

ACHIEVING PARIS AGREEMENT GOALS BY ADDRESSING CROPLAND FUNDAMENTALS: REAL PROPERTY RECORDING AND LANDOWNER-TENANT LEASE LENGTH

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I. INTRODUCTION

A sprawling field, planted full of corn, and Barclays, a global bank, may not appear to have much in common at first glance, but with elevated levels of interest in addressing climate change, these two things are growing more closely connected.

Climate change is increasingly a concern for individuals and businesses around the world.¹ Agriculture is an essential sector of the world's economy, and agricultural activities do contribute to emissions.² "Agriculture is the ONE sector that has the ability to transform from a net emitter of [carbon] to a net sequester of [carbon]—there is no other human managed realm with this potential."³ Therefore, agriculture has a distinct opportunity to help mitigate climate impact by adjusting practices on croplands.

As multi-national corporations take notice of climate related activities, a market has emerged for carbon offsets from croplands.⁴ This creates an advantage for multi-national corporations because they are able to more plausibly achieve both mandatory and voluntary climate commitments globally.⁵ This also creates an opportunity for farm operators of cropland to adjust their practices in ways that are climate friendly.⁶ The ultimate objective is to decrease the amount of carbon released into the atmosphere thereby decreasing greenhouse gas emissions and limiting the amount of global temperature increase to less than the 1.5° Celsius goal established in the Paris Agreement.⁷ However, there remains great room for improvement to ensure that environmental commitments and land use activities actually accomplish the climate objectives that they set out to achieve.

One approach to help limit carbon in the atmosphere is to sequester carbon

1. See JONATHAN D. HASKETT, CONG. RSCH. SERV., CARBON CYCLE: KEY COMPONENT OF THE CLIMATE SYSTEM, WITH IMPLICATIONS FOR POLICY (2022).

2. See Alexis Brunet Marks, *(Carbon) Farming Our Way Out of Climate Change*, 97 DENV. L. REV. 497, 498 (2020).

3. CARBON CYCLE INST., CARBON FARMING, <https://www.carboncycle.org/wp-content/uploads/2018/09/carbon-farming-brochure-Sept2018-CCI-5.pdf> [<https://perma.cc/G66D-BXG6>]; see also Gary E. Marchant, Zachary Cooper & Philip J. Gough-Stone VI, *Bringing Technological Transparency to Tenebrous Markets: The Case for Using Blockchain to Validate Carbon Credit Trading Markets*, 62 NAT. RES. J. 159, 165 (2022).

4. See Peter Lehner & Nathan A. Rosenberg, *Legal Pathways to Carbon-Neutral Agriculture*, 47 ENV'T L. REP. 10845, 10872-73 (2017).

5. Albert C. Lin, *Making Net Zero Matter*, 79 WASH & LEE L. REV. 679, 698 (2016).

6. Fabiano de Andrade Correa & Christina Voigt, *The Paris Agreement and Net-Zero Emissions: What Role for the Land-Sector?*, 2021 CARBON & CLIMATE L. REV. 1 (2021).

7. See *The Paris Agreement*, U.N. FRAMEWORK CONVENTION ON CLIMATE CHANGE, <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement> [<https://perma.cc/3KGF-LRBG>] (last visited May 11, 2024).

in soil that is used for agricultural purposes. One use of agricultural land is cropland.⁸ Cropland includes areas used for production of adapted crops for harvest,⁹ and it covers 392 million acres in the United States alone.¹⁰ Globally, cropland covers more than ten percent of the global land surface.¹¹ This Note will begin by describing climate change broadly.¹² It will discuss the Paris Agreement, net zero pledges, and private actor climate commitments as well as carbon markets, agriculture's role in carbon markets, and carbon-friendly farming practices. Additionally, this Note will analyze challenges created by antiquated county-based real property recording systems and a variety of lease considerations that increase tenure security to broaden sustained adoption of carbon friendly practices by farm operators.

Addressing carbon contract concerns as they relate to United States cropland requires a fundamental two-prong approach. First, to ensure that land is committed to carbon sequestration for a significant time period, real property recording laws must be updated to create a more nationally consistent and accessible opportunity to record changes to a real property deed. This motivates the landowner and subsequent purchasers to comply with sustainability commitments. For the forty percent of United States cropland that is farmed by farm operators, more secure land tenure is essential in leasing agreements to motivate widespread adoption of sustainable climate practices.¹³ Progress toward achieving Paris Climate goals will be realized when participants sequester carbon at scale.¹⁴ As an aggregate, farm operators cannot be ignored for their role in increasing carbon sequestration in cropland. By addressing land recording and farm operator land tenure through longer lease terms, two key challenges to establishing permanence for carbon sequestration will be addressed. This creates a meaningful opportunity for accountability and growth in the cropland carbon market which contributes to carbon offset credits and limits greenhouse gases in the atmosphere. By mitigating carbon emissions into the atmosphere, the United States can more effectively contribute to achieving the

8. *See Croplands*, NAT. RES. CONSERVATION SERV. U.S. DEP'T OF AGRIC., <https://www.nrcs.usda.gov/conservation-basics/natural-resource-concerns/land/cropland> [https://perma.cc/3X3G-UR5S] (last visited May 11, 2024).

9. *Id.*

10. Peter H. Lehner & Nathan A. Rosenberg, *The Climate Crisis and Agriculture*, 52 ENV'T L. REP. 10096, 10098 (2022).

11. *Sustainable Food and Agriculture: Land use in agriculture by the numbers*, FOOD & AGRIC. ORG. OF THE U.N. (May 7, 2020), <https://www.fao.org/sustainability/news/detail/en/c/1274219/> [https://perma.cc/K9QM-MWC6].

12. *See* HASKETT, *supra* note 1.

13. PEGGY PETRZELKA, JENNIFER FILIPIAK, GABRIELLE ROESCH-MCNALLY & MATTHEW J. BARNETT, AMERICAN FARMLAND TRUST, UNDERSTANDING AND ACTIVATING NON-OPERATOR LANDOWNERS i (2020), https://farmlandinfo.org/wp-content/uploads/sites/2/2021/01/AFT-NOLs-MultiState_1_21-web.pdf [https://perma.cc/857Z-5GB3].

14. *See* U.S. ENV'T PROT. AGENCY, EPA 430-R-22-003, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS 5.1 (2022), <https://www.epa.gov/system/files/documents/2022-04/us-ghg-inventory-2022-main-text.pdf> [https://perma.cc/XN3E-DN5P].

Paris Agreement's 1.5° Celsius global goal.

II. HISTORY/BACKGROUND

A. *Causes of Climate Change*

Climate change is a growing concern for countries and businesses around the world.¹⁵ Climate change is attributed to the release of greenhouse gases into the atmosphere.¹⁶ The most prominent greenhouse gas is carbon dioxide.¹⁷ The amount of carbon stored in the atmosphere is important because as more carbon dioxide is added to the atmosphere, more heat is trapped, thereby raising the temperature on the earth.¹⁸ Greenhouse gases help keep the planet warm enough for life to flourish by acting as a blanket.¹⁹ Greenhouse gases let heat from the sun through to the Earth, but they also prevent that heat from escaping into space.²⁰

The more greenhouse gases there are in the atmosphere, the warmer the temperature of the atmosphere around the planet.²¹ Therefore, in order to reduce the risk of increasing impacts from climate change, stabilizing global temperature is important.²² Living plants absorb carbon from the atmosphere and pass it along to animals that eat those plants.²³ When those organisms die and decay, their carbon is either trapped underground or it is emitted as carbon dioxide.²⁴ Organisms that were trapped underground decaying form fossil fuels such as oil, coal, and natural gas.²⁵ When these fossil fuels are used, sequestered carbon is released back into the atmosphere as carbon dioxide.²⁶ Tilling soils is another way that carbon is released from soil.²⁷

The atmosphere, oceans, vegetation, and soils are all capable of storing carbon.²⁸ The largest reservoir of carbon is the oceans; the second largest reservoir of carbon is soils.²⁹ These are considered net sinks for carbon because

15. See HASKETT, *supra* note 1.

16. *Id.* at 4.

17. AARON SMITH, AM. ENTER. INST., CAN FARMERS REVERSE CLIMATE CHANGE THROUGH CARBON FARMING 1 (2022), <https://www.aei.org/wp-content/uploads/2021/12/Can-Farmers-Reverse-Climate-Change-Through-Carbon-Farming.pdf?x91208> [<https://perma.cc/3SAU-HZC7>].

18. HASKETT, *supra* note 1.

19. SMITH, *supra* note 17.

20. *Id.*

21. *Id.*

22. HASKETT, *supra* note 1, at 10.

23. SMITH, *supra* note 17, at 4.

24. *Id.*

25. *Id.* at 2.

26. *Id.*

27. *Id.* at 5.

28. HASKETT, *supra* note 1.

29. Brunet Marks, *supra* note 2, at 503.

they currently absorb more carbon than they release.³⁰ Since plants absorb more carbon through photosynthesis than they release back into the atmosphere, land is a net carbon sink.³¹ If land surfaces and oceans were not acting as net sinks, the carbon dioxide concentration in the atmosphere would be increasing more quickly.³² Since carbon dioxide is a greenhouse gas, the concentration of carbon in the atmosphere impacts global temperature.³³

B. Global Climate Agreements

The Kyoto Protocol is a widely recognized global climate agreement that brought a commitment to promoting research, development, and increased use of renewable energy as well as carbon sequestration technologies to the attention of the countries around the world.³⁴

The Kyoto Protocol required developed countries to limit greenhouse emissions.³⁵ It treated certain types of land-based carbon removal as equivalent to emission mitigation to determine whether countries met their emission targets.³⁶ Developed countries calculated emissions by including “greenhouse gas emissions by sources and removals from sinks resulting from direct human-induced land use change.”³⁷ Subsequent decisions integrated cropland management into the emissions calculations.³⁸ The Kyoto Protocol laid a foundation that the Paris Agreement built upon. The Paris Agreement ultimately brought a large number of countries together to acknowledge a commitment to addressing the threat of climate change.³⁹

1. Paris Agreement

The Paris Agreement is a prominent global treaty related to the topic of climate change. It is legally binding.⁴⁰ The Paris Agreement was adopted by 196 parties in 2015 and the treaty went into force in 2016.⁴¹ The Paris Agreement was adopted to help strengthen a global response to the threat of climate change, and the goal of the Paris Agreement is to limit global warming to less than 1.5°

30. HASKETT, *supra* note 1.

31. SMITH, *supra* note 17, at 4.

32. HASKETT, *supra* note 1.

33. *See* SMITH, *supra* note 17.

34. Kyoto Protocol to the United Nations Framework Convention on Climate Change art. 2(1)(a)(iv), *opened for signature* Dec. 10, 1997, 2303 U.N.T.S. 162, U.N. Doc. FCCC/CP/1997/L.7/ADD.1, 37 I.L.M. 32.

35. Lin, *supra* note 5, at 735.

36. *Id.*

37. Kyoto Protocol to the United Nations Framework Convention on Climate Change, *supra* note 34, art. 3(3).

38. Lin, *supra* note 5, at 736.

39. *See generally* U.N. Framework Convention on Climate Change, *supra* note 7.

40. *Id.*

41. *Id.*

Celsius when compared to pre-industrial levels.⁴² The Paris Agreement does not require countries to take specific actions to reduce emissions; instead, “it requires countries to establish, maintain, and publish a nationally determined contribution (NDC).”⁴³

A NDC details how much a country plans to reduce its emissions.⁴⁴ According to the World Bank in 2022, more than two-thirds of countries that were parties to the Paris Agreement planned to use carbon markets to achieve their objectives set forth in their NDC.⁴⁵ “The contents of the NDC are not legally binding”; rather, “the legal requirements of the Paris Agreement are procedural, not substantive.”⁴⁶ Though the Paris Agreement does not mention agriculture, it does acknowledge “the role of food security, hunger, and the vulnerability of the food production system in the face of climate change.”⁴⁷

The Paris Agreement has been received with varying levels of enthusiasm and commitment from countries around the world. President Trump announced on June 1, 2017 that the United States would withdraw from the Paris Agreement.⁴⁸ On November 4, 2019, the United States began the official process to withdraw from the Paris Agreement by giving the required one-year notice.⁴⁹ Official withdrawal took place in 2020.⁵⁰ When President Biden took office in 2021,⁵¹ he announced on his first day in office that the United States was rejoining the Paris Agreement.⁵² While the political position of the United States as a party to the treaty has fluctuated since its inception, other countries and global corporations have shown increasing interest in addressing climate concerns. Spurred by a globally connected world and a web of corporations that are subject to wide-ranging national legal restrictions and commitments, interest

42. *Id.*

43. Jessie Gittlemeier & Brigit Rollins, *Agriculture & The Paris Climate Agreement*, THE NAT'L AGRIC. L. CTR. (Apr. 15, 2021), <https://nationalaglawcenter.org/agriculture-the-paris-climate-agreement/> [https://perma.cc/2X7F-L2B5].

44. *Id.*

45. *Countries on the Cusp of Carbon Markets*, THE WORLD BANK (May 24, 2022), <https://www.worldbank.org/en/news/feature/2022/05/24/countries-on-the-cusp-of-carbon-markets> [https://perma.cc/SV5V-RX5W].

46. Gittlemeier & Rollins, *supra* note 43.

47. *Id.*

48. *President Trump Announces U.S. Withdrawal From the Paris Climate Accord*, WHITE HOUSE ARCHIVES (June 1, 2017), <https://trumpwhitehouse.archives.gov/articles/president-trump-announces-u-s-withdrawal-paris-climate-accord/> [https://perma.cc/Q54E-D3QK].

49. Michael R. Pompeo, *On the U.S. Withdrawal from the Paris Agreement*, U.S. DEP'T OF STATE (Nov. 4, 2019), <https://2017-2021.state.gov/on-the-u-s-withdrawal-from-the-paris-agreement/index.html> [https://perma.cc/S6AH-A5K7].

50. *Id.*

51. Joseph R. Biden, President of the U.S., Inaugural Address at the United States Capitol (Jan. 20, 2021). A digital transcription is available at: <https://www.whitehouse.gov/briefing-room/speeches-remarks/2021/01/20/inaugural-address-by-president-joseph-r-biden-jr/> [https://perma.cc/R2JT-6P7E].

52. Antony J. Blinken, *The United States Officially Rejoins the Paris Agreement*, U.S. DEP'T OF STATE (Feb. 19, 2021), <https://www.state.gov/the-united-states-officially-rejoins-the-paris-agreement/> [https://perma.cc/97QK-R3X5].

in climate friendly practices and rhetoric has only grown since 2015. To achieve these broad objectives in slowing the global impact of climate change, there are many industries that must play a role. Agriculture is one industry that is increasingly seen as a space with opportunity to move toward achieving global objectives.

“The Paris Agreement does not require parties to submit NDCs that would be consistent with the 1.5° Celsius or 2° Celsius temperature goals.”⁵³ Further, the Agreement does not “require parties to achieve the commitments that they set forth in their NDCs.”⁵⁴ Instead, the Paris Agreement relies on international pressure to motivate countries to elevate NDCs over time.⁵⁵ Initially, countries’ NDCs focused on emission reductions with little consideration for carbon removal.⁵⁶ Since NDCs are revised every five years and “represent a progression” beyond the parties’ previous commitments, carbon removal activities are expected to play a more prominent role moving forward.⁵⁷ This was likely contemplated by the drafters of the Paris Agreement because underlying modeling that informed the Paris Agreement’s “temperature goals assumes ambitious amounts of carbon removal.”⁵⁸ Nearly a decade after the initial negotiations forming the Paris Agreement, countries are struggling to meet their climate pledges.⁵⁹ Thus, greater reliance on carbon removal will be needed to achieve the Paris Agreement’s temperature goals.⁶⁰

C. Net Zero Pledges

Net zero carbon dioxide emissions is one critical component to stabilize global temperature.⁶¹ Net zero means that emissions of carbon dioxide are evenly balanced with removal of carbon dioxide.⁶² Thus, there is not any net addition of carbon dioxide to the atmosphere.⁶³ Net zero greenhouse gas emissions have since surfaced as one of the most relevant targets for climate mitigation policies around the world.⁶⁴ This goal not only requires significant

53. Lin, *supra* note 5, at 710; *see generally* U.N. Framework Convention on Climate Change, *supra* note 7.

54. Lin, *supra* note 5, at 710.

55. *Id.* at 710-11.

56. *Id.* at 737.

57. Adoption of the Paris Agreement to the United Nations Framework Convention on Climate Change art. 4.3, 4.9, Dec. 12, 2015, T.I.A.S. No. 16-1104, U.N. Doc. FCCC/CP/2015/L.9; Lin, *supra* note 5, at 737.

58. Lin, *supra* note 5, at 736.

59. Lin, *supra* note 5, at 737-38; *see generally* U.N. ENV’T PROGRAMME, THE CLOSING WINDOW: CLIMATE CRISIS CALLS FOR RAPID TRANSFORMATION OF SOCIETIES (2022), <https://www.unep.org/resources/emissions-gap-report-2022> [<https://perma.cc/4URL-8R25>].

60. Lin, *supra* note 5, at 737.

61. HASKETT, *supra* note 1, at 10.

62. *Id.*

63. *Id.*

64. Correa & Voigt, *supra* note 6.

greenhouse gas emission reductions, but it simultaneously necessitates protection of greenhouse gas sinks.⁶⁵

The Paris Agreement directly incorporates a “net zero” concept by stating that parties should “undertake rapid reductions [in emissions] . . . to achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century.”⁶⁶ Thus, government net zero commitments are not required by the Paris Agreement, but they are consistent with it. The Paris Agreement does not impose a top-down mandate for parties to reduce greenhouse gas emissions.⁶⁷ Instead, the Paris Agreement utilizes a bottom-up approach with each party declaring its own NDC.⁶⁸

As a result of the Paris Agreement’s bottom-up approach, national net zero targets are voluntarily made and individually established by each nation.⁶⁹ The nation itself takes responsibility for determining how it will address climate change, but to avoid shifting responsibility, the global nature of the agreement is intended to put international political pressure on nations to act.⁷⁰ Countries across the globe have declared their intent to achieve net zero greenhouse gas emissions. These countries alone represent over two-thirds of the global carbon emissions.⁷¹ An individual nation can achieve net zero emissions by removing carbon from the atmosphere at a level equivalent to emissions or by obtaining offsets that reflect emission reductions outside its boundaries.⁷² Globally, to achieve net zero emissions, there must be a significant amount of carbon removed from the atmosphere. While global policymakers have acknowledged that reality, many national, subnational, and private net zero commitments will require reliance on carbon credits.⁷³

D. Private Actors Climate Commitments

While nations have agreed to the procedural nature of the Paris Agreement and its climate objectives, private actors have begun making their own climate commitments with increased scale and relevance. Though commitments of private actors are voluntary and legally unenforceable, they could make a significant impact to addressing climate concerns.⁷⁴ The net zero targets of private entities demonstrate private governance, which is an action taken by a

65. *Id.*

66. Adoption of the Paris Agreement to the United Nations Framework Convention on Climate Change, *supra* note 57, art. 4.1.

67. *See generally* U.N. Framework Convention on Climate Change, *supra* note 7.

68. Lin, *supra* note 5, at 694.

69. *Id.*

70. *Id.* at 710-11.

71. Net Zero Tracker, CLIMATE WATCH, <https://www.climatewatchdata.org/net-zero-tracker> [<https://perma.cc/7ADD-U84L>].

72. Lin, *supra* note 5, at 687-88.

73. *Id.* at 683.

74. *Id.* at 698.

non-governmental entity that is intended to achieve traditionally governmental ends.⁷⁵ The private environmental standards of companies can apply beyond themselves. These private standards reach “suppliers, borrowers, and other entities with which they interact.”⁷⁶ Sometimes these interactions span across sectors and national borders.⁷⁷

Companies are attempting to capitalize on environmental demands from the market.⁷⁸ Therefore, corporations participating in making and publicizing climate commitments represent a wide range of industries. In total, companies that have communicated climate commitments represent over \$12 trillion in revenue and nearly twenty-five million employees.⁷⁹ Added together, these companies have a carbon footprint greater than 3.5 Gt GHGs.⁸⁰ The list of companies publicizing net zero commitments includes some of the world’s most widely recognized brands such as Apple, Facebook, Ford, and McDonalds.⁸¹ Additional corporations, “especially consumer-facing multinational firms and European-based companies, have made commitments to at least meet the target set by the Paris [A]greement.”⁸² For example, these companies include Danone, General Mills Inc., Nestle, and PepsiCo.⁸³ In many cases, these companies’ commitments include emissions in their supply chains, such as agricultural commodities and food that they procure.⁸⁴ Some companies, such as Walmart, have gone above and beyond Paris Agreement commitments to commit to being carbon neutral.⁸⁵ Other businesses, such as airlines and banking organizations, have made climate specific objectives. For example, Barclays has committed to net zero operations.⁸⁶ Barclays is actively utilizing agricultural land offsets to achieve its’ objectives.⁸⁷

Private entity net zero commitments range greatly in terms of timeline, activities covered, and implementation approach.⁸⁸ Commonly, these commitments focus on net zero attainment by 2050, but some corporations

75. *Id.* at 703.

76. *Id.*

77. *Id.*

78. Michael Lauher, *Carbon Credits: Pay Farmers or Landowners?*, PRAIRIE FARMER, (May 5, 2021), <https://www.farmprogress.com/commentary/carbon-credits-pay-farmers-or-landowners> [<https://perma.cc/UH5J-JA9W>].

79. Lin, *supra* note 5, at 698.

80. *Id.*

81. *Id.* at 682.

82. Philip Brasher & Hannah Pagel, *Corporate Giants’ Climate Pledges Take Root, Pressing Farmers to go Green*, AGRI-PULSE (Nov. 9, 2020, 1:30 PM), <https://www.agri-pulse.com/articles/14799-corporate-giants-climate-pledges-take-root-pressing-farmers-to-go-green> [<https://perma.cc/7KYL-PEDF>].

83. *Id.*

84. *Id.*

85. *Id.*

86. *Achieving Net Zero Operations*, BARCLAYS, <https://home.barclays/sustainability/addressing-climate-change/achieving-net-zero-operations/> [<https://perma.cc/X6CN-KT8V>].

87. *Id.*

88. Lin, *supra* note 5, at 698.

specify earlier or later dates.⁸⁹ Regarding the scope of covered emissions, some corporate pledges cover emissions associated with corporate operations and exclude emissions associated with their supply chain or product use.⁹⁰ Additionally, some corporate approaches significantly rely on purchasing offsets from a third party.⁹¹

While these voluntary commitments demonstrate interest from a company in issues related to environmental, social, and governance matters, without accountability around carbon credit offsets, corporations may merely be participating in greenwashing.⁹² At its core greenwashing is when an entity makes a marketing claim asserting that the entity is environmentally conscious that is deceptive.⁹³ As a result, the creation and sale of the carbon offset itself is essential to the integrity of this climate conversation.

Management of cropland is key to achieving net zero climate goals because soils help sequester and store greenhouse gases.⁹⁴ Practices used on cultivated cropland influence how much and how long that carbon is stored in the soil, thus making cropland increasingly relevant to global interest in limiting the emission of carbon into the atmosphere.⁹⁵

E. Carbon Market

In 2021, delegates at the global climate change meeting COP 26 Glasgow approved Article 6 of the Paris Agreement.⁹⁶ This provides a “rulebook governing global carbon markets,” and it opened the opportunity for a “market where countries can trade *carbon credits* generated by the reduction or removal of greenhouse [] gas emissions from the atmosphere.”⁹⁷ A carbon offset market allows a company or generator of greenhouse gases to pay another party to reduce their emissions or to sequester carbon.⁹⁸ The carbon generating party pays the other party instead of reducing their own emissions.⁹⁹ As applied to croplands, the purchased reductions, known as offsets, are used to compensate farmers for sequestering carbon or reducing emissions.¹⁰⁰

Offset credits involve an entity reducing, avoiding, or removing carbon

89. *Id.* at 698-99.

90. *Id.* at 699.

91. *Id.*

92. DAVID A. BAAY, GARRETT A. GIBSON & JAY P. PATEL, *CTR. FOR AM. & INT’L L.*, 73RD ANNUAL INSTITUTE ON ENERGY LAW § 4.03 (2022).

93. *Id.*

94. *See* Brunet Marks, *supra* note 2.

95. Correa & Voigt, *supra* note 6.

96. *Countries on the Cusp of Carbon Markets*, THE WORLD BANK (May 24, 2022) <https://www.worldbank.org/en/news/feature/2022/05/24/countries-on-the-cusp-of-carbon-markets> [<https://perma.cc/SV5V-RX5W>].

97. *Id.*

98. *See id.*

99. Lehner & Rosenberg, *supra* note 4, at 10872.

100. *Id.* at 10872-73.

emissions.¹⁰¹ One offset credit is defined as “one unit of carbon removed from the atmosphere or prevented from entering the atmosphere but for the action of the party generating the offset credit.”¹⁰² The industry standard for one “offset credit is equivalent to removing or avoiding one ton of carbon that would have otherwise been added to the atmosphere.”¹⁰³ A carbon credit is known as a metric ton of carbon that is avoided or removed from the atmosphere.¹⁰⁴ Therefore, for each metric ton of carbon that is removed from the atmosphere or that is avoided from being generated in the first place, one carbon credit is generated.¹⁰⁵ Carbon credits are not new. They have been around for decades, but demand for the credits has increased in recent years because companies are facing “increasing pressure to demonstrate a commitment to climate action.”¹⁰⁶

The carbon trading market is broadly segregated into two distinct markets.¹⁰⁷ One market is a regulatory or compliance market and the second is a voluntary market.¹⁰⁸ “Voluntary markets . . . operate independent of . . . carbon emission standards and focus on removing carbon from the atmosphere or on avoiding or reducing emissions in the first place.”¹⁰⁹ This is the type of market that companies voluntarily participate in as part of their “net zero carbon” pledge.¹¹⁰ The market contains firms that facilitate trading and sales; in 2019, it was reported that over \$5.5 billion worth of carbon offset credits were traded which allegedly removed 1.3 billion tons of carbon from the atmosphere.¹¹¹ Further, interest in carbon offset credits has only continued to grow in recent years.¹¹²

The typical criteria for an offset program are that offsets generated within the program “must be quantifiable, real, permanent, and additional.”¹¹³ Quantifiable generally means that the greenhouse gas reductions from the

101. Marchant, Cooper & Gough-Stone, *supra* note 3, at 163.

102. *Id.*

103. *Id.*

104. Elizabeth G. Dunn, *The Latest Farm Product: Carbon Credits*, N.Y. TIMES (Nov. 23, 2021), <https://www.nytimes.com/2021/11/23/business/dealbook/farm-carbon-credits.html> [https://perma.cc/5UWQ-56PM].

105. *Id.*

106. *Id.*

107. Marchant, Cooper & Gough-Stone, *supra* note 3, at 163.

108. *Id.*

109. *Id.* at 164.

110. *Id.*

111. *Id.*

112. Christopher Blaufelder, Cindy Levy, Peter Mannion & Dickon Pinner, *A Blueprint for Scaling Voluntary Carbon Markets to Meet the Climate Challenge*, MCKINSEY SUSTAINABILITY (Jan. 19, 2021), <https://www.mckinsey.com/capabilities/sustainability/our-insights/a-blueprint-for-scaling-voluntary-carbon-markets-to-meet-the-climate-challenge> [https://perma.cc/E9KW-9CJ6].

113. Lauren Bernadett, Comment, *Agricultural Soil Carbon Sequestration Offset Programs: Strengths, Difficulties, and Suggestions for Their Potential Use in AB 32's Cap and Trade Program*, 31 UCLA J. ENV'T L. & POL'Y 198, 209 (2013).

efforts must be capable of being measured.¹¹⁴ Currently, “real” means that an independent third party is able to verify the reductions.¹¹⁵ A reduction in emissions is permanent if the emissions reduced by the project will not be released in the future.¹¹⁶ Lastly, to be additional, a project has to reduce emissions that would not have been reduced but for the offset agreement.¹¹⁷

In the United States, there are limited government regulations that standardize or validate carbon contracts. For example, limitations exist for the ability to specifically measure carbon.¹¹⁸ There is also no national registry to confirm whether the carbon credits have been previously sold.¹¹⁹ Instead, the party to the contract is often required to warrant that the carbon credit has not been sold to another party.¹²⁰ Carbon offset credit trading markets typically include “contractual terms such as mandatory retirement conditions, representations, warranties, and covenants” to overcome issues.¹²¹ Contractual terms also usually include a condition that if terms are breached, the aggrieved party can terminate the contract or enforce it.¹²² In the case of carbon offset credits, a warranty can be used as the “[c]redit purchaser’s guarantee, and statement of understanding, that the credits are non-transferrable or . . . retired upon the close of the transaction.”¹²³

F. Agriculture

Globally, “food systems contribute about one-quarter to one-third of total greenhouse gas emissions.”¹²⁴ Therefore, scientists are now realizing that agriculture plays a pivotal role in the discussion about climate change.¹²⁵ The Paris Agreement acknowledges the importance of land use and food security as the global population grows.¹²⁶ It also contemplates that food systems will need to adapt to new climate realities such as drought or floods.¹²⁷ Agriculture does contribute to climate change, but it can also help mitigate climate change through responsible practices.¹²⁸ It has been said that “[a]griculture is the one sector that has the ability to transform from a net source of [carbon] to a net sink

114. *Id.*

115. *Id.*

116. *Id.*

117. *Id.*

118. Lin, *supra* note 5, at 746.

119. See Marchant, Cooper & Gough-Stone, *supra* note 3, at 164.

120. *See id.* at 168.

121. Marchant, Cooper & Gough-Stone, *supra* note 3, at 168.

122. *Id.*

123. *Id.*

124. Lehner & Rosenberg, *supra* note 10.

125. Brunet Marks, *supra* note 2, at 499.

126. Gittemeier & Rollins, *supra* note 43.

127. *Id.*

128. Brunet Marks, *supra* note 2, at 499.

of [carbon]—there is no other human managed realm with this potential.”¹²⁹

Agriculture refers to both cultivating crops and raising animals for food, feed, fuel, and fiber.¹³⁰ Growing crops requires resources such as water, heat, and sun.¹³¹ With too little or too much of these inputs, the plants cannot properly grow.¹³² Climate change impacts weather patterns in the United States, and these changing weather patterns, as well as increased extreme weather events, take a toll on American agriculture’s ability to meet the food demands of the world.¹³³ Extreme weather events such as floods and wildfires that are caused by changes in temperature patterns threaten crop yields and jeopardize global food security.¹³⁴

United States agriculture is particularly well-positioned to adapt its food production systems because the United States has some highly productive soils, beneficial regional climates, an advanced technological infrastructure, resourceful farmers, and developed agribusinesses.¹³⁵ Agriculture is responsible for the production of food around the world, and this food is most typically grown in soil.¹³⁶ “[I]n 2016, researchers concluded that the expansion of existing [United States Department of Agriculture] USDA conservation practices could lead to the sequestration of 277 [million metric tons of carbon dioxide equivalent] annually by 2050.”¹³⁷ This amount of carbon being captured in the soil would cut net agricultural greenhouse gas emissions in half.¹³⁸

In the United States, the majority of cropland, often used to produce corn, soybeans, and wheat, is owned by individuals and family landowners.¹³⁹ These landowners have rights to their property and the ability to influence the practices that are used on the land, even if they do not directly operate the land for agricultural purposes. Farmers have an opportunity to reduce carbon emissions by utilizing farming practices that increase carbon sequestration.

129. CARBON CYCLE INST., *supra* note 3; *see also* Marchant, Cooper & Gough-Stone, *supra* note 3.

130. Lehner & Rosenberg, *supra* note 10, at 10846.

131. *Id.*

132. *See id.*

133. Lehner & Rosenberg, *supra* note 10.

134. MacKenzie Thurman, *Climate-Smart Agriculture Certification: A Call for Federal Action*, 122 COLUM. L. REV. F. 37, 38 (2022).

135. *See* Correa & Voigt, *supra* note 6, at 5.

136. *See generally* Lehner & Rosenberg, *supra* note 10.

137. *Id.* at 10110.

138. *Id.*

139. Steven Savage, *Who Owns America’s Farmland? And What is Their Role in the Response to Climate Change?*, FORBES (July 19, 2022), <https://www.forbes.com/sites/stevensavage/2022/07/19/who-owns-americas-farmland-and-what-is-their-role-in-the-response-to-climate-change/> [<https://perma.cc/5H6W-VVYF>].

G. Soil Management and Carbon Sequestration

“Land provides the basis for human livelihoods and well-being.”¹⁴⁰ It produces food supply and includes freshwater and multiple other important ecosystems as well as biodiversity.¹⁴¹ Since the second largest reservoir of carbon is found in soils, there is recognition that soils are important natural carbon sinks.¹⁴² Agricultural land covers thirty-eight percent of the global land surface and about one-third of that is used as cropland.¹⁴³ Agricultural land accounts for fifty-two percent of the United States’ total landmass, and it is the single largest type of land use in the United States.¹⁴⁴ Of the 2.3 billion acres in the United States, 392 million acres are cropland.¹⁴⁵ Since agriculture covers such a significant amount of land, modest reductions in emissions per acre could have a significant cumulative effect when adopted across large numbers of acreage.¹⁴⁶

Soil management practices are significant because they generate forty-eight percent of all United States agricultural emissions.¹⁴⁷ When unsustainable agricultural and grazing practices are used, carbon is released into the atmosphere.¹⁴⁸ While agricultural practices contribute to the release of carbon into the atmosphere, there is also an opportunity for agriculture to be a part of mitigating carbon releases by utilizing the soil to absorb carbon from the atmosphere.¹⁴⁹ One estimate provided by the United States Environmental Protection Agency (EPA) projected that “conservation tillage could sequester between .6 and 1.1 metric tons of carbon dioxide per acre per year.”¹⁵⁰ The USDA has estimated that improved crop rotation and fallowing practices can sequester between .2 and .4 metric tons of carbon dioxide per acre per year.¹⁵¹ While estimates vary greatly, one global estimate said that .6 to 1.2 petagrams of carbon per year could be sequestered globally.¹⁵² This is “enough to offset one-fourth to one-third of the annual global increase in carbon dioxide concentrations.”¹⁵³ The scale of possibility for carbon sequestration in agricultural land has made it attractive for investment from parties that are

140. Correa & Voigt *supra* note 6, at 5.

141. *Id.*

142. Brunet Marks, *supra* note 2, at 503.

143. Food & Agric. Org. of the U.N., *supra* note 11.

144. Lehner & Rosenberg, *supra* note 10.

145. *Id.*

146. *Id.*

147. Lehner & Rosenberg, *supra* note 4, at 10875; *see also* U.S. Env’t Prot. Agency, *supra* note 14.

148. *See* Brunet Marks, *supra* note 2, at 503.

149. *Id.*

150. Bernadett, *supra* note 113, at 215.

151. *Id.*

152. *Id.*

153. *Id.* at 216.

interested in offsetting their carbon emissions with carbon credits.¹⁵⁴

“Carbon mitigation and carbon removal must be permanent to effectively address climate change.”¹⁵⁵ Carbon mitigation is avoiding emissions.¹⁵⁶ For example, carbon stored in soil can escape when disturbed.¹⁵⁷ One challenge with calculating carbon credits is that the way that carbon accumulates in soil “can vary substantially based on soil composition, geography and depth.”¹⁵⁸ Historical sampling data is also scarce.¹⁵⁹ Nature-based carbon removal does present some challenges for accounting for what a “ton” of carbon really means.¹⁶⁰ “[C]arbon removal rates depend on complex flows between carbon reservoirs [which] change over time.”¹⁶¹ “Climate conditions, tree species, rates of decomposition, and soil quality all” have an impact on carbon removal rate.¹⁶² Additionally, changes in land cover and climate change’s effects on plant growth as well as natural disturbances make it difficult to accurately and objectively quantify soil carbon removal.¹⁶³

In agricultural carbon sequestration programs, ensuring quantifiability and permanency are central concerns.¹⁶⁴ Since soil is a living system, it is differentiable from a point source such as a smokestack where measurement is more concentrated and accurate.¹⁶⁵ In soil, “seasonal variations, weather, precipitation, plant species present,” soil type, and soil quality all impact the amount of carbon that is secured.¹⁶⁶ Activities like tilling, wind and water erosion, or a natural disaster such as an earthquake, fire, or disease outbreak all reverse carbon sequestered in soil and thus present risk related to permanence requirements.¹⁶⁷ Since permanence is a risk in agricultural soils, it is even more important that those responsible for the land steward their practices with great care. When soil is disturbed due to changes in water, air, and temperature conditions, carbon is released into the atmosphere.¹⁶⁸ Therefore, reducing a practice such as tilling, can increase the carbon sequestered in the soil.¹⁶⁹

154. See U.S. Env’t Prot. Agency, *supra* note 14.

155. Lin, *supra* note 5, at 747.

156. *Id.* at 747-48.

157. See Bernadett, *supra* note 113.

158. Dunn, *supra* note 104.

159. *Id.*

160. Lin, *supra* note 5, at 746.

161. *Id.*

162. *Id.*

163. *Id.*

164. See Bernadett, *supra* note 113.

165. *Id.* at 222.

166. *Id.* at 216.

167. *Id.* at 222.

168. *Id.* at 216.

169. *Id.*

H. Carbon Farming Practices

Carbon farming practices incorporate five principal techniques to focus on soil health and improving land.¹⁷⁰ The first regenerative technique is to minimize soil disturbance.¹⁷¹ This includes minimizing activities such as tilling and use of synthetic pesticides and fertilizers.¹⁷² These practices help increase the amount of carbon sequestered and reduce emissions from farm machinery since the machinery is not entering the field as often.¹⁷³ Secondly, farmers use techniques to energize soil with crop diversity both above and below ground.¹⁷⁴ Third, farmers can use cover soil to increase carbon sequestration.¹⁷⁵ Fourth, farmers can ensure plant roots remain in ground.¹⁷⁶ Alternatively, farmers can plant longer rooted crops and incorporate organic materials into the soil.¹⁷⁷ The fifth regenerative principal that farmers may use is integrating animals such as goats, cattle, buffalo, and sheep on cropland during a dormant period of the year.¹⁷⁸ For agricultural carbon mitigation to be effective, it is important that growing numbers of farmers adopt carbon farming practices.¹⁷⁹

Cover crops involve planting grasses on cropland that would not be planted otherwise.¹⁸⁰ For example, during the winter, cropland is not typically utilized.¹⁸¹ If a crop was planted during that time, it would be known as a cover crop.¹⁸² These crops can help secure carbon into the soil and reduce erosion.¹⁸³ Erosion is one source of soil carbon loss.¹⁸⁴ An additional helpful practice is minimizing tillage because tillage surfaces carbon.¹⁸⁵ Without tillage, carbon stays buried below the surface of the cropland.¹⁸⁶ Since plant matter stores carbon, “increasing the volume of plant matter increases carbon storage.”¹⁸⁷ If matter from plants is left in the field after harvest, it can decompose and be trapped in the soil.¹⁸⁸ This is particularly effective with plants that have significant root systems.¹⁸⁹

170. Brunet Marks, *supra* note 2, at 507.

171. *Id.*

172. *Id.*

173. Bernadett, *supra* note 113, at 215.

174. Brunet Marks, *supra* note 2, at 507.

175. *Id.*

176. *Id.*

177. *Id.*

178. *Id.*

179. *See* U.S. Env’t Prot. Agency, *supra* note 14.

180. SMITH, *supra* note 17, at 4.

181. *Id.*

182. *Id.*

183. *Id.*

184. *Id.*

185. *Id.*

186. *Id.*

187. *Id.*

188. *Id.*

189. *Id.*

One way that farmers typically prepare for planting is to plow the soil.¹⁹⁰ This breaks up soil and eliminates unwanted material.¹⁹¹ This process also speeds the breakdown of organic matter in the soil and increases emissions of carbon dioxide.¹⁹² No-till agriculture completely eliminates tillage and uses herbicides or other methods to control weeds.¹⁹³ By leaving the soil physically undisturbed, organic matter is protected “from soil microbes that could otherwise accelerate the carbon cycle by returning soil carbon to the atmosphere as carbon dioxide.”¹⁹⁴

Transitioning to no-till can present initial yield reductions, but after a transition period of five or more years, yields are similar to conventional tillage.¹⁹⁵ However, no-till can be more profitable for farmers because it has the “potential to reduce expenditures on labor, fuel, and . . . fertilizer.”¹⁹⁶ Input costs such as labor, fuel, and fertilizer are important considerations that impact the profitability of a crop in significant ways.¹⁹⁷

Cover crops and crop rotations also “foster soil carbon by increasing carbon input from plants.”¹⁹⁸ A cover crop is a plant that is grown to enhance soil conditions, rather than for the purpose of producing an agricultural product.¹⁹⁹ Cover crops are typically grown during times when land would otherwise be fallow.²⁰⁰ Generally, this is in the late fall and winter after commodity crops like corn, wheat, and soy have been harvested.²⁰¹ Crop rotations of “perennial plants, such as alfalfa, or grass hay, can also be especially effective at sequestering carbon.”²⁰² A producer of a perennial crop may not return to an annual crop for one to three years.²⁰³

The benefit of these practices is recognizable when they are practiced at scale to increase soil carbon and reduce emissions.²⁰⁴ These practices when utilized together have a synergistic effect, and if adopted widely across farming operations could meaningfully contribute to achieving climate goals.

III. ANALYSIS

Currently, the market for carbon credits is being driven by demand from a

190. Lehner & Rosenberg, *supra* note 4, at 10850.

191. *Id.*

192. *Id.*

193. *Id.*

194. *Id.*

195. *Id.*

196. *Id.*

197. *See generally* Lehner & Rosenberg, *supra* note 4.

198. *Id.* at 10850.

199. *Id.*

200. *Id.*

201. *Id.*

202. *Id.* at 10851.

203. *Id.*

204. *See* U.S. Env't Prot. Agency, *supra* note 14.

private market. Corporations have set for themselves net zero objectives, and they are looking for a way to offset their emissions.²⁰⁵ Cropland provides a carbon sink and thus a market is created to purchase additional sequestered carbon for the benefit of the corporation and global interest in succeeding at complying with the Paris Agreement's goal to keep the increase in global temperature less than 1.5° Celsius.²⁰⁶

To understand the challenges presented for carbon sequestration practices and thus the selling of carbon credits to a market, it is important to consider relevant real property issues such as United States recording practices and how the existing system presents prohibitive barriers for proper participation from brokers in the existing carbon market.²⁰⁷ These barriers include complexities and fragmentation that result from use of historical real estate legal practices that do not comport with modern technology availability.²⁰⁸

Secondly, agriculture is also rapidly changing as land prices rise and farmers and landowners are aging.²⁰⁹ Increasingly, a system that separates land ownership from farm operation is emerging.²¹⁰ This is a different structure than has been valued in agriculture, and it is a structure that is different from the structure for which laws and policies were developed.²¹¹ This rise in the separation of landownership and land use rights leads to important implications for climate considerations when two parties enter into a lease agreement. By considering the current realities and opportunities of the real estate recording system as well as key aspects in landowner-operator lease agreements, two key challenges associated with the long-term sequestration opportunity of carbon in agricultural cropland can be addressed.

A. Real Property Issues

A key approach to facilitate carbon agreements on cropland that meaningfully contributes to the sequestration of carbon for the benefit of the global climate is to bind the land to specific practices for an extensive period of time. During the course of a carbon contract, it is necessary to ensure that sequestration farming practices continue if land passes into the hands of a third-

205. Lin, *supra* note 5, at 699.

206. *See generally* U.N. Framework Convention on Climate Change, *supra* note 7.

207. Todd J. Janzen, *Are Antiquated Real Estate Laws Stopping Farmers from Fighting Climate Change*, A.B.A. (Mar. 11, 2022), https://www.americanbar.org/groups/environment_energy_resources/publications/am/20220311-are-antiquated-real-estate-laws/ [<https://perma.cc/4NGP-ZF6H>].

208. *See* Reid K. Weisbord & Stewart E. Sterk, *The Commodification of Public Land Records*, 97 NOTRE DAME L. REV. 507, 519 (2022).

209. Neil D. Hamilton, *Feeding Our Green Future: Legal Responsibilities and Sustainable Agricultural Land Tenure*, 13 DRAKE J. AGRIC. L. 377, 381 (2008).

210. *Id.* at 383.

211. *Id.* at 382.

party buyer or lessee.²¹² Contracts need to run with the land to bind subsequent users, such as subsequent farmers of the land for the period that the sequestration practice was originally contracted.²¹³ Binding the land, rather than the landowner itself, to climate-friendly farming practices helps to overcome the risk that comes with landowners selling land or landownership changing through succession. Successors in interest to land need to be bound by legal tools that attach directly to the land itself. Recording is the central method used in the United States to document restrictions on real property and notify subsequent purchasers of real property restrictions.²¹⁴

The American legal system provides that recorded deeds are accessible as a public record.²¹⁵ Recording creates a network of information which market participants can use to help facilitate transactions related to land and protect interest in real property.²¹⁶ In essence, the recording process is intended to ensure that those who transfer land title and any subsequent acts which limit, encumber, or divide interests are recorded to provide public record of these actions.²¹⁷ Recording is relevant to those who contract with landowners because it allows ownership interests associated with the property to be identified.²¹⁸ Furthermore, prospective buyers rely on verifiable title information to make informed purchasing decisions.²¹⁹ It is important that these market participants are able to identify title limits with reliable clarity.²²⁰ Facilitating verification of land title helps enable progress and the market depends on information certainty.²²¹ Government plays an important role to provide “authority and certainty in the creation, preservation, cultivation, maintenance, stewardship, and improvement”²²² of recording because it holds the power to protect property and free exchange.²²³

Land records, including deeds, are often recorded at the local level.²²⁴ Typically this is by county. As a result, recording is completed in thousands of local offices and there is no standard system for recording,²²⁵ but there are many common characteristics.²²⁶ Historically, the local nature of land recording was

212. Brant M. Leonard, *Carbon Sequestration as Agriculture's Newest Market: A Primer on Agriculture's Role in Carbon Cap-and-Trade*, 15 DRAKE J. AGRIC. L. 317, 334 (2010).

213. *Id.*

214. See Tanya D. Marsh, *Foreclosures and the Failure of the American Land Title Recording System*, 111 COLUM. L. REV. SIDEBAR 19, 22 (2011).

215. Weisbord & Sterk, *supra* note 208, at 516.

216. *Id.* at 518.

217. Donald J. Kochan, *Certainty of Title: Perspectives After the Mortgage Foreclosure Crisis on the Essential Role of Effective Recording Systems*, 66 ARK. L. REV. 267, 273 (2013).

218. *Id.*

219. *Id.* at 274.

220. *Id.* at 276.

221. *Id.* at 306.

222. *Id.* at 307.

223. *Id.* at 310.

224. Weisbord & Sterk, *supra* note 208, at 519.

225. Marsh, *supra* note 214.

226. Kochan, *supra* note 217, at 272-73.

important for the accessibility of the records.²²⁷ In the early days, it was ideal for recording offices to be no more than “one day’s horse ride away from any closing.”²²⁸ Today, real property records can be electronically recorded.²²⁹ Since the widespread adoption of the Uniform Real Property Electronic Recording Act (URPERA), land records may be computerized.²³⁰ As a result, economies of scale can be achieved by streamlining recording at a state level instead of the currently implemented county-level recording.²³¹

In the current carbon offset market, traditional means of recording interests in land are being ignored.²³² For example, one current market participant, Indigo, states on their website that for a farmer to begin the process of enrolling land in a carbon program, they need to “map (or import) some or all of [their] field boundaries.”²³³ This language entirely omits any requirement for checking a deed or traditional real estate record. It is not surprising that brokers are foregoing the traditional real estate systems because the transactional costs of working with hundreds or thousands of local county recording offices are impracticable for a broker attempting to establish contracts across the United States.²³⁴ The antiquated systems associated with recording land interests are complex, slow, and costly.²³⁵ To enroll land through these systems would require a title search, land survey, and the signing of a recordable lease or easement agreement.²³⁶ However, the consequences to circumventing the standard recording system for meaningful achievement of climate objectives are substantial.²³⁷ Without notice, upon sale of enrolled land there is no obligation for the subsequent owner to sequester carbon because an unrecorded contractual agreement itself only binds the parties which entered the agreement.²³⁸ Therefore, the protocols established in the agreement do not run with the land and a new owner can choose to undo previous climate practice efforts thereby releasing sequestered carbon into the atmosphere.²³⁹

There has been some effort to use technology to make recording systems more searchable and useful, but there is still a significant amount of innovation needed to improve the recording system and to increase compliance by parties

227. Weisbord & Sterk, *supra* note 208, at 519.

228. *Id.*

229. *Id.* at 526.

230. *See id.*

231. *Id.* at 519-20.

232. Janzen, *supra* note 207.

233. *Enrich Your Soil, Improve Your Profit Potential with Carbon by Indigo*, INDIGO, <https://www.indigoag.com/carbon/for-farmers> [<https://perma.cc/9J3R-VC6K>] (last visited May 11, 2024).

234. Janzen, *supra* note 207.

235. *Id.*

236. *Id.*

237. *See id.*

238. *See id.*

239. *Id.*

who have interests in land.²⁴⁰ These recording systems serve as repositories of valuable and necessary market information as well as databases for the public market.²⁴¹ Reform of the recording system would benefit from a focus on creating a straightforward and comprehensive tracking of ownership in property.²⁴² Key characteristics of a more relevant system could include “transparency, accuracy, completeness, and authoritativeness.”²⁴³ Consequences for a lack of compliance and data quality would also be key considerations.²⁴⁴ Private property rights create an incentive to invest in property because individuals have assurance that they will receive benefit from that investment.²⁴⁵ Therefore, “confidence and certainty in ownership are essential for the efficient use of property.”²⁴⁶ Real property recording is a critical mechanism to bind land for successors in interest and provide notice to relevant parties.

B. Non-Operator Landowners

Often, those who own agricultural land do not actually farm the land.²⁴⁷ These landowners are known as non-operator landowners because they do not actively farm the land themselves.²⁴⁸ Another significant factor impacting cropland ownership in the United States is that the number of farms has been steadily shrinking.²⁴⁹ “Today, less than two percent of Americans farm.”²⁵⁰ Additionally, “sixty percent of farm operators own their land and are fifty-eight years old on average but do not have a succession plan” for when they choose to retire.²⁵¹ New farmers are often unable to afford prime agricultural real estate due to high prices.²⁵² As of 2022, the average cost of cropland in the United States was \$5,050 per acre.²⁵³ Since purchasing land at these prices is often not an option, new farmers typically lease the land that they farm.²⁵⁴ In the United States, nearly forty percent of farmland is rented or leased from landowners.²⁵⁵

240. Kochan, *supra* note 217, at 276.

241. *Id.* at 310.

242. *Id.* at 312.

243. *Id.* at 314.

244. *See id.*

245. *Id.* at 303.

246. *Id.*

247. Leonard, *supra* note 212, at 334.

248. PETRZELKA ET AL., *supra* note 13, at 1.

249. Carrie A. Scufari, *Tackling the Tenure Problem: Promoting Land Access for New Farmers as Part of a Climate Change Solution*, 42 COLUM. J. ENV'T L. 497, 502 (2018).

250. *Id.*

251. *Id.* at 502-03.

252. *Id.* at 503.

253. U.S. DEP'T OF AGRIC NAT'L AGRIC. STAT. SERV., LAND VALUES: 2022 SUMMARY (2022), https://www.nass.usda.gov/Publications/Todays_Reports/reports/land0822.pdf [<https://perma.cc/RD5M-FETD>].

254. PETRZELKA ET AL., *supra* note 13, at 503.

255. *Id.*

A non-operator landowner holds title to cropland, but under a lease authorizes an operator, farmer, to complete the farming activities on the land.²⁵⁶ The USDA describes someone who is a tenant or renter running a farm as an “operator.”²⁵⁷ A lease is a private agreement that governs the terms under which a farm operator can use the land. Leases between a non-operator landowner and farm operator can be very informal, such as an oral agreement.²⁵⁸ While many non-operator landowners and farm operators have a relationship that lasts more than three years, seventy percent of lease agreements are renewed annually.²⁵⁹

Non-operator landowners should be paid attention to when considering environmental issues on agricultural lands.²⁶⁰ A survey by the American Farmland Trust showed that non-operator landowners are supportive of their farm operators utilizing conservation-oriented action on land.²⁶¹ The survey further revealed that non-operator landowners are willing to provide support through extending lease lengths for operators to help facilitate implementation of conservation practices.²⁶² That particular survey also demonstrated that non-operator landowners would be willing to ask the farm operator to use certain conservation practices on land.²⁶³ Lastly, the American Farmland Trust survey found that non-operator landowners would be willing to amend a lease or add an addendum to require conservation practices by the farm operator on their land.²⁶⁴ These findings reveal that non-operator landowners are willing to participate in facilitating greater adoption of carbon sequestration on cropland, but to realize this potential there are multiple aspects related to leases and real property rights that must be addressed.

C. Carbon Sequestration Property

When cropland is used for carbon sequestration, the potential creation of a new property right to the sequestered carbon itself is worth considering. “Sequestered carbon” is carbon which is actually retained by soil and

256. See Leonard, *supra* note 212, at 334.

257. *Glossary*, U.S. DEP’T OF AGRIC. ECON. RSCH SERV., <https://www.ers.usda.gov/topics/farm-economy/farm-household-well-being/glossary/> [<https://perma.cc/4U84-F7P8>].

258. See Keith Duffy, *Soil Carbon Offsets and the Problem of Land Tenure: Constructing Effective Cap & Trade Legislation*, 15 DRAKE J. AGRIC. L. 299, 313 (2010).

259. Daniel Bigelow, Allison Borchers & Todd Hubbs, *U.S. Farmland Ownership, Tenure, and Transfer*, U.S. DEP’T OF AGRIC. ECON. RSCH. SERV. ECON. INFO. BULL. NO. 161, at 25 (2016) <https://www.ers.usda.gov/webdocs/publications/74672/eib-161.pdf?v=4813.1> [<https://perma.cc/6G7R-X54B>].

260. PETRZELKA ET AL., *supra* note 13.

261. *Id.* at ii.

262. *Id.*

263. *Id.*

264. *Id.*

vegetation.²⁶⁵ In cropland, “the primary carbon reservoir is the soil through the incorporation of organic matter.”²⁶⁶ When land ownership and farming operation are separated between two different parties, it is worth considering who has the legal title to the stored carbon and the carbon sequestration potential.²⁶⁷ This is especially pertinent because the sequestration of soil, while dependent on a range of factors, is impacted by practices utilized on the land itself.²⁶⁸ In a relationship between a landowner and operator, the landowner holds legal title to the land while the operator is given authority to make decisions related to the use of the land.²⁶⁹ When considering carbon sequestration potential, these two responsibilities converge because a product with value in the land itself emerges, but that product is dependent on the practice choices that an operator selects or is required to maintain.²⁷⁰ Essentially, the carbon rights are linked to the underlying soil asset where traditional property rights are associated.²⁷¹ Therefore, clarity of ownership is critical for a carbon sequestration initiative. Establishing ownership sets the beginning point for a system of cropland sequestration rights and for transfer and trading based on these legal rights.²⁷²

First, security of legal title by verifying publicly available recorded documents gives owners an awareness of the value of their rights which puts them in a position to be able to market their rights.²⁷³ Buyers of the rights have assurance of sellers’ title and consequently are able to assign value.²⁷⁴ Ownership is also important for the overall integrity of the offset trading system.²⁷⁵ Without clarity of ownership, double counting sinks-based offsets can compromise the operation of the entire system.²⁷⁶

When a landowner purchases surface land, a purchaser should use due diligence to understand the availability of carbon sequestration rights.²⁷⁷ A title investigation and opinion, as well as reliance on a land registration system, become relevant because without a means to ascertain ownership in a reliable way, potential purchasers may be unwilling to risk investment.²⁷⁸

265. Steven A. Kennett, Arlene J. Kwasniak & Alastair R. Lucas, *Property Rights and the Legal Framework for Carbon Sequestration on Agricultural Land*, 37 OTTAWA L. REV. 171, 178 (2005).

266. *Id.* at 179.

267. *Id.*

268. *Id.* at 188.

269. *Id.* at 190.

270. *Id.*

271. Bryce A. Davis, *A Climate Solution on Shaky Ground: The Voluntary Carbon Market and Agricultural Sequestration*, 2023 U. ILL. L. REV. 955, 979-80 (2023).

272. Kennett, Kwasniak & Lucas, *supra* note 265, at 179.

273. *Id.*

274. *Id.*

275. *Id.*

276. *Id.*

277. *Id.*

278. *Id.*

When negotiating a sequestration contract, a landowner and a party acquiring sequestration rights have interest in accurately identifying the present and future uses of land and associated carbon assets.²⁷⁹ These interests include who has “control over land uses, the possibility of conflicting uses, the landowner’s ability to sell or lease land, and the duration of an obligation to maintain . . . sequestered carbon.”²⁸⁰ Since carbon sequestration is likely “a secondary land use achieved through changes in agricultural practices,” landowners typically “maintain underlying ownership and primary control over the land” itself.²⁸¹ The “[p]roperty rights in carbon assets will therefore be carved out of a landowner’s fee simple interest.”²⁸² When a carbon contract includes ongoing monitoring and soil testing to ensure permanence for relying parties, a landowner is contracting with respect to their right to exclude, one of the central real property rights.²⁸³

There are two ways to approach sequestration rights.²⁸⁴ An indirect definition of sequestration rights focuses on obligations for use or non-use of land.²⁸⁵ For example, this approach would include an operator’s obligation to practice no-till or abstain from clearing vegetation or other activities which would adversely affect carbon sinks or reservoirs.²⁸⁶ As a result, the purchaser of sequestration services would “take the form of . . . oversight or control relating to land use practices.”²⁸⁷ Essentially, this approach would create land use rights that incidentally facilitate carbon sequestration.²⁸⁸ This approach does not give full legal recognition to regulatory limits on greenhouse gas emissions and makes carbon assets a valuable and marketable commodity in and of themselves.²⁸⁹ It is possible that this approach would create credits that are personal property where creditors could take interest in the associated real property to monitor and inspect land.²⁹⁰ When land use practices are the primary focus, there is uncertainty about ultimate ownership of sink-based offsets resulting from sequestration practices.²⁹¹

A contract establishes a nexus between sequestration and cropland.²⁹² A party to the contract could agree to provide sequestration services, but when done through contract, the agreement is only binding on the parties to the

279. *Id.* at 186.

280. *Id.*

281. *Id.* at 188.

282. *Id.*

283. Davis, *supra* note 271, at 980.

284. Kennett, Kwasniak & Lucas, *supra* note 265.

285. *Id.* at 188.

286. *Id.*

287. *Id.*

288. *Id.*

289. *Id.* at 189.

290. Davis, *supra* note 271, at 981.

291. Kennett, Kwasniak & Lucas, *supra* note 265, at 189.

292. *Id.* at 190.

contract.²⁹³ However, carbon sequestration is inseparably linked to land itself.²⁹⁴ Since sequestering a significant amount of carbon takes time and must be maintained in order to produce a recognizable offset, sequestration transactions need to involve restrictions to land use over a specified period of time.²⁹⁵ Therefore, parties to a sequestration transaction need “to ensure” that they have the right to “manage the[] assets, protect their interest in them, and perhaps even dispose of the[] assets during the term of the contract.”²⁹⁶

Climate objectives are more effectively met when carbon sequestration transactions “run with the land” and bind subsequent purchasers.²⁹⁷ For the landowner, this “preserves the flexibility to sell the land without being burdened” with “personal liability for the sequestration obligations.”²⁹⁸ For the holder of the sequestration rights, this also ensures that the direct connection with the land itself and the contracted sequestration project will not be severed if land comes under new ownership.²⁹⁹ When carbon sequestration rights are recorded as interests that run with the land, a legal basis is provided for disposition by the rights holder and helps to communicate that sequestration rights are assets in and of themselves with value.³⁰⁰ Registration on title also provides a method for verification that ensures that acquiring parties receive notice that sequestration rights have been granted.³⁰¹

D. Cropland Lease Agreements

It is necessary that landowner-tenant lease agreements incorporate elements regarding carbon sequestration.³⁰² If, for example, a farm operator wants to utilize no-till practices to earn offsets on cropland that they lease, a lease agreement will need to define who the offsets belong to because the carbon sequestration potential of the land and the land itself are two distinct assets.³⁰³ As a result, the impacts of marketable credits for soil carbon sequestration should be discussed when contracting.³⁰⁴

Farm ownership may change over a long contract period, but to be environmentally effective, there is a need for long-term durable carbon

293. *Id.*

294. *Id.*

295. *Id.*

296. *Id.*

297. *Id.*

298. *Id.*

299. *Id.*

300. *Id.*

301. *Id.*

302. Leonard, *supra* note 212, at 334.

303. *Id.*

304. *Id.*

storage.³⁰⁵ Many farm operators of cropland do not have leases that are ten or fifty years long.³⁰⁶ It is typical for leases to be renewed annually.³⁰⁷ Sometimes these leases are oral agreements rather than being put in writing.³⁰⁸ If a farm operator loses the right to operate on the land, “the sequestered carbon may be released into the air by the next [farm] operator.”³⁰⁹ In order to have a long-term impact, the land’s future enrollment needs to be secure so that soil carbon sequestration can be an effective means of countering climate change.³¹⁰ Aspects such as a lease duration that is shorter than a carbon sequestration contract create concern that when farm operators enter into contracts for carbon that can last for terms up to fifty years, they do not have the authority to agree to use specific farming practices on that specific parcel of land for the contracted amount of time. Therefore, it becomes essential that the landowner itself is a party to any carbon agreement with a third party.

Landowners may be opposed to becoming a party to a carbon sequestration agreement because it limits land use flexibility for future farm operators. Future operators who the landowner would like to make an agreement with may not be interested in maintaining practices that contribute to carbon sequestration on the land. However, for cropland to effectively sequester carbon, practices that store carbon in the land need to be maintained over a significant period of time because practices such as tilling cropland where carbon credits have been pledged releases carbon into the atmosphere destroying any positive climate contribution that was agreed to.³¹¹

Carbon sequestration does not need to be a zero-sum game between a farmer and a non-operator landowner.³¹² Rather, it can be an opportunity to engage a non-operator landowner with their real property and a farming operation.³¹³ Engaging non-operator landowners as partners and sharing benefits of carbon credits can be a winning strategy for both parties.³¹⁴ Greater levels of carbon sequestration in soils can have benefits to the soil and to the crop yield itself.³¹⁵ An increase in crop yield means that less land is required to produce the same amount of crop.³¹⁶ Since a crop is the product of cropland, an economic

305. Dana Cronin, *Carbon is Agriculture’s Latest Money-Maker. But is it Enough to Combat Climate Change?*, NPR, <https://www.kcur.org/2022-07-15/carbon-is-agricultures-latest-money-maker-but-is-it-enough-to-combat-climate-change> (July 18, 2022 4:00 AM CDT) [<https://perma.cc/7PCF-DSCG>].

306. Duffy, *supra* note 258.

307. Bigelow, Borchers & Hubbs, *supra* note 259.

308. *Id.*

309. Duffy, *supra* note 258, at 310-11.

310. *Id.* at 311.

311. Bernadett, *supra* note 113, at 209.

312. Lauher, *supra* note 78.

313. *Id.*

314. *Id.*

315. Todd Edwards & Matt Russell, *Earth Friendly Agriculture for Soil, Water, and Climate: A Multi Jurisdictional Cooperative Approach*, 21 DRAKE J. AGRIC. L. 325, 345 (2016).

316. *Id.*

objective of the farm operator and landowner is to maximize the yield. Therefore, understanding and communicating that practices advancing carbon sequestration are beneficial to soil is essential to create a compelling situation for landowners and farm operators to commit to key practices that facilitate carbon sequestration. For example, soil benefits from sequestration of carbon because it holds more water.³¹⁷ This is beneficial in both extreme rain and drought events.³¹⁸ Furthermore, higher levels of “carbon in soils can improve the efficiency of nutrient cycling.”³¹⁹ Both of these elements can contribute to higher yields.³²⁰

Landowners have the ability to set the terms of a lease agreement.³²¹ Farm operators compete for land to farm, but as tenants acquire larger amounts of land and operate profitably, they may be less interested in entering into an agreement with restrictive provisions related to farming practices.³²² Therefore, it may be necessary to provide incentives within the lease that help to motivate the farm operator to adopt sustainable practices.³²³ A key provision to achieve this is related to tenure security.³²⁴

Before addressing the importance of tenure security, it is important to acknowledge that two key types of lease agreements exist. The most common type is cash renting.³²⁵ Another type of agreement is share rent. “Cash renters pay cash rent and retain all products of the operation.”³²⁶ In contrast, share renters pay no cash rent, but the products of the operation are split between the landowner and farm operator in predetermined portions.³²⁷ Lease provisions that stipulate a landowner and farm operator to share costs of improvements help to increase opportunities to make improvements.³²⁸ Cost-sharing provisions in a lease agreement help to incentivize sustainability practices because landowners and farm operators share risk.³²⁹ This also gives an increased sense of security and certainty to the farm operator.³³⁰

Short-term leases present uncertainty for a farm operator which make them less likely to engage in sustainable practices.³³¹ The Food and Agriculture

317. *Id.*

318. *Id.*

319. *Id.*

320. *Id.*

321. See generally Edward Cox, *A Lease-Based Approach to Sustainable Farming, Part II: Farm Tenancy Trends and the Outlook for Sustainability on Rented Land*, 16 *DRAKE J. AGRIC. L.* 5, 6 (2011).

322. *Id.* at 12.

323. *Id.*

324. *Id.* at 13.

325. See *id.*

326. Jesse J. Richardson, Jr., *Land Tenure and Sustainable Agriculture*, 3 *TEX. WESLEYAN L. REV.* 799, 803 (2015).

327. *Id.*

328. *Id.* at 808.

329. *Id.*

330. *Id.*

331. *Id.* at 806.

Organization defines land tenure as “the relationship, whether legally or customarily defined, among people, as individuals or groups, with respect to land.”³³² Land tenure defines rights of “use, control and transfer” of land, “as well as associated responsibilities and restraints.”³³³ It further defines “security of tenure” as “the certainty that a person’s right to land will be recognized by others and protected in cases of specific challenges.”³³⁴ When land tenure insecurity exists, the risk of challenges to land rights increases.³³⁵

Leased cropland raises sustainability concerns due to a lack of incentives that the farm operator has to invest in long-term measures that enrich the soil.³³⁶ The farm operator is not as strongly incentivized to enrich the soil because benefit belongs to the landowner upon termination of a lease.³³⁷ Research has repeatedly shown that there is a connection between security of land tenure and sustainable agriculture which affects willingness to use conservation practices.³³⁸

To increase certainty and security in cropland leases, there are several matters to address. The duration of the agreement itself provides the most obvious indicator of security and certainty. When cropland leases are subject to year-to-year renewal or cancellation, they fail to promote farm operator security and certainty.³³⁹ Another area to address is the amount of cash rent paid by a farm operator to a landowner. The price of commodities and land values fluctuate from year to year.³⁴⁰ Therefore, both landowners and farm operators may be adverse to the inability to adjust rent on an annual basis.³⁴¹ However, long-term contracts would not need to directly establish cash rent for future years but could instead agree to renegotiate the rent each year.³⁴² Factors that go into the calculation of rent could surface disagreement.³⁴³ To address this, a third party could be mutually agreed upon to make a determination if the parties are unable to agree.³⁴⁴ Another alternative is for the agreement to utilize an index based on crop yield, market price, or even overall inflation measures.³⁴⁵

Another barrier to long-term leases is that the ability to sell the land itself during the lease is affected.³⁴⁶ This can be addressed by including a provision

332. *What is Land Tenure*, FOOD & AGRIC. ORGAN. OF THE U.N., <https://www.fao.org/3/y4307e/y4307e05.htm> [<https://perma.cc/C4DV-6VH8>] (last visited Feb. 23, 2024).

333. *Id.*

334. *Id.*

335. *Id.*

336. Richardson, *supra* note 326, at 804.

337. *Id.* at 808.

338. *Id.* at 803.

339. *Id.* at 807.

340. Cox, *supra* note 321, at 13.

341. *Id.* at 13-14.

342. *Id.* at 14.

343. *Id.*

344. *Id.*

345. *Id.*

346. *Id.* at 15.

for termination upon sale in the lease that reasonably compensates the farm operator.³⁴⁷ Alternatively, this could be addressed by subjecting purchasers of the land to the terms of the lease agreement.³⁴⁸ While this arrangement would be favorable for the farm operators because it would create greater land tenure security, the landowner would likely hold some opposition to a term like this because it would limit the market price of the land itself.³⁴⁹ Ultimately, it is worth acknowledging that leasing cropland is increasingly a reality in the United States; therefore, addressing issues such as lease duration to provide greater tenure security to farm operators will permit broader adoption of carbon-friendly farming practices.

IV. RECOMMENDATION

At first glance, the Paris Agreement's temperature objectives seem incredibly remote to rural croplands in the United States, but through an intersectional collection of stakeholders that have interest in a carbon offset credit, ultimately the carbon sink is the soil directly stewarded by farm operators who have entered into a lease agreement with a non-operator landowner. Desired climate outcomes, therefore, rely on soil and land stewardship rooted in real property ownership and private parties' contractual agreements.

Addressing carbon contract concerns as they relate to United States cropland requires a fundamental two-prong approach. First, to ensure that land is committed to carbon sequestration for a significant time period, real property recording systems must be updated to create a more nationally consistent and accessible opportunity to record changes to a real estate deed. Second, for the forty percent of United States cropland that is farmed by farm operators, more secure land tenure is essential in leasing agreements to motivate more widespread adoption of sustainable climate practices.³⁵⁰

A. Real Estate Recording System Updates

Private landowners hold title to the land itself and farm operators are granted land use responsibilities.³⁵¹ When considering climate impact, collaborative solutions are essential. One place to start when considering the carbon offset market for croplands in the United States is updating real estate recording systems to streamline records in a way that minimizes transactional costs. This result would allow land commitments to easily be recorded and effectively run with the land for a substantial period of time. The recording system needs to provide the market with certainty and verifiable title information that is easily

347. *Id.*

348. *Id.*

349. *Id.*

350. PETRZELKA ET AL., *supra* note 13.

351. *See* Leonard, *supra* note 212.

accessible and understood.³⁵² Modernization of the existing system by leveraging real estate descriptions based on GPS coordinates and transitioning to cloud-based recording systems that are easily accessible for interested stakeholders are two achievable approaches to updating the existing slow, complex, and fragmented recording systems.³⁵³ The existing county-based system is not practicable for implementing the broad solutions that addressing climate change requires. Since the URPERA allows real estate records to be kept online, there is a strong opportunity to advance in that direction.³⁵⁴ Further modernization would also allow a cloud-based system for stakeholders to access records from anywhere. These changes help to lower transactional costs associated with transferring interests in property. Lowering transactional costs prevents parties from circumventing a process designed to give subsequent landowners notice of restrictions to land use. Improved access to reliable information provides notice to relevant parties and helps promote maintaining climate friendly practices through the time required to facilitate more than illusory carbon sequestration in cropland.

B. Landowner-Operators Lease Agreement Terms

Secondly, non-operator landowners and their contract lease agreements cannot be overlooked as a key component of providing land tenure since forty percent of cropland in the United States today is leased.³⁵⁵ Secure land tenure incentivizes farm operators to implement carbon farming practices on land thereby facilitating carbon sequestration.³⁵⁶ Landowner-operator lease agreements facilitate secure land tenure for farm operators by instituting longer lease terms. Alternatively, adjusting the rental framework from cash rent to shared rent helps shift risk between parties for a transition period to climate-friendly farming practices. Lease agreements that provide for shared rent pricing will motivate farm operators to be more willing to adopt new practices on the land because they do not bear the entire risk of the practices, instead, the risk is shared with the landowner. Furthermore, to address concerns about land price fluctuation from year-to-year, price renegotiation could still be established on an annual basis even in a long-term lease. Lease agreements that set forth use restrictions and incorporate pricing terms which benefit interests of both the landowner and the farm operator, while clearly delineating property rights of the parties, will help to address concerns about permanence in carbon sequestration.³⁵⁷ Lastly, it is essential that lease agreements address the ownership of any carbon sequestration property right which may be created on

352. Kochan, *supra* note 217, at 274.

353. Janzen, *supra* note 207.

354. *See* Weisbord & Sterk, *supra* note 208, at 519.

355. PETRZELKA ET AL., *supra* note 13.

356. Richardson, *supra* note 326, at 802.

357. *See* Bernadett, *supra* note 113.

cropland through the implementation of carbon farming practices. By incorporating terms that increase land tenure and share risk, non-operator landowners and farm operators can more effectively participate in a carbon offset market.

Only after basic real estate recording and lease term elements have been addressed will the cropland carbon market effectively provide more than an illusory promise of carbon offset credits which nations and corporations are interested in to help achieve net zero emissions and thus limit global temperature increase to less than 1.5° Celsius as set forth in the Paris Agreement.³⁵⁸

V. CONCLUSION

Climate change is a growing concern for countries and businesses around the world as net zero pledges demonstrate voluntary or mandatory commitment to reducing greenhouse gas emissions in the interest of limiting global temperature to less than 1.5° Celsius as set forth in the Paris Agreement.³⁵⁹ Cropland is a relevant contributor to these efforts through producing carbon offset credits by sequestering carbon. Progress toward achieving Paris Climate goals will be realized when participants sequester carbon at scale.³⁶⁰ As an aggregate, farm operators cannot be ignored for their role in increasing carbon sequestration in cropland. By streamlining real property recording and increasing farm operator land tenure through longer lease terms, two key challenges to establishing permanence for carbon sequestration will be addressed. These improvements ensure that carbon sequestration practices run with the land through proper and streamlined recording systems as well as empower the entire scale of cropland owners and farm operators to participate. For the largest amount of land to be available for effective carbon sequestration, non-operator owner lease terms with farm operators need to facilitate land tenure, manage shared risk between the parties, and establish clarity for credit sequestration property ownership. By starting at the most basic level, with systems and legal instruments that bind landowners and farm operators of cropland, corporations and nations will be one step closer to achieving global climate objectives and bringing the Paris Agreement's intentions to reality.

358. *See generally* U.N. Framework Convention on Climate Change, *supra* note 7.

359. *Id.*

360. *See* U.S. ENV'T PROT. AGENCY.