



REDDy SET GROW

UNITED NATIONS ENVIRONMENT PROGRAMME

Part 1

A briefing for financial institutions

Opportunities and roles for financial institutions in forest carbon markets

A study by the UNEP Finance Initiative's Biodiversity and Ecosystems Workstream (BEWS) and Climate Change Working Group (CCWG)

May 2011



UNEP Finance Initiative
Innovative financing for sustainability

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Foreword from the United Nations Environment Programme Finance Initiative (UNEP FI)

Forests are the natural treasure chests of the world, providing a host of ecosystem services that – this needs to be said very clearly and up-front - all economic progress and human well-being, even human life itself, rely on. What forests give us is fundamental in the strictest sense of the word: they stabilise the global climate system, regulate water cycles, provide habitat for biodiversity and people and host genetic resources of unimaginable potential. Forests and their services remain, however, chronically undervalued by today's economic and political decision makers which results in their rapid destruction. One of the many consequences of current deforestation is its contribution of approximately one fifth of global greenhouse emissions.


There is a glimmer of hope, though, as there is increasing consensus at national and international levels and within the UNFCCC climate change negotiations for the need to include in a new climate change deal efforts to reduce deforestation and forest degradation as well as to accelerate reforestation, as what they must be: a central component of the global response to the challenge of global warming.

Given the investment volumes, USD 17 – 33 billion per year, required to only half emissions from the forest sector by 2030, there is a clear, yet unaddressed, need to mobilise private sector financing at scale, in addition to government investment. There are many important roles that financial institutions and intermediaries can play in this respect: Investment managers can invest their own equity directly into forestry projects, forestry project development companies and forest funds or act as brokers or intermediaries for other investors. Debt finance can take the form of lending to forest companies, leveraged funds or individual projects on a non-recourse basis. Insurance and guarantees are a crucial way to manage both conventional investment risk in the forestry sector, as well as such risks which are more specific to forest-carbon endeavours.

This briefing does not mark the end but the beginning of an effort by UNEP FI to work together with its members, other UN agencies and stakeholders to help build regulatory frameworks and private sector capacity in order to scale up investment in emerging environmental markets, including forest-carbon markets. Part 1 of this study provides a briefing to the financial world on current and emerging avenues for business activity in forest-carbon, and highlights roles and barriers for financial institutions to become involved. Part II develops recommendations to national policy makers and international negotiators on what the international climate change architecture needs to deliver to effectively mobilise private finance and investment for forests at the need scale.

We hope this briefing is informative to you, and we look forward to working with you in the near future.

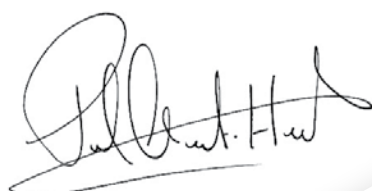
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Abbreviations

AFOLU	Agriculture, Forestry and Other Land Uses
A/R	Afforestation & Reforestation
BBOP	Business and Biodiversity Offsetting Programme (Katoomba Group)
CCB	Climate, Community & Biodiversity
CCX	Chicago Climate Exchange
CDM	Clean Development Mechanism
CIFOR	Center for International Forestry Research
COP	Conference of Parties
CSR	Corporate Social Responsibility
EU ETS	European Union Emissions Trading System
FCPF	Forest Carbon Partnership Facility
FFI	Fauna and Flora International
FIs	Financial Institutions
GHG	Greenhouse gas
GtCO₂e/yr	Gigatonnes of carbon dioxide equivalent (1 Gt = 1 billion tonnes)
IFM	Improved Forest Management
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
KP	Kyoto Protocol
LULUCF	Land use, land-use change and forestry
MtCO₂e/yr	Megatonnes of carbon dioxide equivalent (1 Mt = 1 million tonnes)
NGO	Non-Governmental Organization
NSW	New South Wales (Australia)
OTC	'Over-the-Counter' (transaction)
PCF	Prototype Carbon Fund (World Bank)
PES	Payment for Ecosystem Services
RED	Reducing Emissions from Deforestation
REDD	Reducing Emissions from Deforestation and Degradation
REDD+	Reducing Emissions from Deforestation and Degradation in developing countries and the role of conservation of forest carbon stocks, sustainable management of forests, and enhancement of forest carbon stocks
RGGI	Regional Greenhouse Gas Initiative (North America)
SGER	Specified Gas Emitters Regulation (Alberta, Canada)
t CO₂e	tonnes of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollars
VCS	Voluntary Carbon Standard
WB	World Bank

1 Executive summary

A 50% reduction in deforestation is needed by 2020 if the forestry sector is to support, rather than undermine, global efforts aimed at holding global temperature rise below 2 degrees Celsius, the global climate target that the world's governments have set themselves in the international climate change agreements of the UNFCCC¹.

Previous research suggests that slowing down, and ultimately even reversing, emissions from forestry activities requires a combination of three distinct approaches: **(i)** withdrawing the current drivers of deforestation, particularly through shifts in the production of agricultural commodities, **(ii)** mobilising investment into the pro-active protection of standing forests, **(iii)** mobilising investment into the creation of new, sustainably-managed forests. The focus of this study is on areas **(ii)** and **(iii)**.

In these two areas, considerable investment is needed to realise the climate change mitigation potential of forests: roughly USD 17-33 billion per year are needed to halve emissions from deforestation by 2030 (Eliasch, 2008); UNEP's Green Economy Initiative comes to the conclusion that annual investment in the order of USD 40 billion is needed to both halve global deforestation by 2030 as well as to increase reforestation and afforestation by 140% by 2050 relative to business as usual. Investment is needed both up-front for capacity building and preparatory work as well as on an ongoing basis for implementation, which entails compensation for opportunity costs as well as the costs of forest protection.

Investment at this scale is unlikely to come from governments alone. Hence active investment from private sector investors is essential, including financial institutions (FIs) and intermediaries of different kinds, particularly for implementation activities. This will depend on making the protection and enhancement of natural forests, and the creation of new forests, a competitive investment opportunity.

The international carbon market offers an avenue for increasing the financial competitiveness of forest protection and creation. While investment in forest-carbon has been limited to date – with an estimate market value of only USD 37 million in 2008 in the regulatory and voluntary markets combined – future investment opportunities in forest-carbon promise to be of great interest to the private sector in general, in particular investors and other financial intermediaries, for a variety of reasons:

- 1. Profit:** Aside from traditional forest gains, such as through timber and non-timber forest products, new profits can be made in the sector through the generation and export of carbon credits. In the forest sector this is at present largely limited to voluntary carbon markets which are small in size and weak in prices. The potential is expected to significantly increase, however, if carbon credits from avoided deforestation are recognised in regulatory markets post-2012. At present, only such credits from the creation of new forests (afforestation and reforestation) are tradable on official, regulatory markets.
- 2. Diversification:** Forest-based climate mitigation investments can constitute a viable opportunity for risk management by diversifying investors' portfolios, including such portfolios with an exposure to the forestry sector. Forest carbon prices are unlikely to be highly correlated with (for example) pulp or timber prices (at least initially – as there is more competition for limited resources, prices could become increasingly correlated).
- 3. Compliance:** Financial institutions or their clients may have emission reduction targets that they need to meet (for example in Kyoto Protocol Annex I countries), or they may expect such targets to be imposed in the future (for example in the case of a number of states in the USA). Investing in forestry can help meet such targets.
- 4. Corporate social responsibility (CSR):** Financial institutions or their clients may be interested in demonstrating CSR through a financially competitive investment which, in addition, yields environmental and social returns. Such non-financial returns can be capitalised on via marketing and

¹ This target was recently confirmed in the Cancun Agreements 2010

institutional positioning. Forestry projects can have especially interesting characteristics as they often result in a wide variety of significant sustainability benefits alongside reductions in greenhouse gas emissions.

5. Broader sustainability: Forestry investments can indirectly lead to the provision of a variety of ecosystem services and sustainability benefits next to emissions reductions. These include enhanced water-cycle management, the retention of valuable soil, and landscape protection. Despite the current lack of systems of payments for ecosystem services and resulting revenue streams, these could lead to additional returns in the future, once such systems are established. The overall market value of payments for water-related ecosystem services and other ecosystem services were estimated at USD 5.2 and USD 3 billion in 2008, respectively (TEEB, 2010).

Despite the commercial promise of these benefits, activities and investment in forest-based climate change mitigation have to date been slow and modest, especially when compared to other types of emissions reduction efforts. A variety of reasons for this can be identified:

- There is at present no mechanism under the formal international climate change architecture to capitalise on emissions reductions from avoided deforestation. Such activities are possible only on voluntary carbon markets. There is at present no guarantee that such a mechanism will be put in place in the future; although the current UNFCCC agreements specify the set-up of an international REDD+ mechanism, it remains undecided how the implementation of concrete REDD+ activities will be financed and whether the mechanism will be based on a system of tradable credits. Part 2 of this two part series, will make suggestions on such design options of the future international REDD mechanism that will ensure effectiveness in mobilising private finance and investment.
- Despite the fact that the generation and trade of carbon credits from reforestation/afforestation projects is possible under the Clean Development Mechanism (CDM) of the Kyoto Protocol, such projects remain far from being competitive with other types of CDM projects. The carbon sequestered by new forests is not captured permanently as, at some point in the future, forests will cease to exist and will release the carbon back into the atmosphere. The modalities of the CDM address this issue by allowing reforestation and afforestation projects to generate only such carbon credits which are ‘temporary’ and which need to be replaced by additional credits at predefined points in time. The temporary nature of forestry credits is a clear disadvantage when compared with conventional CDM credits, and the result is a price discount as well as only marginal demand on international carbon markets.
- Trade with forestry credits is banned from the European Emissions Trading Scheme (EU ETS) and other domestic carbon markets, which ultimately alienates reforestation and afforestation projects from the main sources of global demand for CDM-derived offsets.
- Voluntary carbon markets allow activities in the area of avoided deforestation to generate tradable carbon credits, and also address the issue of ‘non-permanence’ through a system of buffers and insurance rather than through a solution of temporary credits; this makes forestry credits equivalent to and competitive with other types of offsets. The result is that on the voluntary carbon markets forestry credits play a much greater role, relative to other emissions reduction efforts, than in the regulatory markets. Voluntary markets are, however, limited in demand and size and have therefore only mobilised relatively modest volumes of investment into emission reduction activities.
- There has to date been only limited effort in informing and educating relevant commercial actors with potentially important roles in these markets. This Briefing and subsequent activities by UNEP FI address this barrier.
- In addition to broader barriers, investments for both the creation of new forests, and especially the protection of standing forests, are exposed to a variety of distinct and very unique risks; these exacerbate the already challenging risk landscape inherent to such developing countries and emerging economies where most, if not all, opportunities in forest-based mitigation are found.
- In the domain of policy and political risk, for instance, overall governance risks at the domestic level as well as the general lack of law enforcement, are compounded by the risk that a specific country might not be eligible for the participation in official conservation projects and for the generation of forestry credits. Furthermore, a country may be formally eligible but de facto unable to put in place the operational

frameworks and systems needed, such as credible deforestation baselines and reliable monitoring systems. The most notable international policy risk is underpinned by the uncertainty of whether or not a global agreement on climate change is achieved and a corresponding architecture put in place in time.

- Market risks are significant given the reliance of demand and supply in any regulatory carbon market on public decision-making and intervention. Ad-hoc and unexpected government measures can lead to sudden shifts in demand and supply which are difficult, if not impossible, to hedge against. The result can, especially, consist of a strong downward pressure on forestry credits. In addition to risks that are common to all carbon market activity, there are risk categories which are more specific to projects in the area of reduced deforestation. Projects and efforts in this area may, for instance, perform well at the local level but be unable to generate revenue as a result of failure in the reduction of deforestation levels at regional or even national levels. Other specific risks in the area of reduced deforestation might be associated with the rules for establishing (and possibly updating) national, regional or project-level baselines, the rules for measurement, reporting and verification, international rules for the transfer or use of credits and liabilities for error, fraud or other factors after transfer of credits. There are a wide variety of instruments and approaches that can be considered in order to manage and mitigate different classes risk.

Despite the variety of barriers and risks, and in light especially of the promising business potentials, different types of financial actors around the world - ranging from local commercial lenders, over large diversified financial conglomerates, to mainstream capital market actors and niche insurers - have already started with the commercial implementation of pilot projects in financing, brokering and insuring of forest-based climate change mitigation projects. These are presented in this Briefing and used to portray the variety of generic roles that investors and financial institutions can play in combining financial returns with a wide variety of environmental and social benefits.

REDDy - Set - Grow explained

Part 1: A briefing for financial institutions

This part of the report provides private sector actors, particularly financial institutions, with an overview of the current and emerging business opportunities in forest-based climate-change mitigation, including an assessment of the risks involved and possible measures to reduce them. This will also be useful for policy makers in understanding the approach and needs of financial institutions.

Part 1 will address the following questions:

- **What is the current shape and status of forest carbon markets?**
- **What are the emerging opportunities for, and potential roles of, investors and financial institutions?**
- **What experiences have been made by financial actors when establishing operations in this space?**
- **What are the risks and barriers that private actors face?**

Part 2: Policy makers

This part of the report provides an assessment of current international regulation and recommendations to national and international policy makers on what the international regime under the United Nations Framework Convention on Climate Change (UNFCCC) needs to deliver to effectively mobilise private finance and investment for forest-based climate change mitigation. This will also be useful for financial institutions in understanding policy design and implementation.

Part 2 will address the following questions:

- **What policy options are most conducive towards effectively financing forest-based climate change mitigation?**
- **How does policy design and implementation reflect on the risks, barriers and issues of forest-based mitigation opportunities as perceived by the private sector?**

2 Introduction

The protection and enhancement of forests, especially in the tropics and sub-tropics, is an essential part of the international effort to stabilise the global climate. Previous research suggests that a 50% reduction in deforestation is needed by 2020 if the forestry sector is to support, rather than undermine, global efforts aimed at holding global temperature rise below 2 degrees Celsius. On average, 13 million hectares of tropical forests are disappearing annually (FAO, 2010), which is equivalent to about six billion tonnes of carbon dioxide being released into the atmosphere. Deforestation also damages crucial ecosystem services such as soil stability, affects watershed production and destroys habitats and livelihoods. The potential of forests to mitigate climate change is vast. In terms of their ability to reduce greenhouse gas emissions, stopping tropical deforestation and planting new forests could represent the equivalent of doubling current global nuclear energy capacity, or the construction of two million new wind turbines (Pacala & Socolow, 2004).

However, considerable investment is needed for this potential to be realised – estimated at a minimum of USD 17-33 billion per year to halve emissions from the forest sector to 2030 (Eliasch, 2008). Reducing deforestation and forest degradation can mitigate climate change at considerably lower costs than many other technology-based abatement options, and with immense potential co-benefits such as biodiversity conservation and watershed protection - ‘free’ services with an estimated annual value of up to USD 45 billion by 2050 (TEEB, 2010). These services are central to human well-being and economic progress in the medium to long term: estimates show that on a business as usual path, the deforestation-related impacts of climate change on the world economy could reach USD 1 trillion/year by 2100 (Eliasch, 2008).² UNEP’s Green Economy Report concludes that, on average, the global climate regulation benefits of reducing deforestation by 50 per cent exceed the costs by a factor of three (UNEP, 2011).

Nevertheless, investment on the scale of USD 17-30 billion per year is unlikely to come from governments alone, and thus active participation of private sector investors, including financial institutions (FIs) and intermediaries of different kinds, is essential. This in turn depends on making the protection and enhancement of natural forests, and the creation of new forests, a competitive investment opportunity.

There are many reasons why forest-based mitigation should be interesting to FIs, as shown below in **Figure 1**, and discussed further throughout this study. However, in order to mobilise this private sector capital at the required scale, it is paramount that policy-makers increase the financial competitiveness of forest-based climate mitigation investments, and minimise the risks involved.

² Please note this is an estimate of the forestry-related impacts of climate change, additional to the climate change impacts underpinned by other industrial emissions of greenhouse gases.

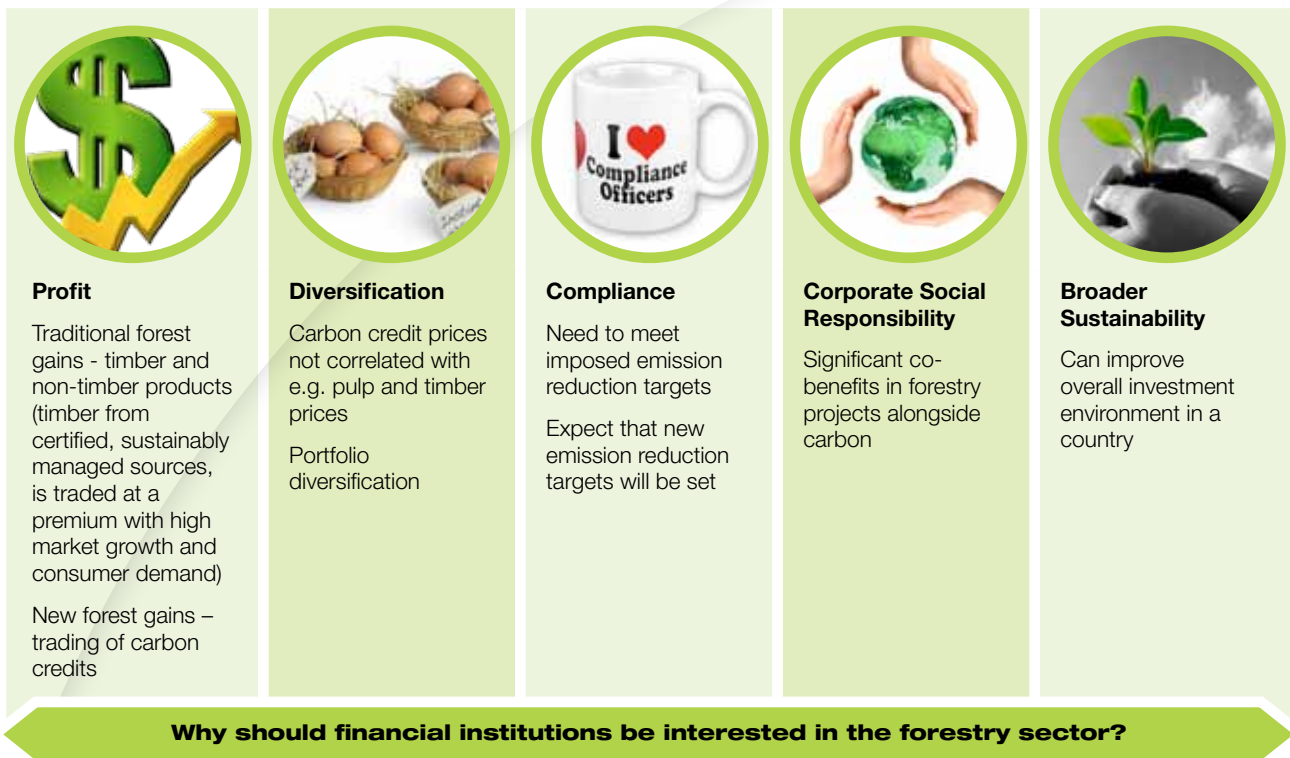


Figure 1: **Overview of why financial institutions should be interested in the forestry sector**

While a global framework for REDD+ is now a top priority in the international climate negotiations, there is no guarantee that a framework agreed at this political level will be investor-friendly. However, policy and regulatory initiatives designed to attract or guide capital are evolving at both international and national levels. In broad terms these seek to (a) improve potential returns, through support for new markets, and (b) decrease risk, either directly through access to risk mitigation products, or indirectly through policy design and implementation.

It is therefore essential that:

- (a) Financial institutions** fully understand the nature of the commercial opportunities, potential investment mechanisms and risk mitigation instruments available within the forestry sector; and;
- (b) Policy-makers understand** the needs of private sector investors, lenders and insurers in relation to the specific characteristics of forest sector emissions abatement opportunities.

Improving the understanding of both stakeholder groups is the fundamental objective of this two part series.

3 Current financial opportunities in forest-based climate change mitigation

This section explains the current frameworks within which investments in forest-based climate change mitigation occur, in particular through regulated and voluntary carbon markets.

3.1 Background and scope of study

Forests have been managed as profitable investments for hundreds of years. Today, managed forests worldwide generate around USD 100 billion/year in wood removals alone, plus at least a further USD 18.5 billion/year in non-wood forest products (FAO, 2010). An estimated USD 64 billion is invested in the forest sector every year, with USD 18 billion of this being for forest management and USD 46 billion in forest product processing and trade (Tomaselli, 2006). The majority of this is domestic investment (90%), mainly concentrated in developed countries and associated with plantations and processing facilities for pulp, paper and biofuel. Official development assistance accounts for only around 7% of the total investment in forestry worldwide; However, it is a significant factor in forestry investments in poorer developing countries (Tomaselli, 2006). Overall, the picture for developing countries is that, apart from official development assistance, financing is primarily domestic and relies heavily on internal cash flows, as lending and equity capital is difficult to access (Streck *et. al.*, 2010).

When taking a step back and providing the broader context for this study, the interactions of the private sector (and financial institutions in particular) with forests and the forestry sector become more complex and multifaceted. As much as there is a key role for private actors and investors to play in mobilising investment for the protection and creation of forests, private investors and financial institutions today play a central role in and contribute to current deforestation and forest degradation trends.

Figure 2 gives an overview, in red, of the areas where the private sector and capital markets today underpin and benefit from deforestation, particularly in areas such as timber extraction, agricultural commodities (especially soy beans, palm oil and meat), as well as infrastructure. **Figure 2** furthermore highlights how the economic use of forests can be shifted to a more holistic and sustainable approach and how they can become a pillar of the Green Economy; this can happen through a combination of efficiency gains and more fundamental step changes, particularly by:

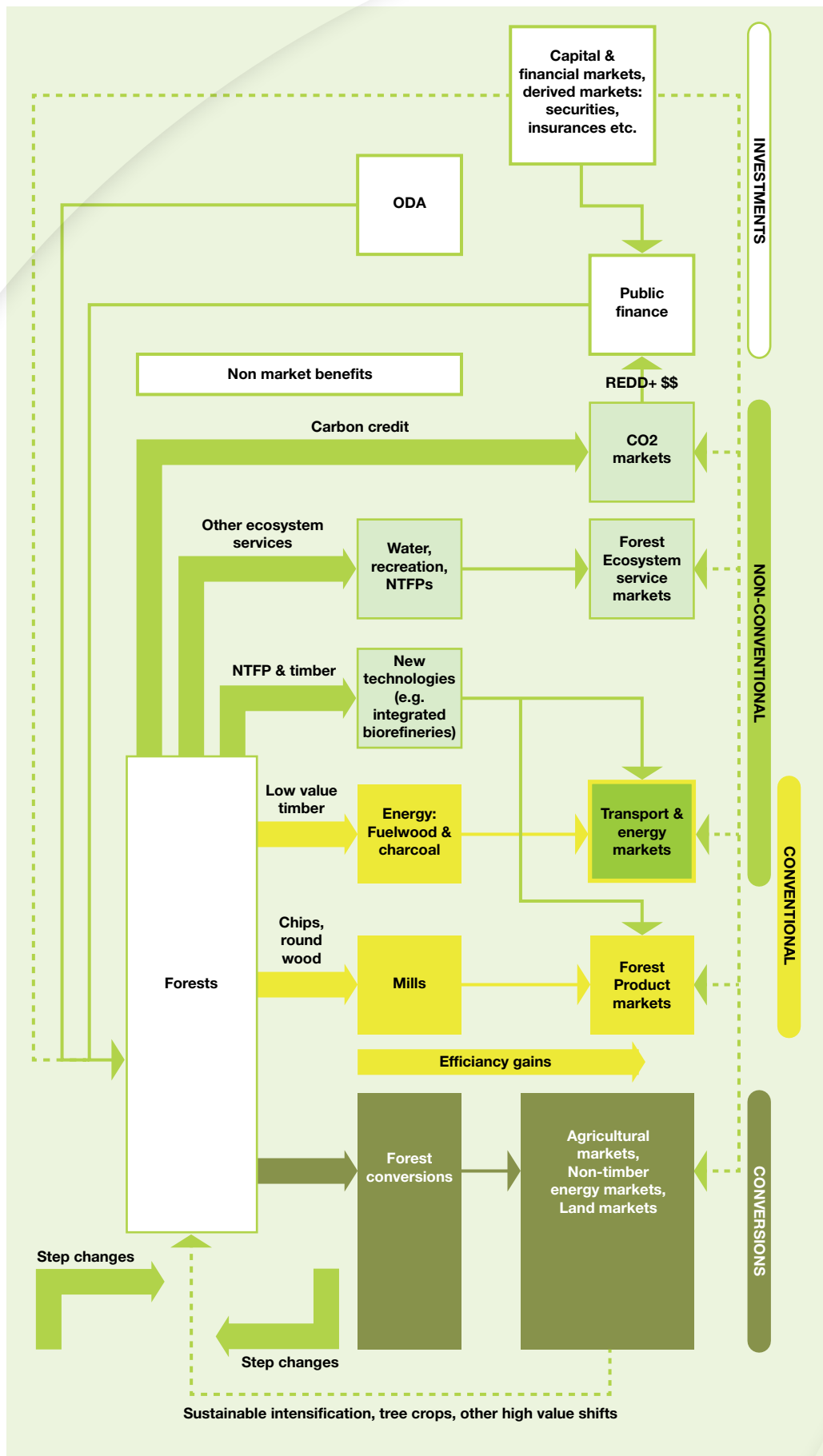
- (i) Increasing efficiency and inducing step changes in the sectors that drive deforestation (higher land efficiency in agricultural production, greater exploitation of already deforested land, and shifts from conventional agriculture to agro-forestry and a greater focus on tree-crops);
- (ii) Enhancing land efficiency in the production of conventional forest products, such as timber, fibre and other non-timber products.
- (iii) Establishing markets for and create monetary value of such forest-based ecosystem services that, despite their tremendous value to societal and economic well-being, remain formally unvalued.

While private actors, investors and financial institutions have fundamental roles to play in re-thinking their own behaviour patterns and shifting – via all three avenues above - the way today's forests are exploited, this study focuses exclusively on the third category, and particularly on the ecosystem service of carbon storage. In the near future, UNEP FI will further explore the current roles of private finance and investment with regards to the sectors driving deforestation and the avenues to rapidly shift behaviour patterns.

Figure 2:

Framework of links between forests, forestry and financial institutions

Source: Prabhu after Aulisi et al (2008), Personal Communication



Efforts are currently underway at a variety of levels with the aim of incentivising forest-based climate change mitigation. The global market can be roughly segmented by location (e.g. forests in developed or developing countries) and activity (with the main opportunities being to reduce deforestation and degradation, known as REDD+³, or to plant new forests, known as afforestation/reforestation, or A/R).⁴ This report focuses exclusively on REDD+ and A/R opportunities in developing countries. The level of forest-based climate change mitigation investment in developing countries is currently low (the value of forestry credits in the global carbon markets amounted to USD 37.1 million/year in 2008 – **see Table 1**), but if scaled up to the USD 17-33 billion necessary to halve deforestation, this would become a major category of investment in the forest sector as a whole, rivalling traditional land use and land-use change for timber products and agricultural expansion.

The market can be further segmented according to the type of incentive mechanism: broadly, into carbon markets (which in turn can be broken down into regulatory and voluntary markets) and a wide range of other mechanisms, such as official development assistance (aid funding), over-the-counter markets, other multilateral and bilateral funding initiatives, debt-for-nature swaps, philanthropic donations, national forestry budgets, premiums paid by consumers for certified forest products, etc. This report emphasises carbon markets as a primary mechanism likely to drive investment in forest-based climate change mitigation over the long term (Eliasch, 2008), despite some of the likely shortcomings of current carbon markets in unlocking private investment at scale which are discussed in more detail in **Part 2** of this study. It should be noted that carbon markets may take many different forms, and could include results-based inter-governmental payments as well as more conventional private-sector led investments in emission reduction projects. Besides carbon, there are other forest ecosystem services that hold significant (economic) value, and which may be capitalised on a bigger scale in the future.

3 While this is a handy way of categorising forestry-based mitigation activities, it may be simplistic: REDD+ activities namely include more than reducing emissions from deforestation and forest degradation and may very well include also reforestation activities, as well as forest restoration.

4 Opportunities to reduce emissions or enhance storage of carbon also exist in a range of other forest-related areas, such as increasing the longevity of wood products and substituting for more carbon-intensive construction materials, but these are outside the scope of this report.

Box 1: Reducing Emissions from Deforestation and Degradation (REDD+)

The international community has debated how to reduce tropical deforestation for decades. At the Rio Earth Summit in 1992, attempts to negotiate an international forest protection treaty failed, while treaties on climate change and biodiversity conservation were successfully concluded. Recognition of forest-based climate change mitigation proved contentious in the Kyoto Protocol negotiations because some saw it as an easy compliance option for developed countries; as a result, eligibility for forest carbon credits under the Clean Development Mechanism was limited to afforestation and reforestation, specifically excluding any recognition of reductions in deforestation. Nevertheless, at the Montreal Conference of the Parties in 2005 a formal process was launched to consider mechanisms for compensating developing countries for reducing emissions from deforestation (RED), later expanded to include forest degradation (REDD). In 2007, the Bali Action Plan called for a new post-2012 climate change agreement to include *“policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.”* Significant progress was achieved by this expanded approach, labelled **REDD+**, being included as an important element in both the 2009 Copenhagen Accord and the 2010 Cancun Agreement, and it is expected to be an important feature of the 2011 climate change negotiations in Durban, South Africa. The Cancun Agreement marked a watershed moment, with countries reaching a definitive agreement on the establishment of a REDD Mechanism, leaving open, however, the question of its design and, hence, ability to mobilise the private sector.

Support for REDD has also been included in US climate legislation which passed the House of Representatives in June 2009 but stalled in the Senate in 2010 (Cortez *et al*, 2010). Meanwhile, voluntary trading of carbon credits related to reduced deforestation projects also has a long history, with forest carbon credits actually forming the basis of the world's first ever carbon trades in the early 1990s (Hamilton, Chokkalingam & Bendana, 2010). In the absence of a legally binding international framework, the voluntary market is currently a significant driver of REDD+ activity.

While international negotiations on REDD will continue and while there is still no guarantee that an agreement will be reached, multilateral progress on REDD, and the mobilisation of considerable amounts of resources, is already taking place outside the formal negotiations: in June 2010, 69 governments, including all major forest-rich countries, joined efforts in the Interim REDD+ Partnership. This partnership serves as an interim platform to coordinate REDD+ activities, with the objective of enhancing the effectiveness, efficiency and transparency of current activities and existing financing instruments. Furthermore, this partnership is facilitating the flow of USD 4 billion fast-start climate finance pledged for REDD+ efforts, particularly for readiness and capacity building, and is demonstrating the future potential of REDD+ activities.

Box 2: Afforestation and Reforestation (A/R) in developing countries

In contrast to REDD+, Afforestation and Reforestation (A/R) projects create new forests by planting or assisting natural regeneration. The carbon uptake of the growing trees then creates a carbon sink in the tree biomass. A/R projects in developing countries are eligible for carbon credits under the Kyoto Protocol's Clean Development Mechanism (CDM). At the climate negotiations in Marrakesh in 2001, it was agreed that industrialised countries could meet a part of their emission reduction commitments under the Kyoto Protocol by financing A/R activities in developing countries through the CDM. Although an international framework exists to support A/R in developing countries, the voluntary market is also currently a stronger driver of A/R activity (Hamilton, Chokkalingam & Bendana, 2010).

3.2 Where is the opportunity?

Land use, land use change and forestry (LULUCF) currently contributes close to one fifth (17.5%) of global emissions, which puts the sector as the third largest greenhouse gas (GHG) emitter worldwide. Emissions in the forestry sector occur primarily as a result of deforestation activities in countries in the tropics and subtropics, where Indonesia (33.6%)⁵, Brazil (18%), Malaysia (9.2%), Myanmar (5.6%) and the Democratic Republic of Congo (DRC) (4.2%) have been identified as key players in terms of REDD (Verchot & Petkova, 2009). Opportunities for A/R are more widely distributed in a larger number of developing countries.

Hope and Castilla-Rubio (2008) estimated that the net present value of benefits in terms of reduced climate-change damage associated with reducing deforestation and hence emissions by 50 per cent each year from 2010 to 2100 would be US\$5.3 trillion (mean) with a 90 per cent confidence interval (CI) of US\$0.6 to US\$17 trillion (UNEP, 2011).

The global benefits of annually mobilising roughly USD 30 billion of investment, from 2010 to 2050, into avoiding deforestation as well as increasing sustainable reforestation and afforestation, are not limited to the avoided damage that would otherwise result from climate change. Modelling done for UNEP's Green Economy Report further suggests that as a result of such investment the global added value, or additional return on investment, in the forestry sector would reach USD 0.6 trillion in 2050 (UNEP, 2011).

3.3 What are the potential benefits?

Forests can generate large emission reductions at relatively low cost. Studies have shown that forestry mitigation options can contribute to reductions of 1.3 to 13.8 billion tonnes of carbon dioxide emissions per year (GtCO₂e/yr) in 2030 (IPCC, 2007)⁶. According to the Stern Review (Stern *et al.*, 2006), emission savings from avoided deforestation could yield reductions in CO₂ emissions for under USD 5/tonne CO₂, and possibly for as little as USD 1/tCO₂⁷, while planting new forests could result in increased absorption of CO₂ at between USD 5 and USD 15/tCO₂. This is considerably cheaper than achieving emission reductions in many other sectors (though not cheaper than energy efficiency, which can potentially be achieved at negative cost).

The extent to which the difference between *actual* forest sector abatement costs and the price paid for abatement can be exploited will be a key determinant of the attractiveness of the sector to private investment. This is because the difference translates into 'rent' or potential profit. It should be noted that the potential for future profit is what drives present investment, and the level of expected profit must be high enough to compensate for expected risk: a scheme that aimed perfectly to compensate for actual costs, without taking risks into account, would fail to attract private investment.

Forest-based mitigation, and REDD+ in particular, can deliver attractive co-benefits. These include:

- Biodiversity conservation and environmental protection (UNEP & WCMC, 2009); (see **Box 3**); and
- Improved livelihood standards and sustainability for stakeholders that directly and indirectly depend on forests (CIFOR, 2010).

5 Percentages show proportion of total deforestation emissions.

6 This wide range is a result of the fact that the carbon mitigation potential of the sector varies greatly depending on the region and activities being undertaken and the price that one is prepared to pay.

7 This range is a result of different opportunity costs of land which would no longer be available for agricultural activities if deforestation was avoided.

Box 3: Looking outside of REDD+

REDD+ presents the opportunity to establish the very first global system of payments for ecosystem services (PES) (TEEB, 2009). Outside the REDD+ realm, approaches already exist to compensate forest stewards for a range of other ecosystem services. The three principal services that are usually subject to PES schemes are: the regulation of climate (carbon) including but not limited to REDD+, water cycles (watershed protection), and the protection of biodiversity.

While biodiversity offset payments are the most tangible form of ecosystem service compensation with an estimated market value of US\$1.9 – 2.9 billion (Madsen et al., 2010), other more indirect forms of payments exist as well. These include bio-prospecting opportunities linked to the commercial value of species' genes for the pharmaceutical sector, ecotourism, payments for watershed services, and eco-taxes. Market activity and thus private sector involvement is most dynamic in the trading of water rights (e.g. US, Australia), and the development of biodiversity offsets, similar to the voluntary carbon market. Attempts to develop an independent biodiversity offsetting scheme are led by the Business and Biodiversity Offsetting Programme (BBOP). While this report predominately focuses on harnessing the financial value of carbon in forests, there are also ways for financial institutions to capitalise on the economic value of other forest ecosystem services. New Forests and Canopy Capital are examples of private finance enterprises active in this domain (UNEP FI, 2010).

Experience with structured finance products, such as securitisation, may be beneficial to capture the economic value of forest-ecosystem services as the beneficiaries (those who pay) differ depending on the type of ecosystem service. In the case of forests, the global community benefits from carbon storage and sinks in forests, and hence it has become an important point of negotiation in a future climate change protocol. Water services, on the other hand, predominantly benefit local users in the same water catchment area, including both businesses (e.g. food & beverage companies) as well as municipalities (for water supply and hydro power). In addition, biodiversity is beneficial for the global community (in terms of bequest and existence values), but also to local communities and businesses (e.g. tourism). Hence, experience by the financial sector in structuring financial products will be valuable in identifying, valuing and integrating various ecosystem services into various finance products. As more data and tools are developed and become available this should speed the process further – for example the UNEP World Conservation Monitoring Centre (UNEP-WCMC) has extensive databases, as well as tools such as the 'Carbon Calculator', jointly developed with the CBD's LifeWeb Initiative, that allow for estimating carbon stored in biomass and soil as well as the biodiversity present in any given spatial area.

Payments for ecosystem services typically cover two main categories of cost: firstly, a compensation to the landholder for the opportunity cost of forgone land-use, and secondly the costs of any actions necessary for conservation (such as fencing or employment of guards), and the transaction costs of designing, setting up and operating the payment scheme, including contract management, fund management, the transfer of funds and monitoring (UNEP, 2011).

3.4 Concretising the asset class: What are potential REDD and A/R activities?

Measures that could contribute to reduce emissions from forest destruction, thus reducing carbon losses from standing forests, are diverse: selected examples are provided in **Figure 3**. These areas of activity can be interpreted as potential targets for investment and could be delivered by a range of actors – companies, government agencies, environmental NGOs or community groups – each with unique financing requirements.

Figure 3:
Example ventures that could be part of REDD+ projects

Direct compensation payment for less deforestation	Community development and environmental education	Enhance alternative income sources	Agricultural extension	Improve land-use planning
Restrict transportation infrastructure	Establish protected areas	Police against encroachment and illegal logging	Reduce Impact logging	Enhance productivity of forests and agroindustry
Provide alternative sources of timber	Extend rotation age	Timber market restrictions	Forest law-enforcement	Introduce improved tree varieties (e.g. fast-growing species)

Figure 4 provides examples of activities that can be undertaken as projects in the areas of afforestation and reforestation:

Figure 4:
Example ventures that could be part of A/R projects

Large-scale, industrial plantations	Biomass plantations energy production	<i>Jatropha curcas</i> plantations	Enrichment planting	Small-scale plantations by landowners
Woodlots on communal land	Assisted natural regeneration	Rehabilitation of degraded areas	Introducing trees into agricultural systems	Restoration of marginal areas with native species
Fruit orchards		Coffee or cocoa plantations		

3.5 Forests in the global carbon markets

Global carbon markets can be divided into two segments: the regulatory (compliance) markets and the voluntary markets. Regulatory markets include countries and organisations that have to reduce their emissions as a result of a binding regulatory framework, most notably as a result of emission reduction targets established under the Kyoto Protocol. On the other hand, voluntary markets include all carbon credit trades that are not required by regulation, but which are driven by organisations or individuals voluntarily seeking to offset their emissions.

Today's global carbon market is a patchwork of regulatory and voluntary markets. **Table 1** provides an overview of the size (in terms of both volume and value) of regulatory and voluntary markets, and the same data for forestry-based transactions in those markets.

Table 1: **Volume and value of voluntary and regulatory markets in general and specific to forestry in 2008 (adapted from Hamilton *et. al.*, 2009 and Hamilton *et. al.*, 2010). Data is provided for 2008 rather than 2009 as no comparable data is currently available for forestry beyond 2008.**

Markets	Volume (Million t CO ₂ e)	Value (Million USD)	Forestry volume (Million t CO ₂ e)	Forestry Value (Million USD)
Total regulatory markets	4,090	119,483.4	0.2	0.3
EU ETS	2,982	94,971	n.a.	n.a.
Primary CDM	400.3	6,118.2	0.1	0.3
Secondary CDM	622.4	15,584.5	n.a.	n.a.
Joint Implementation	8	2,339.8	n.a.	n.a.
Kyoto (AAU)	16	177.1	n.a.	n.a.
New South Wales	30.6	151.9	0.2	n.a.
RRGI	27.4	108.9	n.a.	n.a.
Alberta's SGER	3.3	31.3	n.a.	n.a.
Total voluntary carbon markets	123.4	704.8	5.0	36.8
Voluntary OTC	54	396.7	3.7	31.5
Chicago Climate Exchange (CCX)	69.2	306.7	1.3	5.3
Other exchanges	0.2	1.3	n.a.	n.a.
Total all markets	4,213.5	120,188.2	5.3	37.1

3.6 Regulatory carbon markets

Regulatory (compliance) carbon markets have emerged in response to a regulatory commitment for emission reductions that a government or other regulatory body imposes on the emitters. Market players are primarily entities that are legally obliged to reduce emissions, although brokers, exchanges, speculators and a variety of supporting service providers also play important roles. Regulatory markets include those directly linked to the Kyoto Protocol such as:

- (1) The Clean Development Mechanism (CDM), one of the flexible mechanisms under the Kyoto Protocol. It has experienced significant investment with thousands of projects under development and a market volume exceeding USD 20 billion in 2009 (Kosoy & Ambrosi, 2010).
- (2) Joint Implementation (JI), another flexible mechanism under the Kyoto Protocol. While substantially smaller than the CDM, it saw transactions in excess of USD 350 million in 2009 (Kosoy & Ambrosi, 2010).

- (3) The EU Emissions Trading System (EU ETS) established in 2005 as a means to help EU Member States meet their Kyoto Protocol targets. Allowance trading values totalled USD 118 billion in 2009 (Kossoy & Ambrosi, 2010).
- (4) New Zealand's Emissions Trading Scheme, which has covered domestic forests since 2008. However, imports of forest carbon credits from CDM or JI are not allowed.

Regulatory markets also include a series of markets which are not directly linked to the Kyoto Protocol but to alternative regional or national compliance regimes. Most of these markets are small compared to markets linked to the Kyoto Protocol. They include:

- (1) The Australian New South Wales (NSW) GHG Reduction Scheme;
- (2) Emerging markets in North America, such as the Regional Greenhouse Gas Initiative (RGGI), and the market linked to the Alberta-based Specified Gas Emitters Regulation (SGER).
- (3) The California Global Warming Solutions Act (AB 32); passed in 2006, this Act sets the 2020 greenhouse gas emission reduction goal into law, and it is likely that international REDD+ credits could be imported into the AB 32 cap-and-trade system by 2015 (see **Box 4**). The Californian emissions trading scheme will be established in early 2012.

Box 4: Regulatory carbon markets, the forest sector and California's AB 32

Forest-based mitigation activities - despite their tremendous potentials as well as unique and multiple benefits - remain massively under-represented in the Kyoto markets. As of October 2010, 57 forestry projects made up just 1% of the CDM pipeline, and of these only a handful (17) were formally approved or registered (UNEP Risoe, accessed Oct 2010). The JI pipeline includes only one afforestation project (registered), which corresponds to 0.3% of the pipeline (UNEP Risoe, accessed Oct 2010). REDD activities are not currently eligible under the Kyoto markets, which therefore contain no such project developments. The EU ETS does not include domestic forestry activities, and while imports of credits from both CDM and JI are allowed, forest carbon credits are explicitly excluded. Both the Australian New South Wales scheme and Regional Greenhouse Gas Initiative allow for the use of offsets from reforestation, although so far only from domestic activities.

The passing of AB 32 in California has been hailed as one of the most encouraging developments in REDD+. The regulation includes and adopts four compliance offset protocols, including U.S. forest projects and urban forest projects. Through this, forestry offsets generated by US landholders will be eligible for trading under the new system already in 2012, and a framework has been adopted which will allow international forestry credits from REDD+ to be eligible for trading under the state's cap-and-trade system. With California having one of the world's largest economies, it could establish a compliance market with demand for up to 74 million tonnes of CO₂ equivalent (total) from 2012 to 2020 (Tropical Forest Group, 2010).

3.7 Voluntary carbon markets

These have emerged as a result of organisations and individuals voluntarily deciding to offset their own emissions. Forest-related carbon credits have played a more prominent role in voluntary markets (**Box 5**) than they have in the Kyoto markets. The demand on voluntary markets is driven by:

- (a) Environmental concerns, as in the case of individual air travel, or a sense of corporate social responsibility. In 2009, purely voluntary reasons were the driver behind at least 48% of voluntary carbon market transactions.
- (b) The expectation of a future regulatory market, with an emission reduction commitment i.e. if companies expect to be assigned an emissions cap under a future market, or are speculating on that possibility. In 2009, around 23% of transactions had pre-compliance as a stated objective (EcoSecurities, 2010).

Voluntary carbon markets can be divided into:

- (a) Voluntary 'over-the-counter' (OTC) markets, which transacted **51 MtCO₂e** in 2009 (Hamilton *et al.*, 2010); and
- (b) Voluntary exchange-based markets, primarily the Chicago Climate Exchange (CCX), which transacted **41 MtCO₂e** in 2009 (Hamilton *et al.*, 2010).

Box 5: Voluntary carbon markets and the forest sector

Forestry and land use projects constitute a significant proportion of transactions in the voluntary carbon markets. Projects that involve trees are traditionally very popular, and reached a market share of 24% on the voluntary markets in 2009, thus being one of three project types with largest market share (together with renewable energy and methane gas projects) (Hamilton *et al.*, 2010). A/R and REDD+ activities are all eligible under various voluntary carbon market standards, and all three project types have a tangible share in the market (A/R: 10%; Improved Forest Management (IFM): 3%; REDD: 7%).

3.8 Comparing the carbon markets

A number of reasons can be found, both on the supply and on the demand side, to explain why forestry projects play such a different role in the compliance and voluntary markets.

Supply Side:

- The scope of the CDM is limited to only allow for tree planting (A/R) activities, while the voluntary market offers a much broader range of activities, including forest establishment (A/R), management (IFM) and conservation (REDD+);
- Transaction costs for forestry CDM projects are particularly high due to the complexity of pertinent methodologies (Neeff & Henders, 2007). The ten approved methodologies for large-scale A/R projects are highly complex, requiring a high level of expertise and significant amounts of data that are often not available. This makes developing A/R projects under the CDM cumbersome, time consuming and expensive. These features cause a major bottleneck on the supply side of CDM A/R projects.

Demand Side:

- CDM rules address the non-permanence risk of carbon stored in standing trees through the issuance of temporary, rather than permanent, carbon credits; i.e., they expire after 5 years. This was one of the reasons why CDM forestry credits were excluded from the EU ETS, thereby eliminating an important potential source of demand. Few actual transactions of carbon credits from forestry CDM have taken place; and prices of these have only reached fractions of the prices enjoyed for permanent CERs (USD 3–4). In fact, there are few actual buyers apart from the World Bank's BioCarbon Fund (see **Box 8**), which renders price dynamics virtually absent (Neeff & Henders, 2007). In **Part 2** of this study we suggest avenues to improve the commercial viability of A/R projects under the CDM.
- A consequence of the above, and a further challenge to A/R project developers, has been the need for substantial upfront funding and the difficulty to identify investors or project donors at an early stage of project development. There is a major challenge of developing innovative financing mechanisms (e.g. private-public partnerships) for A/R CDM projects.

Voluntary markets have taken a broader and more flexible approach both to supply and demand of forestry projects than regulated markets. Alongside the numerous eligible project types, voluntary carbon standards avoid the concept of temporary credits and are instead testing alternative ways of insuring the permanence of emission reductions, mainly through the creation of reserve buffers of carbon credits that cannot be traded to hedge against the risk of a reversed carbon sink. The ability to generate permanent credits is a distinct market advantage for forestry under the voluntary compared to the CDM markets (Neeff & Henders, 2007).

This explains why forestry CDM, unlike the voluntary market, so far has not proven very successful or as interesting an investment opportunity for the private sector (see **Boxes 4 and 5**). However, several market players see a future role for A/R CDM post 2012 - mainly in the context of a broader land use approach, or within integrated projects complementing emerging forestry activities like avoided deforestation and managing soil carbon (Hamilton, 2008). A continuation of CDM A/R is only realistic, however, if a major simplification and streamlining of project requirements can be achieved, and demand can be created. A sounder and more cost-effective framework for carbon sink projects under CDM can contribute alongside REDD+ to promote sustainable management of tropical forests through constituting a payment for the important ecosystem services provided by them.

4 Roles, opportunities and risks for financial institutions

Using case studies, this section provides an overview of the opportunities for private financial institutions (investors and fund managers, lenders and insurers) to play a key role in the emerging forest-carbon market, outlining the potential risks involved and how these could be mitigated.

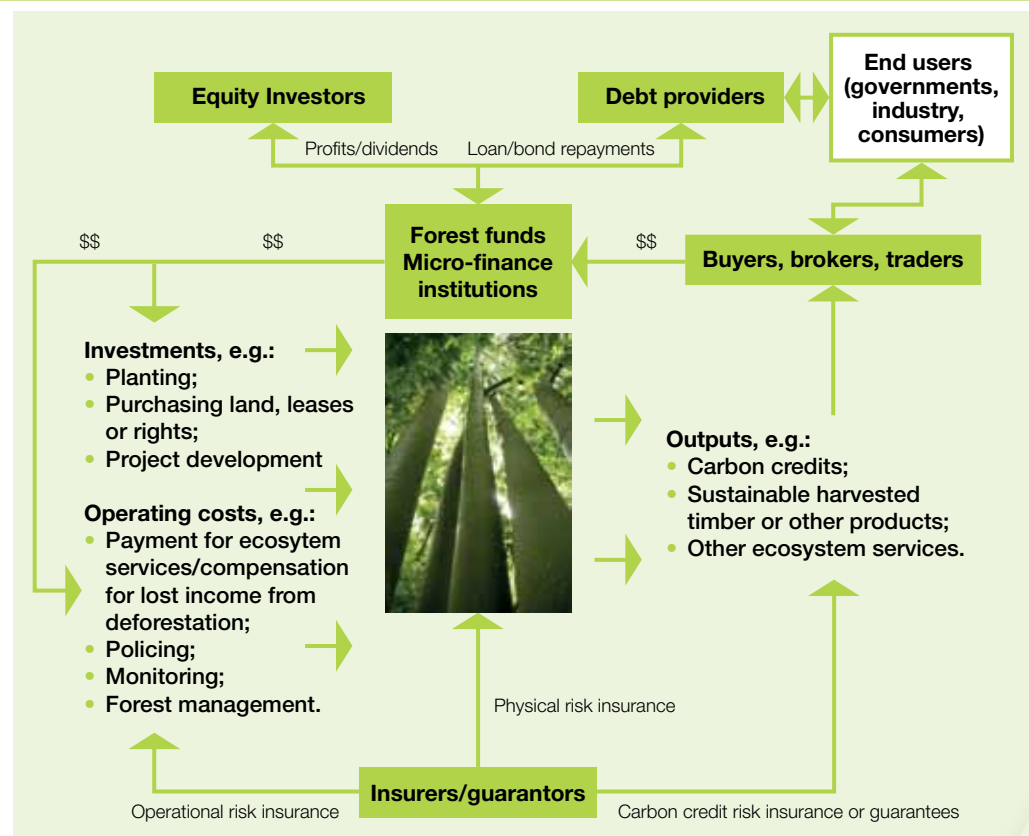
4.1 Roles for financial institutions in the forest-carbon market

A notable feature of carbon market mechanisms is that they typically provide ex-post revenue support via the generation and sales of some kind of carbon credit, rather than up-front investment for climate change mitigation activities. In other words, while the mechanism can provide a new potential future revenue stream for emission reduction or carbon sequestration activities, it is up to the private sector to source the up-front investment and to implement the project successfully over a certain period of time; only then will they start to receive a return on their investment. In addition, generally the revenue support originates in developed countries with mandatory emission reduction requirements, while the investment needs are in developing countries.

Financial institutions (FIs) can play a vital role in overcoming the spatial and temporal mis-matches between investment needs and available capital. The diagram below (Figure 5) provides a highly simplified representation of the major potential roles for FIs in the forest-carbon market.

Figure 5:

Overview of the major potential roles for FIs in the forest-carbon market



An essential requirement for any private sector investment proposition is that the risk-adjusted returns (on the right hand side of the diagram) should more than compensate the risk-adjusted costs (on the left hand side). Therefore one of the most important drivers of success is the amount of demand from end users of carbon credits – especially governments, industry and individual consumers (FIs themselves can also be end users, but their demand is small relative to the whole). If there is sufficient demand, then FIs can play various roles to move capital from developed to developing countries through brokerage and trading functions and from larger to smaller scale via micro-finance structures; to bring forward capital in time through forms of debt and equity investment and to reduce risks through off-take agreements, guarantees and insurance. These roles are discussed in further detail in the sections below.

1. Investors & fund managers

One option would be for financial institutions to invest their own equity directly into forestry projects, or into forestry project development companies or forest funds. An example of this is Bank of America Merrill Lynch investing in the Ulu Masen REDD project (see **Box 6**), possibly a model for what may increasingly happen as the policy outlook for REDD+ becomes clearer.

Box 6: Pilot investment in REDD+ for generation of pre-compliance voluntary carbon credits

The Ulu Masen REDD project covers an area of 750,000 hectares in Aceh province in the north of Sumatra, Indonesia. The project aims to generate 3.3 million carbon credits a year to finance conservation and development projects for local communities. The initiative is led by the Government of Aceh in partnership with Carbon Conservation International Pty Ltd and international environmental NGO Fauna and Flora International (FFI).

The project was the first REDD activity to be validated under the Climate, Community & Biodiversity (CCB) standards, and is planning to obtain additional accreditation under the Voluntary Carbon Standard (VCS) as well as other relevant standards as they emerge. In a major demonstration of confidence in the viability of REDD+ offsets as a potential to deliver future compliance-grade carbon credits, Merrill Lynch agreed a structured financial deal with the Government of Aceh, which enables the bank to purchase generated carbon credits at pre-agreed prices. The innovative deal includes an options premium, fixed volume off-take, and optional volumes spread over several years. It also includes an upside sharing agreement to ensure alignment of incentives among all parties involved in the deal.

Financial institutions can also act as intermediaries between third-party investors (whether government or private sector) and forestry projects, managing funds contributed by investors and finding and managing forestry projects in which to invest those funds (see example of the World Bank's BioCarbon Fund as a model for private-public partnerships in this area in **Box 7** and Macquarie Bank's REDD funds in **Box 8**).

Box 7: Mobilising resources for forest-carbon projects – creating a private-public fund

The BioCarbon Fund (BioCF) of the World Bank is a private-public initiative mobilising resources to pioneer projects that sequester or conserve carbon in forest and agro-ecosystems. Window 1 of the BioCF focuses on CDM-eligible projects and Window 2 on non-CDM projects, including REDD+ and sustainable land management, aiming to support the pioneering of new activities and expand the carbon market. Currently the BioCF has a portfolio of over 20 A/R CDM, 3 REDD+ and 2 sustainable land management projects.

The Fund, capitalized at \$90 million, became operational in 2004 shortly after the modalities and procedures for A/R CDM projects were finalized and even before the Kyoto Protocol entered into force in 2005. At a time of no experience and high uncertainty, the role of the World Bank was to catalyse a then nascent market and pave the way for the increased participation of public and private buyers. In 2004 and 2005, when there were no approved methodologies for A/R CDM, the first 17 projects entered the BioCF portfolio. Eight BioCF projects developed their own methodologies, seven of which were then approved by the CDM Executive Board and are now in the public domain. These early projects provided an opportunity to test the CDM rules and methodologies on the ground, which has also contributed to the publication of guidance, clarifications and tools by the UNFCCC.

The experiences made with A/R CDM projects demonstrate that these initiatives are not only mitigating climate change, but also improving rural livelihoods, conserving biodiversity, and restoring degraded lands. Their capacity to promote sustainable land management activities stabilises deforestation patterns and reduces pressure on natural forests, and should be seen as an effective tool for REDD+. On average, each dollar of carbon finance in the BioCF portfolio has leveraged approximately 7 dollars of underlying investment, half of which has come from private sources (this is the ratio of the net present value of the Emissions Reductions Purchase Agreement (ERPA), discounted at 10%, to the total underlying investment). It should however be noted that most project entities managed to blend different sources of investment to finance their projects – in the absence of carbon finance participating investors would not have financed the projects.

Financial institutions can also act as intermediaries between third-party investors (whether government or private sector) and forestry projects, managing funds contributed by investors and finding and managing forestry projects in which to invest those funds (see example of Macquarie Bank's REDD funds in **Box 8**).

Box 8: REDD+ fund management for the voluntary carbon market

In mid-2008, the Macquarie Group partnered with Fauna and Flora International (FFI), an international conservation NGO, to form the Macquarie-FFI Carbon Forests Taskforce, with the aim of directly investing in and jointly developing commercial REDD projects. Macquarie's role is to provide the required capital, financial services, structuring and sales and marketing, while FFI provides the forest sector expertise, in-country management and identifies potential projects.

At least three projects have been identified and are at various stages of development, with stakeholder mapping, community consultation baseline determination and carbon measurement underway. Macquarie is seeking investors in a REDD equity investment vehicle, established by Macquarie, which would invest in and generate income from the sale of REDD credits (initially in the voluntary carbon market, with the aim of transitioning to a future regulatory market) from the REDD projects.

Financing potential of forest bonds

Issuing 'forest' bonds for financing REDD+ and A/R would offer institutional investors a major new sustainability themed asset class. To date institutional investors have made direct investment in forests through specialist forestry funds, albeit at a relatively small scale. However, while buying the shares and bonds of forest-rich pulp and paper companies offers indirect exposure at a larger (financial) scale, it doesn't provide the same long term investment characteristics. Increasingly, fixed income institutional investors are also looking for ways to proactively address climate change; against this background traditional allocation

strategies are being re-examined and new products sought. Bonds markets could undoubtedly offer the scale and tenor of capital required; investor appetite for project/infrastructure, corporate and government bonds far exceeds that for private equity style forest funds.

However, while most agree that forest bonds are a promising option, key stakeholders express concerns including how the bonds will ultimately pay off and what their value will be if there is no political agreement on the future of REDD+ (O'Sullivan *et. al.*, 2010).

Research is ongoing; over the medium to long term, material progress is closely tied to enabling conditions, in particular the future shape of carbon markets and/or performance related payments for REDD+, and the role of governments in mitigating regulatory risk connected with these schemes.

One model envisages developed country governments or a multilateral institution issuing forest bonds to mobilise funds which they then pass on to developing countries in the form of loans. To be attractive these would clearly need to be on better terms than a beneficiary could access themselves under normal, commercial borrowing market circumstances, given their credit rating. Repayment options for such a bond could include a levy on insurance premiums, the auctioning from cap and trade schemes or levies on aviation and shipping fuels (O'Sullivan *et. al.*, 2010). A second model under discussion would see forest bonds issued directly by developing forest nations, either at national or sub-national level.

Financing forestry through securitisation

Securitisation is another way to provide up-front financing for REDD+ pilot projects. Key advantages of the securitisation model are the possibility of raising funds through an instrument other than REDD+ credits, and to do so within an already regulated and transparent framework. Securitisation differs from bond issuance in one important respect; investors buying 'asset-backed securities' (the product of a securitisation deal) directly 'invest' in the asset or group of assets financing the repayment. By contrast, bond investors are creditors of the issuer and they are not necessarily repaid from the cash-flows of the underlying, financed asset. The advantage of using asset-based rather than, for instance, 'themed' sovereign bonds is that the former could be packaged by any investors, or project sponsors themselves in a flexible, decentralised, disperse and needs-driven fashion

The disadvantages and barriers of securitisation in this context relate to the question of whether investors would be prepared to take on the risk associated with REDD+ securities which are not issued by a sovereign country. Investors such as pension funds may not be allowed to invest in such high-risk instruments. As a result of this risk, it is likely that securities would be listed at a highly discounted price, which would represent considerable value lost for REDD+ given the high cost of capital for the provision of upfront finance (O'Sullivan *et. al.*, 2010).

Securitisation can be attractive if an asset or group of assets can be structured to operate successfully independent of their originating entity. Underlying security and cash flow offered by the assets (and correlation between individual assets) are fundamental considerations in determining the viability of a securitisation.

An eco-securitisation of future REDD+ carbon revenue or performance based payments would likely involve assigning rights to a third party special purpose vehicle, which would in turn issue a series of REDD+ notes or forest-backed securities tradable in national or international capital markets.

2. Lenders

Banks and other lenders may be involved in lending to forest companies, leveraged funds or individual projects on a non-recourse basis, where the returns and expected cash flows are commensurate with their lending criteria. Debt finance can be particularly important for A/R projects, where most of the capital is required up-front (for planting and establishment) and returns are spread over long periods of time (as the trees grow). Many different sorts of debt instrument can be offered, from conventional 'senior' debt secured over assets such as land or a future stream of carbon credits (see **Box 9** below), to more innovative 'mezzanine' products such as convertible loans which revert to equity under certain conditions.

Box 9: Collateralised lending and afforestation - voluntary and compliance markets

The Plantar project involved the establishment of eucalyptus plantations in degraded areas that would be harvested after seven years and converted to charcoal for use in the pig-iron industry. Emissions reductions were to be generated by displacing the use of coal in the pig-iron industry through the use of renewable charcoal. This was the first Brazilian carbon project approved by the World Bank's Prototype Carbon Fund (PCF).

The PCF entered into a contract to purchase Verified Emission Reductions (credits for the voluntary market) from the project, with the hope that the project could eventually be registered as a CDM project and generate Certified Emissions Reductions (CERs). The PCF therefore took on all CDM risk. The PCF also agreed to pay for the emission reductions during the growth of the trees, rather than at the point of displacement of coal in the pig-iron industry. This resulted in revenue to the project starting in the project's second year, rather than the eighth year (when non-carbon revenue would also start from the sale of charcoal to the pig-iron industry).

This highly secure revenue stream, starting in the second year of the project, allowed the project to obtain a loan of US\$ 5 million from Rabobank Brazil, under which the repayment schedule was structured to match the expected payments from the PCF. As an added precaution, the payments from the PCF were made directly to the lender rather than to the project sponsor. This, coupled with actions of the Government, enabled Rabobank to consider the transaction 'country risk free' and eliminated the need to purchase country risk insurance, which was unavailable for Brazil at the time. The project therefore became bankable. Structuring the loan repayments to match the emission reduction payment schedule also enabled Rabobank to increase the loan term from two years without carbon finance to five years with carbon finance (Bishop, 2004).

Microfinance

One of the key challenges for REDD, in particular, is how to set up a sustainable, long-term framework for making small compensation payments to thousands of individual forest dwellers. Similarly, forest protection efforts may depend on extending small amounts of credit to smallholders to help them establish alternative livelihoods that do not involve deforestation or forest degradation. Microfinance institutions could play an important role in providing the necessary micro-payment and micro-credit infrastructure to support REDD. As yet, there are relatively few examples of this occurring in practice, but a pioneering model of how this could be achieved is described in **Box 10**.

Box 10: Microfinance

The Project de Gestion Intégré des Ecosystems Senegaises (PGIES) is a Senegalese government project, established in 2002 with funding from the Global Environment Facility (GEF), United Nations Development Programme (UNDP) and Government of Senegal. PGIES aims to promote community based integrated ecosystem management in the four most important eco-regions within Senegal. In all four areas the PGIES aims to reduce the rates of deforestation and forest degradation to preserve biodiversity and reduce emissions of greenhouse gases.

The PGIES's approach to community-based, integrated ecosystem management involves the establishment of a network of villages that are responsible for the management of a Reserve Naturelle Communautaire (RNC), a community nature reserve. Upon transfer of these forest reserves from the local government to the community, a management plan for the RNC is developed, which includes activities such as the establishment of fire breaks, surveillance by specially appointed eco-guards and active fire prevention by the community. Alternative livelihood activities are also supported, including vegetable gardening, animal husbandry and fruit tree planting. By reducing fire incidence and intensity, and by providing alternatives to the communities the pressure on the forests in the RNCs is reduced, thereby avoiding emissions from further deforestation and capturing carbon by allowing the forests to regenerate. These climatic benefits will be presented for carbon finance either as a project in the international carbon markets or in the future in the context of a national REDD+ incentive scheme

To further promote alternative livelihoods for local communities and reduce the pressure on the forest, the PGIES has established several micro-finance institutions to service members of the communities. These microfinance institutions provide low interest rate loans (10%) to its members for eligible "environmental activities", as determined by the microfinance institutions governing body. 5% of all interest payments are used to finance an Environment Fund which in turn is used to support the protection and rehabilitation activities undertaken within the RNCs. The project's hope is that these microfinance institutions and associated Environment Funds will become a sustainable source of financing for all activities undertaken to protect and manage the RNCs. In the PGIES project the microfinance institutions are relatively small local institutions that, through their investment into activities that avoid forest loss and restore forest biomass, will share in the project's carbon revenues. Alternatively, one could envisage a role for larger financial institutions in the management of such community-oriented microfinance schemes, particularly when significant scaling-up occurs. Though the contribution to the Environment Fund reduces profit margins this can be made up through a share in the project's carbon finance. Access to capital from a well-functioning scheme is essential for the success of a community-based ecosystem management scheme such as the PGIES in Senegal.

3. Insurers/guarantors

Financial institutions can play a crucial role in improving the viability of forestry projects by providing insurance products to cover, for example, the risk of physical damages resulting in increased emissions or reversals of carbon storage, or to back-up a credit buffer set aside for a similar purpose.

As previously noted, the CDM deals with the risk of non-permanence of carbon sequestered in A/R projects by issuing temporary credits which require periodic renewal. This characteristic of CDM A/R credits severely depressed demand, whereas demand has remained strong for voluntary market A/R credits such as those from the Verified Carbon Standard (VCS), which issues fully fungible, permanent credits, but requires sellers to put aside a buffer of credits which goes into a global shared insurance pool. The advantage of this buffer approach - over temporary crediting - lies in its simplicity and efficacy in attracting investment, such as the Nedbank–Wildlife Works REDD project described in **Box 11**. Alternatively, the insurance provided by a credit buffer could be provided – perhaps far more efficiently – by financial products issued by insurers. The Verified Carbon Standard Association is currently investigating the potential to allow the use of insurance products to back up a credit buffer system in this way - see **Box 12**. Forest insurance is therefore a largely untapped opportunity, and the climate change challenge creates a very strong stimulus for the insurance industry to unleash innovation in this emerging market⁸.

8 UNEP FI. 2008. Making Forests Competitive: exploring insurance solutions for permanence. UNEP FI Climate Change Working Group and UNEP FI Insurance Working Group.

Box 11: The Nedbank-Wildlife Works REDD Project - the first generation of Voluntary Carbon Units

In February 2011 Wildlife Works announced the Kenya-based Kasigua Corridor REDD project as the first to be issued Voluntary Carbon Units (VCUs) for REDD under the Voluntary Carbon Standard (VCS), demonstrating the potential of REDD projects to attract private investment.

The company's "Kasigua Corridor REDD project" protects over 500,000 acres of forest and brings the benefits of direct carbon financing to Kenyan communities while also securing the entire wildlife migration corridor between Tsavo East and Tsavo West National Parks. The project has generated 1.45 million carbon credits in its first six-year crediting period, and is estimated to reduce over 6 million tonnes of CO₂ equivalent over its 30 year project life.

Launched in 2005, early support for the project was given by Nedbank Group of South Africa, who have pledged a commitment to become Africa's first carbon neutral bank. Through a multi-million dollar carbon credit sale brokered by Nedbank Capital, Nedbank Group purchased 1.6 million VCUs from the project, and have the ongoing option to purchase 200,000 credits annually. Around 300,000 VCUs (around 20% of the initial credits issued) went into a VCS buffer account.

Building on the early financial support from Nedbank Group, Wildlife Works is now leveraging the extensive rural African experience it has gained and aims to expand this model to other REDD projects in Africa (and worldwide) with an aim to protect 5 Million hectares of native forest that will mitigate 25 million tons of CO₂ emissions annually. The success of the project has been confirmed by BNP Paribas announcing in September 2010 that it will invest 50 million USD to help develop the project, and it will have the option to buy up to 1.25 million VCUs (250,000 credits annually over 5 years) from the project's second phase.

Box 12: The Verified Carbon Standard Association's consideration of insurance products as an alternative to the mandatory buffer for forest projects

The Verified Carbon Standard (VCS) is the dominant standard in the voluntary carbon market, accounting for 35% of transaction volume in 2009 (Hamilton et al., 2010). First released in 2006, the VCS was able to learn lessons from the CDM and took a different approach to dealing with the risk of non-permanence in forest projects.

The VCS provides a tool to evaluate a project's risk of reversal, and the required percentage of credits to be placed in the buffer varies according to the evaluated risk. Some insurers and project developers have argued that this process results in overly conservative risk assessments, resulting in a lower volume of credits being available to the market than is strictly necessary from a risk management perspective. However, the VCS also allows credits from the pool to be released back to the project over time as they show an ability to mitigate risks. This provides an important incentive for projects to implement risk mitigation activities in order to receive a greater number of credits back from the pool. The buffer pool will also be 'trued up' over time based on actual project performance to ensure an adequate level of credits are maintained in the pool and appropriate buffer withholding percentages for projects.

An insurance product could potentially provide the same risk cover at a lower overall cost. A recent study conducted for the VCS Association showed a similar overall cost for an insurance product vs. the buffer pool, but reduced the up-front premium, which may be of interest to projects that face high start-up costs. The VCS Association is currently examining the feasibility of allowing project developers to employ approved insurance products as an alternative to the current requirements, and if allowed, what characteristics would need to be required of any such insurance product. It will be important to determine how an insurance product would function with the buffer pool, to ensure that the use of insurance products would not undermine the pool by reducing contributions or biasing the pool towards more risky projects. The VCSA will be undertaking this research in 2011.

For two years, UK-based forest insurer ForestRe has been involved in designing a forest carbon insurance product to support the Climate Action Reserve (CAR) initiative in California. The intent is that CAR will register many forest projects from all over the USA that meet CAR protocol standards, with these projects being able to sell registered carbon offsets to clients. To protect such sales and ensure that such sold carbon credits are not lost due to various hazards (natural, financial and political), a contribution is made to a buffer by all registered projects. The contribution of each project to the independently managed buffer is related to risk assessments laid down in the protocols. In providing natural hazard insurance cover, ForestRe runs risk assessment models on all immediate projects that may participate in the programme and register CRTs (Carbon Replacement Tonnes) with the registry.

Insurance is a potentially useful tool for mitigating investment risk in the forestry sector. A number of forestry insurance providers exist (see for example Forum for the Future & EnviroMarkets (2007)), though they have so far primarily focused on known and measurable risks such as natural events, as opposed to REDD-specific risks (such as the risk of 'leakage' and credits not being issued to a particular project due to an increase in emissions elsewhere in the country). Experience in dealing with risks specific to REDD+ activities and mechanisms is still limited and insurers will find it difficult to put together actuarial models for this due to a lack of information (O'Sullivan *et. al.*, 2010). As scale is important to insurers (the larger the scale, the easier it is to insure because it becomes more straightforward to balance risks and probabilities and hence to budget appropriately for payouts), it is likely that insurers will focus on larger areas, or even whole countries and regions. Insurance companies currently engaging with REDD+ include ForestRe, MunichRe and SwissRe (O'Sullivan *et. al.*, 2010).

Guarantees

Guarantees can form a valuable tool for mitigating risks and encouraging FI involvement in forestry projects. Guarantees can cover a number of risks and are especially useful for managing government-related risks (such as government implementation risk and country risk). Guarantees can range from unconditional performance guarantees to limited guarantees that cover specific events, are limited by time and/or capped at a certain amount (O'Sullivan *et. al.*, 2010). Guarantees are typically provided by host country governments (sovereign guarantee) and/or multilateral institutions such as the World Bank, MIGA and regional development banks. An example of what REDD+ guarantees can look like is provided in **Box 13**.

One of the key disadvantages of guarantees is that they only deal with the symptoms, rather than tackling the root causes of the risks and as such cannot constitute a viable long-term solution (O'Sullivan *et. al.*, 2010). Another shortcoming is that the scope for guarantors to issue guarantees is limited by their ability to cover the potential liability if those guarantees are called upon (Neeff and Ascui, 2009).

Box 13: World Bank partial risk guarantees and buffer account and guarantees

World Bank Partial Risk Guarantees are applicable when a REDD+ credit purchaser enters into a contract with a Government to pay upfront for future credit delivery. The World Bank extends a partial risk guarantee to the REDD+ purchaser covering the government's obligations under the REDD+ contract. This means that if the Government does not deliver the credits, then the World Bank pays the purchaser the agreed indemnity. If there is a payout, the Government then has to reimburse the Bank (World Bank, Accessed Oct 2010).

A national buffer can either act as the guarantor, or be guaranteed by a third party. In the first case (buffer as a guarantor), a national level buffer, which could be fed by a given percentage of credits from each project issuing in country, could act as a guarantee for projects taking place at the sub-national level. In the second case (buffer being guaranteed), a guarantor, such as the World Bank or even the government, could back the buffer ensuring that it has credits to pay out, thereby making the buffer all the more credible.

4.2 Opportunities: why should financial institutions be interested in the forestry sector?

The forestry sector, and REDD and A/R in particular, could be of interest to FIs for the following reasons (O'Sullivan *et. al.*, 2010; Streck *et. al.*, 2010):

- 1. Profit.** Aside from traditional forest gains, such as through timber and non-timber forest products, new profits can be made in the sector through the generation and export of carbon credits. In the forest sector this is at present largely limited to voluntary carbon markets which are small in size and weak in prices. The potential is expected to significantly increase, however, if carbon credits from avoided deforestation are recognised in regulatory markets post-2012. At present, only such credits from the creation of new forests (afforestation and reforestation) are tradable on official, regulatory markets.

- 2. Diversification.** Forest-based climate mitigation investments can constitute a viable opportunity for risk management by diversifying investors' portfolios, including such portfolios with an exposure to the forestry sector. Forest carbon prices are unlikely to be highly correlated with (for example) pulp or timber prices (at least initially – as there is more competition for limited resources, prices could become increasingly correlated).
- 3. Compliance.** Financial institutions or their clients may have emission reduction targets that they need to meet (for example in Kyoto Protocol Annex I countries), or they may expect such targets to be imposed in the future (for example in the case of a number of states in the USA). Investing in forestry can help meet these targets now (through A/R projects), or in the future if REDD+ is recognised in compliance markets.
- 4. Corporate social responsibility (CSR).** Financial institutions or their clients may be interested in demonstrating CSR through a financially competitive investment which, in addition, yields environmental and social returns. Such non-financial returns can be capitalised on via marketing and institutional positioning. Forestry projects can have especially interesting characteristics as they often result in a wide variety of significant sustainability benefits alongside reductions in greenhouse gas emissions.
- 5. Broader sustainability.** Forestry investments can indirectly lead to the provision of a variety of ecosystem services and sustainability benefits next to emissions reductions. These include enhanced water-cycle management, the retention of valuable soil, and landscape protection. Despite the current lack of systems of payments for ecosystem services revenue streams, these could lead to additional returns in the future, once such systems are established. The overall market value of payments for water-related ecosystem services and other ecosystem services were estimated at USD 5.2 and USD 3 billion in 2008, respectively (TEEB, 2010).

4.3 Risks identified in forest-carbon market activities

Forest-based mitigation activities are exposed to a number of risks which have acted and can continue to act as deterrents to financial institution involvement and investment. Key risks can be grouped into three main categories (Forum for the Future & EnviroMarkets, 2007):

1. Political risks (P), including:

- (1) *International policy risk* – For example, the risk that an international REDD+ agreement does not enter into force and as such there is no compliance market (at least at the UNFCCC level) for REDD+ credits. While this policy risk would not directly affect the voluntary markets, the latter is tightly linked to the compliance market and demand therein will also likely fall if there is no international agreement on REDD+ (O'Sullivan, Streck, Pearson, Brown, & Gilbert, 2010).
- (2) *Eligibility risk* – The risk that a country, region or project type is not allowed to participate in a REDD+ scheme as a result of an international or bilateral agreement (O'Sullivan, Streck, Pearson, Brown, & Gilbert, 2010).
- (3) *Government implementation risk* – The country does not successfully implement a REDD+ strategy and as such the framework conditions for REDD+ project implementation are not in place (O'Sullivan, Streck, Pearson, Brown, & Gilbert, 2010).

2. Market risks (M), including:

- (1) *REDD+ credits traded at a very low price* - This could happen if, for example, too many REDD+ credits are allowed to enter the market, or if emission reduction targets are not set sufficiently high (Streck, Lehmann, Rau, & Coren, 2010).
- (2) *Carbon market specific regulatory risks* – Any performance-based payment system where both demand and supply are created by government regulation will inevitably be subject to a number of unique regulatory risks, much like the risks currently affecting investments in the CDM (Ascui & Moura Costa, 2007). The experience of CDM A/R suggests that the way in which the potential non-permanence of forest carbon is

dealt with from a regulatory and carbon accounting perspective can ‘make or break’ investment in the sector (Neeff and Ascui, 2009). An equivalent challenge for REDD could be what has been termed ‘national baseline risk’ – i.e. the risk that a well-performing sub-national project will not receive credits due to poor performance elsewhere in the country affecting the national baseline (Neeff and Ascui, 2009).

Other REDD-specific risks might be associated with the rules for establishing (and possibly updating) national, regional or project-level baselines, the rules for measurement, reporting and verification, international rules for the transfer or use of credits and liabilities for error, fraud or other factors after transfer of credits.

3. (General) business risks (B), including:

- (1) *Natural events* – for example fire, wind, pest and disease;
- (2) *Country risk* – for example, political stability and security, non-carbon specific regulation and taxation, financial markets, quality of infrastructure and human resources (Forum for the Future & EnviroMarkets, 2007).
- (3) *Social risk* – Forest-based mitigation activities involve new relationships and financial flows that are likely to change the lives of some of the world’s poorest smallholders and forest dwellers. This may lead to unique risks associated with social confrontations.

4.4 Risk mitigation measures

A number of risk mitigation measures can be taken by both FIs and policy-makers to make forest-based mitigation activities investable, as illustrated in **Table 2** below.

Table 2:

Risks and risk mitigation options to make forest-based mitigation more attractive to FIs (O'Sullivan et al., 2010).

Risk category	Risk	Risk mitigation option	Available to	
			FIs	Policy makers
P	International policy risk	Early conclusion and entry into force of a clear, long-term and ambitious REDD+ agreement	✓	
		Contractual arrangements that define the obligations of the parties in the absence of an international REDD+ agreement		✓
P	Eligibility risk	Ensure the capacity for achieving and maintaining eligibility is in place		✓
		Ensure sufficient funding in the national REDD+ implementation to maintain eligibility		✓
		Establish warning systems if a country is likely to lose eligibility		✓
		Obtain a guarantee from the World Bank or developed country government	✓	✓
P	Government implementation risk	Design REDD+ scheme to reduce risk		✓
		Provide guarantees and insurance	✓	
M	REDD+ credits traded at a very low price	Negotiate appropriate price structures that reduce exposure to price volatility	✓	
M	Carbon market specific regulatory risks	Design REDD+ scheme to reduce risk		
		Assign risks to specialist intermediaries	✓	✓
		Define REDD+ proxies (such as payments per ha conserved) that could serve as a substitute for compliance-grade accounting systems, either in an interim phase or for specific countries		✓
B	Natural events	Establish better monitoring systems		✓
		Establish early warning systems		✓
		Provide guarantees and insurance	✓	
B	Country risk	Improve overall country situation	✓	
		Provide guarantees and insurance		✓
B	Social risk	Ensure projects are socially sustainable	✓	✓

P Political risks

M Market risks

B General business risks

5 Conclusions

This report provides an analysis of the opportunities, risks and roles for financial institutions (FIs) in the area of forest-based climate change mitigation. The forest-carbon market is attractive to both private sector actors, including financial institutions, and policy makers due to its large potential for abating carbon emissions in a cost-effective way, while providing an opportunity to achieve substantial co-benefits for biodiversity conservation and human development.

While the forestry sector presents new business opportunities for the private sector, a lack of both national and especially international regulation, as well as modalities that are not particularly friendly to the private sector, has meant that financial institutions and other private actors have been slow to get involved; high perceived levels of risk and a general lack of awareness of the opportunity have also added to the problem. However, with the right actions, regulations and modalities, policy makers and the private sector can ensure that forests and their services are attributed their true value and that investment at the needed scale is rapidly mobilised for meaningful reductions in deforestation and forest degradation and increases in reforestation and sustainable forest management.

Key messages and conclusions for financial institutions

- Currently, forestry projects are underrepresented in the CDM market (only 1% of the pipeline). This is related to the scope of forestry being limited to A/R activities in the CDM, the temporary nature of carbon credits that forestry projects can generate and the limited demand for them, due to their current exclusion from the EU ETS. In the voluntary market, on the other hand, forestry projects are well represented (24% of 2009 transaction volume) and there is high demand for them.
- There is still uncertainty about the form of a future REDD regime, which will depend on an international agreement being reached in the context of post-2012 climate negotiations. However, a number of activities (mainly REDD-readiness and pilot activities) are underway across the developing world and are being financed primarily through multilateral and bilateral public sources. It can be expected that - other than for capacity-building, preparatory and pilot activities - public funding will not be sufficient to 'implement' REDD+ projects and programs at the needed scale and speed.
- Financial institutions can take and are already taking important roles in getting forestry projects off the ground. Key roles that FIs can assume include for investment managers to invest their own funds into forestry projects, forestry project development companies and forest funds or act as brokers or intermediaries. Debt finance can take the form of lending to forest companies, leveraged funds or individual projects on a non-recourse basis. Insurance and guarantees are a crucial way to manage both conventional investment risk in the forestry sector, as well as such risks which are more specific to forest-carbon endeavours.
- FIs' interest in the opportunities offered by REDD+ is due to the potential for profits, portfolio diversification, compliance, CSR, broader sustainability and political imperatives.
- Key risks that FIs will need to face when investing in REDD+ include political risks, such as international policy risk, eligibility risk, government implementation risk; market risks, such as a low price for REDD+ credits and carbon market-specific regulatory risks; and other more general business risks such as natural events, county and social risks
- There are a number of tools available to FIs that can help mitigate the risk associated with forestry projects. These include guarantees, insurance, (forest) bonds and securitization.
- In order to be interesting to FIs, forest-based mitigation activities need to contain elements that guarantee:

- Return on investment commensurate with the risk.
- Transparent and efficient procedures for gaining government approval of REDD+ initiatives, projects and activities.
- Clarity on ownership, acquisition and transfer of forest carbon asset rights, including the potential to seek leases, concessions, or other recognized interests or securities in land or forest that are consistent with REDD+ project life periods.
- Investment laws or guarantees granting assurance that REDD+ credits or investments will not be subject to expropriation by host countries.
- Decisions on government levies or taxes on REDD+ credits or profits, or any de *minimus* national requirements on benefit sharing.

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The United Nations Environment Programme Finance Initiative (UNEP FI) is a global partnership between the United Nations Environment Programme and the private financial sector. UNEP FI works closely with the nearly 200 financial institutions that are Signatories to the UNEP FI Statements, and a range of partner organisations, to develop and promote linkages between the environment, sustainability and financial performance. Through regional activities, a comprehensive work programme, training activities and research, UNEP FI carries out its mission to identify, promote, and realise the adoption of best environmental and sustainability practice at all levels of financial institution operations.

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The Biodiversity & Ecosystem Services Work Stream (BESWS) is based on the need to engage the financial services sector in identifying and addressing the challenges arising from the loss of biodiversity and the degradation of ecosystem services.

About the Climate Change Working Group (CCWG)

UNEP FI channels its work on climate change through the Climate Change Working Group (CCWG). The CCWG's membership is diverse, ranging from banks, over insurers and re-insurers, to capital market actors, with a wide array of knowledge and expertise and open to all regions of the world.

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