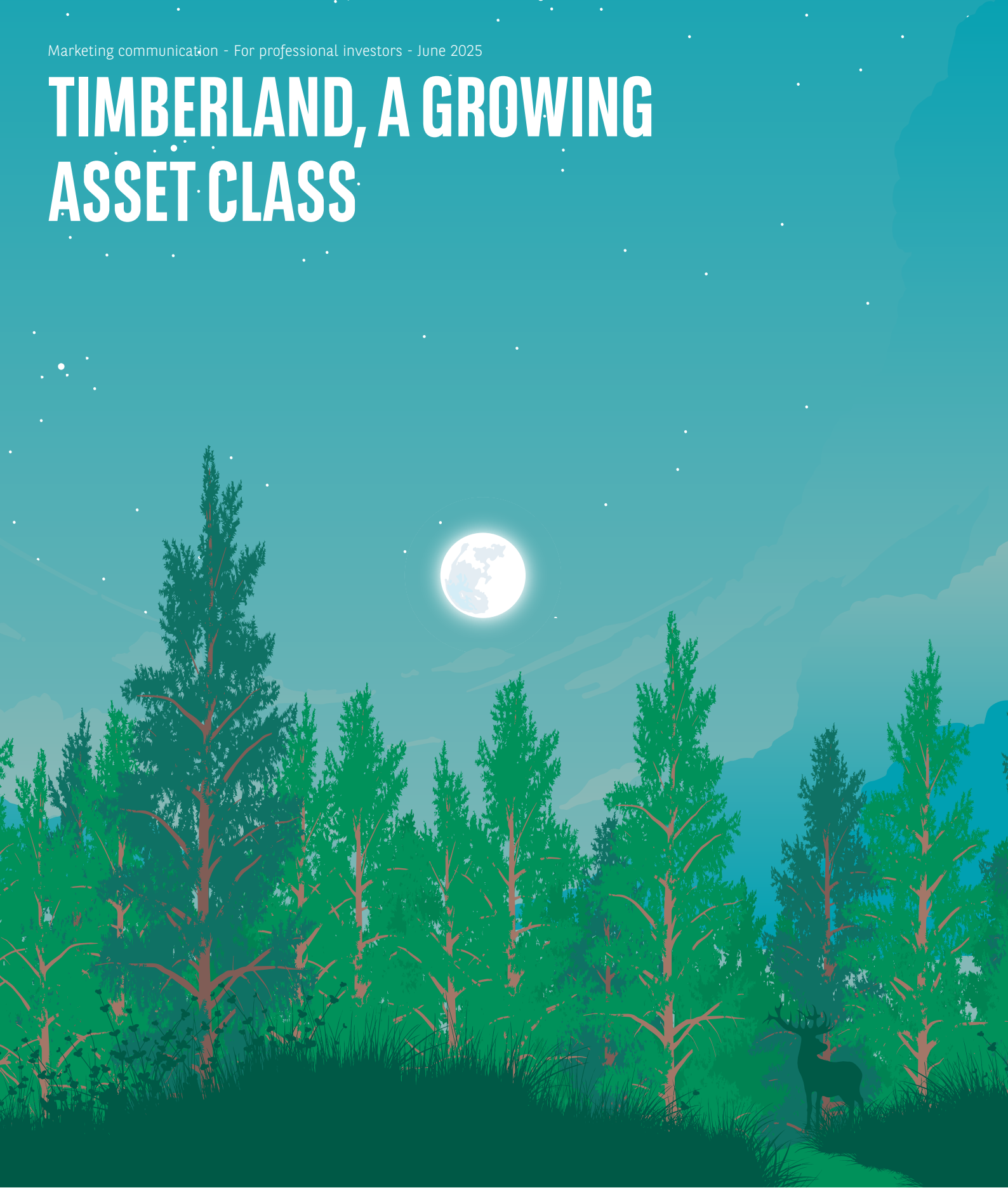
Marketing communication - For professional investors - June 2025

TIMBERLAND, A GROWING ASSET CLASS



BNP PARIBAS
ASSET MANAGEMENT

The sustainable investor for a changing world

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EXECUTIVE SUMMARY

- Timberland – commercially managed forest – presents an investible universe of some USD 200 billion and offers a compelling opportunity for investors seeking to align financial with environmental and social benefits.

- Timberland as an asset class can play an effective and significant role in investment portfolios. It can offer attractive long-term risk-adjusted returns, stable annual income, diversification benefits due to its low correlation with other asset classes, and inflation-hedging properties.

- There are several direct and indirect ways to obtain exposure to the timberland asset class. These can range from directly purchasing and managing timberland properties, to investing via specialised investment managers, timber real estate investment trusts (REITs), or timber exchange-traded funds (ETFs).

- Large institutional investors such as public and private pension funds and insurance companies are the primary investors in timberland, an asset class which has duration characteristics that match long-term liabilities arising from pension funds' and insurers' obligations.

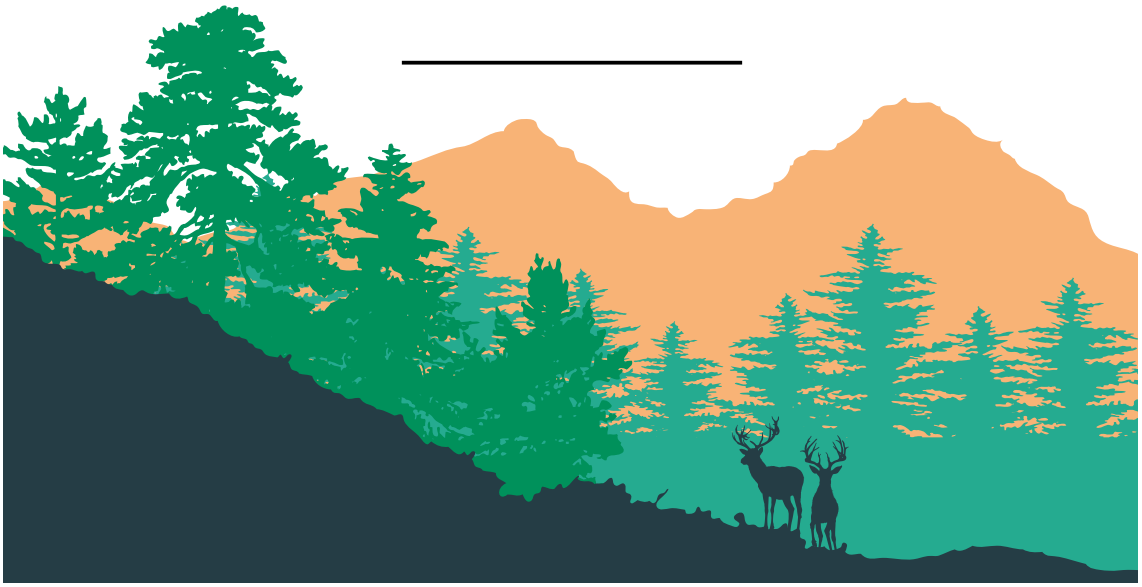
- Sustainably managed timberland offers a tangible way for investors to contribute positively to climate change adaptation and/or mitigation, and to meet several of the UN's Sustainable Development Goals. Sustainable forestry management fosters resilient ecosystems, protects wildlife habitats and maintains biodiversity, aligning them closely with investors' commitment to environmental stewardship. As a natural climate solution, timberland presents an attractive opportunity for investors who commit to decarbonise their portfolios and contribute to the achievement of global net zero goals.

- It is anticipated that the coming years and decades will see a sustained increase in demand for timber products arising from population growth, urbanisation, increase in per capita income, and a green transition substituting polluting materials in manufacturing and buildings. Such trends should support future timber prices, which together with biological growth and land prices, constitute timberland's main return drivers.

- Unique to the timberland asset class is the ability to generate additional income from other contributory sources, such as recreational leases, hunting fees, conservation easements, sale of carbon offsets or mitigation credits, and leases for renewable energy installations.

Timberland investment is not without risk, the three primary sources of which are market risk, physical risk, and regulatory, legal, and policy risk, all of which are addressed in this paper.

1. INTRODUCTION



A. ROLE OF FORESTS

Globally, forests cover more than 4 billion hectares[1] or around 30% of the Earth's land area. The tropics host the largest proportion of the world's forests (45%), followed by the boreal (sub-Arctic), temperate and subtropical regions. Over 90% of the world's forest area is composed of naturally regenerating forests, the remaining area is planted forest. About 30% of all forests are used primarily to produce timber and non-timber forest products.

Forests are natural systems that provide many ecosystem goods and services crucial to sustaining the global economy and development of human societies. Forests supply renewable materials for a wide range of industries, as well as non-timber forest products which contribute to human health, well-being and enjoyment. These include food, medicinal plants or raw materials for pharmaceutical products, and outdoor recreation and culture, such as sports and various forms of tourism. In addition, forests provide a variety of important environmental services like air and water purification, soil protection, nutrient recycling and climate regulation.

Forests are also key to climate change mitigation. They have the potential to absorb and store about 10% of the global human-induced carbon emissions projected for the first half of this century.

Finally, forests are also one of the most important reservoirs of global biodiversity, providing a natural habitat for a vast range of animals, plants, and other living organisms.

1. UN Food & Agriculture Organization (FAO), 2020.

B. ROLE AND SIGNIFICANCE OF TIMBERLAND

Definition of timberland

Timberland refers to forested areas, typically plantations, that are primarily used for commercial purposes, specifically for the production of wood and paper products. Timberland plantations are usually managed and harvested in a sustainable manner to ensure that the land remains productive for future generations. A timberland investment generally includes both an investment in the trees and underlying land.

Importance of timberland

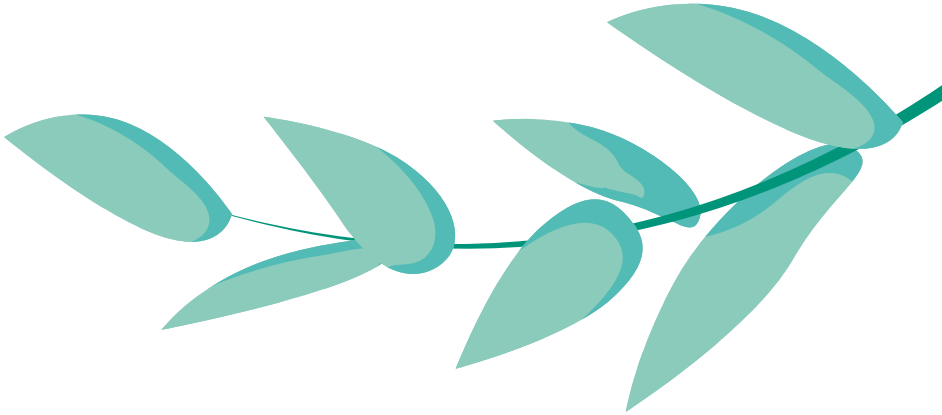
Timberland plantations play a vital role in the global bioeconomy, carbon sequestration, and the protection of natural forests from excessive logging. While only accounting for around 3% of the world's forest area, productive plantation forests produce one-third of global industrial timber[2]. This means that productive plantation forests on average produce close to five times as much industrial quality timber compared to other forests used primarily to produce timber.

Commercial timberland is in the future expected to take up a larger share of global wood production. This is because customers are increasingly demanding wood that is certified as having been sustainably produced, and it is expected there will be a reduced supply of timber from other sources due to more stringent environmental regulations and monetisation of other ecosystem services (e.g. carbon credits).

End-markets for wood products

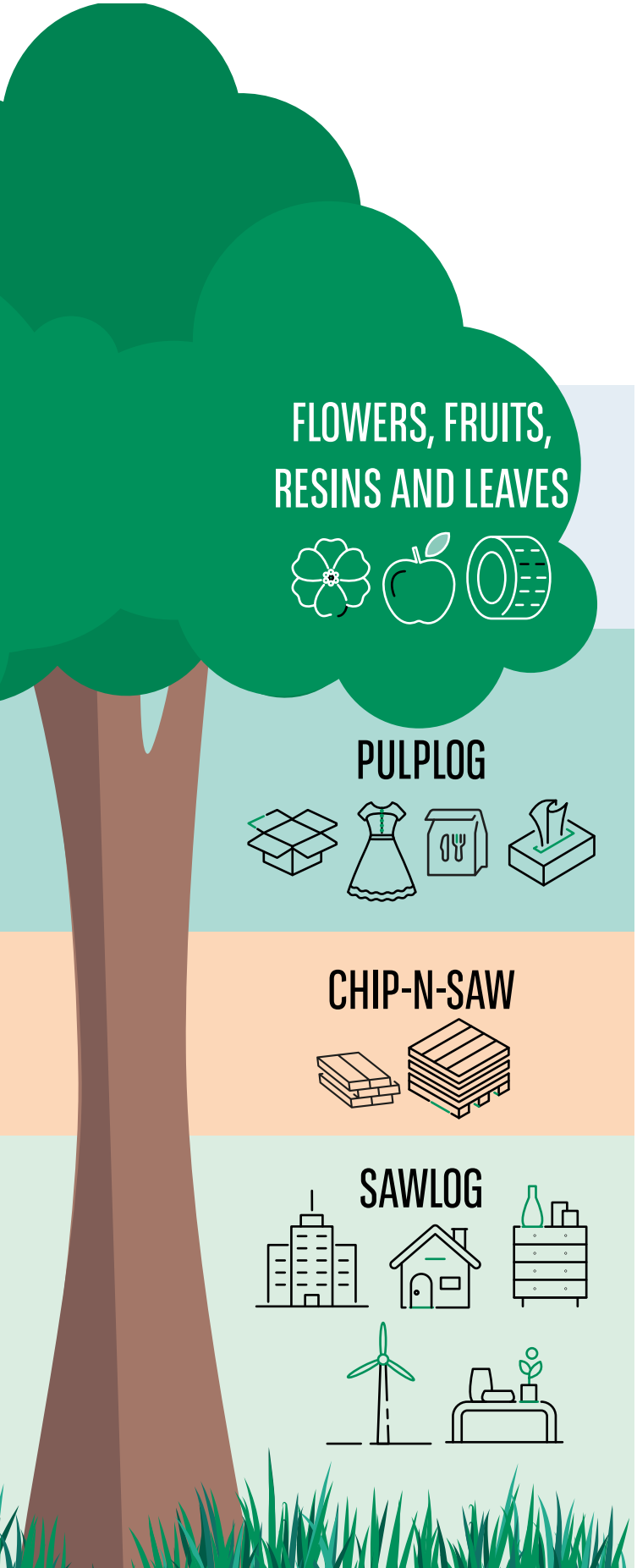
Wood has historically been an important commodity, with humans using wood for numerous applications for thousands of years. Wood continues to be used in a wide range of industries today and is one of the world´s most important renewable raw materials (Exhibit 1).

Major end-use markets for these products include construction, furniture, hygiene products and packaging. Each tree species has distinct products and markets. Hardwoods are generally directed toward higher value 'niche' markets such as furniture, mouldings, flooring and cabinetry, while softwoods are mainly used for structural lumber in construction, plywood and pulp. In addition to traditional wood product markets, engineered wood or mass timber products (e.g. cross-laminated timber, glue-laminated timber), biofuels and renewable alternatives for plastics, chemicals and textiles represent rapidly growing new markets for timber.



2. FAO, 2020.

Exhibit 1: Timberland is the source of a wide and growing range of end-market products



Demand outlook for wood products

Global demand for wood products is influenced by various drivers. This includes world population growth, urbanisation, increase in per capita income, consumer preferences and behaviour, availability of wood, and product and technological developments.

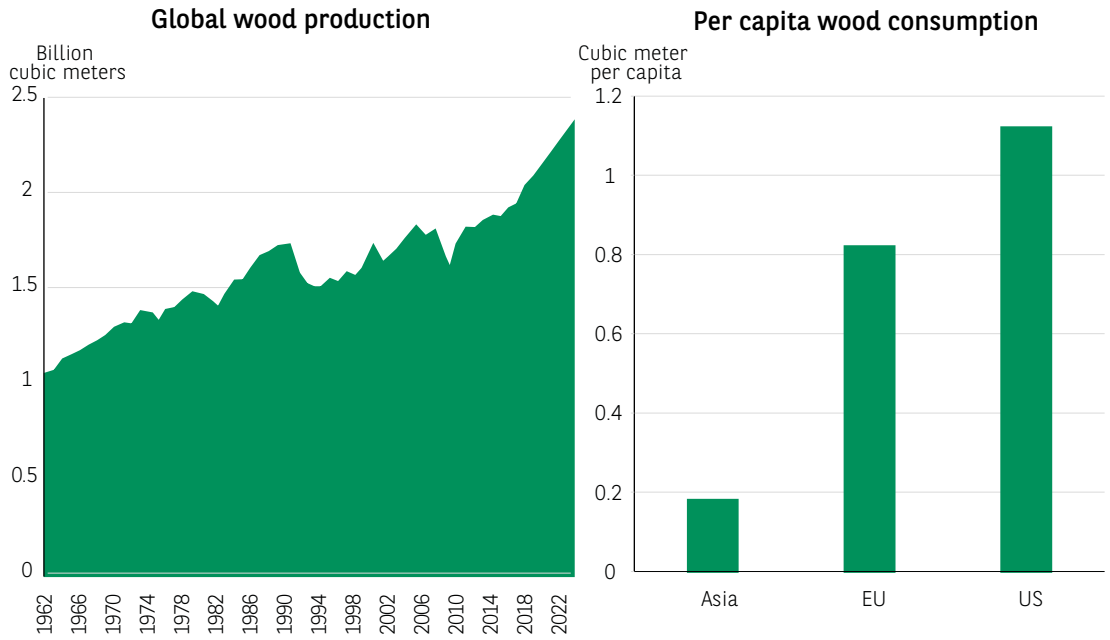
Diverse policy and regulatory developments, such as those relating to responsible-sourcing strategies, carbon pricing and carbon taxes, renewable energy development and green building standards, also affect wood production and trade.

The world population is projected to grow from 8.0 billion in 2022 to 9.7 billion in 2050[3], at which point nearly seven out of 10 people are likely to be living in cities or other urban centres. Overall population growth and the high urbanisation rate will affect demand for wood products, most obviously for housing and furnishing (Exhibit 2).

Furthermore, rising per capita incomes in fast-growing emerging economies, such as Asia, Central Europe and Latin America, are expected to augment the demand for wood products. In particular, those used in construction, housing and paper products, including packaging and hygiene products.

3. UN Global Issues: Population (2025).

Exhibit 2: Growing demand for wood product



Sources: UN Food and Agriculture Organisation (FAO, 2024), World Bank (2020).

Changes in consumer preferences and behaviour triggered by people's growing awareness of the climate, environmental and social impacts of consumption, should positively affect demand for wood products. Indeed, wood is increasingly used as a substitute for non-renewable, carbon-intensive and polluting materials such as plastics, cement, concrete or steel.

Policy developments to accelerate the decarbonisation of economies and the development of a circular bioeconomy should also lead to greater use of wood and its associated wood by-products.

These trends result in strong market fundamentals and the FAO forecasts global demand for timber to increase by 37% to 60% between 2020 and 2050, possibly exceeding accessible supply by as soon as 2040. This imbalance is expected to lead to a long-term increase in timber prices. Investing in sustainably managed timberland can thus be a direct way to benefit from a growing global demand for wood.

Contribution to bioeconomy

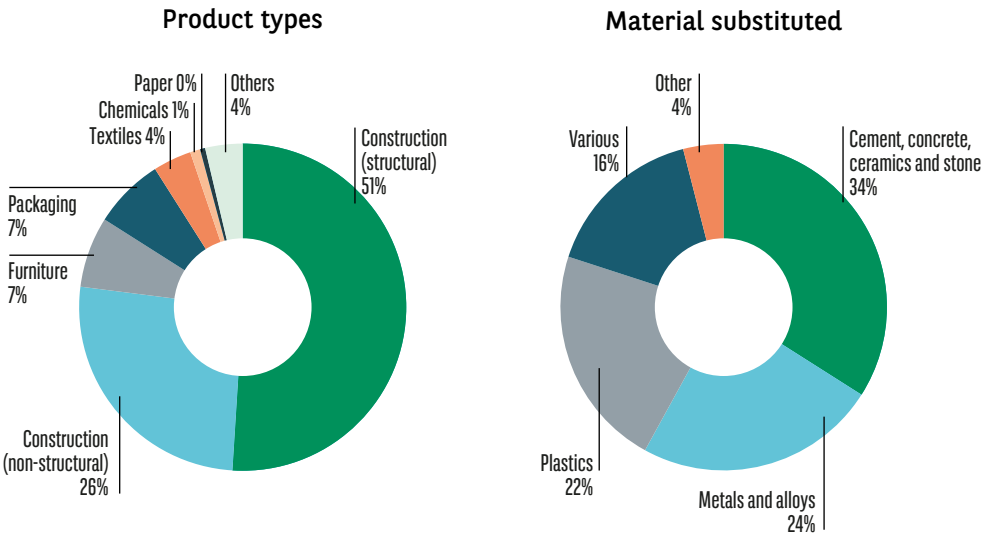
Nowadays, 74% of humanity's consumption is based on non-renewable natural resources, whose extraction, transportation, processing, use and disposal can cause major impacts to the environment, climate and biodiversity[4]. The bioeconomy has emerged as a concept for tackling challenges related to the over-consumption of, and over-reliance on, non-renewable natural resources. Forests and the forest sector are important components of the global bioeconomy (Exhibit 3).

4. International Resource Panel, 2020.

Wood is a renewable, recyclable, climate-friendly material that is increasingly used to substitute for non-renewable, and/or fossil-based, and/or greenhouse gas (GHG)-intensive materials. Wood-based products such as paper and cardboard are increasingly replacing plastic packaging that not only has climate mitigation benefits but also reduces pollution. Advances in the production of refined products from wood fibres could potentially enable the substitution of oil-based products.

In addition, forests provide many non-wood products with high economic value. For example, resins and derivates thereof are used to manufacture products in the chemical and food industries. Chemicals derived from resin generally have a smaller carbon footprint than their fossil-based equivalents.

Exhibit 3: The role of forest products in the global bioeconomy



Source: FAO (2022).

New technologies are emerging that could further increase the added value of wood products. And help to reduce the carbon and water footprint of products and processes, reduce pollution and waste generation, and improve economic circularity.

Carbon sequestration

In addition to providing renewable, environmentally friendly materials to the global economy, forests serve as vast carbon sinks. Forests sequester carbon as they grow by capturing carbon dioxide from the atmosphere and transforming it into biomass through photosynthesis. Sequestered carbon is then accumulated in the form of above and below-ground biomass, deadwood, litter, and in forest soils. Between 2001 and 2019, the world's forests sequestered about twice as much carbon dioxide as they emitted.[5]

Sustainable forest management activities have the potential to increase carbon sequestration by changing the age structure and through improving growth rates by implementing better forest management practices and planting improved seedlings.

5. World resources institute (2021). Forests Absorb Twice As Much Carbon As They Emit Each Year.

The contribution of forests to carbon cycles should be evaluated by taking into account the use of harvested timber that is converted into a wide variety of wood products ranging from short-lived paper products to durable wood products that can last more than 100 years. These harvested wood products (HWPs) continue to store carbon removed from the atmosphere for the duration of their useful life.

Unlike conservation forests where there is little or no expectation of timber production, a significant part of the greenhouse gas mitigation potential of productive forests involves locking up carbon in the HWPs.

Protection of natural forests

The FAO expects overall consumption of processed wood products to grow by 37% by 2050 in a business-as-usual scenario, while in a scenario of a more accelerated transition to the bioeconomy involving the greater participation of wood products, the rise in consumption of wood products could reach 60%.

Many of the world's natural and semi-natural forests are already under severe pressure from human activity and will not be able to sustain increased production targets due to unsustainable timber extraction[6].

As previously mentioned, one-third of global industrial timber currently comes from productive plantation forests, yet they comprise only 3% of the total global forest area[7]. This is due to the combination of high productivity and focused activity in relatively small areas. This has the additional benefit of leaving a smaller 'environmental footprint' in comparison with the more expansive and damaging timber extraction from natural forests. The expansion of productive timberlands can thus not only help meet the soaring global demand for wood products, but also allow most remaining natural forests to be devoted to wildlife protection and habitat conservation.

6. Barua et al. 2014.

7. FAO, 2020.

2. TIMBERLAND AS AN ASSET CLASS



A. EMERGENCE OF THE ASSET CLASS

Timberland as an institutional investment asset class emerged in North America in the early 1980s when integrated forest product companies began selling off their timberland properties and outsourcing the business of growing and harvesting timber to focus on their core operations of producing wood products. This led to a shift in timberland ownership from operating companies to financial investors. To handle these transactions and oversee investment partnerships, Timberland Investment Management Organizations (TIMOs) were formed.

Over the past four decades, the institutional timberland investment universe has grown significantly. Its value is now estimated at USD 200 billion, with about half of available timberland investments located in the US, 21% in Latin America, 17% in Oceania, 9% in Europe and 5% in Asia and Africa[8].

The investment universe continues to expand globally as new plantations emerge, companies and governments continue to divest from their timberland holdings, and smaller private owners sell their properties which can then be aggregated into larger ones.

B. TIMBERLAND RETURN DRIVERS

Timberland investments have three primary return drivers – **biological growth, timber price movements and land value appreciation** – the interaction of which determines the total returns from timberland investment. Before reading the following details about each primary value driver and its significance, it should be noted that timberland value drivers are case-specific, depending on the investment strategy.

8. IWC and New Forests, 2021.

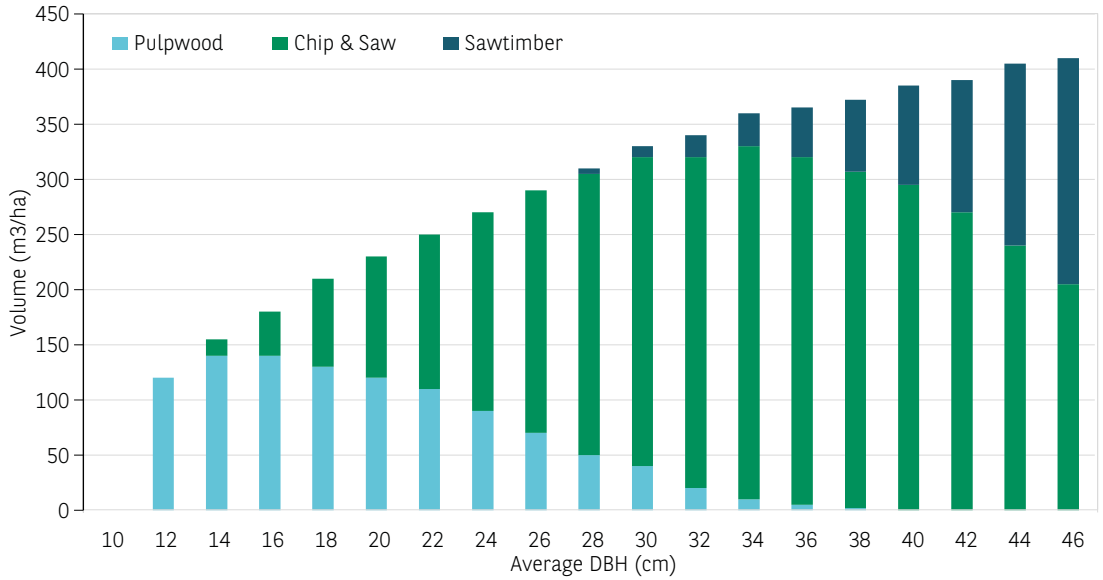
Biological growth

Biological growth is a unique, and the most consistent, determinant of timberland investment returns. It can account for up to 75% of the total return. Biological growth combines two dynamic components: the physical growth in size and volume and the value growth (also referred to as ingrowth) from a lower-priced (pulpwood) to a higher-priced (sawtimber) product.

Exhibit 4 illustrates how pine trees' biological growth not only provides additional volume (m3 per hectare) but higher valued products as the tree matures (average diameter at breast height (DBH) in cm). Smaller and lower-value trees (pulpwood) are mainly used to produce paper, packaging and hygiene products, whereas larger and higher-value trees (sawtimber) are used to produce large-dimension lumber for construction or veneer logs for plywood.

Biological growth is predictable and can therefore be modelled. As it is independent of business cycles and market fluctuations, it helps reduce the volatility of timberland investment returns.

Exhibit 4: Average diameter at breast height (DBH, in cm) of pine trees determine the type of wood product



Source: IWC (2015).

Timber price movements

Timber pricing is the most volatile component of timberland investment returns. Numerous macroeconomic factors determine its dynamics, including population growth, GDP per capita, construction sector activity, interest rates and consumer demand.

However, timberland investments have a natural built-in hedge against timber price fluctuations. When timber prices are low, investors may choose to withhold parts of planned harvests and store growing trees 'on the stump' until market conditions improve. Unharvested trees continue to grow and add value through time. This flexibility to postpone at least part of the harvest during weak market cycles provides downside protection to investors.

As mentioned in the introduction, there are several trends resulting in strong market fundamentals supporting the global demand for timber, so it is expected that timber prices will generally improve in the future.

Land value appreciation

Land value can be a significant part of a timberland investment and **land value appreciation** is, in most cases, responsible for a modest percentage of total timberland investment returns, although increasing competition for land to be used for agriculture, bioenergy production, or recreational use, as well as for forestry, can provide major upside potential. Land values are indeed related to local supply and demand dynamics and, therefore, vary from area to area. Factors such as location, accessibility, development potential and market dynamics can influence the value of the timberland property.

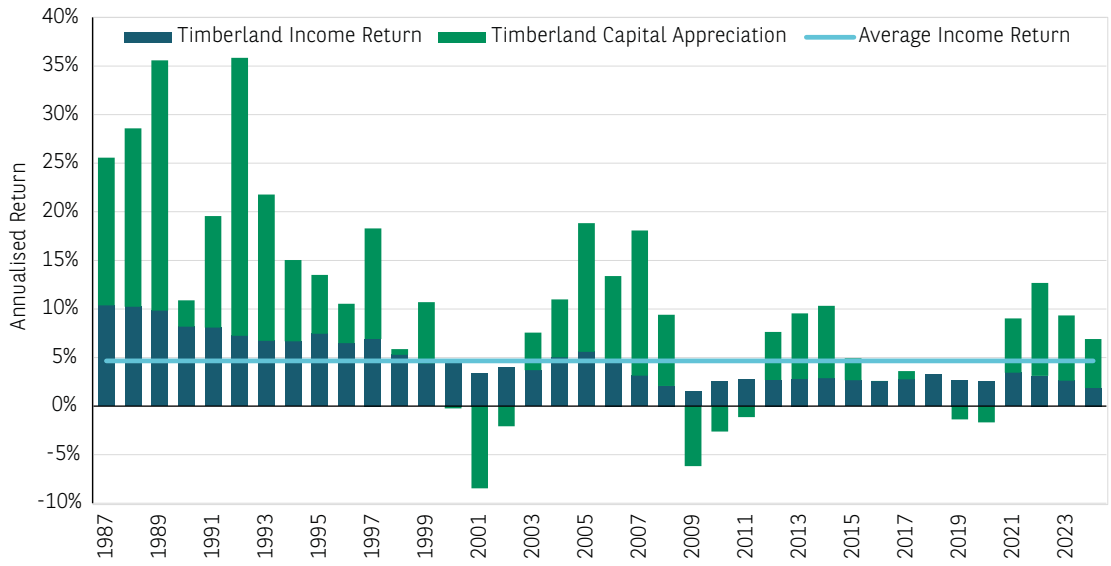
To conclude this section, it is important to note that proactive management is of great significance to timberland returns. This largely depends on the managers' ability to ensure optimal tree growth and to foresee market developments, incorporate these into silvicultural regimes if possible, and use their network to receive the highest prices possible.

Income return and capital appreciation

As illustrated in Exhibit 5, historically, timberland investments have generated an attractive annual income, mainly from harvest operations. The annual cash yield depends partly on the age class profile – the age distribution of the growing trees – of the timberland assets.

A reasonably even age class distribution is important for steady yearly cashflows from harvesting. Unique to the asset class is the ability to generate additional income from alternative sources, such as recreational leases, hunting fees, conservation easements, sale of carbon or mitigation credits, and leases to renewable energy like solar panels or windmills.

Exhibit 5: Annual reported return for US timberland split into income and capital appreciation
(Annualised time-weighted return (%))



Source: National Council of Real Estate Investment Fiduciaries (NCREIF) Timberland Property Index (2025).

Although more volatile when compared to annual income, capital appreciation has historically been a significant component of total timberland return due to biological growth, timber price movements, land value change, and sometimes discount rate compression in asset valuations.

In our view, long-term investors could expect to benefit from potential continued capital appreciation, arising mainly from productivity gains through enhanced forest management practices and the use of improved genetic materials. In addition, expected growing global demand for wood products against a backdrop of a limited supply from sustainably managed timberland plantations, could put upward pressure on timber prices and therefore timberland valuations.

The returns presented in Exhibit 5 are those of the National Council of Real Estate Investment Fiduciaries (NCREIF) Timberland Property Index, a property-based index reporting aggregated returns for about USD 28 billion worth of timberland assets as of the end of 2024, all located in the US. Returns from other regions will be different but we believe they should be similar in other core regions, such as Oceania and Northern / Western Europe (see more under the investment universe section).

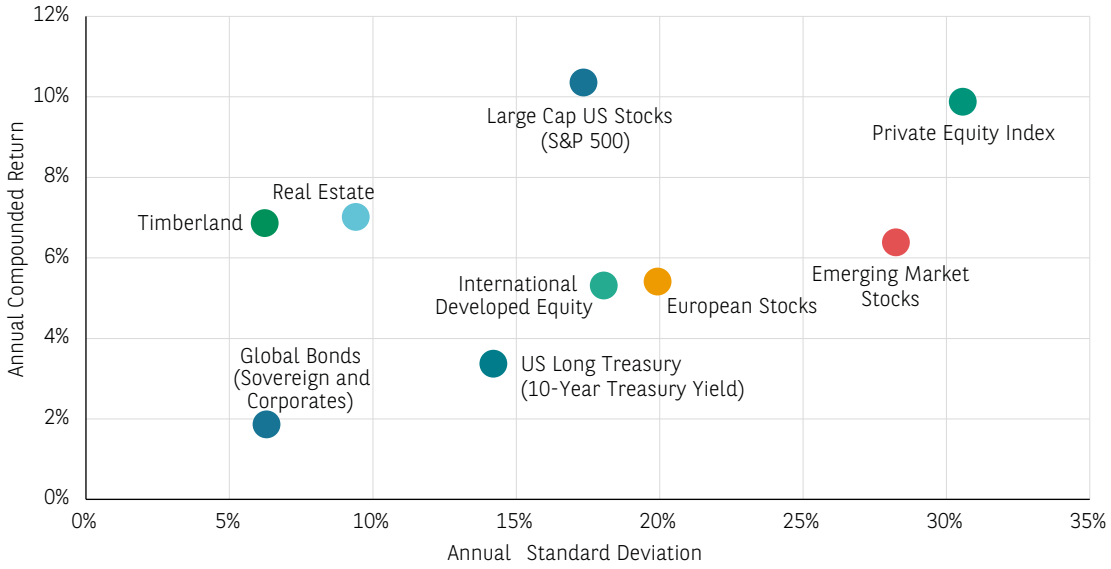
C. ROLE OF TIMBERLAND INVESTMENTS IN AN INSTITUTIONAL PORTFOLIO

Timberland assets exhibit several distinctive characteristics that can aid in creating a more efficient investment portfolio. Indeed, core timberland investments can provide attractive risk-adjusted returns, less volatility, low to negative correlation with other asset classes, and an effective inflation hedge.

Attractive risk-adjusted returns

Core timberland has historically offered attractive risk-adjusted returns compared to other asset classes. Exhibit 6 illustrates this point by presenting the risk-return profile of timberland versus other asset classes. It particularly shows that timberland returns have historically delivered average returns while displaying low volatility.

Exhibit 6: Timberland and other asset classes' annual returns and standard deviations 2005 -2024



Sources: Bloomberg and NCREIF Timberland Property Index (2025).

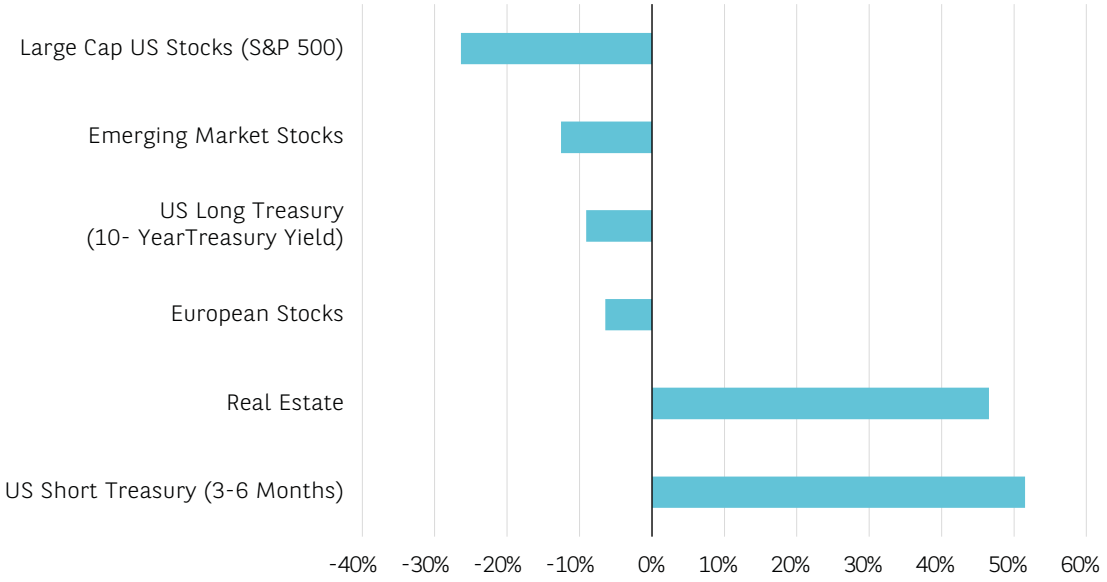
Again, the timberland data presented in Exhibit 6 is based on the NCREIF Timberland Property Index, and therefore only includes timberland assets in the US. Higher returns can be achieved in emerging regions, should investors be willing to accept additional risk (see more under the investment universe section).

Diversification through low return correlation

In addition to attractive risk-adjusted returns and low volatility, timberland investments offer low correlation with most other major asset classes. This is largely due to the non-financial nature of timberland, as returns are predominantly driven by the biological growth of trees, which is independent of financial markets. Consequently, the addition of timberland to an investment portfolio may provide diversification benefits, lowering overall volatility, and enhancing risk-adjusted returns.

Exhibit 7 shows historical correlations between the NCREIF Timberland Property Index and other major benchmarks. Looking ahead, correlations with other asset classes are expected to stay low as cashflow and capital preservation drive long-term institutional timberland investments.

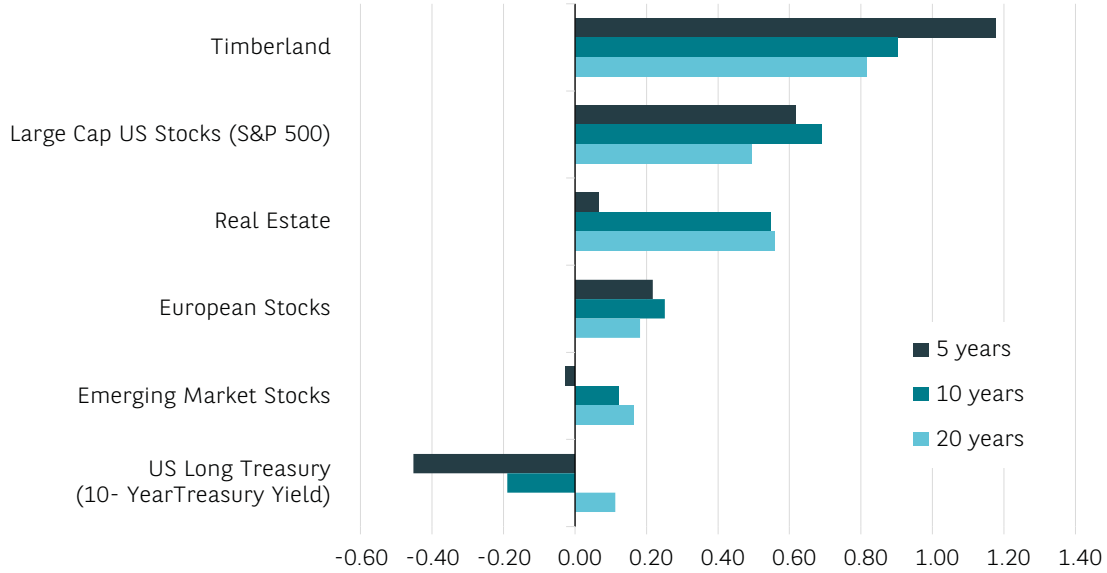
Exhibit 7: Timberland correlations with other asset classes (annual returns 2005-2024)



Sources: Bloomberg and NCREIF Timberland Property Index (2025).

Furthermore, the Sharpe ratio has been calculated for each asset class over three distinct periods of time – 5, 10, and 20 years. As shown in Exhibit 8, timberland stands out for having the most positive effect on the risk-adjusted return when added to a portfolio during any time period.

Exhibit 8: Sharpe ratio of timberland and other asset classes (2005-2024, 2015-2024, and 2020-2024)



Sources: Bloomberg and NCREIF Timberland Property Index (2025).

Payments for ecosystem services, like carbon credits, recreational leases, etc., provide an additional source of uncorrelated return and have the potential to further enhance the diversification benefits from timberland.

As in other asset classes, a diversified timberland portfolio is key to reducing risk and generating stable returns. The resilience of a timberland portfolio to climate-related and market-related risks can be optimised through spatial, temporal, product and market diversification.

Spatial portfolio diversification includes the selection of different countries, regions or local markets. Temporal portfolio diversification focuses on the age class distribution of forest assets as well as investment vintage. Product and market diversification can come via investments in different commercial tree species. This is achieved by focusing on different wood assortments and different end-markets, and to a lesser extent by pursuing a range of non-timber income sources.

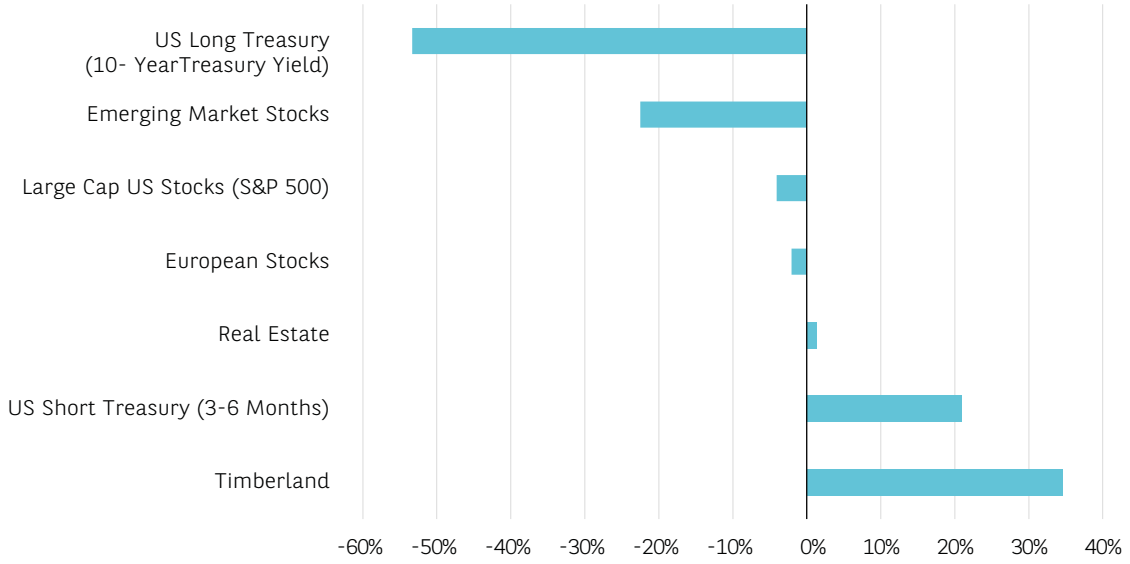
Inflation hedge and real return

Historically, timberland has maintained a positive correlation with inflation, and timberland investments have provided an effective hedge against inflationary pressures.

Exhibit 9 shows that the correlation coefficient for inflation and timberland over the two decades from 2005 to 2024 was the highest among the different asset classes analysed.

9. Source: Timberland Investment Resources.

Exhibit 9: Correlation with inflation for timberland and other asset classes 2005-2024

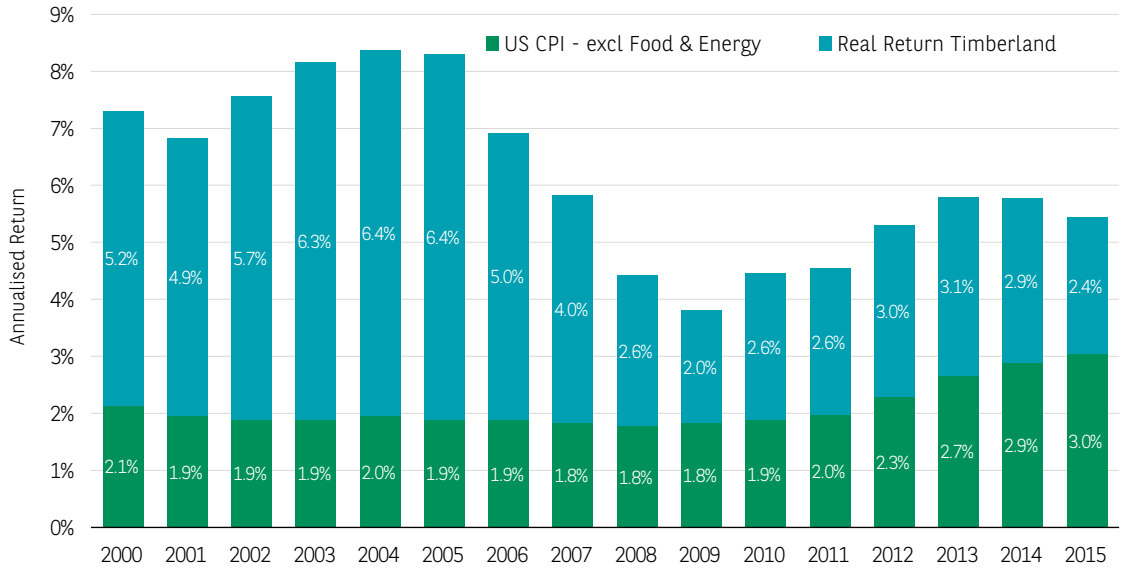


Sources: Bloomberg and NCREIF Timberland Property Index (2025).

The inflation-hedging properties of timberland investments stem mainly from the fact that timberland assets produce the raw materials for a multitude of sectors within the global economy, including consumer goods (e.g., furniture, food and other packaging, hygiene products, etc.). The historical correlation between timber prices and overall prices in the economy has over the long term performed better than many other commodities, including energy, precious metals, and agricultural goods.[9]

Looking at 10-year investment windows, starting from 2000, Exhibit 10 shows that no matter which vintage a timberland investor chose, maintaining a timberland position for a decade resulted in a positive real return, underscoring timberland's strong value-preservation properties.

Exhibit 10: 10-year timberland real returns by vintage



Sources: Federal Reserve Bank of St. Louis and NCREIF Timberland Property Index (2025).

9. Source: Timberland Investment Resources.

Risks

Timberland investment is not without risk. The three primary sources of risk are: (1) market risk, (2) physical risk and (3) regulatory, legal and policy risk.

Market risks include those affecting the income from, or value of, a timberland asset. The primary risk is associated with the volatility of timber (logs or woodchip) prices, which are affected by supply and demand, as well as cyclical and seasonal fluctuations.

Physical risks include factors affecting the volume and quality of timber, such as fire, storms, drought, insects and diseases. The degree of physical risk varies considerably across geographic regions and climates. It should be stressed that such risk is relatively low for an institutionally owned timberland portfolio. Looking at the 2016-2022 period, actual losses pertaining to physical risks on a 3-million-hectare portfolio (average fair market value of USD 15 billion) have been minor for institutional investors, with 0.18% of asset value per year (Source: IWC). Active forest management, portfolio diversification, insurance and climate change integration are the main mitigation tools.

Regulatory, legal and policy risks arise from changes made to land use regulations, environmental laws, green certifications, or tax codes that may have potentially adverse effects on a timberland investment's returns. If regulatory risk is not addressed, it could trigger a reputational risk that could be particularly damaging for institutional investors.

In addition, when investing in emerging markets, foreign exchange and country risks must be assessed. Apart from within Europe, international timberland investments are usually US dollar-denominated – as is timber as a commodity worldwide – but timberland values may be adversely affected by swings in local foreign exchange rates.

Finally, in some regions, land prices, including for the agriculture sector, may also be considered a risk where land prices have recently sharply increased in areas where the economy has slowed down.

Portfolio diversification across geographies, species, age classes, products and end-markets are the main tools to address and mitigate timberland investment risks.

The benefits of including timberland in an institutional portfolio

The below illustrative case-study shows that including timberland in an already well-diversified investment portfolio of an insurance company can further improve its risk-adjusted return, both from an economic and a regulatory perspective. This is mainly due to the attractive risk-return profile of the asset class itself, in conjunction with good diversifying properties, i.e., a low correlation with the more traditional asset classes. This is illustrated in the tables below, which show the forward-looking capital market assumptions of BNP Paribas Asset Management for a range of asset classes on a 10-year investment horizon.

Exhibit 11 shows that timberland investments are expected to continue to have an equity-like return with a bond-like volatility, resulting in a more attractive Sharpe ratio.

Exhibit 11: Expected return, standard deviation, Sharpe ratio, SCR*, and ER/SCR for timberland and other asset classes over the next decade

Investment horizon: 10 year	Return [ER]	St. Dev.	Sharpe ratio	SCR*	ER/SCR
Cash EUR	1.2%	0.6%	0.0%	0.0%	
Bond EUR Sovereign	3.5%	5.5%	0.41	7.8%	44.8%
Bond EUR Investment Grade	3.8%	4.9%	0.52	9.5%	40.0%
Bond EUR High Yield	4.7%	7.4%	0.47	15.0%	31.2%
Equity Global Developed Countries	4.9%	14.0%	0.26	41.8%	11.8%
Real Estate Listed Global	6.8%	17.0%	0.32	41.7%	16.2%
Timberland	6.0%	7.0%	0.68	25.0%	24.2%

* Solvency Capital Requirement: the regulatory capital for European insurance companies; timberland falls in the property-module.
* It is noteworthy when comparing to Exhibit 8 that the cash/risk free rate is approximately 2% in Exhibit 11. This largely explains the difference in the historic and forward looking Sharpe ratios calculated for Timberland. All risk and return numbers assume the currency risk is hedged to EUR.
Source: BNPP Asset Management (April 2025).

Exhibit 12 shows that the correlation of timberland with the more traditional asset classes is also expected to continue to be low over the next 10-year period.

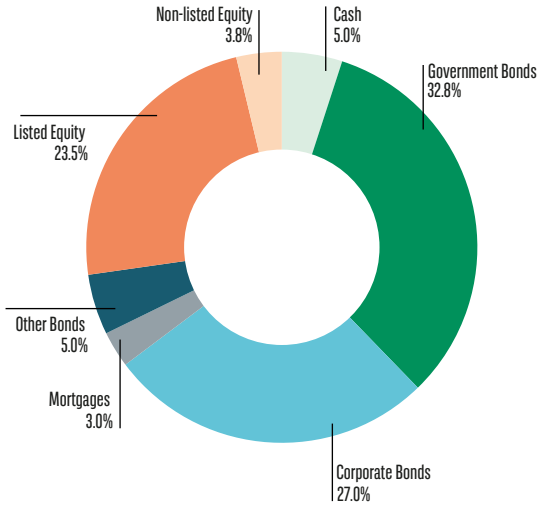
Exhibit 12: Correlation of timberland with other asset classes over the next decade

Correlation matrix	Cash EUR	Bond EUR Sovereign	Bond EUR Investment Grade	Bond EUR High Yield	Equity Global Developed Countries	Real Estate Listed Global	Timberland
Cash EUR	100%						
Bond EUR Sovereign	-3%	100%					
Bond EUR Investment Grade	-4%	68%	100%				
Bond EUR High Yield	0%	9%	64%	100%			
Equity Global Developed Countries	10%	-12%	28%	70%	100%		
Real Estate Listed Global	4%	21%	45%	56%	64%	100%	
Timberland	4%	-28%	-27%	-8%	1%	-13%	100%

Source: BNPP Asset Management (April 2025).

Our starting point for the analysis in a multi-asset context is the allocation illustrated in Exhibit 13, which is already well diversified over a range of asset classes.

Exhibit 13: Illustrative multi-asset allocation

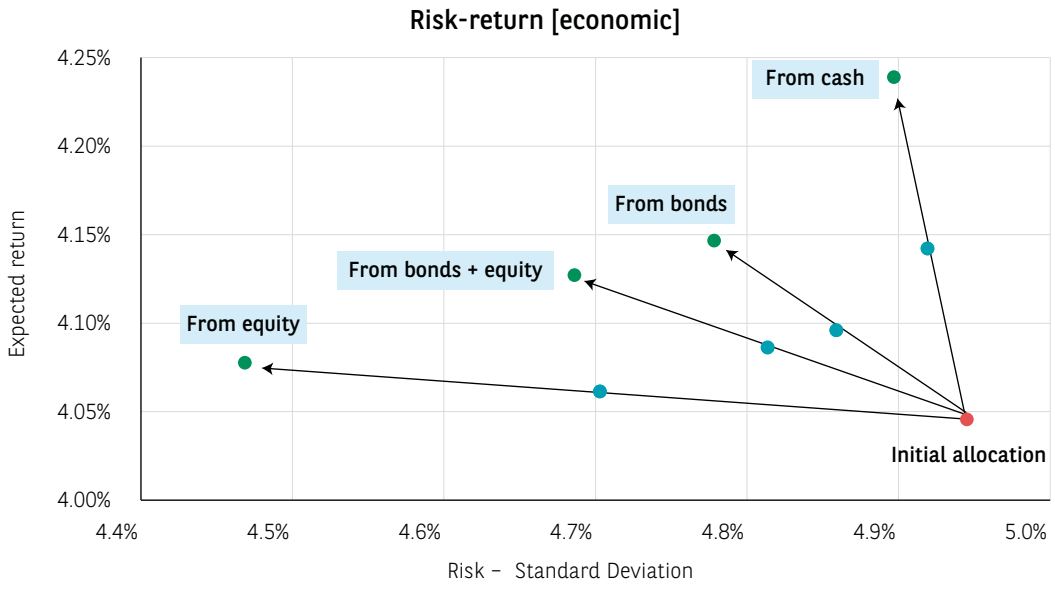


Source: BNPP Asset Management (April 2025).

Based on the capital assumptions mentioned earlier, capital market assumptions, this illustrative allocation has an expected return of 4.05% with a standard deviation of 4.95%. The solvency capital charge of this portfolio is approximately 13.8%, i.e., higher than for bonds, but lower than for equity.

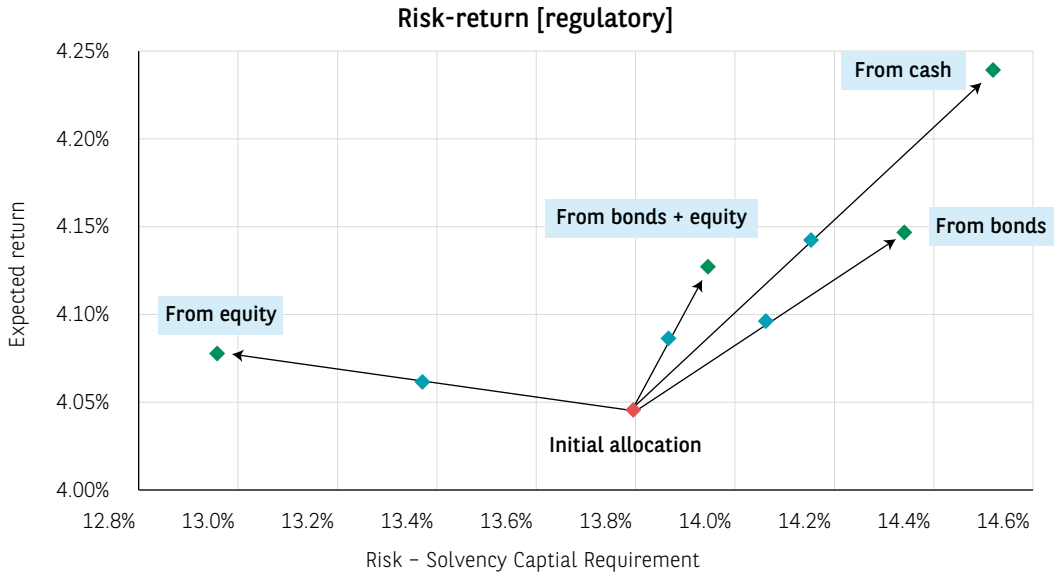
Exhibits 14a and 14b show the change in the respective economic and regulatory risk-return profile when adding 2% (blue dots) or 4% (green dots) of timberland to this allocation financed from different sources.

Exhibit 14a: Change in economic risk-return profile by adding timberland



Source: BNPP Asset Management (April 2025).

Exhibit 14b: Change in regulatory risk-return profile by adding timberland

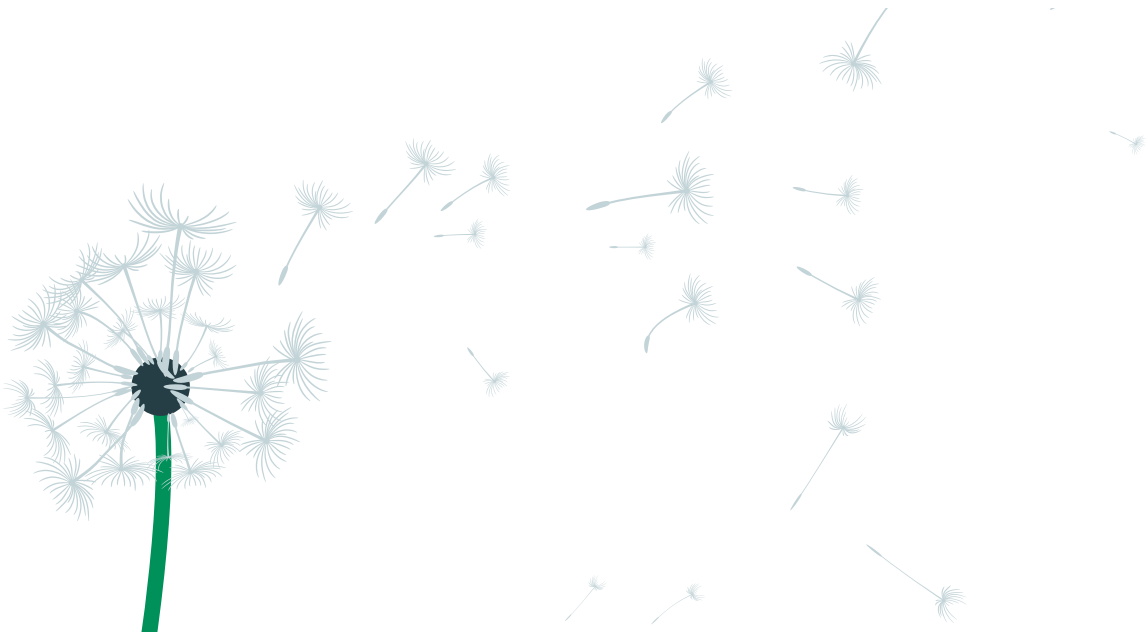


Source: BNPP Asset Management (April 2025).

From these graphs, we can conclude that financing an allocation to timberland from:

- **Cash / bonds:**
  - Improves the return potential
  - Leads to a comparable or slightly lower economic risk
  - Increases the regulatory risk.
- **Equity:**
  - Results in a comparable return potential
  - Reduces the risk from both an economic and regulatory perspective.
- **A combination of equity and bonds:**
  - Allows for the calibration of the risk-return profile of the asset allocation to the desired level, which is superior to the risk-return profile of the initial allocation.

We believe this case study clearly demonstrates, from a pure financial standpoint, that including timberland in an already well-diversified institutional portfolio to improve its efficiency from the risk, return and regulatory perspectives.



3. TIMBERLAND INVESTMENT UNIVERSE

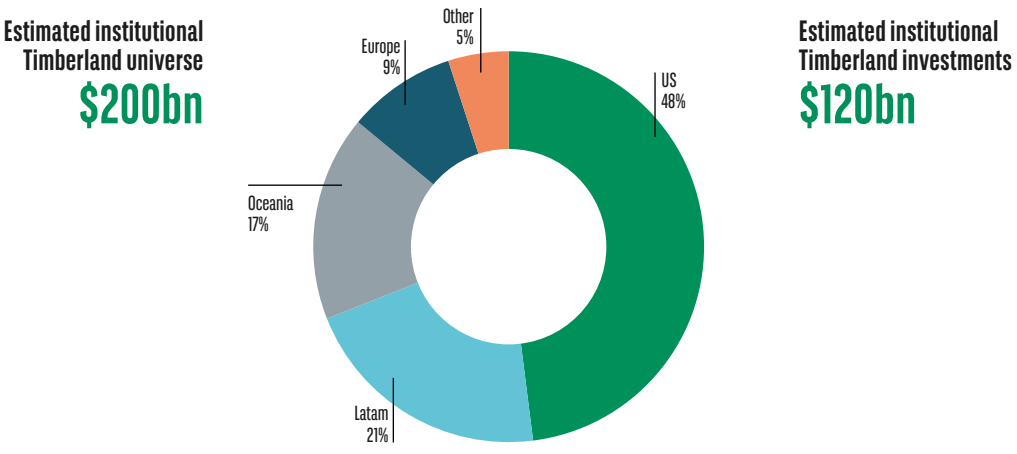


A. INVESTMENT UNIVERSE

Since the asset class emerged in the early 1980s, the institutional-quality timberland investment universe has grown significantly and is today estimated at USD 200 billion, with current institutional investments around USD 120 billion. The investment universe continues to expand from new commercial plantation establishments, divestment/lease of industrial and government timberland, and sale of properties owned by smaller private holders.

Today, almost half (48%) of all institutional-quality timberland is located in the US (within different sub-regions), which is the most mature market and offers the greatest liquidity. The remaining half is mainly located across Oceania, Latin America and Europe.

Exhibit 15: Geographic locations (%) of institutional quality timberland

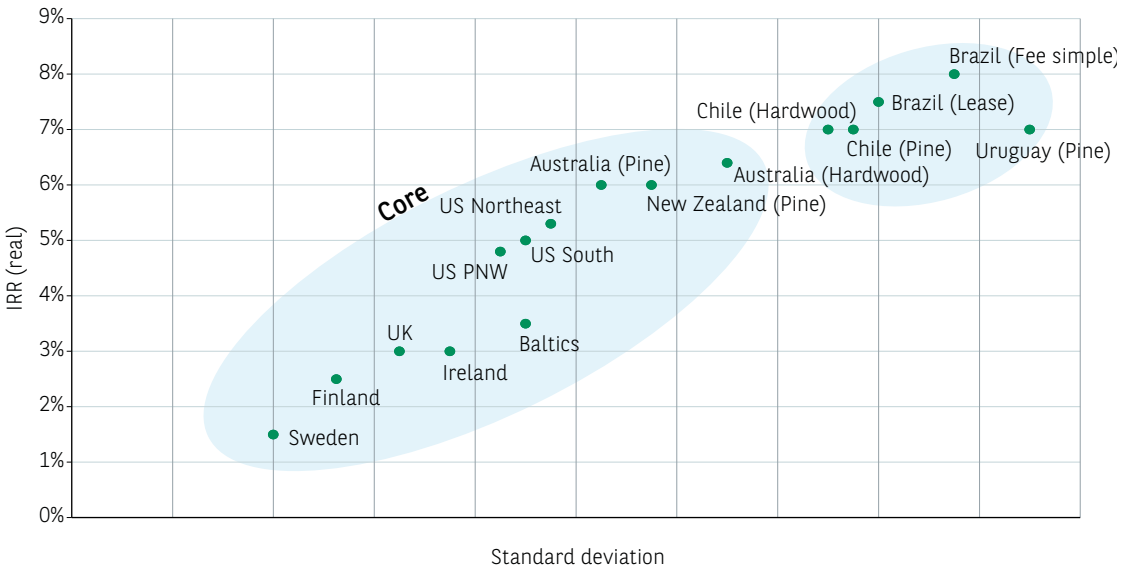


Sources: IWC (2025) and New Forests (2021).

Many institutional investors tend to favour timberland assets located in well-established core markets, such as the United States, Australia and New Zealand. Although emerging timberland markets offer a higher risk premium, the political, regulatory, foreign exchange and business environment risks associated with these markets make them less attractive for institutional investors seeking the potential timberland benefits of low volatility and stable, predictable returns.

Exhibit 16 depicts general timberland return (real internal rate of return (IRR), in US dollar terms) and risk (standard deviation) expectations. However, each opportunity must be assessed for its own characteristics and the performance of similar assets under similar market conditions may differ due to the manager's capabilities and proactive management. There is no guarantee that the performance expectations presented will be achieved.

Exhibit 16: Timberland real internal rate of return (IRR) in USD and risk (standard deviation) expectations



Source: IWC (2023).

B. TIMBERLAND INVESTMENT VEHICLES

There are several ways – direct and indirect – to obtain exposure to the timberland asset class.

Investors can directly purchase and manage timberland properties. Direct investment allows for full control over the land and its resources but requires significant capital and strong expertise in forest management.

Another avenue is to invest in timberland through specialised investment managers referred to as TIMOs (defined above). TIMOs help investors identify, acquire and manage investment properties that best suit their needs.

Investors with significant capital can then access the asset class via a separately managed account (SMA). SMAs allow investors to build a tailored portfolio of directly owned timberland properties with a high level of control and flexibility. However, the level of diversification may be relatively low if the size of the SMA is not above a certain threshold.

TIMOs also offer co-mingled funds allowing multiple investors to participate in a relatively large, diversified portfolio of timberland assets. Compared to direct investments and separately managed accounts, co-mingled funds give investors limited control over timberland assets but offer the advantage of critical mass in buying properties of scale and attaining a broader diversification of holdings.

Co-investment opportunity along side fund investment and secondary deals are also sometimes available, but such deal flows are scarce.

Fund-of-funds and fund-of-separate accounts overseen by an expert timberland manager are generally an easy way for smaller and/or first-time investors to quickly obtain a diversified allocation to timberland.

Investors can also have exposure to the asset class by purchasing shares of timber real estate investment trusts (REITs). Timber REITs are publicly traded companies that own and manage timberland properties. Investing in these companies allows investors to indirectly benefit from timberland investments. The capital input in timber REITs can range from a few hundred to millions of dollars. This investment vehicle offers investors high liquidity but no control over timberland assets and historical data shows that the low correlation to equities is not true for timberland REITs.

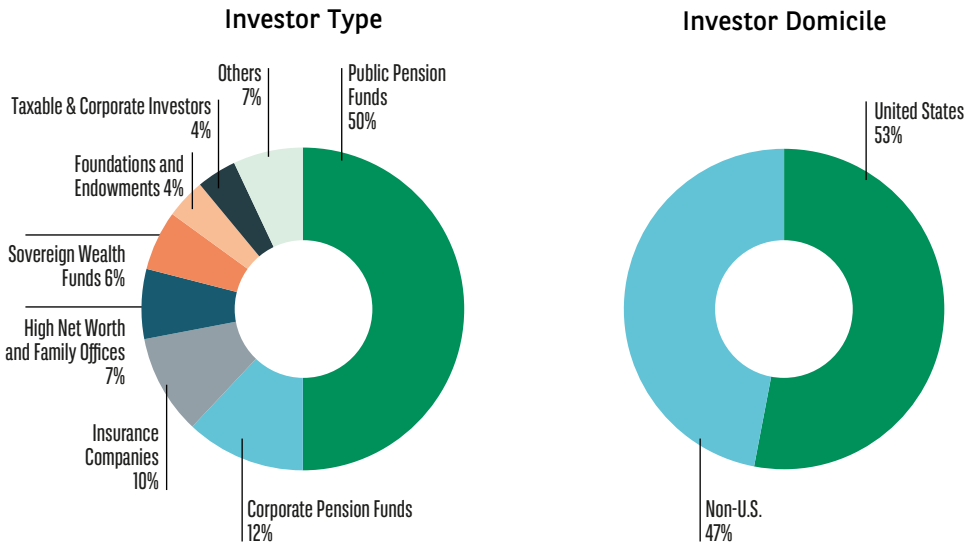
Finally, investors can invest in timber exchange-traded funds (ETFs). Timber ETFs hold a diversified portfolio of stocks of companies that own timberland and produce timber-related products, thus providing investors with broad exposure to the industry, but again not necessarily the core timberland characteristics.

C. TIMBERLAND INVESTORS

Large institutional investors such as public and private pension funds (e.g. OTPP, MassPRIM, APG, AP3, ATP, NZ Super), insurance companies (e.g. MunichRe, AXA, Groupama), foundations, endowments, high net worth and large family offices are the primary investors in timberland. Some have done so for more than a century, mainly in their domestic market, although the last two decades have seen the growth of international timberland investment.

According to a recent survey illustrated in Exhibit 17, half of the net asset value of institutional timberland investments are held by public pension funds, and more than half of the value invested in timberland globally comes from US-domiciled investors.

Exhibit 17: Net asset value of timberland by investor type (left) and investor domicile (right)



Source: Timberland Investment Resources, Timberland Investments: A Primer (2021).

The over-representation of pension funds among timberland investors is likely because timberland has duration characteristics that match the long-term liabilities arising from pension funds' obligations.

Timberland often does not fit neatly into traditional asset allocation models due to its hybrid nature, part real asset, part biological growth engine. Its long investment horizon and low liquidity can challenge typical portfolio structures focused on shorter-term returns, and timberland's return profile differs from conventional asset classes like equities or bonds. As a result, many investors grapple with in which category natural capital belongs. Today, timberland is frequently categorised under alternatives or real assets, but it is the expectation that more and more investors will create a specific natural capital bucket and allocation, in order to fully appreciate its unique characteristics.

4. ROLE OF TIMBERLAND IN ACHIEVING ENVIRONMENTAL OBJECTIVES



A. CLIMATE CHANGE MITIGATION THROUGH REDUCTION OF CO_2

To mitigate the impact of climate change, it is considered critical to limit global warming to 1.5°C above pre-industrial levels. Achieving this requires a significant and urgent reduction in the CO_2 entering the atmosphere (e.g., burning of fossil fuels, intensive agricultural systems, destruction of natural forests), and increase in the levels of CO_2 removed from the atmosphere (carbon capture and storage), in line with UN Sustainable Development Goal #13 (Climate Action).

Managed forests play an important role in climate change mitigation in several ways, by:

1. Reducing greenhouse gas (GHG) emissions through prevention of deforestation and forest degradation

2. Maintaining or enhancing forest carbon stocks and sinks through forest management and restoration

3. Allowing for greater carbon storage over the long-term by using wood products and emissions avoidance through substitution of emissions-intensive materials (IPCC, 2019, 2022).

Globally, existing natural and managed forests absorb approximately 2.6 billion tons of CO_2 annually, equivalent to one-third of the CO_2 released from burning fossil fuels each year[10]. This carbon sink function helps slow climate change by reducing the rate at which CO_2 builds up in the atmosphere. With technical solutions (e.g., direct air capture) still barely scalable and ineffective from a cost/benefit perspective, forests remain the best and most cost-effective carbon-capture solution available.

Wood harvested from forests can retain the carbon originally removed from the atmosphere by trees in the form of wood-based products for centuries, thus delaying the release of that carbon into the atmosphere after harvest.

Additional mitigation effects from the use of wood can be achieved by reducing GHG emissions from other industrial sectors where wood replaces functionally equivalent but more emission-intensive materials or energy products. Indeed, the use of wood and wood-based products is generally associated with lower fossil and process-based emissions when compared to non-wood, functionally equivalent products.

For example, research has shown that a reduction in carbon emissions by substituting timber for masonry and concrete in building construction is around 20% and 60%, respectively[11]. In addition to construction, promising markets for emerging wood-based products include textiles, biochemicals, packaging and plastics.

While there is an urgency to reduce the GHG levels in the atmosphere associated with climate change, there is an equally pressing need to reduce carbon entering the atmosphere related to deforestation and forest degradation. Sustainably managed productive timberlands play a critical role in slowing deforestation by removing the economic pressure to continue logging endangered natural and semi-natural forests elsewhere.

As previously mentioned, although productive timberlands total only 3% of the world's forest area, they produce one-third of the world's industrial wood due to the combination of high productivity and focused activity in relatively small areas.

Forests and net zero targets

The climate mitigation benefits of forests, notably the ability to remove CO_2 and store it as carbon in growing trees and soils, can be relevant for investors with a climate-related net zero target in three ways:

1. Under certain conditions and provided operational or legal control, an investor owning a forest can include the carbon removals in the estimation of its scope 1 emissions and removals under most net zero frameworks, including the Science Based Targets Initiative (SBTI) framework[12].

10. (FAO 2021).
11. (Spear et al. 2019).
12. Initiative by WRI, WWF, CDP, and UN Global Compact regulated voluntary net zero target setting across different sectors. Forests fall in the FLAG sector. https://sciencebasedtargets.org/.

2. Any company using timber from a forest can use part of the removed carbon in its estimation of its scope 3 carbon footprint, provided that traceability is established along the supply chain. This is relevant for investors with exposure to the forest sector companies, e.g. furniture and construction materials.

3. When there is no operational or financial connection to forestry assets, investors may purchase carbon credits, whereby part of the carbon removal is bought and transferred to the investor.

From a forest owner's perspective, all three ways of accounting for and eventually transferring carbon removals can create an income stream, yet carbon credits are in many cases the most mature and developed market. In this context, SBTI and other frameworks allow investors to attest to having neutralised or compensated emissions from other activities.

Carbon credits

As outlined above, a common approach is to monetise the carbon sequestered and stored by a forest in the form of registered carbon credits that can be used by buyers for offsetting or in-setting purposes. A forest carbon credit is created when forest owners undertake specific projects (e.g., afforestation or reforestation, avoided conversion, improved forest management) to increase their forests' ability to absorb CO_2 and store carbon or reduce, delay or avoid CO_2 emissions.

The volume of carbon in the forest is determined using a rigorous forest inventory technique that measures the growing stock and sometimes other carbon pools such as below ground biomass. Carbon content is then computed using derived factors, look-up tables and expansion factors. Once these volumes have been calculated against a project ex-ante baseline and certified as accurate and valid, they can be sold on the carbon markets as credits.

In broad terms, there are two types of carbon market: the compliance market and the voluntary market. The compliance, or regulatory, market is driven by emitters who need to reduce emissions to meet regulatory requirements or who want to reduce their carbon taxes. The voluntary market is driven by emitters who buy carbon credits for purely voluntary reasons, e.g., to meet voluntary net zero targets by offsetting unavoidable GHG emissions from their operations or to demonstrate their commitment to mitigate climate change.

Over the past decade, carbon has increasingly become a liquid and investable asset class that trades across physical carbon, futures and options markets. It has exhibited attractive historical returns and a low correlation with other asset classes. Therefore, prudently adding forest-based carbon as an alternative source of income to a timberland portfolio could improve its overall risk-return profile.

High-quality carbon credits are increasingly recognised as a key tool in the fight against climate change. As a result, demand for carbon credits – both nature-based (expected to account for 65%–85% of the total carbon credit supply by 2030) and technology-based – is growing among businesses across all sectors and industries as they work towards net carbon neutrality. These positive demand trends are likely to contribute to increases in carbon credit pricing. Nature-based credits, including forest carbon credits, can offer a valuable basket of additional environmental and social benefits (e.g., increased biodiversity, funding for land conservation, job creation) and can therefore often command premium prices relative to credits produced from engineered solutions.

B. BIODIVERSITY

Forests are home to a significant portion of Earth's biodiversity, with a large number of species living in various forest ecosystems worldwide. The exact number of species can vary based on factors such as the type of forest, its location, and ecological conditions.

Tropical rainforests are usually known for their high biodiversity, including diverse species of plants and trees such as orchids, bromeliads, rubber trees, kapok, under-canopy plants, mammals (jaguars, tigers, monkeys, bats), birds (parrots, hummingbirds, toucans), fish (angelfish, catfish) reptiles and amphibians (tree frogs, chameleons, anacondas) and insects (butterflies, beetles, ants).

Temperate and boreal forests support a different but still considerable variety of flora and fauna, though generally fewer species compared to tropical regions. Iconic tree species in temperate deciduous and coniferous forests include oak, maple, beech, pine, spruce, and fir. Fauna also thrives in these ecosystems, such as mammals (deer, bears, wolves, foxes, and rodent species), birds (robins, owls, woodpeckers, hawks, songbirds), fish (eels, trout), reptiles and amphibian (toads, salamanders) and insects (moths, beetles, dragonflies).

However, these ecosystems and the services they provide are under threat as approximately 95% of the world's deforestation occurs in the tropics because of expanding agriculture. Meanwhile, two-thirds of forest degradation occurs in temperate countries, mostly due to wildfires and logging. Even though temperate regions have seen a net gain in forest since 1990, it is important to remember that deforestation in the world's temperate forests peaked in the first half of the 20th century.

For these reasons, ending deforestation and restoring degraded forests while increasing afforestation and reforestation, are crucial levers to protect and restore life on land, in line with UN Sustainable Development Goal #15 (Life on Land).



BIODIVERSITY

Natural forests generally contribute more to biodiversity conservation and provide a wider range of benefits and certain ecosystem services than planted forests. When sustainably managed, planted forests can help reduce harvesting pressure on natural forests and play a part in promoting biodiversity preservation and conservation. In addition to carbon sequestration and cultural and indigenous values recognition, practices such as selective logging, reforestation and habitat preservation contribute to:

1. **Species diversity:** Sustainable forestry methods help preserve a variety of plant and animal species by maintaining a balanced and natural forest structure, providing different niches for diverse organisms.

2. **Habitat protection:** By avoiding extensive clear-cutting and creating conservation areas and riparian buffer zones, sustainable forestry preserves essential habitats for various species, including those with specialised requirements for breeding, nesting or feeding. Maintaining ecological corridors is also essential for allowing species to move around.

3. **Ecosystem resilience:** Encouraging a mix of tree species and age classes enhances ecosystem resilience against pests, diseases and natural disasters, helping forests to recover and adapt.

4. **Water quality:** Well-managed forests act as natural filters, regulating water flow and quality. Sustainable practices minimise soil erosion, protecting water bodies and ensuring a healthier environment for aquatic species. Typically, sustainably managed forests restrict the use of pesticides and fertilisers, which can harm non-target species and impact soil and water quality.

5. **Soil health:** Sustainable forestry helps maintain soil fertility and structure, supporting a diverse range of micro-organisms and invertebrates that are essential for overall ecosystem health.

In summary, sustainable forestry practices promote biodiversity conservation by fostering resilient ecosystems, protecting habitats, and addressing the interconnected ecological, social and economic aspects of forest management.

C. CONTRIBUTION TO UN SDGs

Sustainably managed forests make a significant contribution to meeting the Sustainable Development Goals.[13]

By providing renewable, recyclable and environmentally friendly materials to a number of sectors within the global economy, managed timberlands actively contribute to SDG #12 (Responsible Consumption and Production), which aims to disconnect economic growth from environmental degradation by increasing resource efficiency, reducing degradation and pollution along the whole life cycle, and promoting sustainable lifestyles.

Carbon removal/sequestration and the substitution of wood-based products for GHG-intensive products contribute to SDG #13 (Climate Action), which focuses on reducing GHG emissions and adapting to the adverse impacts of climate change.

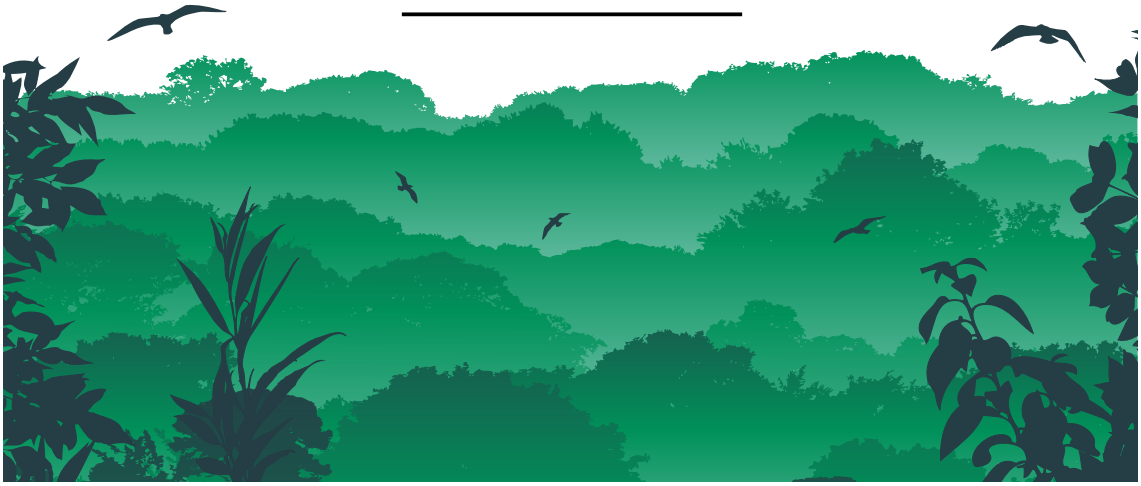
Preventing deforestation and improved, sustainable forest management practices contribute to SDG #15 (Life on Land), which focuses on the sustainable use, management, and conservation of all terrestrial ecosystems.

In addition to renewable materials and carbon sequestration, managed forests provide other benefits, including clean water and wildlife habitat, recreational opportunities, and a source of living-wage jobs in rural communities. These attributes positively align with SDG #6 (Clean Water and Sanitation) and SDG #8 (Decent Work and Economic Growth), among others (Baumgartner, 2019; WBCSD, 2020).

13. FAO and UNEP, 2020.



5. CONCLUSION



Timberland investments present a compelling opportunity for investors seeking to align financial returns with environmental and social benefits.

Wood has historically been an important commodity, and this renewable raw material continues to be used in a wide range of industries today. Looking ahead, one can reasonably anticipate a sustained increase in demand for timber products arising from population growth, urbanisation, increase in per capita income, and a green transition substituting polluting materials in manufacturing and buildings. Such trends should support future timber prices, which together with biological growth and land prices constitute timberland's main return drivers.

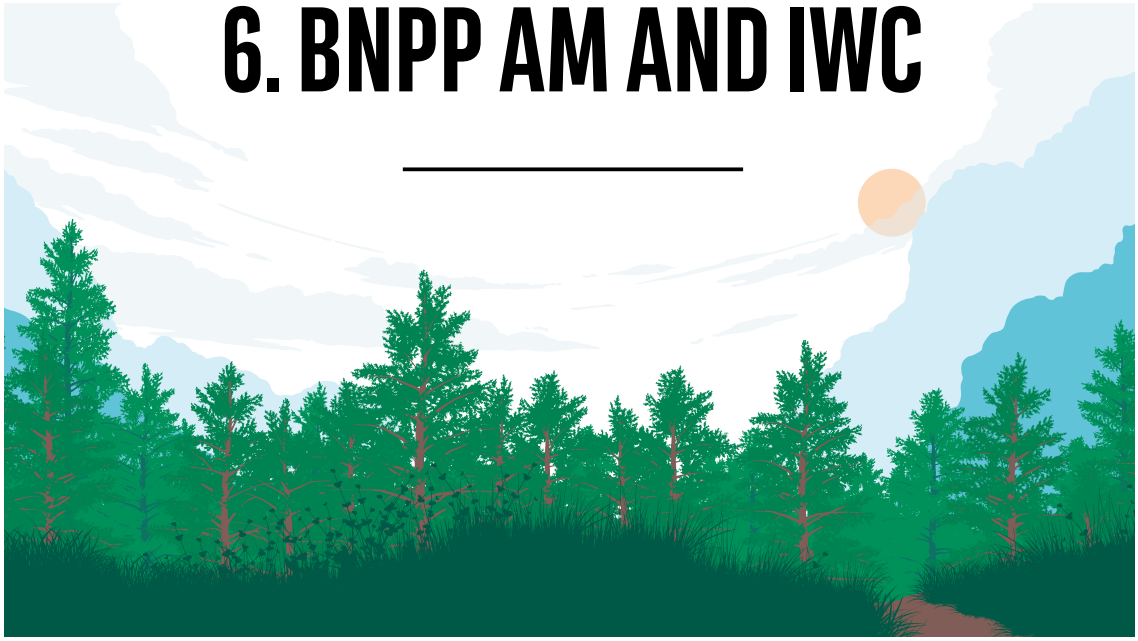
Timberland as an asset class has an important role to play in investment portfolios.
For example, it can offer:

- attractive long-term risk-adjusted returns,
- stable annual income yields,
- diversification benefits due to its low correlation with other asset classes,
- and inflation-hedging properties.

Beyond its attractive financial characteristics, sustainably managed timberland also offers a tangible way for investors to contribute positively to climate change adaptation and/or mitigation, and to meet several of the UN's Sustainable Development Goals. Indeed, sustainable forestry management aims to foster resilient ecosystems, protect wildlife habitats and maintain biodiversity, aligning them closely with investors' commitment to environmental stewardship. As a natural climate solution, timberland also presents an attractive opportunity for investors who commit to decarbonise their portfolios and contribute to the achievement of global net zero goals.

However, it is important to note that an investment in timberland is not without risks and challenges. Investors considering timberland investments should conduct thorough due diligence and consider all risks associated with the asset class, as well as the specific objectives and constraints of their portfolios.

6. BNPP AM AND IWC



A. TIMBERLAND IS A KEY COMPONENT OF OUR PRIVATE ASSETS STRATEGY

As a part of BNPP AM's strategy to offer a wide range of Private Assets solutions, we have since 2019 considered natural capital, and especially timberland, as a possible addition to our current offering. We quickly realised that the asset class is attractive from a financial standpoint, due to its risk-adjusted return, low correlation to other asset classes, and inflation hedging properties. We also saw that the macroeconomic factors wood production depends on are trending positively (population growth, increase in per capita income, green transition, etc.).

In parallel, conscious that deforestation, the conversion of natural ecosystems, and forest degradation are systemic risks, in 2019, we set ambitious targets in our **Global Sustainability Strategy** to improve the environmental impact of our investments, with a focus on forests. We believe a better world is one with an economic model built on a successful Energy transition, healthy Ecosystems, and Equality and inclusive growth – our "3Es".

In 2021, we launched our **Biodiversity Roadmap**, which details our views on why biodiversity loss matters to us and how we are actively responding to it. Consequently, in 2022, we launched our **Net Zero Roadmap** outlining our commitment to the goal of achieving net zero portfolio emissions by 2050 (or sooner). Natural carbon cycles and nature-based solutions are instrumental in **climate change** mitigation and adaptation, as well as in reverting **biodiversity loss**. But today, nature-based solutions are an **underexposed** area for investors to support the net zero transition. Our partnership with International Woodland Company (IWC) is thus a key element in delivering these roadmaps. But beyond IWC, BNPP AM will continue to seek to reduce the impact of its investments coming from land-use change through the **six pillars of our approach to sustainability**.

Our commitment:

- We engage with the highest impact industries with a core focus on addressing deforestation and water issues. In particular, we have joined the Investor Policy Dialogue on Deforestation (**IPDD**) initiative to target our engagement on deforestation with public agencies and industry associations in Indonesia, Brazil and consumer countries. We also play a leading role in developing and launching the collaborative investor initiative Nature Action 100, which aims to engage companies that are the most systemically important in the context of reversing nature loss by 2030.

- Our palm oil, wood pulp and agriculture sector policies include criteria related to deforestation. In particular, BNP Paribas requires full traceability of beef and soy (direct and indirect) channels by 2025. We also intend to review the potential to extend the scope of BNPP AM's target for relevant companies in our portfolios to comply with no deforestation, no peat and no exploitation (**NDPE**) commitments for agricultural commodities (palm oil, soy, paper, timber and beef products) to cocoa, coffee and rubber products.

- We are participating in a range of private and public partnerships and collaboration initiatives to give more visibility to nature and learn how to better account for it. In particular, we helped to launch the **Task Force on Nature-related Financial Disclosures** (TNFD), a corporate reporting framework to address nature-related risks, as well as **Forest IQ**, which provides market-leading data about corporate performance on deforestation, conversion of natural ecosystems and associated human rights abuses. We are also involved with the Zoological Society of London / SPOTT to incentivise the implementation of corporate best practice through increased ESG disclosures in palm oil, timber and pulp, and rubber supply chains.

- We are also providing our clients with a range of solutions targeted at solving biodiversity challenges. IWC is enhancing our offering in sustainable timberland investments through our Private Assets unit. In addition, we have an Environmental Strategies team with the capability to invest in companies that are engaged in improving aquatic, terrestrial and urban ecosystems services, through their products, services, or processes, such as sustainable forestry or alternative proteins.

We are convinced timberland can help delivering positive real-world outcomes alongside industry-leading financial returns to clients. But the transition towards a bio-based economy is a challenge that cannot be faced alone. We therefore believe it is critical to work in partnership with clients, colleagues, companies, governments and civil society.

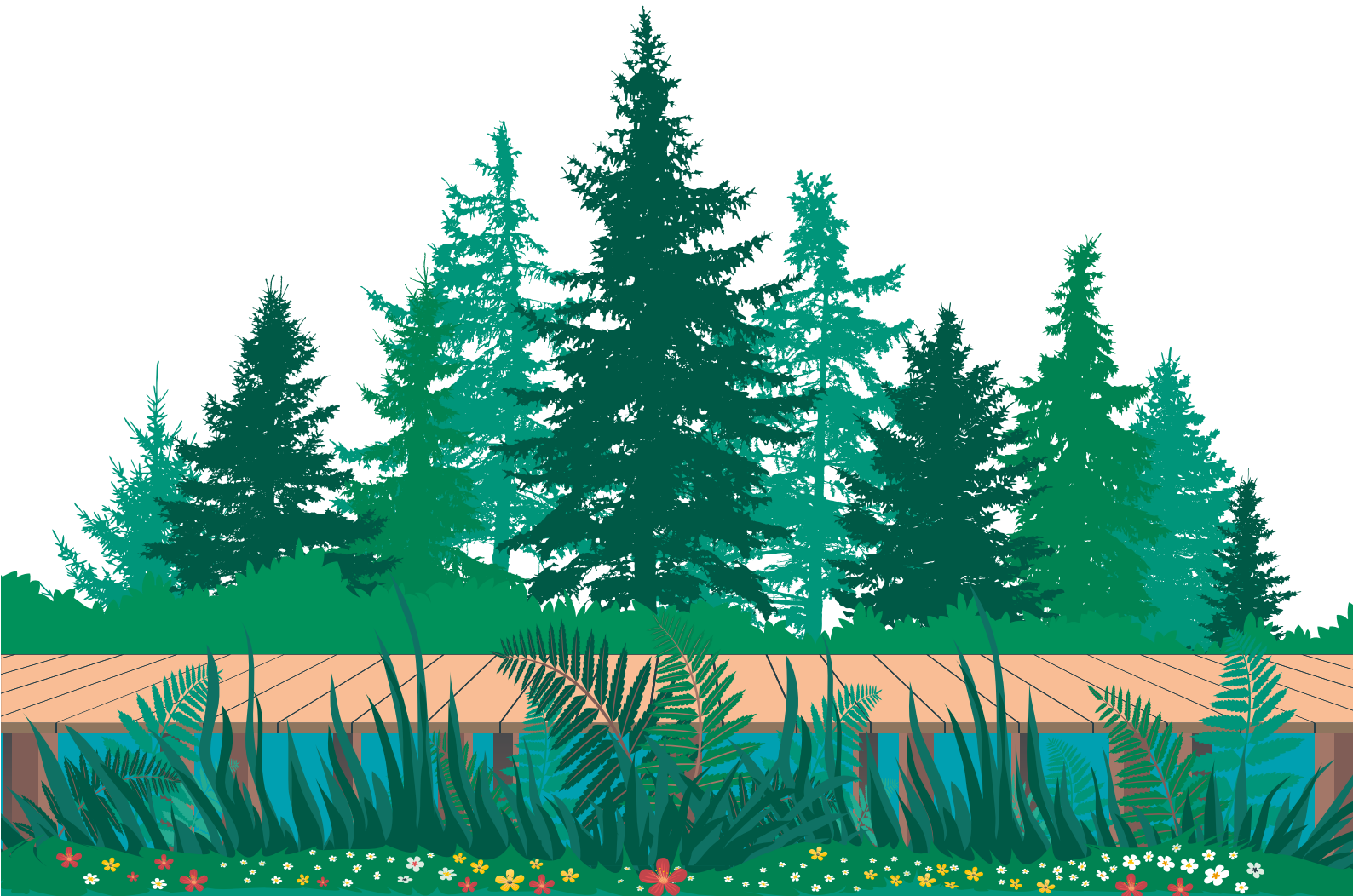
B. ABOUT IWC

Since 1991, IWC – a BNP Paribas Asset Management partner – has been providing timberland investment solutions and investment advice to institutional investors. IWC is today a leading Natural Capital investment expert with deep experience in global timberland, agriculture, ecosystem restoration and responsible investment, providing diversification, inflation hedging and capital appreciation investment opportunities, which also have a positive impact. IWC is proud to count among its clients some of the largest timberland investors in the world.

Since its establishment, a strong sense of responsibility has driven IWC to employ best practices based on a deep and thorough approach to sustainability, biodiversity, ESG and impact investing. Striking a balance between economic, social, and environmental needs has always been the backbone of IWC's philosophy and core values. IWC is a recognised leader within the timberland investment community and is eager to publish and share best practices across a variety of relevant industry topics.

IWC is a **UNPRI** signatory, **FSC** member, participant in **PEFC**'s stakeholder consultation forum, **Dansif** member, and **TNFD** Forum member.

With more than three decades of experience, IWC currently oversees approximately USD 6 billion of institutional mandates dedicated to natural capital investment programmes worldwide.



Private assets are investment opportunities that are unavailable through public markets such as stock exchanges. They enable investors to directly profit from long-term investment themes and can provide access to specialist sectors or industries, such as infrastructure, real estate, private equity and other alternatives that are difficult to access through traditional means. Private assets do, however, require careful consideration, as they tend to have high minimum investment levels and may be complex and illiquid.

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VIEWPOINT

BNP PARIBAS
ASSET MANAGEMENT

The sustainable investor for a changing world