating and distributing information programs;
- creating programs which target at-risk areas;
- tying agricultural aid and subsidies to environmentally sustainable practices; and,
- public ownership of critical land.

This section is a brief overview of alternatives to private property in carbon assets and focuses on approaches directed at land managers, the target of most carbon offset markets. Agricultural land management, rather than forestry land management, is primarily examined in this section because a large percentage, 93 percent, of forest land is publically owned, thus under the management of provincial or federal governments.³⁵⁹ Further, strategies for encouraging agroforestry and forestry land managers to engage in increased sequestration are numerous and diverse: an individual who grows Christmas trees can promote the carbon content of his soil in much the same way as agricultural producers; land managers growing trees for eventual use in

³⁵⁹ Natural Resources Canada, "Boreal Forest: Canada's boreal zone" (April 8, 2012), online: Government of Canada <<http://cfs.nrcan.gc.ca/pages/151>>.

the pulp and paper industry require the scientific knowledge to properly manage the forest to maximize carbon sequestration; persons who retain forested land for environmental tourism, for nature conservation, or for sentimental reasons require completely different support and resources than those who use timber as a means of production.

5.0.1 Carbon-Focused Research

Advancements in science contribute to land use and land use change acting as a carbon sink, rather than a source of emissions. The work of researchers over the last 80 years to develop conservation tillage and reduce the use of summer fallow have resulted in cropland being a net sink of 4.4 Mt of carbon in 2008.³⁶⁰ Further, conservation tillage is a significant reason why existing carbon sinks on agricultural land are protected.

Conservation tillage and the reduction of the use of summer fallow are best management agricultural practices which promote carbon sequestration in soil biomass.³⁶¹ In Canada, the conversion from traditional tillage to conservation tillage and the decline in land managers engaging in summer fallow have been driven by governments (particularly Agriculture and Agri-food Canada (“AAFC”) and the Prairie Farm Rehabilitation Administration (“PFRA”), a former branch of AAFC), university researchers, agri-business companies, and farmers.³⁶² For example, conservation tillage was explored by researchers as early as the 1930s and recognized at that time as a way to reduce soil disturbance, consequently increasing soil organic content and soil fertility. However, conservation tillage practices were not adopted in the 1930s because of issues with weed and disease control. With time, through developments attributed to the partnership between industry and scientific researchers,³⁶³ conservation tillage has become the farming practice of choice for lands under annual cultivation.

The conservation tillage research of AAFC/PFRA and universities have dramatically changed the agricultural landscape.³⁶⁴ Land managers welcomed conservation tillage practices because it allowed for diverse crop rotations, reduced fallow, and provided for more efficient

³⁶⁰ Canada’s 2008 Greenhouse Gas Inventory, *supra* note 91 at 5.

³⁶¹ *Ibid.* at 5.

³⁶² Bernie Ward, Dean Smith, Glen Shaw, Dennis Haak, and Jason Fredette, “Policy and Program Response to Land Management Issues” in C. Wayne Lindwall and Bernie Sonntag, eds., *Landscapes Transformed: The History of Conservation Tillage and Direct Seeding* (Saskatoon, Saskatchewan: Knowledge Impact in Society, 2010) at 20-1.

³⁶³ Specifically, developments in herbicides and engineering of agricultural implements.

³⁶⁴ Ward, *supra* note 362 at 20-1.

weed, nutrient, moisture, and crop residue management.³⁶⁵ Conservation tillage further benefitted land managers by reducing labour, reducing energy consumption / fuel use, improving crop yields, improving soil productivity, and increasing fertilizer efficiency.³⁶⁶ As a consequence of conservation tillage, land managers engaging in best business practices are reducing soil erosion, reducing GHG emissions and promoting carbon sequestration through increased soil organic matter, increasing biodiversity, and improving water quality.³⁶⁷ Land managers are engaging in conservation tillage because of its economic benefit. An increase in crop yield, rather than the sale of carbon credits, provides an incentive to land managers to increase carbon sequestered in the biomass on their land. The environmental service that land managers provide by practicing the best management practice of conservational tillage is a pleasant consequence.

There is great potential that researchers will discover further agricultural practices which achieve the same significant climate change mitigation results as the development of conservation tillage. Research has the potential to change the definition of “business as usual”, thus making it the norm to engage in agricultural practices which sequester carbon above what we currently define as business as usual. In addition to the invention of new technology, research also fits within Worster’s conclusion that environmental conservation is best achieved through the guidance of scientifically trained, disinterested individuals³⁶⁸ and Stern’s recognition that an integrated resource management program, particularly in forest management, is needed to achieve environmental success.³⁶⁹ As seen by the Permanent Cover Program, discussed in more detail later in this chapter, scientific research can direct resources to where they are needed the most or where they will be put to the most efficient use. Research has achieved and can achieve significant success in carbon sequestration and carbon sink protection without the creation of private property rights in carbon assets.

5.0.2 Educational Programs

The most environmentally sound agricultural practices are often also the most economically profitable practices as healthy soils are productive soils. Soil organic matter is a

³⁶⁵ *Ibid.* at 20.

³⁶⁶ *Ibid.* at 20.

³⁶⁷ Ward, *supra* note 362 at 20.

³⁶⁸ Worster, *supra* note 312.

³⁶⁹ Stern, *supra* note 20 at 540.

key indicator of overall soil health.³⁷⁰ Soils with high organic matter are generally the healthiest and most productive soils.³⁷¹ It has long been accepted by the agricultural sector that, without intervention, soil fertility declines over time as a result of tillage.³⁷² Further, as written by Fowler in 1943, “no one has ever advanced a scientific reason for plowing”.³⁷³ Yet, some land managers are still set in their ways – they plow their soil black, losing the soil organic matter which would otherwise be locked in the soil.³⁷⁴

Resistance to the conversion to conservation agricultural practices can, in most cases, be attributed to lack of knowledge.³⁷⁵ Informational programs which encourage agricultural producers to enter into or teach agricultural producers how use conservation methods of farming may have positive benefits for both the producer and for the environment. Providing educational resources to land managers to train them to use environmentally beneficial techniques which have positive influence on their livelihood and incidentally encourage the creation of and protection of carbon sinks is both relatively resource moderate and does not require the creation of property rights in carbon assets.

5.0.3 Target At-Risk Operations

Short-term economic profits may deter land managers from engaging in the most environmentally beneficial practices. Further, distributing public resources, but failing to direct those resources to achieve the desired benefit, is improper.³⁷⁶ In instances where land managers and public funds are failing to protect the environment as desired, public funds may need focus on at-risk operations. A public program may be required, for example, to assist land managers in the conversion of marginal crop land under annual cultivation to permanent cover.

³⁷⁰ Guy P. Lafond and George C. Clayton, “Dispelling Myths and Making Progress with No-Till on the Canadian Prairies” in C. Wayne Lindwall and Bernie Sonntag, eds., *Landscapes Transformed: The History of Conservation Tillage and Direct Seeding* (Saskatoon, Saskatchewan: Knowledge Impact in Society, 2010) at 118.

³⁷¹ *Ibid.* at 118.

³⁷² Murray Fulton, “Foreword” in C. Wayne Lindwall and Bernie Sonntag, eds., *Landscapes Transformed: The History of Conservation Tillage and Direct Seeding* (Saskatoon, Saskatchewan: Knowledge Impact in Society, 2010) at x.

³⁷³ Ward, *supra* note 362 at 27.

³⁷⁴ Fred Fulton and Bernie Sonntag, “History of Early Western Canadian Agriculture – Setting the Stage for Conservation” in C. Wayne Lindwall and Bernie Sonntag, eds., *Landscapes Transformed: The History of Conservation Tillage and Direct Seeding* (Saskatoon, Saskatchewan: Knowledge Impact in Society, 2010) at 11.

³⁷⁵ *Ibid.* at 11.

³⁷⁶ An example of this is Costa Rica’s Payments for Environmental Services where land managers were paid to protect forests which would have been retained even without payment. Pfaff, *supra* note 220 and Gilbertson, *supra* note 11 at 25.

The drought of the 1980s and the subsequent Canadian Senate Committee on Agriculture, Fisheries and Forestry report entitled “Soil at Risk – Canada’s Eroding Future” encouraged a Federal-Provincial response to soil degradation.³⁷⁷ One component of Canada’s National Soil Conservation Program was the Permanent Cover Program. Although the Permanent Cover Program was implemented primarily for soil conservation, other benefits achieved by the Program include improved water quality, enhanced wildlife habitat, and increased carbon sequestration.³⁷⁸

The Permanent Cover Program, introduced in 1989 with the intent of being available for subscription for three years, targeted marginal agricultural lands that had high erosion risk under annual cultivation. The Program paid farmers to convert eligible land to alternate sustainable uses under permanent cover contracts for either 10 or 21 years.³⁷⁹ Each permanent cover contract contained an option for Canada to purchase the Permanent Cover Program enrolled land, a clause invocable upon default of the permanent cover agreement. As an option to purchase is a registerable interest in land, a caveat was registered in the applicable land titles registry to protect Canada’s interest for the length of the contract.³⁸⁰ Registering the caveat, and including terms and conditions in the agreement detailing Canada’s remedy upon default, allowed Canada to circumvent the common law rule against positive covenants burdening real property.

The 1989 Program was fully subscribed within the first few months.³⁸¹ An expansion of the Program was announced in 1991 and was also quickly filled.³⁸² Over 522,000 hectares of marginal land was converted to permanent cover under the Permanent Cover Program. As already mentioned in chapter 4, the Program required a \$74 million program investment of public funds and returned environmental benefits valued at \$72 - \$362 million.³⁸³ This is significantly less resource burdensome and more environmentally beneficial than carbon markets. Under carbon markets, the carbon sequestration is neutralized by

³⁷⁷ Jill S. Vaisey, Ted W. Weins and Robert J. Wettlaufer, Agriculture and Agri-Food Canada, “The Permanent Cover Program – Is Twice Enough?” (September 17-20, 1996), online: Government of Canada <<http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1187267959357&lang=eng>>.

³⁷⁸ *Ibid.*

³⁷⁹ *Ibid.*

³⁸⁰ Although the obligation to engage in permanent cover did not run with the land, the option to purchase gave Canada notice when the land in issue was transferred to another individual. Canada, upon sale of the land, will request the producer to buy out of the remainder of the permanent cover agreement.

³⁸¹ Vaisey, *supra* note 377.

³⁸² *Ibid.*

³⁸³ Luciuk, *supra* note 309.

a corresponding emission and the creation of private property rights is predicted to cost millions of dollars to administer.

The benefits of the Permanent Cover Program endure. Ninety three percent of the individuals enrolled in the Permanent Cover Program declared that they will keep the forage stand as long as possible and just 18 percent indicate they plan to return their land to annual crop production.³⁸⁴ The Permanent Cover Program has permanently removed many hectares of marginal land from annual cultivation, incidentally promoting the sequestration of a significant amount of atmospheric carbon in biotic carbon mass.³⁸⁵

Critical lands cannot be targeted through the creation of property rights in carbon assets and use of carbon offset markets. Markets are indiscriminate. Scientifically trained, disinterested individuals are, however, in a position to identify environmental issues and create a recovery plan.³⁸⁶ As seen by the Permanent Cover Program, target projects, which do not create private property rights in carbon assets, can be very successful in encouraging carbon sequestration and the retention of carbon sinks.

5.0.4 Tying Agricultural Aid and Subsidies to Environmentally Sustainable Practices

Depending on the appetite of program designers and the availability of resources, it is possible to make programs such as Agrastability, Growing Forward II, and advance payments under the *Agricultural Marketing Programs Act*³⁸⁷ dependent on the agricultural producer implementing best management practices. In some instances, tying agricultural aid and subsidies to the practice of environmentally sustainable practices may be administratively burdensome. For example, until the contracts/programs expire, monitoring and random inspections of the lands and management practices will be required. However, in some cases, tying aid to environmentally sustainable practices will be worthwhile. A program, for example, which distributes money to land managers in a flood-prone region may be dependant on the land manager not disturbing wetlands or returning land to wetlands. Tying agricultural aid to environmentally sustainable practices should be examined on a program-by-program basis.

³⁸⁴ Vaisey, *supra* note 377.

³⁸⁵ *Ibid.*

³⁸⁶ Worster, *supra* note 312.

³⁸⁷ S.C. 1997, c. 20.

5.0.5 Ownership of Lands by the Public

Publically owned lands can produce numerous environmental benefits.³⁸⁸ Community pasture lands in the prairies are an example of a successful instance of where government ownership was required to prevent environmental disaster. AAFC's Community Pasture Program was created in the 1930 to purchase privately held lands with the goal of reclaiming badly eroded areas and managing marginal rangelands.³⁸⁹ Currently, one of the Community Pasture Program's two objectives is to "manage a productive, bio-diverse rangeland and promote environmentally responsible land use practices".³⁹⁰ It appears that the Community Pasture Program is achieving its objective; the pastures, among the most degraded land in the prairies in the 1930s, have been described as "pristine environment on a large contiguous tract of land."³⁹¹ Kulshreshtha notes that, as community pastures are under better management than privately held lands, they normally sequester larger amounts of carbon than neighbouring lands.³⁹² Further, community pastures cost very little for the governments to administer. For example, in 2005-06, the Government of Canada contributed \$8.8 million dollars to the Community Pasture Program.³⁹³ User fees and non-fee revenue (such as oil and gas leases) provided the remaining \$15 million required to operate the community pasture program.³⁹⁴ The public's contribution can be considered both a subsidized payment for environmental services and a subsidized payment for social benefits.³⁹⁵ Private property was not created in carbon assets to achieve the sequestration benefits derived from the management of public lands.

5.0.6 Conclusion

Approaches which do not include the creation of private property in carbon assets have a proven history of success. For example, the Permanent Cover Program and scientific innovations

³⁸⁸ Worster, *supra* note 312.

³⁸⁹ Agriculture and Agri-Food Canada, "Community Pasture Program" (March 10, 2011), online: Government of Canada <<http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1298388156452&lang=eng>>.

³⁹⁰ *Ibid.*

³⁹¹ S.N. Kulshreshtha "Community Pastures" *The Encyclopedia of Saskatchewan* (2006), online: <http://esask.uregina.ca/entry/community_pastures.html>.

³⁹² *Ibid.*

³⁹³ Agriculture and Agri-Food Canada, "Community Pasture Program—Business Plan 2006-2011" (March 10, 2011), online: Government of Canada <<http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1298655130912&lang=eng#s10>>.

³⁹⁴ *Ibid.*

³⁹⁵ Among the social benefits community pastures provide are their creation of employment opportunities, their subsidization of summer livestock grazing, and their contributions to scientific research.

leading to the development of conservation tillage have encouraged the sequestration of carbon and the protection of carbon sinks. Carbon markets using private property in carbon assets, on the other hand, have not had the same success. Not only are there legal, administrative, social, and environmental reasons to abandon private property rights in carbon assets, but there may be legal, administrative, social, and environmental reasons to further explore the options for encouraging carbon sequestration on agricultural land provided above.

5.1 Conclusion

By creating property in carbon assets, legislators are promoting above business-as-usual sequestration. For example, it is hoped that, instead of just practicing conservation tillage to increase soil biomass sinks, the ability to sell carbon credits will entice farmers to participate in agroforestry, forested land generally being a larger carbon sink than agricultural land. The goal of legislators is admirable: engaging hundreds of thousands of land managers in above business-as-usual carbon sequestration activities on an ongoing basis would significantly reduce the reduction of the concentration of carbon in the atmosphere.

Economic theory argues that property in carbon assets transferable in a market will make the creation of carbon sinks a consideration in land management decisions. Further, by restricting emitters' ability to emit and requiring emitters to purchase a "right" to emit above their regulated standards, emitters will not only be financing sequestration activities, but the price of carbon may also lure emitters into discontinuing unnecessary emissions and/or transitioning to lower-emissions technology.

As seen by the last two paragraphs, legislators are attempting to use property in carbon to realize an environmental initiative. While property and property rules have been, and can be, used to give effect to social programs, in the case of climate change, the environmental policy has not been properly constructed. Private property in carbon assets, the tool by which governments hope to achieve success, is not justifiable. If the tool governments are using to achieve a solution to climate change is not acting in the predicted or desired manner in any sustainable way, those climate change policies will not be successful, and may even have undesired adverse impacts.

Private property in carbon assets is not acting in a sustainable or predictable manner as natural cycles, including the carbon cycle, are not the appropriate subjects of private property.

Carbon assets represent the portion of the carbon cycle where carbon can be and is stored as organic molecules in organisms and as organic matter in soil. It is a founding proposition of property law that the “spontaneous hand of nature” is not rightly propertized.³⁹⁶

The intrinsic nature of the carbon cycle defeats any private property rights legislators may attempt to assign to carbon. The carbon cycle lacks permanence, as well as the ability to be sufficiently defined, identified and assumed. The corresponding property rights would also suffer from the same deficiencies. How, for example, will property rights be able to accurately capture and represent the ongoing process of dead plant and animal matter increasing the carbon content of soil, thus creating a carbon sink? There are too many variables in this process for the associated property rights to exist with any degree of certainty; the amount of carbon released into the atmosphere from decaying organisms and the amount of carbon stored in soils depend on the availability of microorganisms, soil conditions and soil types, weather, soil moisture, and numerous other factors. It simply is not possible to adequately define, identify, quantify, or transfer rights to this uncertain natural process. Rights would continuously spontaneously be created and destroyed through no action of the rights holder.

It is also not possible to physically, legally, or morally exclude strangers from the carbon cycle, exclusivity being a key feature of ownership.³⁹⁷ Society benefits from carbon sequestration activities by the consequential reduction of the concentration of atmospheric carbon dioxide. Thus, property rights in carbon assets cannot be structured in a way which excludes strangers from the benefits of this resource, nor would society, based on collective mores, desire to do so.

Yet, legislators have created and are creating private property in carbon assets. Canada, Alberta, Saskatchewan, Manitoba, British Columbia, Ontario and Quebec have all created or shown an interest in creating private property rights in carbon assets. Further, through human interference, humans are actively managing a portion of the carbon cycle. As such, even though property rights in the carbon cycle may not be considered appropriate pursuant to the works of theorists Locke, Gray, and Wilberforce, it is necessary to examine whether property theory is able to justify private property rights in carbon assets.

Private property in carbon assets will be considered appropriate if any of the common theories used to justify private property can justify private property in carbon assets. Utilitarian

³⁹⁶ Locke, *supra* note 57 at 286-7.

³⁹⁷ See, for example, A.M. Hornoré (Waldron, *supra* note 6 at 49) and Blackstone (Singer, *supra* note 6 at 2-3).

theory is unable to show how society is best served by creating private property rights in carbon assets to deal with a complex, multifaceted issue. As seen by deforestation in Africa, the solution to climate change may require numerous community-focused strategies. The personal self-assertion and special rights theories justify the norm—either non-property or common property in carbon assets. Economic theory is unable to justify private property in carbon assets as carbon assets are not scarce, thus intrinsically valueless. The principles of labour theory, however, may be a reason to justify private property in carbon assets; legislators’ intent in creating private property in carbon assets is to deliberately manage the carbon cycle by promoting carbon sequestration activities, and thus the labour to carry out those activities.

Offset markets relying on private property are failing because private property rights in carbon assets are unable to achieve subsistence, equality, abundance, and security. Ultimately, the thesis find that private property in carbon assets is not justifiable pursuant to the theory of labour as private property in carbon assets jeopardizes security of food and food production, is administratively wasteful, and is not the approach which will achieve the greatest environmental success.

Carbon offset markets cannot be altered in a way which will lead to their success. Markets and legislators are incorrectly advancing or describing carbon assets as private property. First, the description of carbon assets as private property changes the characterization of climate change from an environmental problem to a property problem. Second, the historically created rules of property are not capable of dealing with a complex issue connected to culpable human behaviours which alter a natural cycle. Finally, the description of climate change as a “property problem” alters associated relationships. By creating and / or accepting private property and carbon markets, legislators have given up the ability to guide the evolution of carbon policy.

However, there are tools useful in mitigating the effects of climate change which do not involve the creation of private property rights in carbon assets. For example, investment in scientific research, creating programs to target at-risk areas, and the public ownership of critical lands have all been previously successful in promoting and protecting carbon sinks. These options should be further considered to determine whether they are able to meet society’s goals in relation to encouraging and protecting biotic carbon sinks.

Private property rights in carbon assets are not working. Abandoning private property in carbon sinks and carbon offset markets, and redirecting these resources to other programs, will

increase the likelihood of society achieving its social and environmental goals in relation to carbon sequestration and sink protection. Thus, this thesis recommends that governments do not proclaim, but discourage markets from recognizing private property rights in carbon assets due to the potential negative social and environmental consequences of private property existing in the carbon cycle.

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