

Sustainable Farmland Investment Strategies

AN INTRODUCTION TO CURRENT CONDITIONS



**Lucyann Murray &
Meaghan McGrath**

November 2016

An Independent Study

Yale School of Management &
Yale School of Forestry and
Environmental Studies

Advisor: Todd Cort

ABSTRACT

Do sustainable farmland investments deliver financial, environmental and social returns? With the rise of impact investing, there has been a jump in investment strategies promoting sustainable agriculture. This research attempts to understand the strategies and performance of a subset of farmland investors focused on sustainability. The project included a literature review and a series of 15 interviews with leaders in the field of farmland investing. It appears that sustainable farmland investment managers are generally able to deliver financial, environmental and social returns. However, due to limited information, we are unable to define to what extent those returns are attributable to specific sustainable agriculture activities. The initial findings point to success with organic conversion, water efficiency, and grass-fed beef. This report explores investment performance, value drivers, management models, public incentives, case studies, project challenges, financial risks, and next steps for the industry. It is our hope that this report will serve as a basis for continued progress in the field of sustainable farmland investing.

ACKNOWLEDGMENTS

The authors wish to thank the many individuals and institutions who made this work possible. In particular, we wish to thank all of the individuals who generously participated in this study. Your willingness to share information and encouragement through the process was instrumental. Additionally, this work was improved thanks to guidance from Todd Cort, Faculty Co-Director of Yale Center for Business and the Environment (CBEY), who advised our project. We were also inspired and guided by Spenser Shadle, Real Assets Manager at New Island Capital, and Patrick Hook, Decision Support Manager at Conservation Forestry, LLC. Kat Friedrich, News Editor at CBEY, and the team at HvADESIGN showed interest in our work and helped us edit and design the final publication. We also wish to recognize the tireless effort of our collaborators at CBEY. Your support enables us to pursue our passions beyond the classroom.

AUTHORS

The authors are Meaghan McGrath, Yale MBA and Master of Environmental Management Graduate 2016, and Lucyann Murray, Yale MBA and Master of Forestry Candidate 2017.

ADVISOR

The authors were advised by Todd Cort, Lecturer in Sustainability at the Yale School of Management.

EDITOR

The report was edited by Kat Friedrich, News Editor at Yale Center for Business and the Environment.

GRAPHIC DESIGN

The graphic design was created by Henk van Assen, Senior Critic at Yale University School of Art, together with Kelly Bryan and Igor Korenfeld, Designers at HvADESIGN. The authors thank these individuals for their valuable insights, support and assistance.

COPYRIGHT

For permission to reprint, reproduce or redistribute any of the contents of this report in a way that goes beyond fair use, please email Meaghan McGrath (Meaghan.Mcgrath@yale.edu) or Lucyann Murray (Lucyann.Murray@yale.edu).

November 8, 2016

Executive Summary | 04

Purpose

Methods

KEY FINDINGS | 05

Value Drivers

Investment Theses and Strategies

Management Models

Public Incentives

Investment Performances

Primary Challenges and Risks

CONCLUSION | 07

Introduction | 08

METHODS | 08

RESEARCH SAMPLE | 09

LIMITATIONS | 09

SUSTAINABLE FARMLAND INVESTING BACKGROUND | 10

Definition

Background

Value Drivers

Key Findings | 14

INVESTMENT THESES AND STRATEGIES | 14

MANAGEMENT MODELS | 16

Lease Terms

PUBLIC INCENTIVE PROGRAMS | 17

PERFORMANCE DISCUSSION | 19

CASE STUDIES | 19

CHALLENGES AND RISKS | 21

Conclusion and Next Steps | 23

REFERENCES | 24

Executive Summary

PURPOSE

With the rise of impact investing, there has been a jump in investment strategies promoting sustainable agriculture. This project attempts to understand the subset of farmland investors employing sustainable agriculture strategies by focusing on the following questions.

Do sustainable farmland investments deliver financial, environmental and social returns? If yes, to what extent? How are those returns realized?

Initial research indicated that there is limited literature on farmland investments that employ sustainable farmland strategies. This paper is an attempt to understand the strategies and to identify key trends, value drivers, structural challenges, and promising opportunities.

Because of limitations related to small sample size, limited data availability, and incongruent bases of comparison, we could not draw any definitive conclusions related to returns. But we are encouraged by the industry's progress to date.

We hope that this report will serve as a starting point for those who wish to understand the sector and incorporate sustainable farmland management practices.

METHODS

The research included a literature review and interviews with experts working in the field of farmland investing with a focus on real assets.

In total, 15 stakeholders were interviewed as part of this project. We interviewed representatives of 10 sustainable farmland investment firms representing over \$6 billion under management. In addition, we spoke with thought leaders and other professional experts representing management companies, nonprofit organizations, and the public sector.

The investment firms were asked questions about perceived sustainable agriculture opportunities, financial and operational strategies, investment vehicles, company motivations, value drivers, performance monitoring, risk management, and industry challenges.

Key Findings

VALUE DRIVERS

The main value drivers associated with sustainable agriculture identified across companies are: **price premiums, market access, lower costs, risk mitigation, and consistent yield.**

INVESTMENT THESES AND STRATEGIES

There are two dominant investment theses among sustainable farmland investors. They are:

- It creates value to invest in efficiencies and improvements, particularly those related to ecosystem function, which enhance the performance of the underlying asset.
- It is financially attractive to meet the growing demand of the natural and organic industry.

The following table provides a brief summary of the strategies and their associated benefits.

IMPROVEMENT	EXAMPLE OF STRATEGY	BENEFIT
Ecosystem Services	No-till farming Cover cropping Rotational/holistic planned grazing Ecological farming	Reduced costs Increased resilience Consistent yield
Farm Infrastructure and Scale	Land Irrigation Ditch improvements Process facilities Vertical integration	Reduced costs Maximized utilization Managed risk (for market price fluctuations)
Farm Management	Skilled managers Agricultural certifications Project contracts	Resource stewardship Sophisticated management Investor integration Premium optimization Asset maximization

MANAGEMENT MODELS

There are two major management models: owner-operator and land-lease.

The owner-operator model is used when the firm continues to hold and manage activities on the land directly.

In the land-lease model, the owner owns the land but leases it out to be managed.

Landowners are starting to innovate lease terms to increase incentives and support sustainable agriculture strategies.

There are a number of sustainable agriculture lease innovations, including:

- **Rotational lease agreements** to preserve management flexibility and accommodate rotational management models
- **Delayed payment schedules** to accommodate transitions from conventional to organic
- **Rents tied to ecological health** in the form of price premiums for high-quality land and/or discounts tied to soil health stewardship to facilitate sustainable strategies
- **Extended lease terms** to include lease-to-own structures or options to renew indefinitely, which incentivize long-term preservation of soil health
- **Use provisions** that outline tenant sustainability activities and owner responsibilities to support market access and business development

PUBLIC INCENTIVES

Public incentive programs are not a significant component of the sustainable farmland investment strategies.

INVESTMENT PERFORMANCE

Based on our limited information it appears that farmland investors are targeting 9-15% IRR, which is in line with historical conventional farmland performance of 10.7% (McMahon, 2016).

Although we cannot draw significant conclusions about sustainable farmland investment performance, we are encouraged by the data available to date.

This report provides additional examples through case studies focused on beyond organic production, holistic planned grazing, and resource efficiency.

PRIMARY CHALLENGES AND RISKS

Key challenges and risks identified include:

- Limitations on access to capital
- Dependence on access to sophisticated land managers
- Difficulties in performance tracking
- Overvaluation in land markets
- Lack of supportive regulation

Conclusion and Next Steps

Based on our research, it appears that sustainable farmland investment managers are generally able to deliver financial, environmental and social returns. However, we are unable to define to what extent those returns are delivered as a result of specific sustainable agriculture activities.

To date, successful farmland investors have exceptionally knowledgeable teams, willingness to experiment, and commitment to long-term value creation. They are partnered with investors that share an interest in creating sustainable food systems.

Our research suggests that the best investments are in row and specialty crop organic conversion strategies. Additionally, the prospect of the organic price premiums combined with the decreased input costs and increased yield from rotational livestock management are highly encouraging. The current investor climate requires investors to be creative on how they deliver returns. It also requires financial partners to be flexible.

As the sector progresses, we recommend the following next steps.

1. **Invest in data collection and monitoring to make the connection between sustainable activities and asset performance.** Consider partnering with academic institutions interested in this type of work.
2. **Conduct a comparative analysis to understand how sustainable farmland investment strategies compare to conventional farmland investment strategies.** It will be valuable to understand what factors exert the most influence and how certain activities affect performance and risk mitigation.
3. **Assess viability of additional social and environmental revenue streams.** Emerging environmental markets, such as the carbon market, and public incentive programs that compensate for the public benefits associated with sustainable agriculture practices, like federal funding and pay-for-success bonds, may be viable sources of revenue for these strategies.

Introduction

This paper explains recent trends in sustainable agriculture investing. It is intended for investors and land managers with an interest in sustainable agriculture strategies. The original intent of the research was to determine the financial, environmental and social returns delivered from sustainable farmland investments by answering the following questions.

Do sustainable farmland investments deliver financial, environmental and social returns? If yes, to what extent? How are those returns realized?

The report describes our research, outlining key trends, value drivers, present challenges, and promising opportunities.

Methods

The research included a literature review as well as interviews with experts and organizations working in the field of farmland investing with a focus on real assets.

Initially, we surveyed existing literature on sustainable agriculture investing seeking to draw out information related to returns and strategies.

To supplement the limited literature available to date, we identified investment firms focused on sustainable real asset farm activities. We prioritized those firms actively seeking economic, social and environmental returns.

We identified a short list of qualifying firms. Those that responded to our request were interviewed about perceived opportunities, investment strategies, key motivations, investment vehicles, value drivers, performance monitoring, risk management, and concrete challenges.

We analyzed the data to identify key trends. Unless otherwise cited, all data was collected during interviews with key stakeholders.

Research Sample

We identified 10 farmland investors and management companies that seek to incorporate sustainable agriculture management as part of their investment strategies.

Together, these firms represent about \$6 billion in assets under management (AUM). TIAA Global Asset Management manages nearly \$5 billion, while the other firms interviewed oversee assets ranging from \$5 million to \$500 million.

Nine of the ten firms interviewed for this research were based in the United States. Collectively, the majority of investment activity was also based in the United States, focused primarily in the Midwest and West Coast followed by the Northeast and the Intermountain West. During this research, only TIAA and one internationally-based firm had holdings outside of the United States. These holdings were in Australia, Chile, Ireland and/or Brazil.

Average deal size varied greatly from less than \$1 million to more than \$20 million. Most firms were executing first-time funds.

Crop type varied from company to company. Overall, the companies were invested in organic and conventional grains such as corn and wheat. They also supported grass-fed livestock and organic dairy. They financed organic and conventional specialty crops such as blueberries, citrus and hazelnuts.

The firms included:

Agriculture Capital Management	Iroquois Valley
Ceres Partners	New Spirit Farmland Partnership
Dirt Capital Partners	SLM Partners
Farmland LP	Sustainable Farm Partners
Grasslands, LLC	TIAA Global Asset Management

Limitations

Our intention here is to provide an introduction to farmland investing that incorporates sustainable agriculture practices as part of the investment strategy. Because of the following data limitations, we hope that this report will be viewed as a starting point for those who wish to understand the sector and begin to incorporate sustainable farmland management practices.

- **Small Sample Size** – Given the time constraints and scope of this project, we only had the capacity to reach out to a limited number of actors. Although the data collected represents the activities of many of the pioneering firms in the field of sustainable farmland investing, it is challenging to draw significant conclusions from such a small dataset.

- **Limited Data Availability** – We found limited literature on sustainable farmland investing. Fortunately, the firms with which we spoke were incredibly generous with their time and willing to participate. Although willing to share their data, they had limited data available.
- **Incongruent Bases of Comparison** – As described above, the targeted firms are active across multiple regions and agricultural markets and operate at different scales. Given the small sample size and diverse nature of activities, comparison across groups is particularly challenging at this stage.

The findings provided here are examples of success, challenges and trends observed based on initial data. It is our opinion that the field has seen significant growth. Our hope is that this research will be used to inform additional parties interested in understanding the sustainable farmland investing landscape.

Sustainable Farmland Investing Background

In this section, we define sustainable agriculture for the purpose of this research project and present some background information on sustainable farmland investing along with an overview of the sector's value drivers.

DEFINITION

A number of sources describe sustainable agriculture as the production of food or plants using farming techniques that protect the environment, promote economic profitability, and provide social and economic equity.

The research in this paper will abide by the definition put forth by The Royal Society, which describes sustainable food systems as those that:

1. Utilize crop varieties and livestock breeds with high productivity per externally derived input;
2. Avoid the unnecessary use of external inputs;
3. Harness agroecological processes such as allelopathy, predation and parasitism – as well as agricultural nutrient cycling and biological nitrogen fixation;
4. Minimize the use of technologies or practices that have adverse impacts on the environment and human health;
5. Make productive use of human capital in the form of knowledge and capacity to adapt and innovate and social capital to resolve common landscape-scale problems;
6. Quantify and minimize the impacts of system management on externalities such as GHG emissions; clean water availability; carbon sequestration; biodiversity conservation; and dispersal of pests, pathogens and weeds.

(Royal Society, 2009)

Ecological farming practices include, but are not limited to:

1. reduced or zero tillage,
2. complex crop rotations,
3. cover crop use,
4. soil biology reliance,
5. soil amendments,
6. species diversity,
7. mixed crops,
8. legume pastures,
9. controlled grazing,
10. coordinated agroforestry.

These practices are not necessarily organic or small-scale.

BACKGROUND

As a real asset, farmland has become an increasingly attractive investment for institutional investors. Real assets are attractive additions to investment portfolios because they are negatively correlated with equities and bonds, are a natural hedge against inflation, provide a source of current income, and have tangible intrinsic value.

The trend to diversify portfolios and invest in land began around 2006 when agriculture commodities prices started rising (Fairbairn, 2014). The economic downturn in 2008 caused more investors to seek out farmland because it was seen as a secure place to store money.

Historical performance data shows that it has outperformed stocks over the last 40 years with a much lower volatility, yielding an average return of 10.7%. Farmland is drawing investments from high-net-worth individuals and institutional investors. Under institutional investors, 103 funds closed between 2006 and 2015 raising \$21.6 billion (McMahon, 2016).

Underlying this investment activity is the world's fundamental need for food, which is reinforced by growing global populations and increased household income in emerging economies. The United Nations predicts food production will need to increase by 70% by 2050 (FAO, 2009).

Industrial agriculture has traditionally been seen as the efficient solution to feeding the world. However, there are a number of risks associated with industrial agriculture including high and volatile input costs, degraded natural assets, climate change vulnerability, negative environmental externalities, and shifting consumer trends (McMahon, 2016).

According to Nielsen's Global Health and Wellness Survey, 41% of people younger than 20 years old and 32% of people from 21-34 have said they will willingly pay a premium for sustainable products (Nielsen, 2015).

Food manufacturers and retailers are sourcing more sustainable foods, which is creating a quickly growing market with price premiums for farmers. Sustainable agriculture practices are emerging as a strategy to reduce reliance on artificial inputs, promote environmental and human health, and deliver healthy products that are in growing demand.

There is a fast-growing body of scientific research that promotes sustainable agriculture according to ecological principles and claims that responsible farming can support the food needs of society without the risks of industrial agriculture. Over \$294 million of USDA research funding is supporting projects with a sustainable agriculture/agroecology tenant (DeLonge, 2016).

Emboldened by these global trends, investors with sustainable agriculture financing strategies that focus on consumer products, agricultural technology, sustainable biotechnology, and other specialties are emerging across asset classes.

This paper seeks to understand the dynamics associated with those strategies focused on farmland management that unlock and capitalize on the value drivers unique to sustainability.

VALUE DRIVERS

The trends mentioned earlier have driven the industry over the past 5-10 years. The investment strategies examined as part of this research seek to capitalize on the following assumed drivers of value. The major value drivers identified are price premiums, new markets, reduced costs, risk mitigation, and consistent yields.

Price premiums come from organic products or grass-fed meat and dairy products. Many people are willing to pay a premium for products based on how they are produced (See Figure 1).

New markets for farmers and ranchers who have not previously sold organic or grass-fed products. They can have access to a new and growing customer base. Also, they may be able to tap into environmental markets such as soil carbon markets, in the future.

Reduced costs are associated with fewer inputs such as pesticides, herbicides, water, etc., and additional supplements or seed costs.

Risk mitigation is associated with improved resource management. It leads to enhanced ecosystem function that helps farms endure temperature changes, climate variability, supply shocks, and pest attacks.

Consistent yield comes from improved long-term nutrient and water availability resulting from greater soil care.

Value drivers are directly linked to the benefits produced by sustainable agriculture management practices that seek to improve ecosystem health and function.

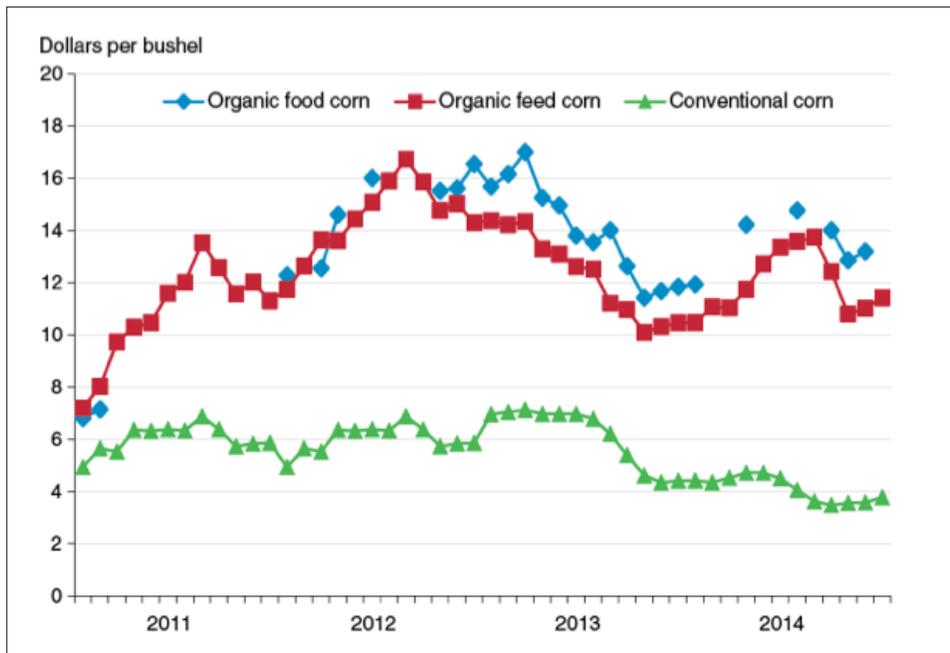


Figure 1: Monthly average price of organic and conventional corn in the US, 2011–2014 (McBride, 2016)

Key Findings

Along with providing select case studies, this section includes:

1. an overview of investment theses, trends in management models and lease terms
2. a discussion of public incentive programs, case studies, and performance results

INVESTMENT THESES AND STRATEGIES

Ecosystem Services: Ecosystem services are the benefits people derive from nature. These include provisioning services such as food, water, timber and fiber; regulating services that affect climate, floods, disease, waste and water quality; maintaining cultural services that provide recreational, aesthetic and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling.

(Millenium Ecosystem Assessment, 2005)

There are two predominant investment theses in the sustainable farmland investment sector.

The first is that value can be created by investing in a series of efficiencies and improvements to enhance the performance of the underlying asset.

These managers focus on finding underperforming or undervalued assets and investing in their future performance.

The second thesis is that the natural and organic industry is financially attractive.

These investors see opportunity in meeting this growing industry's supply needs while price premiums are still available.

For example, from 2011-2014, the monthly average price of organic feed corn was \$6.82 higher than conventional feed corn in the United States (McBride, 2016).

What is interesting about these theses is that the implementation strategies incorporate ecological and social nuances from which many investors hope to derive a competitive edge.

For example, investors seeking value through efficiency improvements are placing significant emphasis on improving the performance of natural ecosystem services.

We classify these improvements as ecosystem service improvements, infrastructure and scale improvements, and farm management improvements, as defined below.

- **Ecosystem Service Improvements:** The focus is around maximizing ecosystem function to enhance soil health, fertility, water retention, biodiversity, and overall productivity. These type of improvements include such activities as no-till farming, cover cropping, rotational grazing, ecological farming, holistic management, and so on. By improving ecosystem services, managers seek to externalize costs to the ecosystem. For example, instead of relying on synthetic fertilizer

Management Model

With farmland investing, there are two dominant management models:

1. **Owner-Operator** – The asset owner oversees all management of the assets. Often institutional investors hire a third-party management company to oversee on-the-ground activities. This model is common in the West Coast for high-value crops and/or when the strategy relies on value-added processing.
2. **Land-Lease** – Asset owners lease out the property to tenant farmers, which is very common in the agriculture industry.

Across both management structures, sustainable farmland investors and farm managers struggle to align incentives for long-term sustainability. Many of the ecological farming practices may take time to develop and return results. This can create conflict when tenants operate on short-term contracts or leases and are not guaranteed access to the benefits they help create. To address this, sustainable farmland investors explore a diversity of contract and lease term arrangements to incentivize performance over the long term.

LEASE TERMS

A farmland lease is a legal agreement that serves to define the parties involved, assets, uses, obligations, term and rent, as well as the payment schedule. It describes the roles and responsibilities of the concerned parties.

As part of this project, we sought to identify any innovation in lease structures that were unique to sustainability strategies. The following is a summary of our findings based on conversations; we did not conduct a thorough review of lease agreements.

As many of the benefits associated with sustainable farmland practices are accrued over the long term, we would have expected to see disproportionately longer lease terms as a way to incentivize tenant behavior and share benefits.

A handful of farmland investors indicated they employ leases with slightly longer terms than normal or their leases included a purchase option.

Overall, lease terms are predominately dictated based on what is customary for the region.

Lease agreements are negotiated between the owner and the tenant. Nearly all of the asset managers we spoke with indicated that there was an unwritten expectation that the tenant would renew indefinitely. Shorter terms in written lease agreements were preferred as they allowed parties to preserve their optionality to renegotiate terms as markets and other circumstances changed.

Table 1: Select Elements of a Farmland Leases for Sustainable Management

TERM	NORMAL CONDITION	SUSTAINABLE INNOVATION
Asset	Lease identifies a particular parcel(s) of land governed by the agreement	Lease allocates a total number of acres within the owner's overall portfolio as opposed to a specific plot of land. This structure provides the owners with the flexibility to move tenants around to maximize ecological function and performance across the portfolio.
Rent	Rent is typically dictated by regional markets. A common form includes a base rent with a variable component tied to performance of relevant agricultural markets (i.e., corn or soy prices).	Price premiums of 20-40% exist for properties considered higher quality (i.e., already certified organic) or with other benefits (i.e., asset owners assisting with market access). Crop sharing is available on properties with good soil. Payments are tied to ecological performance by providing discounts based on composition of soil organic matter, for example (Canella, 2014).
Payment Schedule	Payments vary from lease to lease.	Delayed/reduced payments are scheduled to accommodate the 3 years needed to convert to organic.
Lease Term	Leases extend 1-3 years with options to renew.	3-5 year leases with some extending longer to 9 or 15 years. Many reportedly came with an unwritten agreement to renew indefinitely.
Use Provisions	Uses vary according to owner and tenant preferences.	Uses vary according to owner and tenant preferences. Use provisions outline sustainability programs, require certifications, and support maintenance of soil health. Provisions outline the owner's responsibility to support the tenant through market building efforts, etc.

Public Incentive Programs

Since public incentive programs are targeted as part of other sustainable real assets strategies such as forestry, this research wanted to understand if and how sustainable farmland investors seek out environmentally or socially-focused public programs.

Specifically, we were concerned with the programs administered by government agencies and/or nonprofits. We looked at the use and prevalence of conservation easements, NRCS program funding (such as Agricultural Management Assistance, the Conservation Stewardship Program, and the Environmental Quality Incentives Program (EQIP)) and other grant funding.

Based on our conversations, it seems such public incentive programs are not core to the success of sustainably-focused farmland investment strategies. Although asset managers expressed interest in conservation easements, they responded that the easements were often not applicable given the location of properties and/or they seemed cost-prohibitive or cumbersome to pursue.

One manager mentioned that a few properties were enrolled in an equivalent international program, but that the primary motivation was to maintain good community relations as opposed to attaining direct financial benefit.

In some cases, conservation easements are not applicable to farmland investing because many of the properties in question are in agriculture regions and do not face the kind of development pressure that would make easements attractive.

One manager is actively working on developing organic conservation easements that would provide additional incentives for organic conversion and production, but it remains to be seen how effective the easements will be.

Currently, the USDA's Agriculture Conservation Easement Program, which is a source of funding for many conservation easements, does not have particular objectives around promoting organic cultivation (ACEP website).

Washington's PCC Farmland Trust explored using organic conservation easements that included affirmative statements. For example, some tenants are required to maintain organic certification. But the organization has since moved away from this practice. PCC has since reverted back to its previous easement language with negative terms banning particular behavior such as pesticide use. This is more common and easier to enforce.

In addition to conservation easements, there are many other programs that provide grant funding designed to improve environmental outcomes. The funds can help with farm planning, irrigation upgrades, hedgerow planting, etc.

Many nonprofits have programs targeting similar objectives and provide grant funding to support landowners. Although highly aligned with the impact objectives of all of the managers included in this research, only a few are actively pursuing qualified projects.

Some managers expressed support for the programs, but indicated that they left this decision up to the tenants or farm managers. Others indicated that the funds were harder to access than initially anticipated. The two assets managers who are taking advantage of NRCS programs are doing so for ecological monitoring projects.

Performance Discussion

Based on our limited information, it appears that farmland investors are targeting 9-15% IRR, which is in line with the expectations of the NCREIF index (See Figure 3). But we cannot draw any reliable conclusion across asset classes. However, we do see encouraging examples that can provide useful information for future implementation. Presented here are three case studies that demonstrate how ecological farming can command premiums, lower costs, and improve resilience. The following case studies represent that the most attractive investments are in row crop organic conversion, decreased input costs for crops, and rotational livestock management.

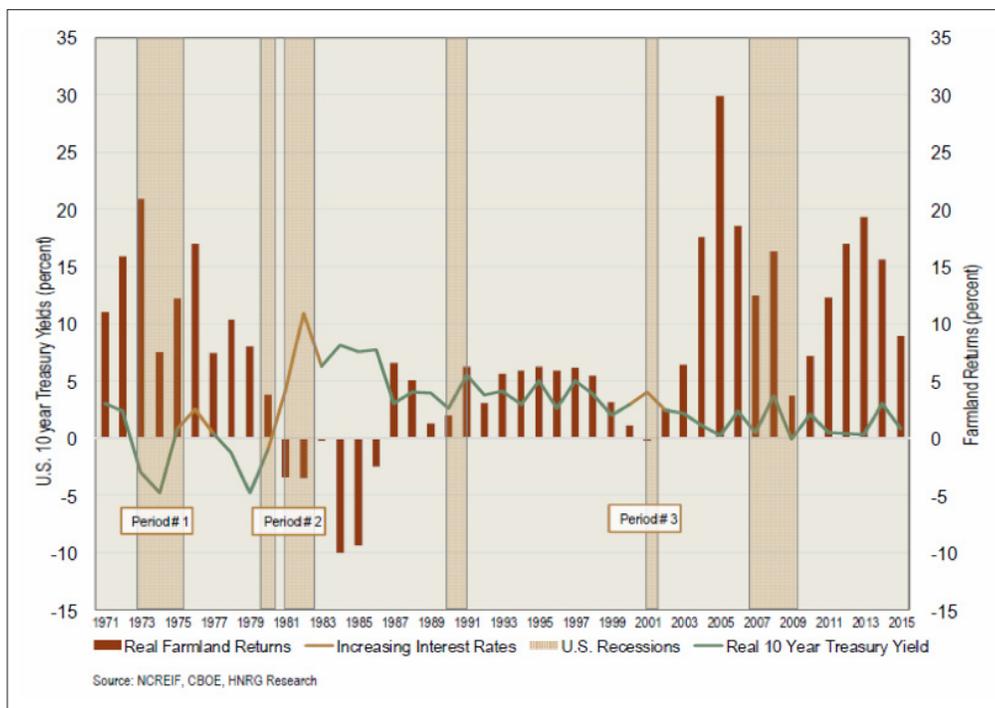


Figure 3: Farmland Returns and Real Interest Rates (Hancock, 2016).

Case Studies

HERDS PERFORM WELL WITH HOLISTIC PLANNED GRAZING

Holistic planned grazing is an alternative form of livestock management that divides the land into smaller paddocks, groups the animals into large herds, and rotates them from paddock to paddock to maximize soil and grass health. This type of grazing can increase soil productivity, which produces more nutritional grasses and greater volumes of growth. In turn, this supports higher stocking rates and reduced input costs. We spoke with one manager who was able to increase stocking rates by 75%, observed improved herd performance when compared to neighboring herds during drought years, and achieved a 7% cash return over the 5-year lifespan of the project.

TIAA LINKS RESOURCE EFFICIENCY TO PERFORMANCE

As discussed in this paper, there is limited data available demonstrating the connection between sustainable agriculture projects and asset performance. Managers indicate that they are starting to allocate resources to better quantify this connection. However, they explain it is a challenging task. Fortunately, there are some examples that not only demonstrate the connection but can also serve as examples for managers seeking to establish better monitoring programs.

As a signatory of the United Nations Principles for Responsible Investment, TIAA Asset Management commits to regular reporting on environmental, social and governance metrics and regularly reports on its agriculture holdings. From these reports, we see that through improved water management and increased irrigation efficiency, TIAA has realized benefits in the form of lower costs, improved risk management, greater resilience, and competitive regional performance.

Activities including but not limited to precision land leveling, erosion control, low pressure irrigation systems, wastewater recycling, and smart irrigation technology can improve water efficiency by 25%. For TIAA's properties in Napa Valley, California, this has meant a 65% reduction in overall water costs and a 75% decrease in dependence on water withdrawals. In Brazil, properties experienced a 5% decrease in yield during extreme drought as compared to the 12% average decrease in the region. In the southern United States, TIAA has observed a 50% decrease in water use for crops like rice (TIAA, 2015).

INVESTORS GO BEYOND ORGANIC

A key challenge to sustainable farming is scale. One farmland investor manages this challenge by consolidating its holdings geographically. By aggregating smaller parcels into the one management regime, the staff are able to achieve scale efficiencies. This is coupled with innovative lease agreements that allocate a certain number of acres as opposed to a geographically distinct parcel of land. This allows the owner to preserve flexibility and manage the portfolio of properties in a holistic way.

This farmland investor employs a complex rotational model in which it moves a variety of producers (livestock, specialty crops, row crops) around their portfolio. The owner coordinates rotations as opposed to requiring the tenants to adopt rotational production systems. As a result, the investor reports being able to command a 20-40% premium above regional land rents because tenants are willing to pay to access the high-quality soil that results from rotational management.

Challenges and Risks

This research identified a number of challenges and risks to investing in real assets and adopting sustainable agriculture practices. As identified above, the farmland investors included in this report have different strategies for investing. The field is relatively young, which leads to a number of challenges associated with adoption into institutional frameworks. The major challenges and risks are associated with access to capital, dependency on sophisticated land management, difficulties with performance tracking, overvaluation of land markets, and issues with regulation.

Limited Access to Capital: The most common challenge reported by the farmland investors included in this study involved accessing capital. Fundraising is difficult. Managers found the nuances embedded in their strategies hard to communicate, particularly without a demonstrable track record.

Many of the investors interviewed have to overcome the challenge in raising capital as first-time fund managers in addition to operating in a young investment field. As the field grows and is able to demonstrate performance, this challenge is expected to decrease. Crucial to this will be making the connection between ecological investment and financial returns.

Dependence on Access to Sophisticated Land Managers: Often, sustainable agriculture management requires the adoption of new production techniques which may be relatively labor-intensive. Many asset owners mentioned challenges in finding the right on-the-ground partner who can navigate the management complexity inherent in sustainable farmland strategies, which is key to success.

To be successful, managers must have in-depth local knowledge to manage the regional variation in climate, weeds and pests. When aligned management is unavailable, the farmland investors must rely on behavior change, which is inherently challenging to achieve.

Difficult Performance Tracking: As previously discussed, farmland investors find it difficult to tease out and attribute specific farm-level activities to overall financial returns. Furthermore, there is a tension between executing the strategy and allocating resources to highly specified monitoring activities.

Overvalued Land Markets: Land values in the United States have been on the rise and are increasingly cost prohibitive for farmland investors (See Figure 4). Managers reported challenges to finding attractive assets. One of the companies we spoke to has not done a deal in two years due to investor wariness of high land prices. Additionally, high land prices discourage farmers from taking a short-term hit on productivity for long-term gain, which is required for organic conversion. For the markets to become appealing, land prices will need to return to a true value.

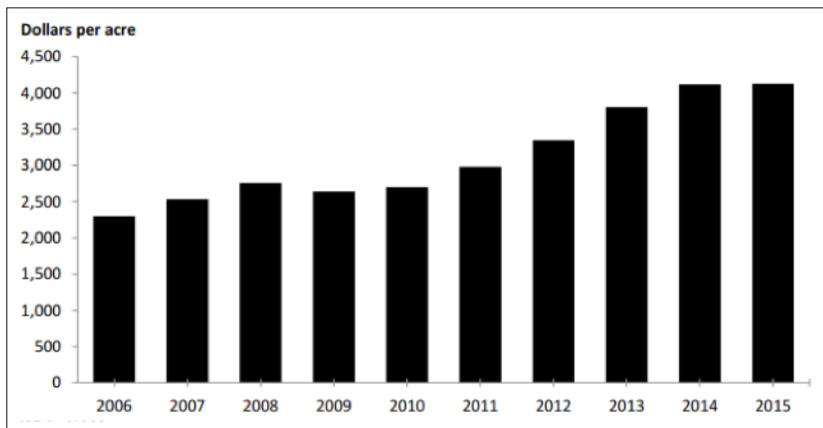


Figure 4. Average US Cropland Values (USDA, 2015).

Unsupportive Regulation: Public policy support for sustainable agriculture practices is relatively small compared to that for its conventional counterparts. Farmers and ranchers who use or grow corn, soy and wheat receive government subsidies and crop insurance. This is good for organic field crops in the Midwest, but poses increased risk for those looking to switch to specialty crop growth (USDA, 2016).

These subsidies deter alternative techniques because there is very little risk mitigation set in place even if the costs may be lowered by switching away from GMO seeds and towards organic practices. The system has created barriers to entry for non-GMO farms and ranches.

There is some government support for organic crops, but it pales in comparison to the behemoth of commodity subsidies.

The National Organic Certification Cost Share Program has provided \$22 million over five years to reimburse farmers for up to 75% of the costs of organic certification. However, organic certifications are only one part of the transition to organic.

The 2008 Farm Bill instated EQIP to provide cost-sharing assistance for farmers transitioning to organic, but it is a competitive program and only one out of three applications will receive funding (Priceless, 2016). Although programs are starting to pop up, EQIP is mostly only for organic, and it is still limited. Sustainable farming support has a long way to go before it can outweigh the regulatory financial benefits associated with conventional growing practices.

Although there are many challenges and risks associated with investing in sustainable agriculture, acknowledging them will allow future investors and managers to mitigate against them. It will take a team of knowledgeable managers working cooperatively with passionate investors with a piece of land under market value to tackle these current challenges.

Conclusions and Next Steps

Based on our research, it appears that sustainable farmland investment managers are able to deliver financial, environmental and social returns. However, we are unable to define to what extent those returns are delivered as a results of specific sustainable agriculture activities.

To date, successful farmland investors have teams that are exceptionally knowledgeable, willingness to experiment, commitment to long-term value creation, and have financial partners that are willing to collaborate and share an interest in creating sustainable food systems.

Our research suggests that the best investments are in row and specialty crop organic conversion strategies. Additionally, the prospect of capturing organic price premiums with the decreased input costs and increased yield from rotational livestock management are highly encouraging.

Greater effort is needed to make the connection between specific sustainable farming activities and asset performance. Results of these monitoring activities will help sustainable farmland investors communicate the value of their strategies, which can facilitate fundraising. They will also provide useful decision-making information for managers to boost performance on existing assets. Farmland investors could consider reaching out to universities that may be interested in supporting this type of work.

In the meantime, investors will need to be creative in how they demonstrate performance and seek out financial partners who are willing and comfortable pursuing unconventional strategies. When land prices drop, there may be more of an incentive to invest in sustainable agriculture, because the barrier to entry will be lower.

Although most of the farmland investors included in this study seek to deliver market-rate returns, a comparison to conventional strategies was beyond the scope of this report. Furthermore, the limited data available on actual returns prevents us from drawing conclusions. As the sector grows, it will be an important research question to answer in the future as data become available.

Last, all land managers should be on the lookout for evolving public incentive programs and additional revenue streams from environmental markets, such as a carbon market. In a carbon market, soil has the potential to be one of the greatest assets for sequestration. Additional markets might include wetland credits, water credits, and other ecosystem services.

As sustainable agriculture strategies are able to demonstrate public benefit, there may be greater programs willing to finance the transition. As public support for sustainable food systems grows, it will be important to keep an eye on the key levers that could enhance asset performance.

References

- Carella, M. (2014, July 1).** *Vermont New Farmer Project*. Retrieved from <http://www.uvm.edu/newfarmer/>
- DeLonge, M. (2016, January).** *Investing in the Transition to Sustainable Agriculture*. *Environmental Science & Policy*, 55(1), 266-273. Retrieved from <http://dx.doi.org/10.1016/j.envsci.2015.09.013>.
- Fairbairn, M. (2014).** *Like Gold with Yield: Evolving Intersections between Farmland and Finance*. *The Journal of Peasant Studies*, 41(5), 777-795.
- FAO. (2009, September 23).** *2050: A Third More Mouths to Feed*. Retrieved from <http://www.fao.org/news/story/en/item/35571/icode/>
- Hancock Agricultural Investment Group. (2016, February 1).** *Farmland Returns, Gauging the Impact of Rising Interest Rates*. Retrieved from <http://hancockagriculture.com/research/>
- MacDonald, J. M. (2013).** *Farm Size and the Organization of U.S. Crop Farming*. Department of Agriculture Economic Research Service. Retrieved from <http://ers.usda.gov/>
- McBride, E. (2016).** "Despite Profit Potential, Organic Field Crop Acreage Remains Low." *USDA Economic Research Service*.
- McMahon, P. (2016, January 1).** *The Investment Case for Ecological Farming. Australia: SLM Partners*.
- Millenium Ecosystem Assessment. (2005).** *Ecosystems and Human Well-Being: Synthesis*. Washington, D.C.: Island Press. Retrieved from: <http://millenniumassessment.org/en/index.html>
- Nielsen (2015).** *We Are What We Eat: Healthy Eating Trends Around the World*. Nielsen Global Health and Wellness. Retrieved from <http://www.nielsen.com/content/dam/nielsen-global/eu/nielseninsights/pdfs/Nielsen%20Global%20Health%20and%20Wellness%20Report%20-%20January%202015.pdf>
- Priceless Documentary: Organic Farming*. Retrieved from <http://www.pricelessmovie.org/the-issues/organic-farming/>
- The Royal Society. (2009).** *Reaping the Benefits: Science and the Sustainable Intensification of Global Agriculture*. Retrieved from <https://royalsociety.org/topics-policy/publications/2009/reaping-benefits/>
- TIAA CREF. (2015).** *Responsible Investment in Farmland: 2015 Report on Ethical Conduct and Responsible Stewardship of the Environment*. Retrieved from tiaa-cref.com/asset-management/sustainability/united-states-farm-bill-2008.
- United States Farm Bill 2008*. Retrieved from <http://www.agriculture.senate.gov/issues/2008-farm-bill>
- USDA. (2015).** *Land Values: 2015 Summary*. Retrieved from <https://www.nass.usda.gov/>
- USDA. (2016, May 1).** *USDA Definition of Specialty Crop*. Retrieved from https://www.ams.usda.gov/sites/default/files/media/USDA_Specialty_Crop_Definition.pdf