



# Introduction to Farmland Investing

[FarmTogether.com](https://farmtogether.com)

Published Date 7/1/2022



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The goal of the typical investor is to maximize returns for a given amount of risk. In this paper, we will highlight that alternative investments are a critical component in achieving this objective. While alternative investments cover a broad range of financial strategies, assets, and instruments, there is one that has historically stood out: farmland.

Farmland has proven to be a unique asset class that has delivered superior returns with relatively less risk or volatility, and there are additional benefits that farmland can add to the overall diversification of most portfolios. Yet, while farmland is an attractive asset class from an absolute returns perspective, it is one of the least understood due to historical constraints in the market. As modern financial platforms evolve, farmland investing, which was historically dominated by large institutions, is becoming increasingly accessible to passive financial investors of all shapes and sizes. In this paper, we seek to provide a general understanding of farmland as an asset class and to highlight the various financial characteristics that can make it an essential addition to any portfolio.

Sierra Foothills Pistachio Orchard  
Tulare County, CA



# The Benefits of Including Alternative Investments in an Investment Portfolio

Broadly speaking, alternative investments (“alternatives”) are investments in assets other than stocks, bonds or cash. Alternative investments may also use strategies that go beyond traditional methods of investing, such as long/short equities or arbitrage strategies. Since alternatives tend to behave differently than typical stock and bond investments, adding them to a portfolio may provide broader diversification, reduce risk, and enhance returns. Common types of alternative investments include real assets, commodities, venture capital, hedge funds, and private equity.

Within the alternative investment space, real assets have proven to improve traditional portfolios in multiple ways:

## Diversification

With low or negative correlations to traditional stocks and bonds, as well as to each other, real assets can provide diversification to an investment portfolio. As private investments, they tend not to move in lockstep with traditional assets or commodities, in part because they are relatively illiquid and are not often exposed to speculative trading in public markets.

## Higher Risk-Adjusted Returns

For over 25 years, real assets have provided similar or higher returns than stocks with much lower volatility, resulting in higher risk-adjusted returns. Similarly, real assets delivered higher risk-adjusted returns compared to bonds or publicly-traded REITs.

## Liability-Matching Characteristics

Real assets have the potential to provide bond-like current income from contractual lease obligations and the sale of commodities, along with long-term capital appreciation from land improvements and rising land values to help meet future liabilities.

## Inflation Hedging

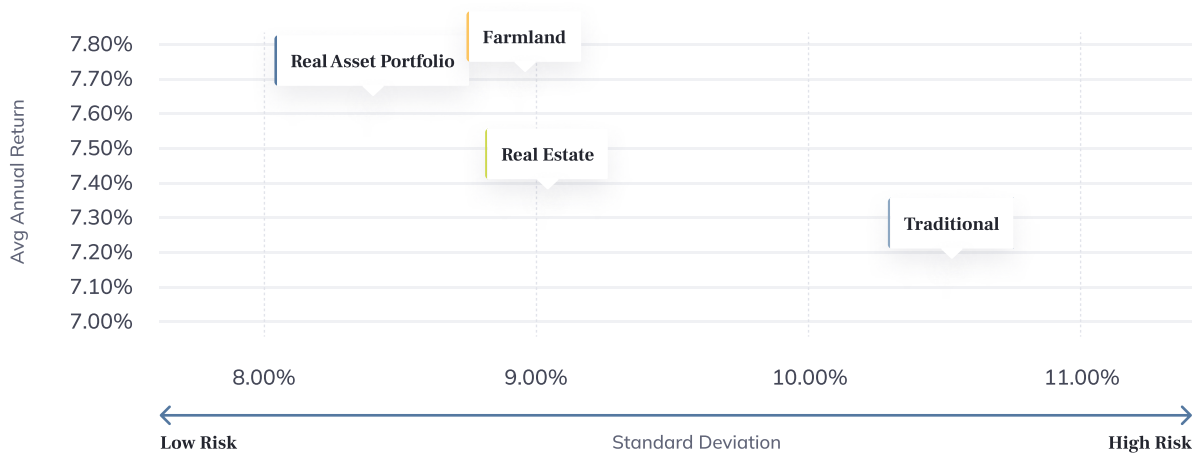
Historically, real assets have provided a strong hedge against inflation. Both the cash yield and the land value of a real asset is linked to inflation measures, such as the Consumer Price Index (CPI). For example, when inflation rises, commodity prices also tend to increase, which can lead to a higher cash yield from the land. Also, rising commodity prices increase the profitability of timberland and farmland, causing land values to appreciate and therefore providing a long-term hedge against inflation.

### Sources:

Blackrock (<https://www.blackrock.com/us/individual/education/what-are-alternative-investments>)  
Nuveen Fall 2018 - Private real assets improving portfolio diversification with uncorrelated market exposure (Global)

Including real assets in a traditional portfolio can improve the risk-adjusted returns, as illustrated in the analysis below. The first chart shows the benefit of adding farmland, real estate, or an allocation of both assets to a traditional portfolio. In all cases, the portfolios with a real asset component have higher average annual returns, less volatility and higher Sharpe ratios than a traditional portfolio of 60% stock and 40% bonds. The second table compares returns, standard deviation and Sharpe ratios of the four hypothetical portfolios.

### Real Assets Increased Risk-Adjusted Returns of Traditional Portfolios



### Farmland Performance Comparison (1992 - 2021)

	100% Traditional Portfolio	Adding Only Farmland	Adding Only Real Estate	Adding 2 categories of real assets, fixed at 10% each
Allocation Representing Highest Risk-Adjusted Return, Based on Sharpe Ratio	<ul style="list-style-type: none"> <li>Stocks 60%</li> <li>Bonds 40%</li> </ul>	<ul style="list-style-type: none"> <li>Stocks 51%</li> <li>Bonds 34%</li> <li>Farmland 15%</li> </ul>	<ul style="list-style-type: none"> <li>Stocks 51%</li> <li>Bonds 34%</li> <li>Real Estate 15%</li> </ul>	<ul style="list-style-type: none"> <li>Stocks 48%</li> <li>Bonds 32%</li> <li>Real Estate 10%</li> <li>Farmland 10%</li> </ul>
Average Annual Total Returns	7.19%	<b>7.72%</b>	7.38%	7.68%
Standard Deviation	10.53%	<b>8.92%</b>	9.09%	8.50%
Sharpe Ratio	0.44	<b>0.57</b>	0.53	0.60

Data are based on annual total returns from January 1, 1992 through December 31, 2021. Asset classes are represented by the following indexes: Stocks - S&P 500; Bonds - Bloomberg Barclays U.S. Aggregate Index; Privately Held U.S. Farmland - NCREIF Farmland Index; Privately Held U.S. Commercial Real Estate - NCREIF Real Estate Index. Indexes are unmanaged and unavailable for direct investment.

# Farmland Value Drivers

As highlighted in the previous charts, farmland investing, in particular, can improve both the average annual return and the risk-adjusted return of a portfolio. Here, we break down the unique characteristics of farmland that make this asset an attractive component of a long-term investment strategy.

## Diversification

For the last three decades, the historical returns of farmland investing have been uncorrelated to conventional assets and securities such as stocks, bonds, real estate, timber, and even short-term agricultural commodity prices. Therefore, the inclusion of farmland in a portfolio can increase its diversity, and such a portfolio may be more resistant to adverse market conditions.

**Correlation Across Major Asset Classes (1992 - 2021)**

	Farmland	US Stocks	US Bonds	Real Estate	US REITs
Farmland	1.00				
US Stocks	-0.06	1.00			
US Bonds	-0.24	0.00	1.00		
Private Real Estate	0.42	0.19	-0.10	1.00	
US REITs	-0.03	0.45	0.18	0.15	1.00

Data are based on annual total returns from January 1, 1992 through December 31, 2021. Asset classes are represented by the following indexes: Stocks - S&P 500; Bonds - Bloomberg Barclays U.S. Aggregate Index; Privately Held U.S. Farmland - NCREIF Farmland Index; Privately Held U.S. Commercial Real Estate - NCREIF Real Estate Index; Publicly Traded U.S. REITs - FTSE Nareit U.S. Real Estate Index. Indexes are unmanaged and unavailable for direct investment.

Bespoke Hazelnut Orchard  
Oregon



## Strong Risk-Adjusted Returns

In addition to being an uncorrelated asset, farmland has experienced historically less volatility than both traditional and alternative asset classes. Farmland has additionally delivered a higher average annual return than most asset classes in the last 30 years (1992 – 2021). From a portfolio perspective, this means that adding farmland results in a higher Sharpe Ratio — the Sharpe Ratio is a metric which investors can use to quickly evaluate returns on a risk-adjusted basis. The higher the Sharpe Ratio, the greater excess return that is being delivered after considering and standardizing for the asset’s volatility.

### Performance of Publicly Traded Assets and Real Assets (1992 - 2021)

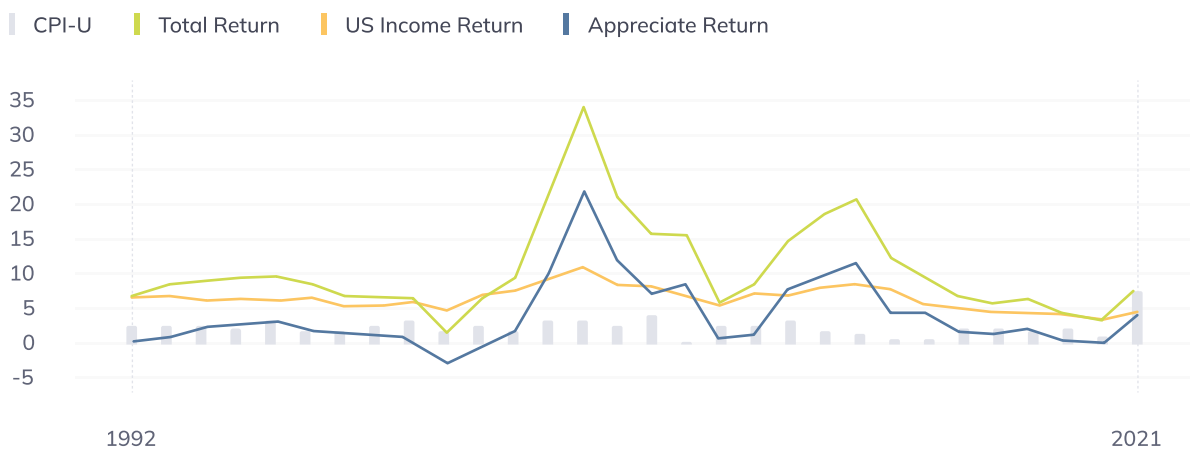
	Farmland	US Bonds	US Stocks	Real Estate	US REITs
Mean	10.74%	5.29%	8.46%	8.49%	10.83%
Standard Deviation	6.75%	4.59%	16.89%	7.73%	18.41%
Sharpe Ratio	1.21	0.59	0.35	0.76	0.45

Data are based on annual total returns from January 1, 1992 through December 31, 2021. Asset classes are represented by the following indexes: Stocks - S&P 500; Bonds - Bloomberg Barclays U.S. Aggregate Index; Privately Held U.S. Farmland - NCREIF Farmland Index; Privately Held U.S. Commercial Real Estate - NCREIF Real Estate Index; Publicly Traded U.S. REITs - FTSE Nareit U.S. Real Estate Index. Indexes are unmanaged and unavailable for direct investment.

## Inflation Hedge

As a commodity-producing asset, farmland has historically provided an excellent hedge against inflation. Over the past several decades, farmland returns have moved in strong correlation with rising prices; in fact, the NCREIF Farmland Index’s Total Return has consistently provided returns more than double the inflation rate since before 1992.

### NCREIF Farmland Returns vs. Inflation (% in 1992 - 2021)



Data representative through December 2021. Sources: NCREIF Farmland Index and the Consumer Price Index - Urban.

The inception date of the NCREIF Farmland Index is Q4 1990. The CPI-U produces monthly data on changes in the prices paid by urban consumers for a representative basket of goods and services since 1913. NCREIF Farmland Index returns are used for the time frame above to demonstrate income and capital appreciation components, which are not available from the TIAA-CREF Center for Farmland Research database.

## Long-Term Tailwinds

### Growing Demand for Food

The global population is expected to grow from 7.7 billion to 10 billion by the year 2050. Also, as greater numbers of people rise from poverty to the middle class, diets will improve and people will consume more meats and proteins. Food production will have to increase by 70% by the year 2050, and 90% of the growth in crop production will come from higher yields. As farmers push productivity higher, land should appreciate in value. By 2050, the demands on agriculture to provide sufficient food, fiber, and energy are expected to be 50 to 70 percent higher than they are today.

### Decreasing Supply of Farmland

It is estimated that only 7% of Earth's land is suitable for cultivation, and most of the world's productive arable land is already in crop production. In the U.S., only 324.1 million acres of agricultural land had productivity, versatility, and resilience ("PVR") values with the optimal soil characteristics and growing conditions to support intensive food and crop production with minimal environmental limitations. This is slightly more than one-third of agricultural land. However, research shows that between 1992 and 2012, almost 31 million acres of agricultural land were irreversibly lost to development. Even more alarming, this loss included almost 11 million acres optimal PVR land intensive food and crop production. This loss is roughly equivalent to losing one of the most productive growing regions in the United States, California's Central Valley.

Vista Luna Organic Vineyard  
San Joaquin County, CA



Yuba Almond Orchard  
Yuba County, CA



Oak Ridge Pistachio Orchard  
Kern County, CA



#### Sources

United Nations estimate  
Capitaline (<https://www.capitaline.net/farmland-investment/>)  
American Farmland Trust (Farms Under Threat: The State of America's Farmland)

# Comparison of Farmland to Other Real Asset Classes

In a risk-return analysis comparing portfolios of all real assets (farmland and commercial real estate), farmland dominated these portfolios. The chart below outlines average annual returns and risk for the three real asset portfolios analyzed (maximum Sharpe Ratio, minimum risk, and maximum returns).

## Structuring a Portfolio of Farmland and Private Real Estate (100% Private Real Assets)



## Farmland Performance Comparison (1992 - 2021)

	Highest Sharpe Ratio	Minimum-Risk	Maximum-Return
Hypothetical Portfolio Allocation	<p>Farmland 77% Real Estate 23%</p>	<p>Farmland 56% Real Estate 44%</p>	<p>Farmland 100%</p>
Average Annual Total Returns	10.23%	9.75%	10.74%
Standard Deviation	6.14%	6.02%	6.75%
Sharpe Ratio	1.23	1.17	1.21

Data are based on annual total returns from January 1, 1992 through December 31, 2021. Asset classes are represented by the following indexes: Privately Held U.S. Farmland - NCREIF Farmland Index; Privately Held U.S. Commercial Real Estate - NCREIF Real Estate Index. Indexes are unmanaged and unavailable for direct investment.



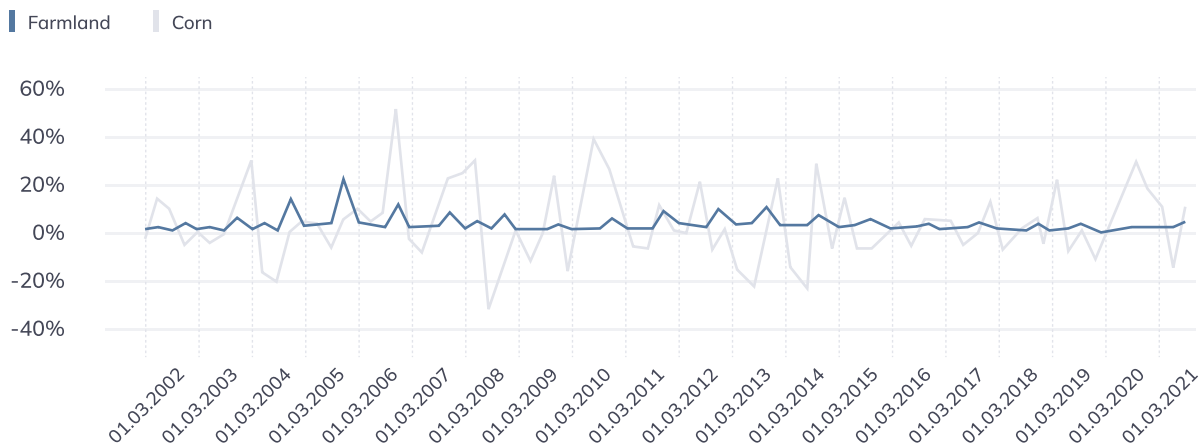
## Overview of Farmland as an Asset

Similar to traditional real estate, returns from farmland investing consist of both lease income and land and related asset appreciation. The current income component can be structured as either an annual lease payment or a profit share from annual crop sales. While soil quality and water availability are relatively fixed determinants of a property's potential yield, technological and management improvements can be brought to bear on individual properties to enhance yields and returns to investors. Capital improvements, such as irrigation, laser leveling, and drainage can increase current income, as well as future value, as improvements that permanently increase productivity are eventually capitalized into land values.

Farmland investing is fundamentally different from investing in food or agricultural commodities, and the two should not be confused. Farmland investing provides the opportunity to hedge short-term exposure to volatility in harvest conditions or commodity prices through fixed lease payments. As crop markets change over the long-term, land can be replanted or converted to more attractive crops and adapt to long term structural changes in market environments.

The returns of agricultural commodities are generally much higher than farmland, but so is the standard deviation and risk. The chart below plots quarterly farmland returns against the returns of a cash crop like corn; it is clear that the cash crop is more volatile relative to farmland. The average quarterly return of U.S. corn futures since 2002 is roughly 2% with a standard deviation of 15%, which implies a Sharpe Ratio of 0.13.

Quarterly Returns of Farmland vs Corn



Sources

NCREIF Farmland Index, Chicago Board of Trade.



## Types of Farmland

Farmland investing can take on various forms. Types of farmland can be grouped into three general categories:



### Row Cropland

Row cropland investments produce annual crops such as corn, soybeans, cotton, wheat, and rice. In general, these have lower annual cash flow yields but less volatility. They typically have shorter harvest periods and involve lower upfront capital expenditure. The crop decisions are made annually providing additional flexibility for farmers to react to relatively current market conditions.

### Permanent Cropland

Permanent cropland investments include perennial crops such as fruit and nut crops, which have both pre-productive and mature periods. Pre-productive or “greenfield” investments must mature before they reach economic profitability, and these investments have a “J-curve” return profile. Some permanent crops, like almonds, peak in productivity and then decline, so orchard age is an important factor in estimating productivity and value. These crops have longer investment horizons and offer opportunities for higher profitability and higher yields but also carry a higher risk.

### Livestock

Livestock investments include land leased to local operators for grazing or direct livestock ownership and operation. In extreme cases, poor herd management can lead to a temporary reduction in land value due to animal damage.



## Historical Review of Farmland Price

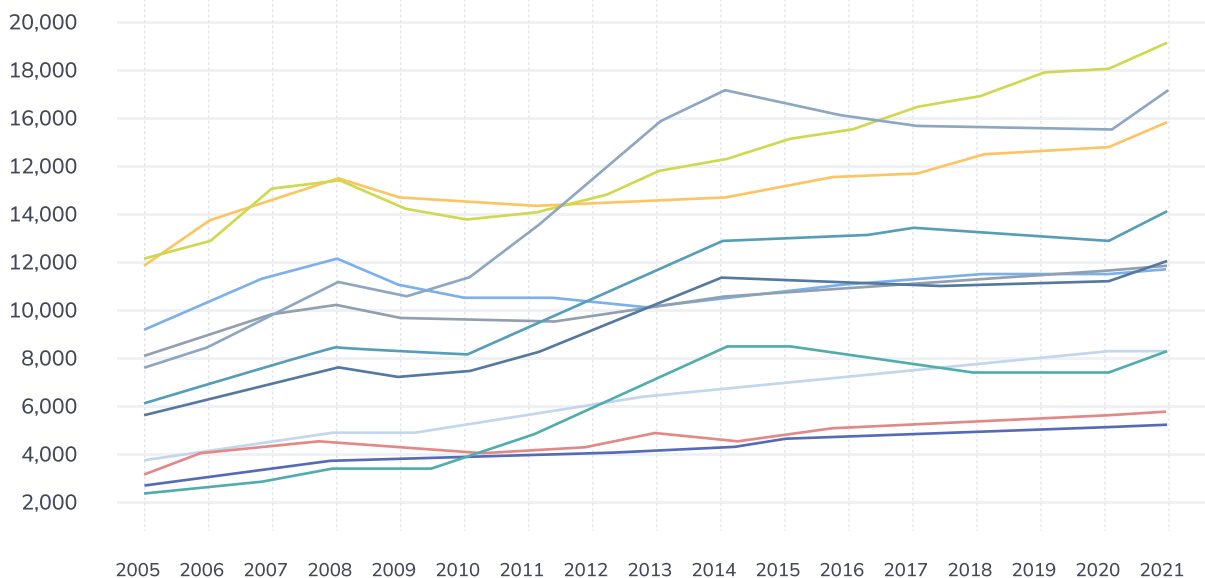
In the 2000s, there was a swift movement of capital into farmland. The massive increase in demand for food crops and animal protein – mainly from China and other emerging markets – drove agriculture commodity prices up across the board, increasing farm income and delivering record appreciation rates in land values. Since 2000, the NCREIF Farmland Income Index, which tracks the value of U.S. farmland, has more than tripled. A similar positive trend in farm income growth and appreciation of land values occurred in other major crop-producing regions, such as South America, Oceania, and Europe.

The 2010s were a different chapter for farmland. While the global farmland investment space successfully weathered the 08/09’ economic crisis and benefited from the race for real assets during this period, it ultimately fell victim to the downturn in agricultural commodity prices which resulted from increased global acreage, conducive weather, and the resulting record stocks.

U.S. farmland prices have leveled off since 2014, after exhibiting rapid growth over the previous decade, supported by relatively strong farm income, low borrowing costs, and the entry of institutional investors. While variations may differ from the survey, the general trends are clear. As a result of these trends, we are convinced there are plenty of deep-value U.S. farmland acres currently and/or soon-to-be-available for sale, and we are excited by this opportunity.

U.S. Cropland Value by Region (\$ / Hectare)

- US
- Pacific
- Mountain
- Southern Plains
- Delta
- Appalachian
- Lake
- Northeast
- Corn Belt
- Northern Plains
- Southeast



Source  
USDA

## Recent Trends in Farmland Investing

Agricultural land ownership is fragmented, with ownership resting largely with families who own a single property and farm it themselves. Non-owner-operators or, in other words, investors, owned 29 percent of US farmland in 2007. They lease the land to operators to ensure guaranteed income. Institutions with alternative investment allocations are attracted to farmland for similar reasons that attracted them to timberland over the last few decades. The low correlations, relative stability of returns, and inflation protection offered by both agriculture and timberland have been the primary drivers for institutional interest. Agricultural land assets sit at an estimated \$8.3 trillion in total value with an estimated \$1 trillion of that being investable. This represents a compelling opportunity for institutional investors.

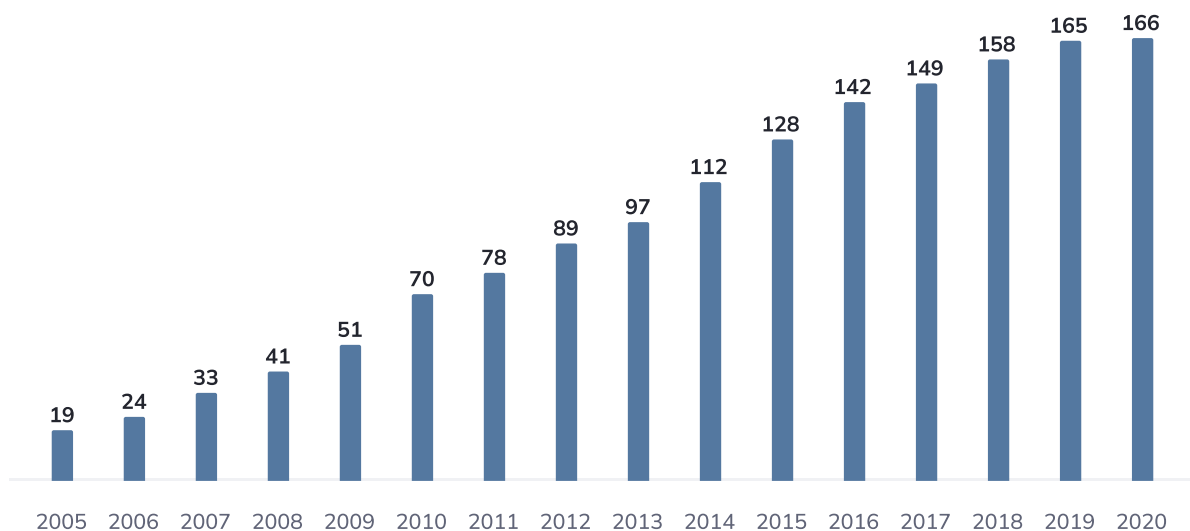
Until recently, agriculture and farmland did not have a natural home in the investment portfolios of the mainstream institutions. This is now changing and has the potential to make significant changes to capital ownership structures in the industry and the number of investments in the sector over time.

Institutional farmland investments typically focus on globally competitive agricultural sectors, including bulk commodity row crops, such as corn, soy, wheat, and rice, that can be produced most efficiently at scale, as well as relatively storable permanent crops, such as tree nuts or wine grapes.

### Growth In Institutional Farmland Investments

Since the early 2000s, institutional investors, including pension funds, university endowments, sovereign wealth funds, and family offices, have joined the space in different waves. In 2005 there were fewer than 20 farmland funds operating around the world. By early 2020, the number of farmland funds had reached 166, with an aggregated AUM of \$38 Billion, as shown in the following figure.

Evolution in The Number of Farmland Funds



Sources

FAO 2011, GMO 2011, HNRG 2012, Global Ag Investing Research & Insight Estimates 2012, Macquarie Agricultural Funds Management 2012 Global AgInvesting Research & Insight  
Valoral Advisors (Food and Agriculture Investments Post COVID-19)

# Challenges of Investing in Private Real Assets and Farmland

There are several barriers to entry that can make it difficult for investors to undertake investments in private real assets, particularly in farmland. Direct investors must deal with the following hurdles:

## Lack of Transparency

Sophisticated due diligence capabilities are essential to analyze the potential profitability and cash-flow profile of the assets and opportunities.

## Capital Requirements

Deep financial reserves are necessary to achieve economies of scale, as well as to invest in technology and infrastructure.

## Operational Risks

Investing in farmland involves a range of operational risks that include: weather, pest damage, marketing perishable crops, and complying with local regulations. Expertise in local markets and access to a network of local operators can allow investors to transfer operational risk and gain steady income through leasing contracts.

# Vehicles to Gain Exposure to Farmland Investing

## Public Farmland REITs

Today, there are two main farmland REITs listed in the U.S: Gladstone Land - listed since 2013 - and Farmland Partners – listed in 2014 and which has subsequently acquired another U.S. farmland REIT - American Farmland. Farmland REITs typically lease the land to local tenants, through a wide range of possible lease contracts. Besides crop prices, cash yields are driven by the quality of the portfolio and tenants, the lease arrangements, and efficiencies in scale and expenses. Long-term appreciation in the value of the farmland portfolio is a major driver of total return.

## Technology-Driven Farmland Management Platforms

These platforms are relatively new, and FarmTogether would fall under this category. These companies provide a platform for investors to choose from a variety of passive farmland investment products. The service provider is responsible for the curation, due diligence, leasing and management of the operations. The platforms allow investors to directly invest in properties and build their own portfolio depending on their investment perspective and risk appetite (e.g., row crop vs. permanent crop, fixed lease vs. variable lease, etc.)

# Summary

Farmland investing is a subset of real asset investing that provides income via lease payments and capital appreciation. The historical returns related to farmland investment have been attractive. The NCREIF benchmark not only shows positive annual returns every year since 2002 but also that the standard deviation of the returns is low, allowing investors to generate consistent returns with limited variability.

An investment in farmland can help create a diversified portfolio that may help hedge against adverse market conditions. Direct investment into a specific farmland fund that targets a specific operation may be a more attractive investment relative to a farmland REIT on a risk-reward basis. FarmTogether provides an investment platform that allows qualified and accredited investors to actively manage their farmland portfolios and compare several deals.

Daybreak Organic Pear & Apple Orchard

Chelan County, WA





If you would like to learn more about  
FarmTogether, please contact us at  
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