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Responsible Investment in the Forest Sector
Recommendations for Institutional Investors



NewForests

New Forests Asset Management Pty Limited

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About New Forests

New Forests manages investments in sustainable forestry and associated environmental markets, such as carbon, biodiversity, and water, for institutional and other qualified wholesale investors. The company has headquarters in Sydney, Australia, with offices in San Francisco and Singapore. New Forests currently has \$1.25 billion in assets under management, and executes three investment strategies: (1) Australia New Zealand Forestry - Sustainable timberland investment in Australia and New Zealand; (2) Tropical Asia Forestry - Forestry investment in high-growth markets of Southeast Asia; and (3) Ecosystem Markets - Global environmental markets for carbon, biodiversity, and water.

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Executive Summary

Forests are renewable natural resources, able to be harvested and regrown in perpetuity, and which produce low-embodied energy products that are recyclable and that decompose naturally. Forest ecosystems contribute significant environmental benefits including carbon storage, watershed regulation, and conservation of biodiversity. Balancing our use of forests for paper, energy and fuel wood, lumber, and furniture with the conservation of forests for their environmental benefits is a central challenge to society.

This paper examines responsible investment in the forestry, or timberland, asset class.¹ It is not our intention to review the substantial literature and public policy debates around sustainable forest management, but rather to highlight important factors that asset owners and managers should consider in designing and implementing effective investment strategies in the forest sector. We are primarily seeking to provide a context for considering how forestry investment can contribute solutions to wider social and environmental issues.

Over the past 25 years, forestry has grown to become a significant alternative asset class for institutional investors. Institutional investment is almost entirely in fast-growing timber plantations, and currently represents about 35-40% ownership of an investible universe of approximately \$160 billion of these timber plantation assets worldwide. From a financial perspective these assets have proven to be low in volatility and to have low correlation to other asset classes but positive correlation to inflation. However, forestry has also been a controversial sector, with often prominent instances of negative environmental and social impacts. Institutional investors are generally unwilling to risk making investments that could be seen as unethical or unsustainable, and this has led many asset owners to make commitments to investment transparency and sustainable finance initiatives such as the UN Principles for Responsible Investment, the Investor Group on Climate Change, the Global Compact, and UNEP Finance Initiative. At the same time, the forestry sector has been evolving and implementing national and international policies on sustainable forest management and operating-level certification and labelling processes that help investors gauge risks and monitor performance of investments.

In this paper we argue that intensively and sustainably managed plantations can and will play a critical part in a solution that balances global demand for timber production and forest conservation. The global demand for industrial roundwood is forecast to increase from 1.5 billion cubic metres per annum today to 2.0 billion cubic metres in the next twenty years.² Theoretically the plantation estate already established across North America, Europe, Latin America, Oceania, Southern Africa, and tropical Asia could be managed to increase productivity and meet much of that demand. Along with some expansion of high-quality tropical plantations, it is likely that a robust and sustainable timber supply of 2.0 billion cubic metres per annum could be produced from a total plantation area of 100 to 150 million hectares, or 2.5 to 3.75% of global forest area.³

However, embracing a philosophy of dedicated production of timber in plantation systems, much like agribusiness, does not allow us to wash our hands of the sustainability issues affecting remaining natural or semi-natural forests. There needs to be a kind of end-game between conservation and production that is supported by both forestry plantations and agri-business, which compete for arable land. While many attempts are being made by governments and stakeholders to reach grand bargains over land use, such as has been done in New Zealand, Australia, Canada, and via international cooperation over the Amazon and Indonesian forests, these will only be durable and sustainable if they engage the private sector and the 'real

¹ Note that while the asset class is usually called "timberland," we have generally preferred the term "forestry" as a more holistic terminology

² RISI, 2010. Bob Flynn, presentation to Timber Invest Europe. "Update: The Global Demand for Wood Fibre." London, October 2010.

³ Assuming an average mean annual increment of between 13-20 m³/ha/year

economy.’ This is why initiatives like pricing of water resources, carbon pricing, REDD+, biobanking, and tradable development rights are central to supporting the conservation side of the equation.

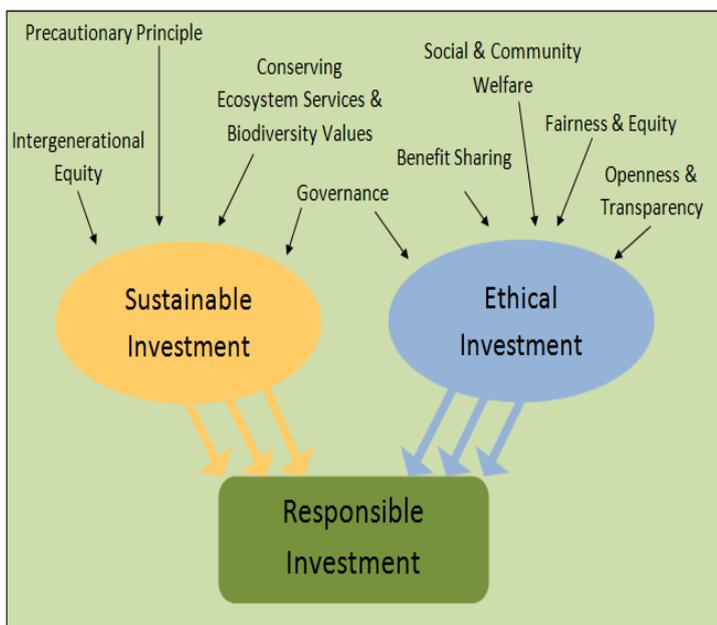
The future of forestry investment by institutional investors will remain tied to the financial performance of forestry as a business. However, to be successful and meet responsible investment objectives over the long term, investments will need to have an ability to operate in a wider context of land use, social and community aspirations, and emerging conservation finance. Investors may need to engage in the commercialisation of the ecosystem services provided by natural forests in order to secure their conservation. While investment policies requiring forest certification and labelling will facilitate monitoring how well environment, society, and corporate governance (ESG) factors are being addressed by managers, they are often not enough. Successful responsible investment in the forestry sector will need managers who can design and execute on investments that are compatible with potentially competing demands from international issues, local issues, and investment performance objectives. We expect a shift from the prevailing model of forestry investment to one that aligns financial objectives with the developing trends in sustainable and ethical forestry investment and management, resulting in investment strategies that reward responsible investment in the forest sector.

Introduction: Why is responsible investment important to institutional investors?

For most institutional investors, there is a growing recognition that their investment choices have impacts on the environment and society. Many institutional investors now accept that concepts of ethical and sustainable investment should be implemented to guide the selection and appointment of managers, investment policies for specific asset classes, and reporting practices. In this paper we will consider ethical investment to be based on trying to define what is ‘good’ or ‘right,’ whereas sustainable investment is based on the principles of intergenerational equity and fairness. It is important to accept that concepts of ethical and sustainable investment are subjective constructs, which may not be universally held and which may change over time or vary based on circumstances. Responsible investment might be considered to encompass both of these concepts as it is centred on risk mitigation in three core areas: environment, society, and corporate governance (ESG). The challenge is to ground these concepts within specific asset classes or investment programs in a way that can be clearly enunciated, monitored, and reported against.

At a policy level there have been international processes to define sustainable forest management via ‘criteria and indicators.’⁴ These processes have made significant progress in identifying the key values reflected in forests—biodiversity conservation, maintenance of soils and ecosystem productivity, conserving freshwater catchments, supporting the role of forests as a storehouse of terrestrial carbon, and providing social benefits such as employment, materials for human society, and cultural values. Ethical dimensions to investments include additional considerations around fairness of benefit sharing, respect for both traditional and legal rights, avoidance of corrupt business practices and unhealthy work conditions, and compliance with government regulations and social norms. At an operating level these values have been further refined in the principles of the Forest Stewardship Council (FSC) and the Programme for Endorsement of Forest Certification (PEFC),⁵ which provide a basis for third-party certification of sustainable forest management.

Figure 1 – Responsible Investment requires integrating a range of ethical and sustainable investment criteria



For many institutional investors, requiring forest certification has been the primary approach to setting a sustainable and responsible investment policy for the forestry asset class. However, despite the growing use of certification, problems continue to arise, and we believe that this is because of a lack of clear understanding of key issues facing the forestry sector and a tendency for many managers to simply engage in certification as a ‘tick the box’ exercise. Asset owners and asset managers need to define key criteria to guide their investment strategy, manager and investment selection, operational controls, and certification policy. We hope in this paper to set out what we see as the key issues around responsible investment that can help investors understand what factors they should consider in establishing an investment program in the forestry or timberland asset class.

⁴ See for example the Montreal Process, which sets out a framework of criteria and indicators of sustainable forest management <http://www.rinya.maff.go.jp/mpci/>

⁵ See <http://www.fsc.org/> and <http://www.pefc.org/>

The Forestry Asset Class

Before we dive much deeper into the questions of sustainability and ethical investment, it is important to set out the general role and purpose of forestry investment as part of an institutional investment portfolio. The nature of forestry returns is the primary reason that institutional investors are attracted to the asset class, and it is worth restating these as a basis for the further discussion of sustainability issues.⁶

Institutional investors have owned forests since the mid-1980s, but it is really over the past 15 years that forestry has become a recognised alternative asset class with relatively specific return characteristics. Forestry assets are a biological system that grows over time, appreciating in value from year to year and producing income when trees are harvested. The total returns from forestry investment thus incorporate both intrinsic capital appreciation and income. An interesting feature is that trees do not have an absolute maturity point like agricultural crops and can be grown over relatively long periods of time, with harvest occurring when market conditions are favourable or management objectives are being met. This means that while timber markets may have significant volatility, the asset values, and therefore total returns, are much less volatile. However, forestry assets are by nature relatively illiquid, and investors need to be prepared to hold investments for several years or potentially decades. Return expectations for forestry assets therefore include an ‘illiquidity’ premium, which is of benefit to long-term institutional investors prepared to accept the liquidity constraints. In addition, as a real asset, forestry investments have been shown to have a strong positive correlation with inflation.

These characteristics mean that incorporating forestry assets in a balanced portfolio offers reduced volatility, inflation protection, and a capacity to match relatively long-dated liabilities. Given the recent volatility in equity markets, anticipated persistence of low real rates of return from bond markets, and expectations that governments will maintain an accommodative fiscal environment in order to stimulate growth, forestry appears an attractive asset class. This has led to increasing allocations to forestry and a search for international expansion of forestry investment opportunities across currencies and market exposures, which raises new risks and opportunities around sustainability, emerging markets, and government regulation.

The Importance of Forests to Environment and Society

Forests have been considered a kind of natural infrastructure that provides both ecological services and a range of goods and materials to society.⁷ As ecosystems, forests provide habitat for a myriad of species, and it has been estimated that forest ecosystems are a basis for over half of terrestrial biodiversity.⁸ Forests can influence local and regional weather patterns,⁹ and forests also store significant quantities of carbon in their living biomass; the amount of carbon stored varies greatly with the type, age, and health of the forest. It has been estimated that forests and soils contain more carbon than the global atmosphere.¹⁰ The impact of forests on atmospheric carbon dioxide is readily detected as the atmospheric concentration drops significantly in the northern spring as leaf buds open and begin growing each year.¹¹ Finally, forests are central to stabilising soil and controlling the quantity and quality of freshwater systems. Most major urban

⁶ Brand D. (2011). A Perspective on Timberland Investment. In Franzen T. (Ed.) *A Decade of Challenges: A Collection of Essays on Pensions and Investments*. Gothenberg: Second Swedish National Pension Fund (AP2).

⁷ Brand D. (2002). Investing in the Environmental Services of Australian Forests. In Pagiola S, J Bishop, & N Landell Mills (Eds.) *Selling Forest Environmental Services: Market-based Mechanisms for Conservation and Development*. 235-244. London: Earthscan Publications Ltd.

⁸ United Nations Environment Program, “Branching Out for a Green Economy” site.
<http://hqweb.unep.org/forests/AboutForests/tabid/29845/Default.aspx>

⁹ Nepstad DC et al. (2008) Interactions among Amazon land use, forests and climate: prospects for a near-term forest tipping point. *Phil. Trans. R. Soc. B* 363(1498):1737-1746.

¹⁰ Streck C, R O’Sullivan, T Janson-Smith et al., (2009). *Climate Change and Forests: Emerging Policy and Market Opportunities*. Washington: Brookings Press.

¹¹ D’Arrigo R et al. (1987) Boreal forests and atmosphere–biosphere exchange of carbon dioxide. *Nature* 329, 321-323.

regions receive their drinking water from forested catchments. Notably, New York City decided in the 1990s to invest in the health of its water catchment area rather than in secondary water treatment as a more cost-effective way to secure water quality results.¹²

Forests are also important to human culture and have been an integral component of many societies over millennia. From the totem poles of coastal British Columbia to the wooden boats of ancient Vikings and Romans and the spectacular wooden temples and shrines of Japan, forests and wood have been ubiquitous in cultural use across time and continents. People have used forests for food, shelter, and recreation, and have often changed the nature and composition of forests to provide for those needs. While in our modern society, more and more people live in urban environments separate from nature, there remains a connection between nature and society that drives us to desire conservation of natural systems and access to nature as a basic aspiration.

Finally, forests are the basis of an extraordinary array of materials from newsprint, printing and writing papers, construction timber, engineered materials (such as medium-density fibre board or finger jointed timber), flooring, furniture, biomass for energy, liquid fuels, and charcoal. Wood products are renewable, recyclable, and decompose naturally. Timber is the lowest embodied energy building material and usually stores more carbon than is used in its production.¹³ For all of these reasons, forests represent an asset class that has both attractive financial characteristics and a myriad of positive environmental and societal benefits.

Figure 2 – Malua Forest



View of forest canopy in the Malua Forest Reserve in Sabah, Malaysia.

Major issues facing the conservation and sustainable management of forests

There are about four billion hectares of forest on earth, and although the rate of deforestation has slowed from the 1990s to the 2000s, forest loss is still occurring.¹⁴ Over the last decade, 13 million hectares of natural forests were lost per annum with a net forest loss of 5.2 million hectares per annum; the difference is largely attributable to the expansion of tree planting.¹⁵ The loss of forests has been concentrated in the tropical forests of the Amazon, Congo Basin, and Southeast Asia, while tree planting has expanded forests in more temperate and subtropical zones.¹⁶ These at-risk tropical forests are particularly rich in carbon and biodiversity and often are used by forest-dependent communities. The majority of forest loss is driven by our

¹² For a review of the success of this program see Daily GC and K Ellison (2002). *The New Economy of Nature: The Quest to Make Conservation Profitable*, chapter 3 “New York: How to Put a Watershed to Work.”

¹³ Buchanan AH and SB Levine (1999). Wood-based building materials and atmospheric carbon emissions, *Environmental Science and Policy* 2(6):427-437.

¹⁴ FAO (2010). *Global Forest Resources Assessment 2010*. Rome: FAO.

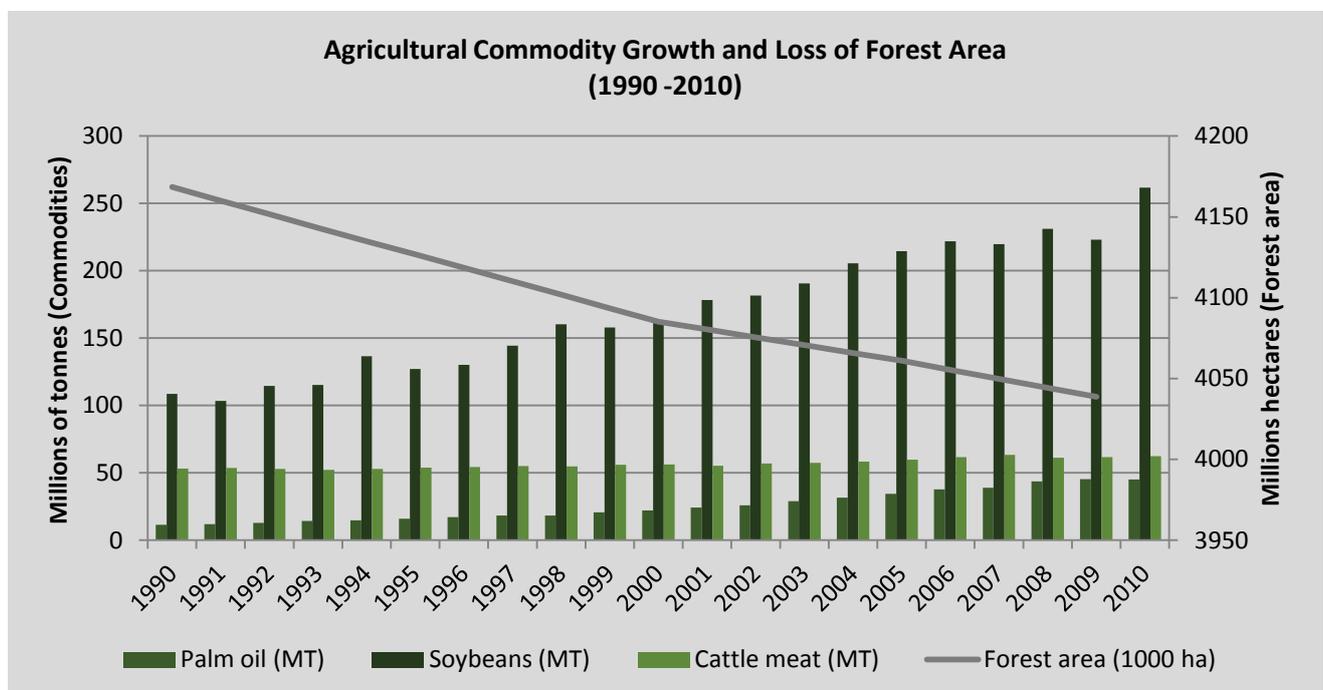
¹⁵ Ibid.

¹⁶ FAO (2011). *State of the World’s Forests*. Rome: FAO.

growing human population, rising affluence, and increasing demand for meat, grains, vegetable oils, and wood products. Smallholder slash and burn agriculture and large-scale agribusiness operations have needed more and more land, and much of this has come from conversion of forested systems to agriculture, particular for increasing production of beef, expansion of oil palm plantations, and greater cultivation of soybeans (see **Figure 3**).

As a by-product of the loss and degradation of forests has come an imbalance in the carbon cycle, and globally forests have become a very significant source of carbon emissions. Recent studies suggest that unsustainable logging, forest clearing, and burning of forests represent approximately 12-15% of global green house gas emissions.¹⁷ Climate change, including rising temperatures, changes in the prevalence of drought and rainstorms, loss of winter chilling, and other climatic influences, will also directly affect the character of forests. Changes in the frequency and severity of wildfires, insect epidemics, floods, and droughts may affect the distribution of forests and their productivity.

Figure 3 – Agricultural Commodity Growth and Loss of Forest Area



Expansion of agricultural land for livestock and crops such as oil palm and soybeans has been a primary driver of loss of forest cover, particularly in developing countries. (Data Source: FAOstat, April 2012)

As the area of forests diminishes and forest ecosystems become less resilient, we are losing a suite of ecosystem services. In some ways the fact that society has received these services for free has led to ecosystems being used inefficiently, wasted, and converted to more commercially valuable production systems. Ultimately, there is recognition of the costs of these losses in erosion, nutrient pollution, reduced agricultural productivity, the need for increased fertilisation, greater water quality treatment costs, greater flood damage and coastal impacts, and a greater spread of weeds, insects, and diseases.

¹⁷ van der Werf GR, et al. (2009) CO2 emissions from forest loss. *Nature Geoscience* 2:737-738 and A. Baccini et al (2012). [Estimated carbon dioxide emissions from tropical deforestation improved by carbon-density maps](#). *Nature Climate Change*

Effectively, the growing global economy is systematically eroding the productive capacity of natural ecosystems and converting more and more land into human-dominated production systems to support a burgeoning and highly urbanised society. The conversion, degradation, and development of forests also affect communities and, particularly in tropical regions, indigenous communities. Forest dependent peoples have been displaced, put into conflict with migrant workers, and sometimes forced into dysfunctional lifestyles in contradiction with their culture and values. These outcomes are often a symptom of wider issues of power imbalances, lack of involvement in decision making, unfair benefit sharing, lack of recognition of traditional rights, and the prevailing of the cash economy over the subsistence economy.

Effectively, the growing global economy is systematically eroding the productive capacity of natural ecosystems and converting more and more land into human-dominated production systems to support a burgeoning and highly urbanised society.

We believe that the goal of responsible investment in forestry is to recognise these challenges and make a contribution to their resolution. This will not happen overnight, but we do believe that solutions are achievable.

Responsible Investment Strategies in the Forestry Asset Class

Addressing the social and environmental issues outlined above will need a set of interacting developments, some of which are already occurring:

- A shift away from natural forest logging and toward more intensive forestry using productive plantation systems, effectively substituting technology and capital for land in a world of 7 billion people with rising incomes
- A growing imperative to find new models to finance the conservation of forests and ecosystem services and to integrate the financing of landscapes that provide both conservation and production functions
- The pricing of carbon and the rising importance of the relationship between forests and climate change
- Increasing investment in tropical plantations that can replace the declining timber supply from natural tropical forests and the need to manage risks associated with tropical regions, as well as potentially more complex sustainability and ethical issues
- Greater demands on forests and land use from stakeholders, especially in emerging markets
- Growth in the prevalence and rigor of certification and sustainable supply chain initiatives—transparency and accountability of responsible investment performance will become increasing drivers of timber value and underlying asset value.

Intensive vs. Extensive Forestry

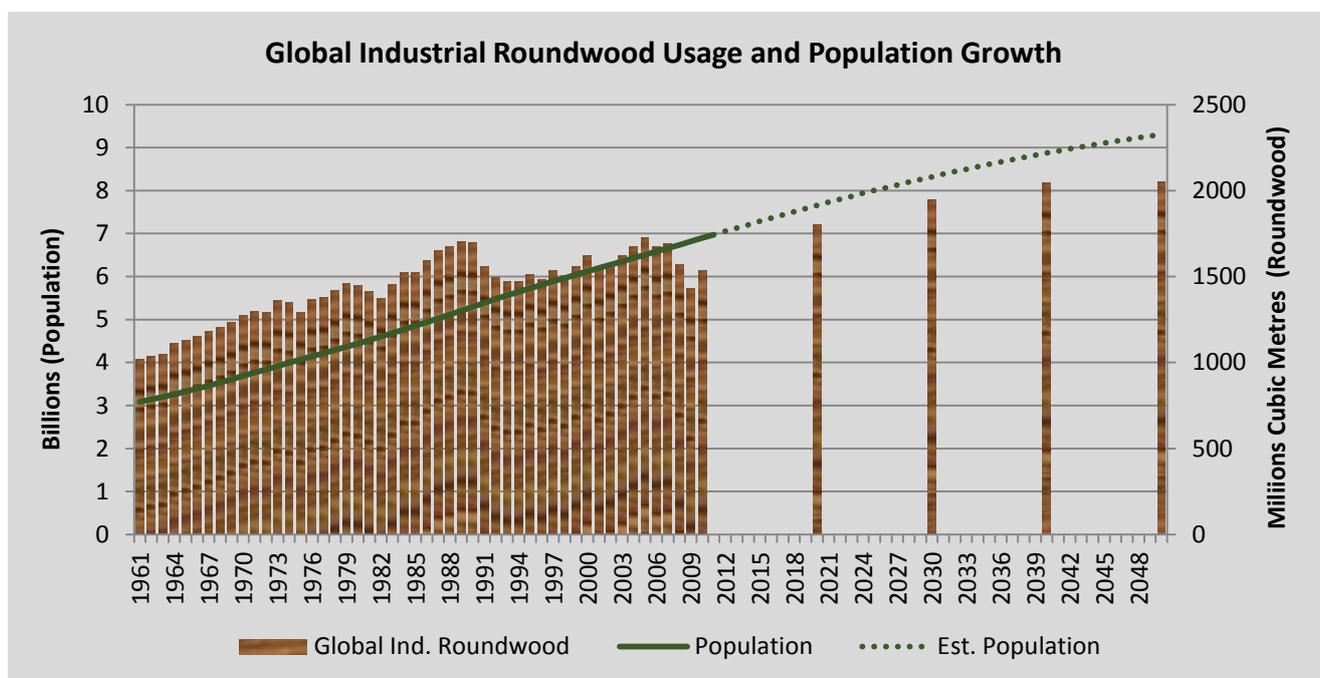
The original philosophy of forest management was to regulate the harvest of natural forests to produce a continuous supply of timber. The goal was to create a ‘normal’ forest with equal age classes that would be harvested and reforested each year to achieve a steady state timber supply. This may have worked in principle, but the economic incentive to cut the best timber first and weak regulation meant that in many countries, particularly in the tropics, forest management became an extractive practice that has left most economically accessible natural forests exhausted of merchantable timber. These ‘logged out’ areas will take decades to recover commercially viable timber volumes or will be converted to agriculture.

The reality is that natural forests are complex to manage, have relatively low timber productivity, and, if managed sustainably, must carry the cost of conserving ecosystem services. The only viable alternative, if we are to meet projected global demand for timber, is to transition the timber industry from one based on extensive, low productivity harvesting of natural forests to one based on intensively-managed plantations or

semi-natural forests over a much smaller land area. There appears to be in the order of 100 million hectares of commercial timber plantations today, which represents about 2.5% of the world’s forest cover. About 40 million hectares are likely to be high-yielding plantations that can produce at 10 cubic metres per hectare per annum. The total global demand for industrial roundwood is currently about 1.5 billion cubic metres per annum, and is likely to rise to 2.0 billion cubic metres by 2030, which is suggested to be a plateau.¹⁸ This suggests that the bulk of the world’s timber supply could be produced from 100 to 150 million hectares of high productivity timber plantations—an area of only about 2.5 to 4.0% of the world’s forest cover.

As this shift toward intensive forest management continues, institutional investors can support this transition by investing in high-yielding, sustainable plantations. This can complement land use models that direct production to the most appropriate land while enabling environmental markets and policy frameworks to support protection of high conservation value areas. Accordingly, investors will need to understand these different land management contexts and gain an understanding of the technologies and risk management systems that underpin high productivity and large-scale, commercial tree plantations.

Figure 4 – Global Industrial Roundwood Usage and Population Growth



Sources: Global Industrial Roundwood Production and Population estimate data from FAOstat, April 2012. Forecast roundwood demand adapted from RISI, 2010. Bob Flynn, presentation to Timber Invest Europe. “Update: The Global Demand for Wood Fibre.” London, October 2010.

Financing Forest Conservation and Ecosystem Services

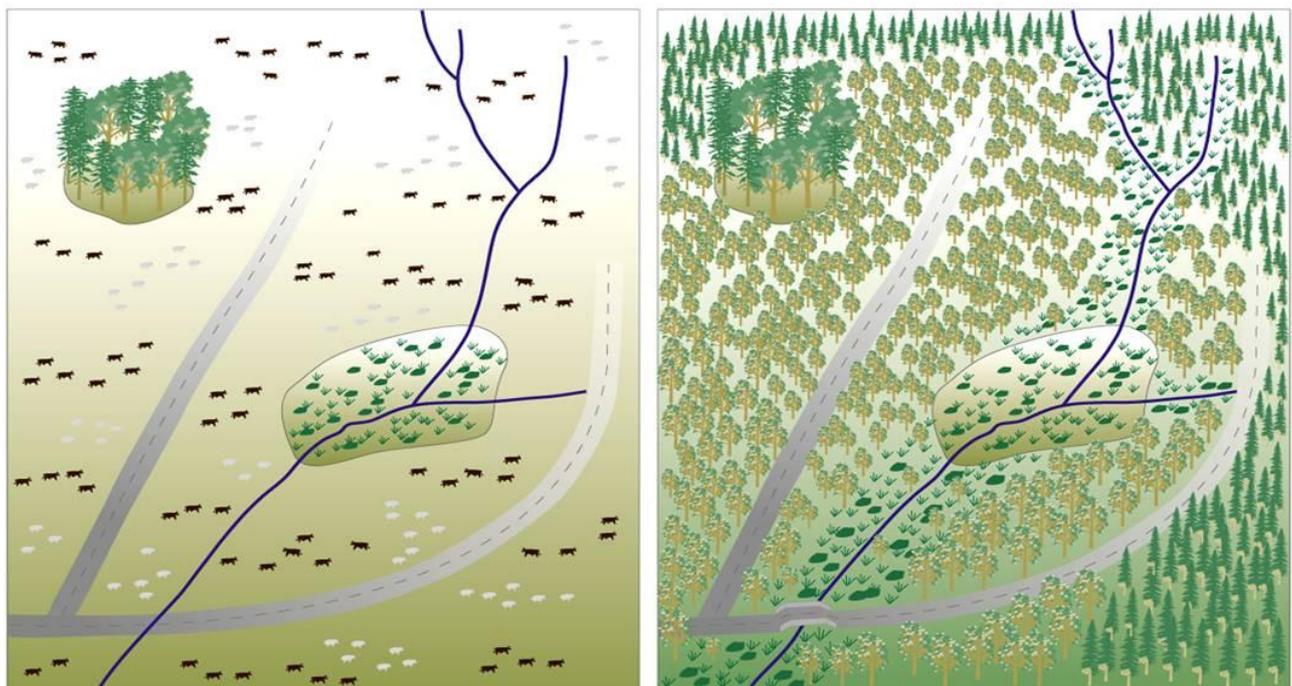
As global policy fora continue to grapple with the question of whether and how nature should be priced, investors must consider both the opportunities and costs associated with environmental markets. There is likely to be a growing expectation that investments will also shoulder some of the burden of maintaining connectivity of natural ecosystems, streamside corridors of natural vegetation, and unique habitats found in association with wetlands, rocky outcrops, or unusual soil types. Some investors may undertake this conservation work on a voluntary basis, but experience suggests that it is unlikely to be successful unless there is at least some commercial value placed on the retention of ecosystems and the services that they

¹⁸ RISI, 2010. Bob Flynn, presentation to Timber Invest Europe. “Update: The Global Demand for Wood Fibre.” London, October 2010.

provide. We are seeing a growing trend towards such price mechanisms and trading schemes. For example there are existing opportunities that allow forest owners to monetise carbon storage and watershed protection functions provided by forests, to trade in compensatory mitigation of wetlands and endangered species, and to sell easements that restrict the future ability to convert forests to other land uses. These environmental markets have proven to be very challenging public policies to implement. Not only are there active efforts to undermine the implementation of these policies by beneficiaries of the status quo, but there are often criticisms from the environmental movement that pricing nature could lead to unintended consequences, such as land grabs, or that such environmental values would be traded as offsets and become a de facto license to continue destructive or polluting activities.

Investing directly into assets with core revenue streams derived from environmental markets is generally outside the scope of institutional forestry investment as these markets are still either too small or immature. However, accessing opportunities to commercialise ecosystem services in association with assets for which core returns are derived from timber offers the potential to generate multiple revenue streams that can diversify sources of return or boost total per-hectare returns. In some cases these activities and income can also offset the opportunity costs associated with setting aside high conservation value areas, as is required in sustainability certification processes. Furthermore, investment in forestry and ecosystem services is likely to result in significant benefits in the future, which may be realised in economic terms. For example, the Eliasch Review estimated that the cost of halving deforestation by 2030 – and therefore addressing forest related greenhouse gas emissions – could cost \$17-33 billion per year but could yield \$3.7 trillion in benefits over the long term.¹⁹

Figure 5 – Before and After – Plantation Timber Production and Integrating Conservation Values



Theoretical example showing production model under existing status quo and traditional markets (e.g. cattle and sheep) at left, and integrated land management model with combined traditional market and environmental market opportunities (i.e. timber production, riparian and water quality management, revegetation, etc.) at right. (Source: New Forests)

¹⁹ Eliasch J. (2008). *Climate Change: Financing Global Forests*. UK Office of Climate Change.

Forests have been described as ‘natural infrastructure,’ which can provide both goods and ecological services to society. In some cases this can be part of a ‘grand bargain’ between forestry producers and stakeholders in conservation and traditional cultural activities. For example, New Zealand reached a forest agreement in the early 1990s in which the environment movement supported timber plantations in return for a downsizing of native forest logging.²⁰ An emerging model may be programs like REDD+²¹ and biobanking²² that allow conservation management areas to earn performance-based payments for carbon storage, protection of endangered species habitats, or conservation of freshwater and coastal resources. Institutional investors and their managers have the business skills, expertise, and capacity to participate in such approaches and to help facilitate a kind of ‘end-game’ that creates a stabilisation of remaining ecosystems and halts the decline in forest area depicted in **Figure 3**.

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Forestry and Climate Change

Carbon management has become the most prominent ecosystem service related issue and is an increasingly mainstream investment consideration. Investors who have concerns about climate change may need to look carefully at the forestry asset class for both risks and opportunities. Physical impacts will emerge from potential climatic shifts that could affect forest productivity and present risks like fire, windstorms, droughts, floods, and insect or disease epidemics. These phenomena will often be more acute at the extremes of species ranges or climatic conditions. Plantation management may be able to adapt to decadal scale changes in climate by changing genetic material or species from rotation to rotation or by shifting management regimes. In addition, as policymakers address climate change, there are likely to be commercial implications for forestry investors, especially where climate change policy creates a price on carbon or through regulations that stimulate new demand for wood and fibre, including for energy generation, or to meet new stricter green building regulations. We generally view a carbon price as an opportunity for forestry investment; however, it is important to recognise that in some cases carbon scheme rules may be introduced that alter asset values and returns. These impacts may be positive, negative, or oscillate depending on the carbon price. Competitive dynamics across sectors may also change as a result of a carbon price. For example, with a carbon price timber products may be favoured over higher embodied energy materials like concrete, steel, and aluminium (see **Table 1**). Biomass could become a significant fuel source for electricity, a source for liquid fuels (both cellulosic ethanol and biodiesel as well as new second generation fuels), and the basis for charcoal and biochar materials that can be both fuel and reductants. Even bio-materials like biodegradable resins, fibres, and plastics could rise in a world of expensive and increasingly scarce oil reserves.

²⁰ See <http://homepages.caverock.net.nz/~bj/beech/other/nzaccord.htm>

²¹ REDD+ or Reducing Emissions from Deforestation and Degradation, is designed to use market/financial incentives in order to reduce greenhouse gas emissions related to deforestation and forest degradation. REDD+ mechanisms, policies, and systems are being developed at international (e.g. UNFCCC), national, and subnational levels and REDD+ carbon credits are also sold in the voluntary carbon market.

²² Biobanking refers to a market mechanism for the trading of biodiversity or other environmental values. Biobanking systems may be regulatory compensatory mechanisms relating to development and other environmental impacts or may be voluntary in nature, as in the case of the Malua Biobank (www.maluabiobank.com).

Table 1 – Fossil Fuel Energy Used in the Manufacture of Building Materials and Carbon Release/Storage

Material	Fossil fuel energy (MJ/kg)	Fossil fuel energy (MJ/m3)	Carbon released (kg/t)	Carbon released (kg/m3)	Carbon stored (kg/m3)
Rough sawn timber	1.5	750	30	15	250
Steel	35	266000	700	5320	0
Concrete	2	4800	50	120	0
Aluminium	435	1100000	8700	220000	0

Source: Presented in Ferguson, I., La Fontaine, B., Vinden, P., Bren, L., Hateley, R. and Hermesec, B. 1996, 'Environmental Properties of Timber', Research Paper commissioned by the Forest & Wood Products Research & Development Corporation.

The global nature of climate change means that the impacts on forestry investment will be felt differently across different investment regions. Investors should look at these factors in considering the market dynamics, risks, and opportunities of the forestry portfolio being developed. Overall, the forest sector appears well positioned to be an important part of low carbon development strategies, adaptation, and mitigation to climate change. It may even be that as electronic communications, e-readers, and mobile technology come to replace newspapers and documents that new bio-based industries will be the natural evolution of the pulp and paper industry.

Emerging Markets and the Evolution of the Investible Universe

In developed markets like the USA, Canada, Australia, and New Zealand, forestry investments rely on secure property rights, a culture of accepted business practices, and a relatively free market where capital and innovation can flourish. The challenge today is that returns from timber plantations are much higher in emerging markets of Latin America and Asia, and incremental investments will seek areas where risk-adjusted returns are most attractive. This means that if institutional investors are to reflect the geographic distribution of the forestry investment universe, they will need steadily rising exposure to emerging markets as part of a forestry investment portfolio. At the same time, many emerging markets are making concerted efforts to become more investor friendly. Indonesia, Malaysia, and Vietnam are examples of countries that are working to create a stable macroeconomic environment, reduce corruption, strengthen legal systems, and invest in enabling infrastructure to become more attractive to institutional investors. However, there are still challenges, and investment managers need to employ a range of risk mitigation measures tailored to the specifics of each investment. Such measures include taking controlling stakes in the businesses they invest in, doing thorough background checks on counterparties, undertaking regular third-party management audits covering operations and third-party transactions, and considering investment guarantee insurance or independent offshore arbitration clauses in transaction documents or lease agreements.

One of the attractions of forestry investment has been its low levels of risk and volatility, and therefore many investors may decide to retain a weighting to lower risk countries like the USA, Australia, New Zealand, and European countries. On the other hand, there is an economic convergence occurring, with many developing countries like China, Brazil, and India becoming the source of the majority of global economic growth. This would suggest that it is not whether, but when, these emerging markets will become part of the mainstream of timberland investment. Further, from a sustainability perspective, growing institutional investment into high-value timber plantations will accelerate the shift to certification, pricing of ecosystems, and improvement in business practices.

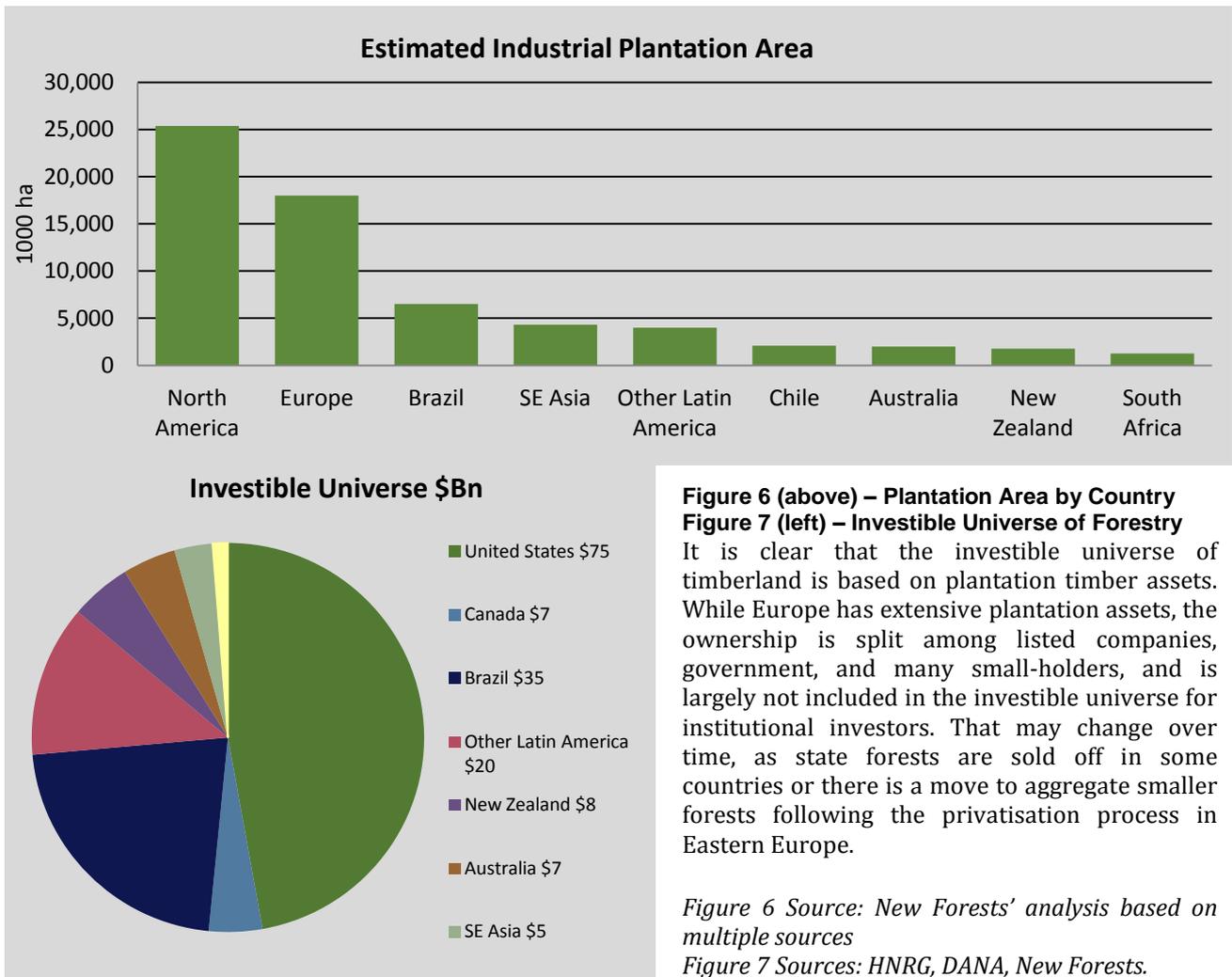


Figure 6 (above) – Plantation Area by Country
Figure 7 (left) – Investible Universe of Forestry

It is clear that the investible universe of timberland is based on plantation timber assets. While Europe has extensive plantation assets, the ownership is split among listed companies, government, and many small-holders, and is largely not included in the investible universe for institutional investors. That may change over time, as state forests are sold off in some countries or there is a move to aggregate smaller forests following the privatisation process in Eastern Europe.

Figure 6 Source: New Forests’ analysis based on multiple sources

Figure 7 Sources: HNRG, DANA, New Forests.

Stakeholder Engagement and Social Concerns

As noted above, there are many interconnections between forests and people. Responsible forestry investment should recognise and support the needs of workers, local communities, and those employed in downstream industries. Investors should consider how timber plantation investments integrate into broader aspects of landscape-level land use planning. In particular, social concerns around forestry investment can present a risk to the so-called social license to operate and lead to costly disruption of operations. Some forestry operations in emerging markets have become engaged in disputes over tenure and access rights with indigenous communities and migrant communities, even when due diligence indicated clear rights to plantation areas. In addition, there is often a need for migrant labour to work in plantations, and this requires the provision of suitable living conditions and anticipation and management of potential impacts on local communities. Health and safety policies and practices often need improvement, and infrastructure such as roads, ports, and management information systems need upgrading. Positive models of community engagement can be tremendously beneficial, for example where communities are engaged as employees or contractors, or in reducing poaching, improving fire risk management on neighbouring agricultural land, or in generating additional wood supply through out-grower schemes in return for a source of income and in-kind contributions to community services like education, health care, and transportation.

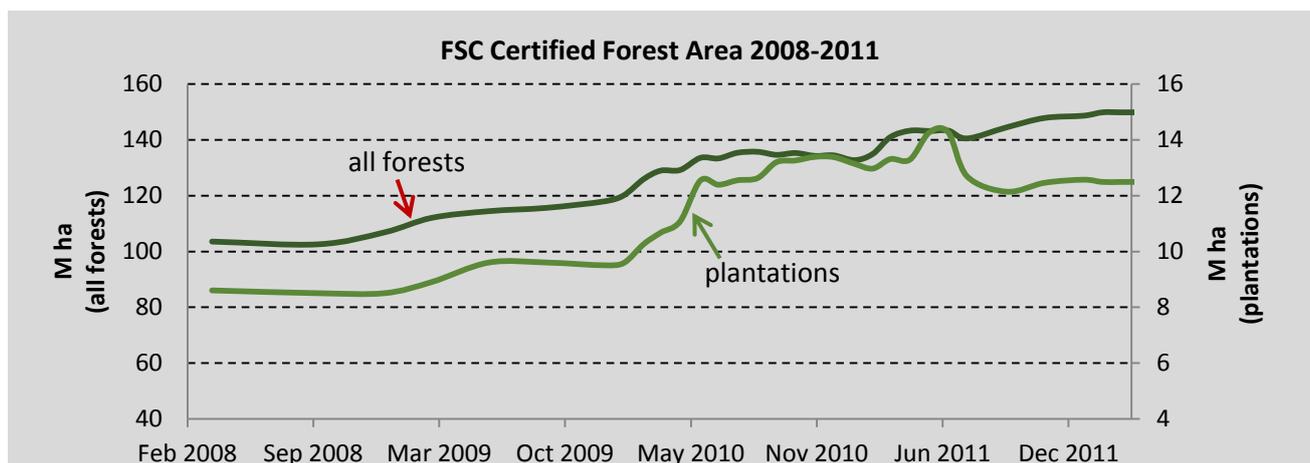
The goal, as with most approaches to responsible investment, is to find win-win outcomes for the investor and the community. Using local NGOs and consultants as advisors and seeking guidance from certification

schemes can help asset managers ensure effective stakeholder engagement that produces positive outcomes.

Certification and Labelling Initiatives

Certification schemes like the FSC and PEFC, as well as commodity roundtables like the Roundtable on Responsible Soy²³ and Roundtable on Sustainable Palm Oil²⁴ seek to provide the market with a way of differentiating products from sustainably managed sources from those that are not. Certification also provides institutional investors with a benchmark against which to assess and monitor whether their investments are managed in accordance with industry best practice and can be a good indicator of management quality. These schemes also include compliance with applicable local, national, and international laws regarding environment and society amongst their requirements, providing a level of investor assurance of legal compliance. However, as noted in the introduction to this paper, some ethical and sustainability concerns have emerged in investments even where certification has been achieved, and it is important that in selecting managers, institutional investors ensure that they have the in-house capacity to anticipate and manage ESG risks, not outsource them in a reactive way to consultants, certification bodies, or the investee companies themselves.

Figure 8 – Area of FSC Certified Forest



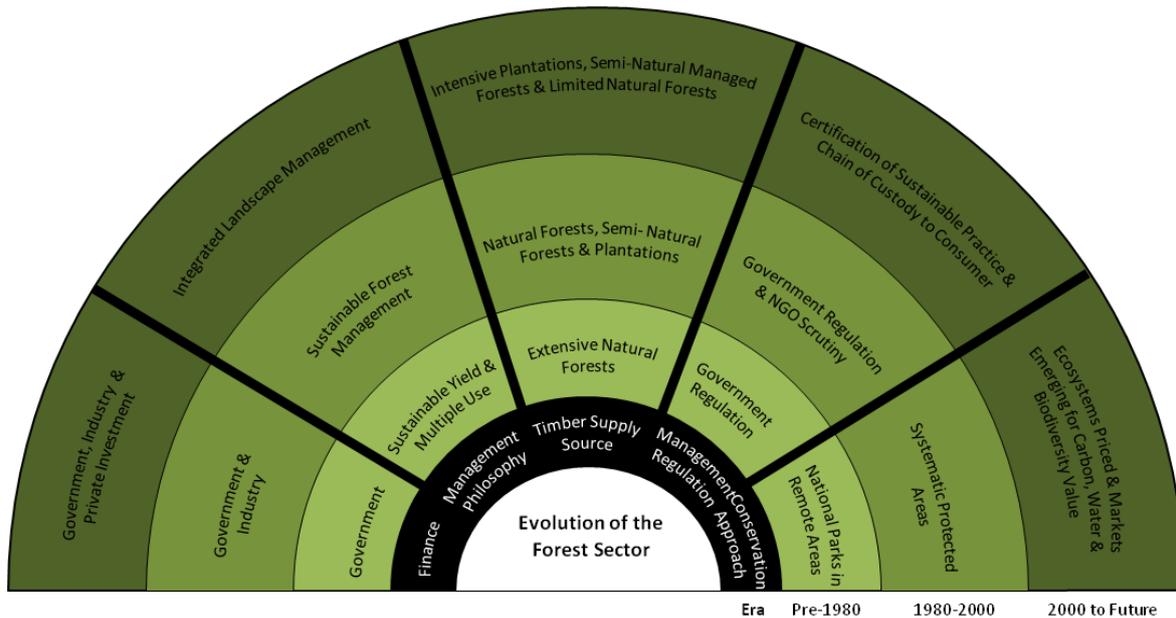
Data Source: FSC International. Note the dip in plantations in mid 2011 is reportedly due to a reclassification based on definition.

Many proponents of certification schemes seek to establish a market price premium for the certified products. In some markets for timber, particularly for higher value timbers, like teak, where supply is constrained, certification has been shown to yield and sustain a market premium, sometimes as much as 50% over uncertified timber. But in most commodity timber markets, supply has been able to catch up with demand, and initial certification premiums have largely disappeared. As a result, for the majority of forestry investments, participation in certification schemes is now more about meeting investment policy objectives and maintaining market share than generating superior operating margins. However, it is important to note that robust certification can also add value in other ways. These include reducing the cost of capital, increasing asset liquidity (by making the asset more attractive on exit) and improving operating margins through better levels of operating efficiency and fewer business disruptions through disputes with communities or regulators.

²³ <http://www.responsiblesoy.org/>

²⁴ <http://www.rspo.org>

Figure 9 – Evolution of the Forest Sector



Responsible Investment in the Forest Sector—Recommendations

The forest sector has gone through substantial evolution over the past 30 or 40 years (Figure 9). While forestry was largely financed by governments and to some extent industry in the past, today there is a significant new source of capital coming from institutional investors. Alongside this evolution of forestry plantations into an institutional asset class, there is also growing consensus on the need for holistic solutions that integrate production and conservation efforts at a landscape scale and mechanisms like certification processes that provide transparency through supply chains to consumers on the underlying source of wood products. A key part of the evolution to a stabilisation of natural forests will be successful implementation of new markets for ecosystem services like carbon, biodiversity, and water catchment protection. While these eco-markets are still in their early stages, we expect that they will be supported by investors, and will in turn reward investors who take a wider view of their responsibilities and the social and environmental outcomes from their investments.

The sectoral trends in the forestry industry discussed above are all inextricably tied to sustainability and ethical concerns. Effective management of these concerns is achievable through investment strategies that not only mitigate ESG risks but also take a proactive approach to responsible investment in the forest sector. For many institutional investors today, ethical and sustainability concerns have become threshold issues in defining investment policy and in selecting investment managers. Effective management of ESG concerns in forestry can not only reduce risk but also add considerable value to investments. With simultaneously growing recognition of the value responsible investment practices and the role of forestry assets in an investment portfolio, institutional capital is likely to be an important and driving factor in the continuing evolution of the forest sector toward an end-game of a sustainable, long-term forestry resource base for renewable, bio-based products. Our recommendations for forestry investors would include:

- Focus the bulk of forestry portfolios on well developed timber plantation regions with well developed log markets. These are the lowest risk investments with pure forestry financial characteristics and can be clearly managed under measurable sustainability and ethical investment parameters.

- The one market exposure that will involve more emerging market investment would be in the area of tropical hardwood timber plantations. These species including rubberwood, teak, and *Acacia mangium* form a key part of the global timber supply.
- Establish that the ability to achieve certification of sustainable management or an equivalent outcome should be a basic condition of investments.
- Ensure that the asset manager also communicates sustainability and ethical investment policies to property management firms, sub-contractors, and even downstream buyers, and uses effective incentives to align interests.
- Select managers who can manage sustainability-related risks and who have a demonstrated culture and corporate values aligned with ethical approaches to problem solving.
- Expect transparency with stakeholders, clear reporting on performance, and a culture of continual improvement.
- Maintain some small allocation in the portfolio to explore trends or opportunities. Whether it is through exposure to environmental markets, energy farming, or mixed agro-forestry systems, small early investments can provide experience and understanding of risks that may pay dividends as new markets begin to reach scale.