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Natural Capital

Agriculture and Timberland Asset Class Spotlight

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With more than half of the world's gross domestic product moderately or highly dependent on nature, recognizing the value of natural capital and prioritizing its sustainable management is essential for achieving long-term environmental, social and economic prosperity.

What Is Natural Capital and Why Is It Important?

Natural capital refers to the elements of the natural environment that provide direct or indirect goods and services to society. It applies an economic lens to the world's stock of natural assets such as land, forests, soils and water and how society and businesses rely on them to function.

These natural assets are the foundation of all economic activity and human well-being. Examples of natural capital range from products such as food from farmland, timber for building structures or fibre for clothing. Natural capital can also provide services such as healthy ecosystems that can buffer extreme events such as floods or storms, or filter air and water.

With more than half (55%) of the world's gross domestic product (GDP) moderately or highly dependent on nature[1], recognizing the value of natural capital and prioritizing its sustainable management is essential for achieving long-term environmental, social, and economic prosperity. By investing in the responsible use of natural resources, we can ensure a resilient and thriving planet for current and future generations whilst generating an attractive risk-adjusted return.

1 Managing nature risks: From understanding to action, PWC. Fifty-five percent of the world's GDP is equivalent to an estimated US $58 trillion in 2023, rising from US $44 trillion in 2020. April 2023

Investing in Natural Capital

A wide range of approaches are available to investors seeking to make investments in natural capital.

This includes a broad spectrum from direct investments in real assets such as forests or farmland, public and private equity investments in forest or farmland management companies, through to buying mitigation offsets for biodiversity or greenhouse gas emissions.

Farmland and timberland represent direct investments in natural capital and both have favourable long-term investment fundamentals with the ability to secure exposure to real assets.

Agriculture Industry Outlook

Agriculture is a large and essential industry, representing approximately 4% of the world's GDP and accounting for 27% of global employment in 2021.[2] It is highly fragmented, capital-intensive and dependent on environmental factors (notably weather, soil and water). Despite a thriving global trade for agricultural commodities, the agriculture industry remains local, with the majority of farmers running small operations in single geographies.

Globally, there are positive demographic and economic trends that are driving up demand for agricultural commodities, putting pressure on existing farmland to increase production. According to the United Nations' Food and Agriculture Organization, the world will need to increase the volume of food production by 70% by 2050 to meet the demands of the human population.[3] This is primarily due to the growth in the world's population, along with the emergence of a growing middle class in many developing economies with greater spending power that is shifting dietary patterns.

In parallel, certain factors are constraining the supply of agricultural inputs. On a per capita basis, the number of acres of arable land has declined precipitously since the mid-20th century and is expected to continue declining further, reducing by close 20% from 2015 to 2050.[4] The factors that contribute to this decline are complex and varied but may include climate-related challenges such as ongoing drought conditions or social pressures such as continued urban sprawl into agricultural areas.

These trends in demand growth and constraints on supply of agricultural products are favourable long-term fundamentals for farmland investments, making farmland valuable.

Agriculture Demand Growth Drivers

1 Population Growth

2 Rising Income

3 Changing Dietary Preferences

Agriculture Supply Constraints

1 Declining Arable Land

2 Declining Alternative Food Sources

3 Water Availability

2 The World Bank | Data, https://data.worldbank.org/indicator, accessed March 2023.
3 FAO, "World Agriculture Towards 2030/2050, The 2012 Revision". June 2012.
4 FAO, "World Agriculture Towards 2030/2050, The 2012 Revision". June 2012.

Shade cloth over apple orchard

A related factor constraining the supply of agricultural inputs is the undercapitalization of farm businesses. This often limits investments in land improvements, equipment and technology, which are necessary to more efficiently utilize critical resources and preserve the quality of soil and water while maintaining, or even increasing, the productive capacity of the land.

An example of efficient resource utilization in action is investing in shade cloth structures, which in a case study at a group of Washington apple orchards, was observed to correlate with: 59% lower wind speed, 36% higher relative humidity, 30% less solar radiation and 3% cooler air temperature.

This enabled several benefits, including reduced water consumption, increased productivity and higher fruit quality.

59% **lower wind speed**

36% **higher relative humidity**

30% **less solar radiation**

3% **cooler air temperature**

Source: Aspect Consulting (2019). Washington State

Sustainable Agricultural Practices – A Part of the Solution

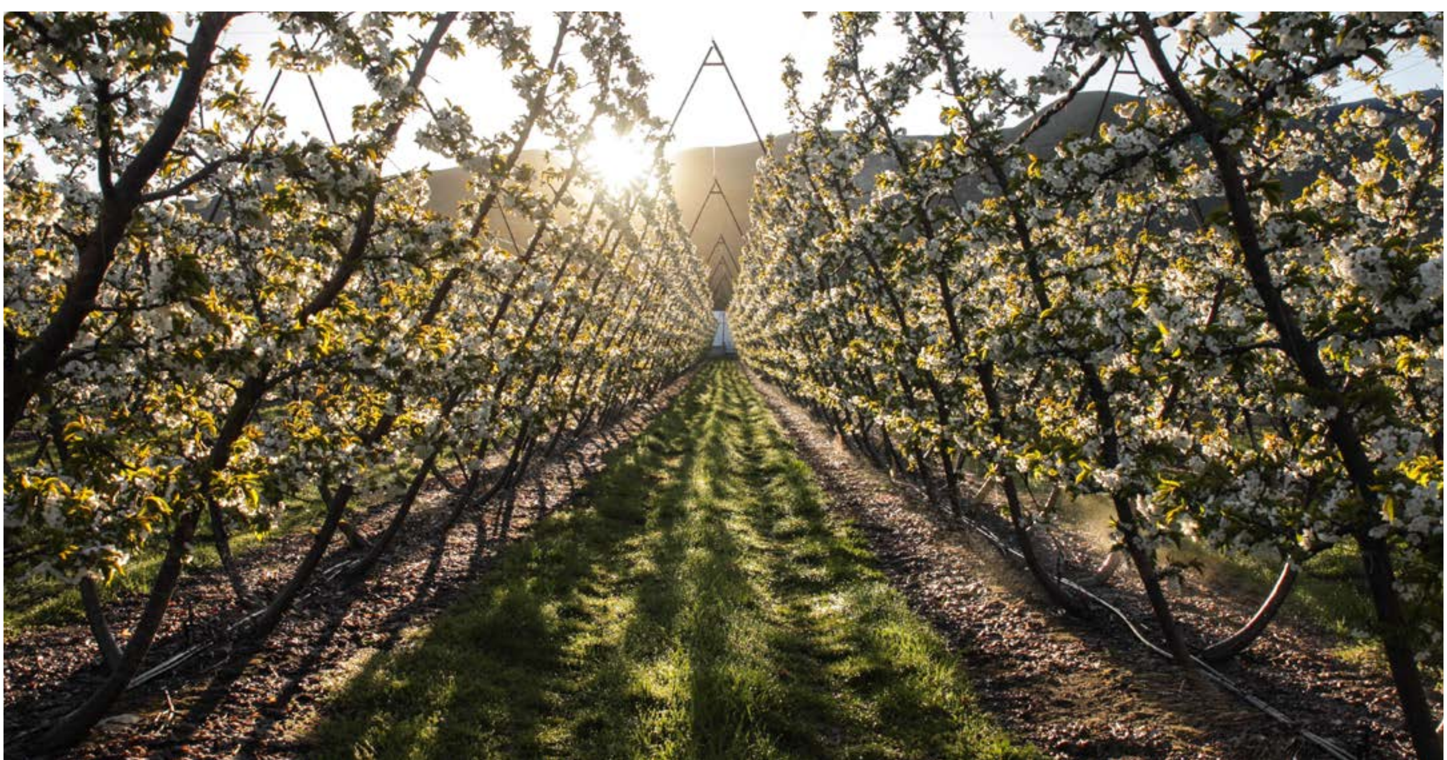
Enhancing the agricultural productivity of farmland will be essential to meet the demand of tomorrow, but it must be done by using natural resources sustainably so future generations can benefit from them as we do.

Protecting and responsibly managing land and water ecosystems directly correlates to the viability of farmland and its productive capacity.

Effective soil and water management can improve long-term farm productivity and viability, while water conservation can increase resilience and reduce reliance on external water supplies, supporting water quality and productivity. Ultimately, this can contribute to the productivity and profitability of farms and support appreciating land value from both an economic and ecological perspective. In addition, sustainable farming practices can help conserve water, reduce greenhouse gas emissions and mitigate land degradation and biodiversity loss.

Examples of Best Practices That Increase Long-Term Farm Resilience and Productivity:

- **No-till Farming -** A method for growing crops without disturbing the soil by digging, stirring or overturning. It decreases soil erosion and helps increase the amount of water in the soil.
- **Cover Crops -** Plants that are planted to cover the soil other than for the purpose of being harvested. They help manage soil erosion, fertility and quality, and increase microbial activity.
- **Drip Irrigation –** A micro-irrigation system that helps save water and nutrients by allowing water to drip slowly to the roots of plants while minimizing evaporation.
- **Fallowing –** The practice of leaving a field bare for a period of time to restore soil health and structure.
- **Precision Irrigation –** An approach that allows the application of water and nutrients to the plant at the right time and place and in small, measured doses to provide it with optimal growing conditions.
- **Rotational Farming –** The practice of growing an alternating series of row crops in a field to promote stronger yields and healthier soils. Each crop type has its own unique nutrient requirements. By varying crops in production, rotational farming can reduce the pressure on the extraction of specific nutrients, replace essential nutrients like nitrogen back into the soil and improve soil structure.



Timberland Industry Outlook

Over the last several decades, global timber consumption has increased modestly but has been steadily driven by population growth and urbanization. Going forward, we believe there are factors that are likely to accelerate demand and constrain cost-effective supply of timber.

In addition to socio-demographic factors (e.g., the growth of cities and rising incomes), a number of secular drivers are spurring demand. In certain countries, there are simply not enough homes being built to satisfy demand. In the U.S., for example, the average number of new family homes being built annually still has not recovered to the long-term average registered prior to the financial crisis over 15 years ago, creating significant latent demand.[5] Wood-frame homes built in the post-Second World War housing boom now require significant renovation or are being replaced, driving additional demand. In addition, advances in engineered timber products are generating demand for wood use in higher rise buildings. The ability to build taller structures out of wood is coinciding with the increasing desire to use more sustainable building products, substituting away from carbon-negative, non-renewable materials like concrete and steel where practical. We believe wood demand is set to grow due to its important role in fighting climate change. Timberland is a renewable natural resource that absorbs carbon dioxide out of the atmosphere as it grows. From timberland, we make wood products (like houses and furniture) that retain the captured carbon for years if not decades. New trees are promptly planted further increasing the carbon captured.

In parallel, certain factors are constraining (and in some cases reducing) the global timber supply. Increasing regulation and conservation, together with higher levels of public scrutiny, are reducing available harvestable timber volumes in both developed and developing countries alike. This is combined with interests in carbon credits, which also increases demand. Given that every acre of global forest is known, the responsible and productive management of existing forests is critical to managing supply to keep up with growing demand for renewable forest products. Softwood timber has multi-decade growing cycles, which makes it difficult to significantly increase production in the near to mid-term from existing working forests. The planting of additional timberland on unforested land (afforestation) and restocking of commercial plantations is not expected to be able to meet increasing demand.[6]

These trends in demand growth, increasing awareness of the environmental benefits of wood products and the constraints on supply of mature timberland have created very favorable long-term fundamentals for softwood timberland investments.

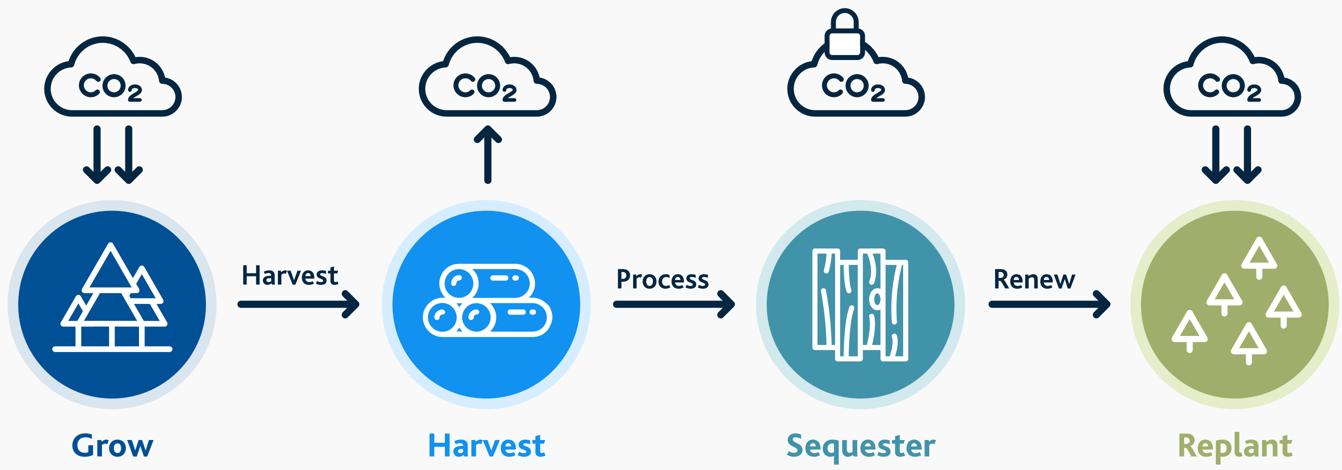
Timberland Demand Growth Drivers

1. Population Growth
2. Urbanization / Rising Income
3. Latent Unmet Housing Demand and Repair & Replacement of Ageing Housing
4. Engineered Wood
5. Carbon Sequestration
6. Wood as a Climate Change Solution

Timberland Supply Constraints

1. Constrained Supply of Commercial Timber
2. Restrictive Environmental Regulation
3. Reduction of Illicit / Unregulated Logging

5 Forest Economic Advisors (FEA), Softwood Lumber and Timber Global Outlook, 2023
6 FAO, Global Forest Resources Assessment – Terms and Definitions, 2020.



Forests - A Nature-Based Climate Solution

Forests are increasingly being recognized for their environmental benefits as the global community continues to grapple with the climate crisis. A working forest captures carbon dioxide as it grows through photosynthesis, retaining carbon in the tree fibre and emitting oxygen as a byproduct. The carbon footprint of wood products is considerably lower than that of other building products like concrete, steel and plastics, which are highly carbon-emitting.[7] When a tree is converted into a long-lived wood product, the carbon remains sequestered, often for many decades. A new tree is then planted and continues the virtuous cycle of carbon capture and sequestration.

In addition, advances in engineered wood solutions and building codes mean that wood can now be used economically in tall building construction, representing a further demand driver going forward. Many jurisdictions have modified or are in the process of modifying their building codes to allow for 6-12+ story buildings in which the structural components are made of engineered wood products (like cross-laminated timber).

Carbon credits represent an additional, distinct source of demand for timberland and a permanent removal of available timber from the supply base. Carbon credits can be generated by deferring harvest or improving forest management, or through planting trees on unforested land. The carbon captured in the trees and their subsequent growth is quantified on a CO2 tonne equivalent basis by independent certification organizations. The resulting carbon units can then be sold to buyers who seek to voluntarily offset their carbon footprint or are legally required to do so through cap-and-trade regulatory frameworks.

Engineered wood products example

7 Laurent AB, van der Meer Y and Villeneuve C (2018), "Comparative Life Cycle Carbon Footprint of a Non-Residential Steel and Wooden Building Structures," Current Trends Forest Res: CTFR-128.

Benefits of an Allocation to Natural Capital in a Policy Portfolio

In addition to a favourable outlook driven by strong secular trends, farmland and timberland's characteristics make them a unique investment class for investors looking for diversification, stability and strong risk-adjusted returns along with the opportunity to promote social and environmental characteristics.

Farmland and timberland have historically shown low volatility in returns in addition to providing a cash yield. Over the years the asset classes have exhibited high Sharpe ratios[8], showing desirable risk-adjusted returns. Both have limited correlation with other major asset classes and can potentially better optimize a portfolio by improving the overall risk-return profile. Farmland and timberland values tend to be resilient across market cycles, offering significant downside protection and an effective inflation hedge.[9]

8 Sharpe Ratio – "The Sharpe ratio is a measure of volatility-adjusted performance and is calculated by dividing excess return by the standard deviation of excess return. Excess return is defined as the return in excess of the risk-free rate of return—for example, the three-month T-bill rate." CFA Institute, doi.org/10.2469/dig.v40.n1.26

9 Past performance is not a guarantee of future results. Inherent in any investment is the potential for loss.

Natural Capital Provides Strong Benefits to a Portfolio

LOW OR NEGATIVE CORRELATION

Low or negative correlation with other asset classes (both traditional and alternative)

INFLATION HEDGE

Farmland and timberland vary positively with inflation

STORE OF VALUE

Significant downside protection given higher proportion of value in land

Low/Negative Correlations
20 Year (2003-2022)

Correlations	Farmland	Timberland
U.S. Equities	(0.18)	(0.28)
10-Yr U.S. Treasuries	0.10	(0.04)
3-Month T-Bills	0.39	0.60
Corporate Bonds	(0.04)	(0.31)
REITs	(0.02)	(0.23)
Gold	(0.08)	(0.19)
International Equities	0.19	0.06
Emerging Mkts Equities	(0.01)	(0.09)

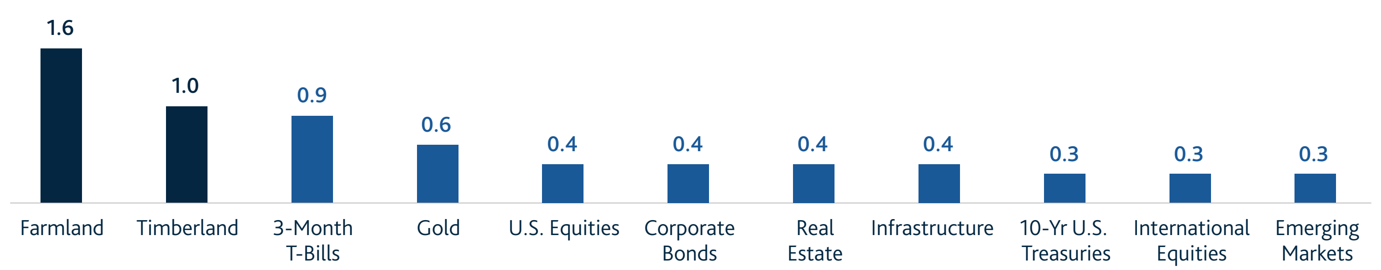
Inflation Hedge[1]
20 Year (2003-2022)

Correlations	US CPI
Timberland	**0.50**
3-Month T-Bills	0.37
Farmland	**0.24**
Gold	0.06
10-Yr U.S. Treasuries	(0.20)
Emerging Mkts Equities	(0.30)
International Equities	(0.33)
REITs	(0.49)
Corporate Bonds	(0.52)
U.S. Equities	(0.55)

Good Store of Value
(Years with Negative Performance)

Correlations	Farmland	Timberland
'91-'95	0	0
'96-'00	0	0
'01-'05	0	1
'06-'10	0	2
'11-'15	0	0
'16-'23	0	0
Total	**0**	**3**
Avg. Decline	n.a.	(3.4%)
Maximum Decline	n.a.	(5.2%)

Sharpe Ratios (period from 2002 to 2022)



Note: Past performance is no guarantee of future returns. Inherent in any investment is the risk of loss. Sources: Based on NCREIF Farmland Index for Farmland, Direct Timberland – NCRIEF Timberland Index, S&P 500 Total Return Index for U.S. Equities, BofA Merrill Lynch U.S. Corp Master Total Return Index Value for Corporate Bonds, Federal Reserve 10 Year Treasury Constant Maturity Rate for 10 Year Treasuries, Federal Reserve 3 Month Treasury Bill Secondary Market Rate for T Bills, MSCI US REIT Index for REITs, Gold Spot Price for Gold, MSCI Emerging Markets Index for Emerging Markets, MSCI EAFE Index for International Equities. Data as of 31 December 2022.

1 Inflation Correlation calculated on a 1-year lag

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