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The Role of Planted Forests in the Global Forest Economy

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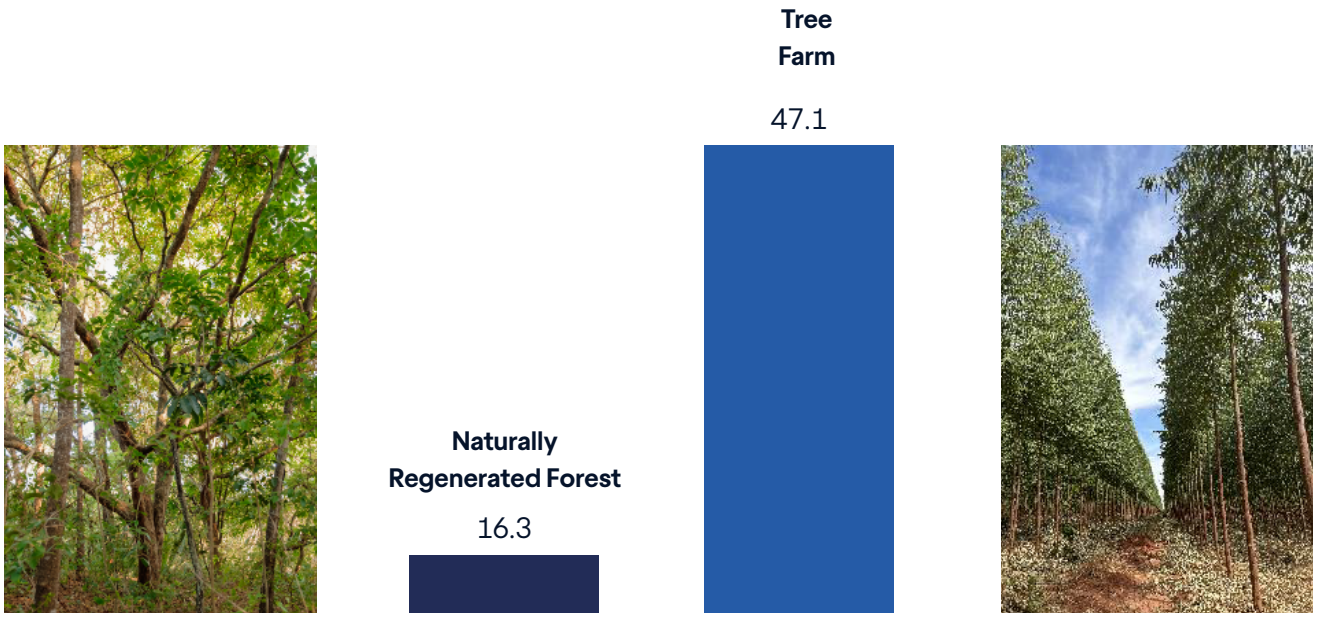
Introduction

Planted forests play an outsized role in supplying raw material for the global forest economy, currently supplying nearly 50% of global industrial roundwood despite comprising only 7% of global forest area.[1] As demand for land to support food production, urban expansion, and other forms of development also increases, the importance of planted forests to efficiently supply forest products is likely to increase even further.[2]

Sustainably managed planted forests can also contribute to a range of other positive benefits. Examples from multiple geographies indicate that planting new forests on previously degraded land can support associated restoration of native habitat, enhanced protection of natural forests, increased rural employment, and increased terrestrial carbon stocks.[3]

Forest protection, restoration, and the sustainable management of naturally regenerated forests are critically important to the future of a sustainable global forest economy. The continued expansion of highly productive planted forests is likely to play an outsized role in meeting growing global demand for forest products, driven by high growth rates, consistency in wood quality and volume, and greater operational efficiencies.

FIGURE 1: EXAMPLE COMPARISON OF CARBON ACCUMULATION RATES OF TREE FARMS & NATURALLY REGENERATED FORESTS IN LATIN AMERICA (TCO_2E/HA/YEAR)



Notes: (1) Planted forest growth rates using IBA 2025 using Brazil as a representative example of South America as a whole; volumetric growth converted to total aboveground/belowground CO2e by multiplying m3 by 1.14 (TIG analysis). natural regeneration growth rates from Bernal, B., L.T. Murray and T.R.H Pearson, 2018. Average carbon removal rate across humid and dry forests for natural regeneration in South America.

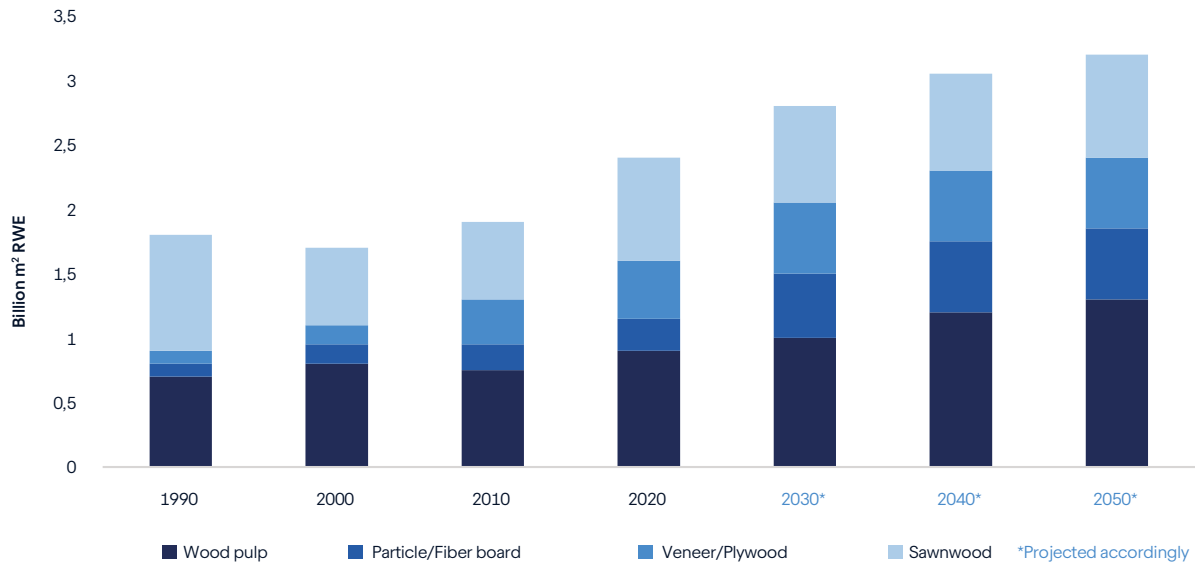
1 FAO, 2022
2 FAO, 2022
3 Qian et al., 2024; Oluwajon et al., 2024; FAO 2024

Demand for Forest Products

Global demand for primary forest products is projected to increase 37% by 2050, driven primarily by growth in global gross domestic product (GDP) and population.[4] Advances in technology and increased productivity are expected to drive continued economic expansion, with global GDP projected to double by 2050.[5]

Higher consumption of forest products is anticipated, driven by a projected 12% increase in global population by 2050, along with growing GDP and per capita income.[6] Together, these macro trends are expected to increase demand for sawn wood, a key material for housing and construction, as well as pulp for paper and packaging, particularly in regions with rapidly growing populations. Demographic shifts, including an aging population, changes in household formation as younger people leave home and form their own households, and continued migration from rural to urban areas are projected to roughly double floor area between 2020 and 2060 – further increasing demand for housing and wood products.[7]

FIGURE 2: GLOBAL HISTORICAL AND PROJECTED ROUNDWOOD EQUIVALENT (RWE) WOOD PRODUCT PRODUCTION[8]

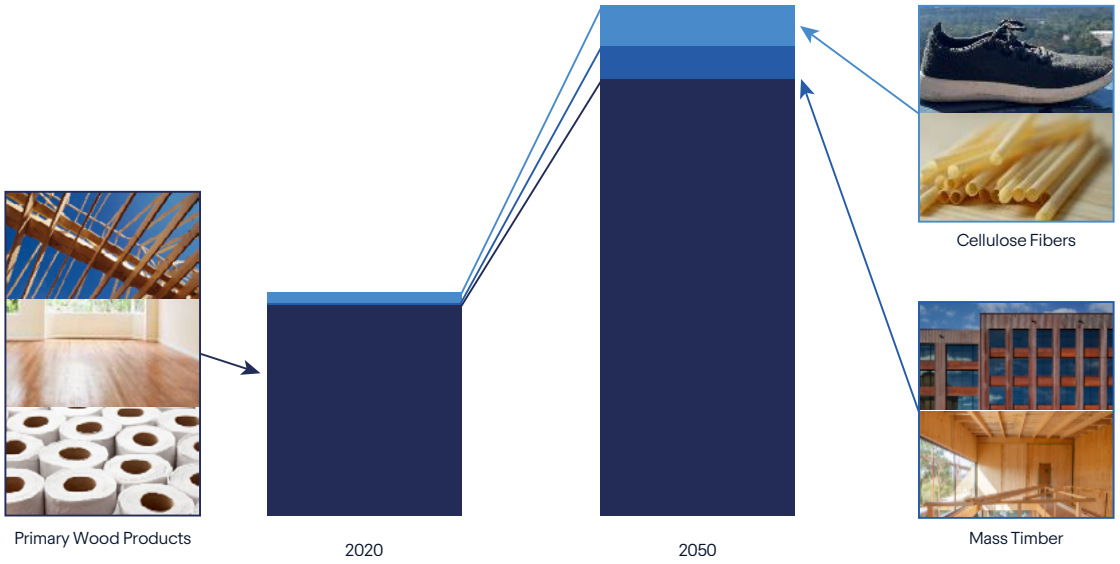


The emerging bioeconomy has the potential to further increase demand for forest products, with projected demand growth increasing from 37% to 49% by 2050[9]. A robust bioeconomy, built on sustainably managed biological resources and circular use of materials, is an increasingly prominent political priority[10]. Wood-based products are central to this transition, encompassing traditional uses alongside newer applications that range from textiles and biochemicals to advanced construction materials. Among the most significant opportunities in the emerging bioeconomy are mass timber and man-made cellulosic fibers (MMCF). Mass timber refers to a variety of engineered wood products, including cross-laminated timber (CLT), glue-laminated timber (glulam), laminated veneer lumber (LVL), and others,

4 FAO, 2022
5 PWC, 2017
6 Prestemon et al., 2021
7 Global building sector CO2 emissions and floor area on the Net Zero Scenario, 2020-2050". 2060 floor area assumes projected trends would continue.The collapse of the Soviet Union and economic restructuring in Eastern Europe caused a sharp drop in forest product output and consumption during the early 1990s
8 FAO, 2022
9 FAO, 2022
10 G20, 2024; IICA, 2025; FCLP, 2025

and is increasingly used in construction as a substitute for traditional steel and concrete. The use of mass timber is forecasted to grow at a compound annual growth rate (CAGR) 12.1% by 2050.[11] MMCFs are reconstituted cellulose fibers from trees (e.g., viscose, modal, lyocell) that can substitute for fossil-fuel-based synthetics like polyester and resource-intensive natural fibers like cotton. Global use of MMCF is projected to increase at CAGR 4.6% by 2050.[12]

FIGURE 3: DEMAND FOR WOOD PRODUCTS IN THE EMERGING BIOECONOMY (RWE)



Million m³ (RWE)	2020	CAGR	2050	Multiplier
Primary Wood Products	2,286	1.0%	3,124	1.4x
Mass Timber	4	12.1%	123	30.8x
Cellulose Fiber	39	4.6%	149	3.8x
Total	**2,329**	**1.3%**	**3,396**	**1.5x**

Source: FAO 2022

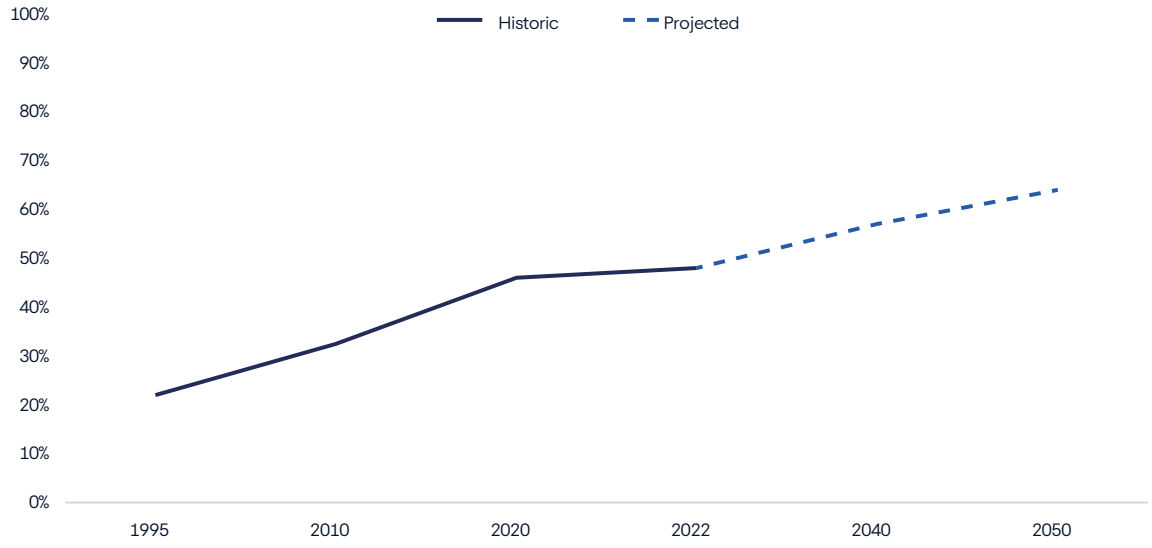
Competing land uses may limit the ability of forests to provide for this increasing demand. Agricultural expansion remains the leading driver of deforestation globally, with cropland and livestock production placing pressure on forest landscapes.[13] Competing land uses may limit the ability of forests to provide for this increasing demand. Development pressures including urban expansion and infrastructure further contribute to competition for limited land resources. Concurrent efforts to protect forest areas for biodiversity conservation and other ecosystem services are increasing.

11 FAO, 2022
12 Sylvester et al., 2024; FAO 2021; Pendrill et al., 2019
13 FAO, 2023; TIG Analysis

Productivity of Planted Forests

Planted forests play a critical role in meeting current demand and are central to sustaining growth against the backdrop of a constrained land supply. These planted forests currently account for nearly 50% of industrial roundwood production despite covering only 7% of the global forest area (Figure 4).

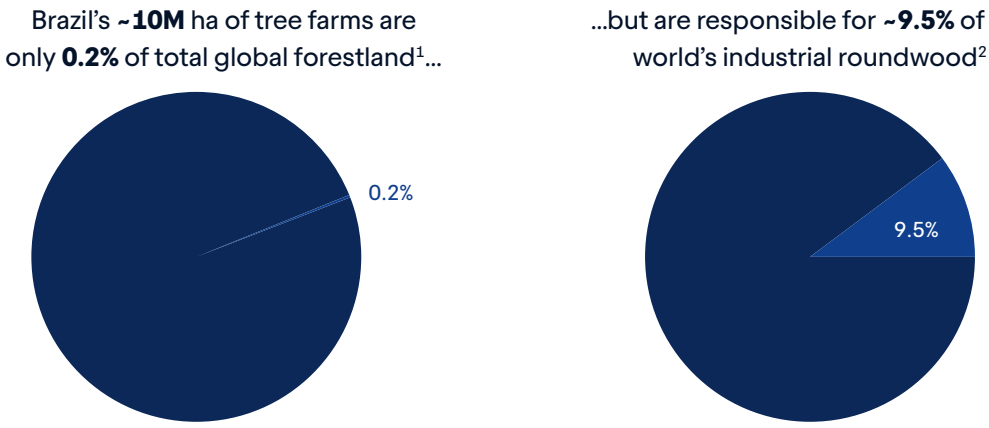
FIGURE 4: PLANTED FORESTS GROWING CONTRIBUTION TO RWE WOOD PRODUCT PRODUCTION



Source: FAO

A notable example comes from Brazil. The country's highly productive 10 million hectares of planted forests produce 9.5% of the world's industrial roundwood while occupying just 0.2% of global forest area.[14]

FIGURE 5: CONTRIBUTION OF BRAZIL'S PLANTED FORESTS TO GLOBAL ROUNDWOOD EQUIVALENT WOOD PRODUCTS



Source: Iba, FAO, TIG analysis

14 FAO, 2023; TIG analysis

Despite planted forests' ability to play an outsized role in supplying current wood product demand, meeting future demand will require a combination of gains in productivity, expansion of planted area, or some combination of both. It is estimated that planted forests will need to expand by 33 million hectares or global average productivity will need to increase by 160% to meet 2050 demand estimates.[15]

Sustainable management of planted forests and their benefits

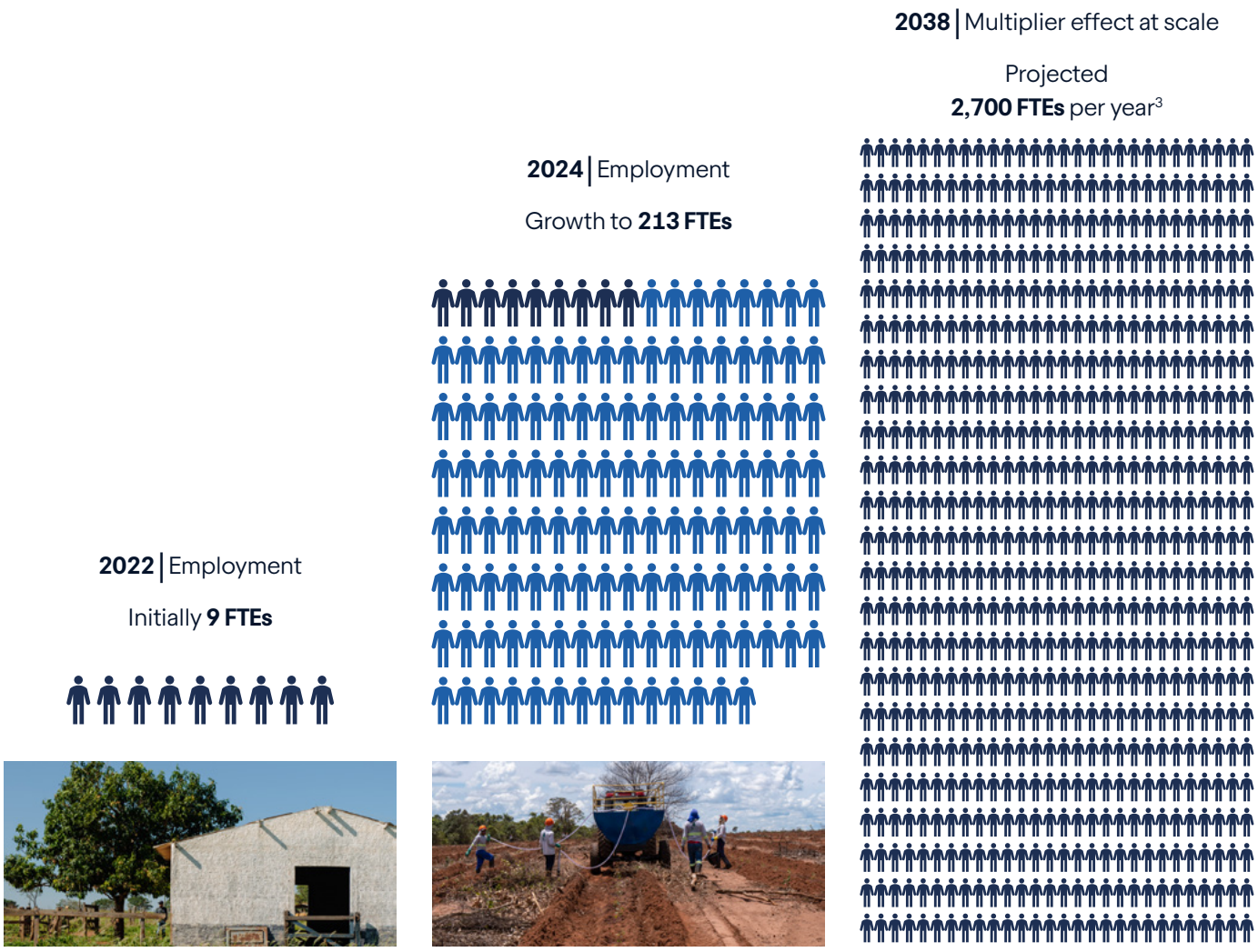
The productive capacity of planted forests, when managed responsibly, can also contribute to landscape-scale sustainability. Responsible management of planted forests can support landscape-scale sustainability by protecting natural ecosystems, improving watershed health, enhancing biodiversity, and fostering constructive engagement with local communities

Sustainable management practices are guided by both government regulations and voluntary standards. The Forest Stewardship Council (FSC) sustainability standard, and national programs endorsed by the Programme for the Endorsement of Forest Certification (PEFC), provide additional guidance, safeguards, and third-party audited assurance that the management of working forests, including planted forests protects important ecological and cultural areas, supports ecosystem and watershed health, and includes active and positive community engagement.

Planted forests can also play an important role in strengthening rural economies by supporting a wide range of employment opportunities across the value chain, from forest management to transportation and manufacturing of forest products. Establishing tree farms in the tropics typically requires about 0.10 full-time equivalent (FTE) jobs per hectare per year, compared to only 0.003–0.004 FTEs for the cattle ranches they often replace.[16] As an example, TIG's Project Alpha in Brazil boosted local employment from 9 to 213 FTE positions within 22 months (Figure 6).

15 Climate Policy Initiative, 2017; OSU DASNR 2013; TIG Analysis
16 FSC Brazil, 2021

FIGURE 6: EMPLOYMENT FROM PROJECT ALPHA



Notes: (1) As of December 31, 2024; (2) Assumes average household size of 3.31 members using UN household data for Brazil as of 2022. There is no guarantee that projections will be realized;Image Source: TIG.

Planted forests can also support the protection and restoration of natural forests across landscapes. Sustainably managed forests can conserve, buffer, or restore natural forest within their footprint; these naturally regenerated forests can benefit from the protection measures applied to the planted forests.[17] Management practices such as fire prevention, disease control, and monitoring may reduce risks to adjacent native forests.[18] Forest certification regimes further reinforce this protection by requiring compliance with forest laws and additional actions; in Brazil, for example, certification ensures the restoration of natural forests on previously non-compliant agricultural lands.[19] A notable example of natural restoration in conjunction with planted forests is TIG's work in the Cerrado region of Brazil, where more than 11,800 hectares of native forest are being restored alongside actively managed planted forests.

17 Silva et al., 2018
18 Brancalion et al., 2016
19 As of 9/22/2025

By acting as a sustainable substitute for wood supply, planted forests can relieve some pressure from less productive, but ecologically valuable natural forests. Their productivity means that a significant share of growing global demand can be met without further expanding harvest activity into natural ecosystems and available research indicates that the increase in the area of planted forests may in turn increase forest conservation.[20] When established and managed under strong policy frameworks, planted forests serve as an alternative source of timber, reducing reliance on natural forests and maintaining their ecological and cultural value.[21]

Planted forests offer rapid and large-scale carbon sequestration that complements the protection of natural forests. While naturally regenerated forests in the Cerrado region of Brazil sequester an average of 13.8 tCO_2 per hectare per year, planted tree farms can capture 47.1 tCO_2 per hectare per year.[22] Sequestration by Brazil's planted forests from 1990-2016 offset nearly all of the emissions from the country's waste sector over the same period. By delivering high levels of sequestration at scale, planted forests can provide the speed and magnitude of carbon storage needed to help close the gap between current emissions trajectories and global climate goals.

Conclusion

Planted forests stand at the intersection of economic necessity and environmental stewardship, offering a pathway to meet rising global demand for wood products while offering the potential to advance restoration, conservation, and climate goals. Their ability to supply large volumes of wood on a relatively small land base may reduce harvest pressure on natural forests, while sustainable management and certification standards can help provide assurance that ecological integrity and community well-being are safeguarded. At the same time, planted forests' outsized role in carbon sequestration positions them as a critical nature-based solution for meeting international climate commitments. As pressures on land and resources intensify, planted forests will remain central to building a resilient bioeconomy and shaping a more sustainable forest future.

20 Jürgensen et al., 2014
21 Paquette & Messier, 2010; Pirard, Dal Secco, & Warman, 2016
22 Iba, 2018; Bernal et al., 2018

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Contact us

BTG Pactual Timberland Investment Group, LLC
180 Peachtree Road NE, Suite 1810
Atlanta, GA 30309

Phone: +1 (404) 551-4021
TIG.Research@btgpactual.com

TIG
Timberland Investment Group

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