



# BUILDING NATURAL CAPITAL:

## HOW REDD+ CAN SUPPORT A GREEN ECONOMY

UNITED NATIONS ENVIRONMENT PROGRAMME



# Acknowledgements

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# **BUILDING NATURAL CAPITAL:**

## HOW REDD+ CAN SUPPORT A GREEN ECONOMY

By UNEP International Resource Panel Working Group on Reducing Emissions from Deforestation and Forest Degradation (REDD+) and a Green Economy



# Foreword



Forests and the services they provide are vital to sustainable development and human well-being, whether in terms of storing carbon, supporting the world's richest reservoir of terrestrial biodiversity, regulating water flows, reducing soil erosion, or providing a source of nutrition, timber and valuable genetic resources. The ecosystem services provided by tropical forests are estimated to be worth an average of US\$ 6,120 per hectare per year.

Despite this clear macro-economic case, the total yearly forest loss averages 13 million hectares per year— equivalent to the surface of a football field being destroyed every three seconds. The scale of forest loss and degradation is indicative of the failure of institutions to sufficiently take into account natural capital considerations when planning and implementing national economic and developmental policies and projects.

UNEP is working to address this issue through global initiatives, such as: The Economics of Ecosystems and Biodiversity, the Intergovernmental Panel on Biodiversity and Ecosystem Services, and the Natural Capital Declaration. And across the United Nations System, progress in addressing tropical deforestation is being made through efforts such as the Global Compact, and the UN-REDD Programme, a collaborative initiative between UNEP, and UN Development Programme, and the Food and Agriculture Organization.

The report examines some of the underlying causes of deforestation and forest degradation. It describes possible solutions in the context of a wider transition to an inclusive Green Economy, which is vital to achieving the emerging post-2015 sustainable development agenda. The report is published at a time when the United Nations approach for Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD+) under the UN Framework Convention on Climate Change is coming into its own. At the 19th Conference of the Parties in Warsaw, member states adopted the 'rulebook' for REDD+ implementation.

Pledges from donor countries such as the US, Norway and the UK mean the initiative is now backed by US\$ 6.27 billion. This clear policy signal brings additional momentum to REDD+ and opens new opportunities to attract private-sector investment to conserve the world's forests.

REDD+ is a bold pilot project that offers an opportunity for countries to pursue a more sustainable development pathway through the conservation, restoration and sustainable management of forests. REDD+ is an important catalyst for achieving an inclusive Green Economy. The true value of forests comes to life when national and local decision-making processes are directed towards natural capital investment, supporting livelihoods and achieving sustainable economic growth.

At the same time, there is a need to create the enabling conditions required for REDD+ to succeed; from good governance and sustainable financial mechanisms to the equitable distribution of benefits. These enabling conditions are themselves the building blocks for an inclusive Green Economy.

The report seeks to improve knowledge about how REDD+ initiatives and a Green Economy transition can better inform each other and contribute towards poverty alleviation and sustainable development. It is the first in a series of products from UNEP that aim to help countries achieve high socio-economic returns for their investment in REDD+ and green economic development.

**Achim Steiner**  
**Executive Director of the United Nations Environment Programme**



Johanny Sawadogo,  
head of the Provincial  
Forest Service,  
training beekeepers  
to maintain hives and  
collect honey in Yalka,  
Burkina Faso.

Ollivier Girard /  
CIFOR

# Preface from the International Resource Panel Co-Chairs

Climate change is an increasingly critical issue, calling for a concerted response by all citizens. Despite the severity of the issue, the necessary collaborative efforts seem scarce on the ground. One welcome exception is REDD+, an effort led by the United Nations Framework Convention on Climate Change to reduce greenhouse gas emissions from deforestation and forest degradation in developing countries, along with conservation, sustainable management of forests and enhancement of forest carbon stocks.

If systematically pursued, REDD+ could address both climate change and the preservation of the world's tropical forests, while also protecting biodiversity and improving hydrological cycles and soil stability. But it is just getting started, with most of the countries that are collaborating in the effort still developing the capacities and policies to put REDD+ into practice on the ground.

On 19-20 June 2013, the UN-REDD Programme convened a Global Symposium on REDD+ in a Green Economy, which explored the ways that REDD+ could be linked to an accelerated effort, initiated at the 2012 Rio+20 United Nations Conference on Sustainable Development to nudge the world's governments and the private sector toward a Green Economy. Concerned governments and progressive businesses are taking some initial steps in this direction, and making major investments to put their economies and operations on a more sustainable basis.

Building on the findings of the Symposium, UNEP's International Resource Panel convened an international Working Group on REDD+ in a Green Economy, composed of experts from a wide range of relevant technical fields, including economists, social scientists, foresters, and spatial planning experts. Over the past six months, the Working Group has synthesized the views of some of the great diversity of stakeholders with an interest in REDD+ and a Green Economy, or in either of these two seemingly disparate initiatives, leading to this report. The vision was that REDD+ could be a catalyst for building broader support for a Green Economy, and that the global interest in a Green Economy could support REDD+ and contribute to its implementation.

Key findings show that REDD+ can help correct the market, policy, and institutional failures that undervalue the more serious climate change mitigation services provided by forest ecosystems, as well as secondary services. If designed well, REDD+ can thereby contribute to the key elements of a Green Economy: low carbon development, social inclusiveness, increased human well-being, and respect for natural capital. It can thus directly serve the interests of the millions of people in developing countries who directly depend on the forests for survival. We anticipate that this report will stimulate further thinking about REDD+ in the larger context of sustainable development, to which it can deliver an essential contribution.

**Dr. Ernst Ulrich von Weizsacker, Emmendingen, Germany**  
**Dr. Ashok Khosla, New Delhi, India**  
**Co-Chairs, International Resource Panel**  
**January 2014**

Non-timber forest products (NTFP) on sale at the village market in Sabo Ouagadougou, Burkina Faso.  
**Ollivier Girard / CIFOR**



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# Acronyms used

<b>AMC</b>	Advance Market Commitment
<b>CBD</b>	Convention on Biological Diversity
<b>CEO</b>	Chief Executive Officer
<b>CGF</b>	Consumer Goods Forum
<b>CHP</b>	Combined Heat and Power plants
<b>CSR</b>	Corporate Social Responsibility
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FLEGT</b>	Forest Law Enforcement, Governance, and Trade
<b>GE</b>	Green Economy
<b>GEF</b>	Global Environment Facility
<b>GEO</b>	Global Environment Outlook
<b>GGGI</b>	Global Green Growth Institute
<b>GNP</b>	Gross National Product
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IRR</b>	Internal Rate of Return
<b>LULUCF</b>	Land use, Land-use change, and Forestry
<b>PES</b>	Payments for Ecosystem Services (or Payments for Environmental Services)
<b>REDD</b>	Reduced emissions from deforestation and forest degradation in developing countries
<b>REDD+</b>	Reduced emissions from deforestation and forest degradation in developing countries, and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks
<b>SEPC</b>	Social and Environmental Principles and Criteria of the UN-REDD Programme
<b>SME</b>	Small and Medium Enterprises
<b>tC.</b>	Tons of carbon
<b>TEEB</b>	The Economics of Ecosystems and Biodiversity, a project that developed economic tools for dealing with elements of a Green Economy
<b>UNCTAD</b>	United Nations Conference on Trade and Development
<b>UNDP</b>	United Nations Development Programme
<b>UNEP</b>	United Nations Environment Programme
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UNGA</b>	United Nations General Assembly
<b>UN-REDD</b>	The United Nations collaborative initiative on Reducing Emissions from Deforestation and forest Degradation in developing countries (UN-REDD Programme)
<b>WBCSD</b>	World Business Council for Sustainable Development
<b>WEF</b>	World Economic Forum
<b>WRI</b>	World Resources Institute



Nyungwe Forest National  
Park, South Province,  
Rwanda, sources for both  
the Congo and White Nile  
Rivers. Jad Davenport.  
**National Geographic /  
Getty Images**

# Executive Summary

REDD+ is the approach adopted by the United Nations Framework Convention on Climate Change (UNFCCC) to reduce greenhouse gas emissions from forests. REDD+ stands for reducing emissions from deforestation and forest degradation in developing countries, plus conservation, sustainable management of forests and enhancement of forest carbon stocks (UNFCCC, 2010). If systematically pursued, REDD+ would bring new momentum and new funding to the task of preserving the world's forests. REDD+ is already delivering important outcomes as it brings further world attention to the conservation of tropical forests, monitoring the state of forests, and the contributions of people living in and around forests.

A Green Economy is defined by UNEP as “an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities.”

The primary conclusion of this report is that many synergies between REDD+ and the ongoing transition to a Green Economy are currently under-utilized. Realizing these synergies will accelerate the transition while maximizing the return on REDD+ investments.

REDD+ can be an important support element for achieving a Green Economy. On the other hand, REDD+ is likely to be successful only if it is supported by an enabling environment that includes Green Economy elements such as good governance, law enforcement, land tenure reform, sustainable supporting financial mechanisms, equitable distribution of benefits, and valuations and recognition of natural capital.

This report provides a concise summary of the elements necessary for integrating REDD+ into a Green Economy. It provides **policymakers** with innovative ideas for supporting economic development while maintaining or increasing forest cover. **Those promoting a Green Economy** can see how REDD+ can add important momentum to their efforts, especially complementing pro-poor strategies. **Business leaders** will learn how REDD+ and the Green Economy can improve investment conditions, leverage their investments, and ultimately increase long-term returns on investments. **Students and the general public** will increase their understanding of

why REDD+ and the Green Economy together provide a pathway to sustainable development that benefits all countries.

Why is this important? Symptoms of climate change such as droughts, wildfires, and torrential rains and even cyclones have caused increasing damage throughout the world. Sea levels are rising and the oceans are becoming more acidic. These expressions of climate change have contributed to the volatility of prices for natural resources, with the costs of food and energy continually increasing the world over. Socio-economic hardship can and does precipitate civil unrest. Many national economies, even among high-income countries, are operating under tight budgets that reduce social support for the poor.

These challenges are being addressed by many different government agencies, and at times with opposing agendas. However, in order to achieve sustainable development these challenges are increasingly recognized as being connected, and due to their complexity e.g. socio-economic improvement but not at the cost of environmental degradation – have been called ‘wicked problems’. Not surprisingly, many governments are searching for ways of dealing with these problems simultaneously; realizing that only a comprehensive and integrated approach is most likely to be sustainable and effective. **One dynamic concept for reaching sustainability is called a Green Economy.** The integrated approach at the foundation of **a Green Economy puts investment in natural capital at the center of improving human well-being.**

While designed for developing countries, REDD+ can also provide important sustainable management lessons for the major carbon intensive and carbon-emitting developed countries. Developed countries also need to address forest-related climate issues. Finally, REDD+ could well become the world's largest payments for ecosystem services (PES) scheme once it is fully implemented, so lessons learned could be widely applicable.

REDD+ is a bold initiative based on Green Economy principles. As it becomes more widely implemented, it has the potential to:

- enhance the focus on the benefits of standing forests and the full socio-economic costs and wider environmental impacts of their degradation or destruction, in particular on biodiversity, soils and water flows;
- encourage governments to clarify land tenure and improve forest and land-use governance as a prerequisite for REDD+;
- generate new funding for sustainable forest management;
- demonstrate that sustainably-managed forests are part of overall landscape management that involves multiple government sectors and stakeholders while representing public and private interests;
- help leverage other investments, especially from the private sector, for the transition toward inclusive green economies that lead to sustainable development; and
- create inclusive, informed and participatory decision-making processes at appropriate scales (landscape and other) where trade-offs between development and conservation objectives are better understood with more balanced outcomes secured across a range of values.

Drawing on the experience of REDD+ and other sustainable resource management initiatives, this report advocates placing REDD+ into a larger Green Economy framework. Integration of REDD+ into all economic planning processes is essential because (a) deforestation and forest degradation are ultimately driven by consumption patterns and processes in virtually every sector of the economy, and (b) Green Economy innovations resulting from REDD+ have the potential to increase the resource efficiency of many of these sectors. REDD+ could thereby **add value to the many other initiatives** that are being implemented within these sectors. No longer simply an intriguing pilot effort, a successfully implemented REDD+ would take its place as a key element in a Green Economy.

As demonstrated by examples presented here, **REDD+ is already helping to develop environmental and social safeguards and standards** that can be more widely applied to investments in a Green Economy. Activities supported by REDD+ can also be designed to increase income from increasing output on land under cultivation, develop new “Green” industries,

forest-based ecotourism, and sustainable production of specified commodities for which demand is increasing. These complementary revenue streams both increase the value of standing forests (via REDD+ payments) and help address the drivers of deforestation (by encouraging increased output on land already under cultivation). The diversified sources of income generated by such projects hedge against risk, which is reassuring to potential investors. Quantifying such benefits can help to specify the opportunity costs of clearing forests, underlining the importance of REDD+.

REDD+ could also help economies increase human well-being while reducing per capita consumption of resources, including timber. Policy instruments that could be used include:

- **fiscal instruments and incentives** (such as public payments like those being provided by REDD+, markets for carbon sequestration and other ecosystem services, and others), supplemented by **reducing economic incentives that drive deforestation**;
- **information policies** that help ensure that both decision-makers and the general public are well aware of the multiple values of forests, perhaps enhanced through measures such as certification schemes;
- **regulations** that may include new laws, stronger law enforcement, new approaches to tenure in forests, binding safeguards, and so forth;
- **increased options for funding** beyond REDD+ to include private payments for other ecosystem services, tax concessions, voluntary offsets, resources to support financial risk mitigation strategies such as Advance Market Commitments, and many others; and
- **continuing research** to quantify costs of inaction, increase understanding of the required changes to fiscal incentive frameworks, and the values of multiple forest benefits, support development of innovative strategies to conservation, and increase the benefits they provide.

The largest challenge for REDD+ in coming years will be to generate the estimated US\$ 30 billion per year for REDD+ performance based payments from 2020 onwards. The report examines the possible role of the private sector in this regard, and it also calls for increased



Consumption practices  
– and drivers affecting  
tropical deforestation  
– also need to be  
addressed.

**Katrina Wittkamp /  
Getty Images**

public investments in and for continuing political support to REDD+, coupled with significantly reduced subsidies for activities that contribute to climate change (for example, fossil fuels were the object of direct pretax subsidies of US\$ 480 billion in 2011). In fact, re-directing current subsidies that are harmful to biodiversity or detrimental to climate change mitigation into REDD+

payments may be one solution for generating longer-term REDD+ finance. Increasing public and private investments in REDD+ would create productive, profitable, and sustainable landscapes that sequester and store more carbon and will enable enhanced delivery of environmental services – the heart of a Green Economy.

## Key recommendations

The report highlights the potential synergies between REDD+ and the transition to a Green Economy. Realizing these synergies, and the resulting increased return on REDD+ investments and accelerated transition to a Green Economy, will require the following developments:

**(1) Greater private sector engagement, and changes in fiscal incentive frameworks:**

Scaling up REDD+ requires the innovative capacity and resourcefulness of the private sector. Public-private partnerships will be essential to deliver REDD+ in a way that also enhances multiple social, environmental and economic benefits, as a basis for a Green Economy transition. At the same time, fiscal incentive frameworks which are currently encouraging harmful practices (such as certain agriculture subsidies, and fossil fuel subsidies) should be harmonized with REDD+ and Green Economy objectives.

**(2) Creating a demand for REDD+:**

Generating the required amount of funding for performance-based REDD+ payments at scale, and creating the required modalities and capacity for REDD+ to effectively function as the first-ever global system of a payment for an ecosystem service remain the major challenges for REDD+ in coming years. Donor countries must recognize and fulfill their role in financing REDD+, as part of a mix of possible funding options. Creating the right enabling conditions and clear rules of engagement for large-scale private sector investment, on the basis of strong safeguards, is part of this responsibility.

**(3) More focus on non-carbon benefits:**

REDD+ needs to expand to give significantly greater attention to non-carbon benefits, and new ways for financing these benefits should be devised (including through the bundling of Payments for Ecosystem Services, such as watershed management payments with REDD+ payments). To date, REDD+ activities have focused mostly on reducing greenhouse gas emissions from forests, but this will not ensure delivery of multiple benefits, nor are REDD+ payments alone likely to be able to compete with the main drivers of deforestation in most REDD+ countries.

**(4) More social inclusiveness:**

The legitimacy of REDD+ depends on legal clarity over which institutions have the

Tourists hiking in Amazon Rainforest. Tourism is an important form of Payments for Ecosystem Services.


Danita Dellmont / Getty Images







authority to make decisions, who has the right to participate in the decision process, who has tenure and rights over forests, and ultimately who receives REDD+ payments. REDD+ must build support among a wider variety of stakeholders and ensure equitable sharing of its benefits. The issue of forest tenure has received unprecedented attention under REDD+, and it is important that the progress in this area informs a wider Green Economy transition. Likewise, the principles of full and effective participation of key stakeholders, and of free, prior and informed consent should become the 'new normal' for any major investments under a Green Economy.



Red-eyed tree frog (*Agalychnis callidryas*), Costa Rica. Amphibians are extremely sensitive to environmental hazards such as the clearing of forest and climate change.

**Daniel N. Proud**

# 1

## CHAPTER

Sustainable development and forests in a changing climate

# Sustainable development and forests in a changing climate: The base of a Green Economy

## 1.1 The links between economic growth and natural capital

Humanity is at a crucial point in its development from a vast diversity of small hunting groups toward a globally connected civilization with high levels of human well-being that can long endure. Since the time of Adam Smith (1723-1790), economists have sought policies and theories to convert natural resources into economic goods and services that improve human welfare and create new forms of capital, including human, physical, and financial stocks of wealth.

Considerable progress has been made. On average, life expectancy, health care, and access to food, material goods and leisure today is vastly superior to that of earlier generations. But over 800 million people still live in poverty, struggling to earn their fair share of goods and services. Over the past hundred years, production of goods and services has increased twentyfold in the world as a whole, while the human population has increased by a factor of about four (Krausmann, et al. 2009).

Much of the agricultural expansion that underpins population growth and increased human well-being has come at the expense of forests. Figure 1.1 shows the link between population growth and deforestation since 1800, which supports the quote attributed to the French writer and historian François-René de Chateaubriand (1768-1848): "Forests precede civilizations and deserts follow them".

However, in the mid-1990's the global deforestation rate started to be decoupled from population and economic growth. More people moved to cities, with over half the world's population now urbanized. This unprecedented change offers both opportunities and challenges for resource use. People living in cities often use resources more efficiently (such as transport and housing) but still depend on a flow of goods and services from the rural countryside whose conditions

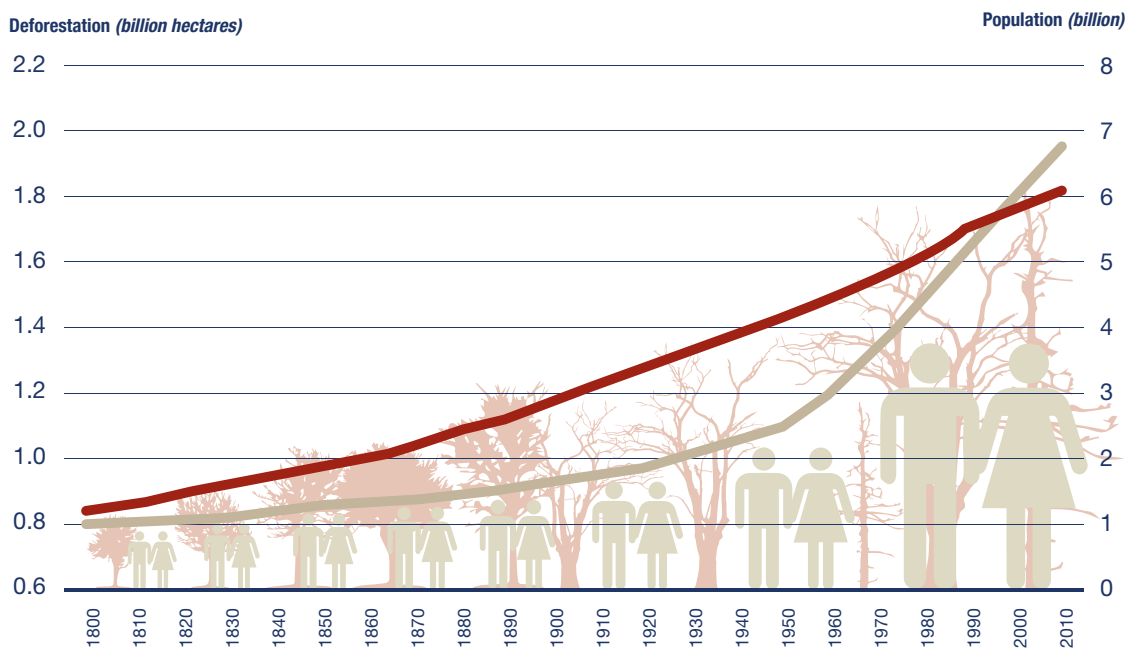
fade into distant memories. The challenge facing modern societies is **how to continue improving human well-being while consuming fewer resources more efficiently in the process (in other words, decoupling improved welfare from unsustainable consumption).**

With a human population now exceeding seven billion and growing toward nine billion, the demand on natural resources is growing quickly and the planet may have already exceeded its ecological carrying capacity (Best et al., 2008). Judging from the pressure that consumption is putting on natural resources, they need to be managed more efficiently. Already, the vital life-support functions that nature's ecosystems provide to people, and all other species, are becoming better appreciated by both governments and the informed general public. Small but significant actions, while yet to generate a transformational shift, demonstrate this increasing appreciation. Citizens are pushing their governments to expand their economies and provide more equitable benefits to people while maintaining or improving environmental quality. More businesses are moving towards accounting for natural capital in their supply chains and balance sheets, and are integrating ecosystem values in their decision making (WBCSD, 2011).



Children scour rubbish dumps daily in city slums around the world for survival, such as this one in Dhaka, Bangladesh. **Danita Dellmont / Getty Images**

Figure 1.1 World population and cumulative deforestation, 1800 to 2010



SOURCE: FAO (2012)



Crowded apartments in a densely populated area of Caracas, Venezuela.  
Alberto Pomares / Getty Images

Many voices are calling for putting sustainable development at the core of the post-2015 framework that will follow the Millennium Development Goals, as by the UN Secretary General's High Level Panel of Eminent Persons on the Post-2015 Development Agenda, (HLP,

2013). But economic growth as currently practiced could deplete natural capital, thereby undermining a country's resources needed to generate growth in the future (Hamilton and Atkinson, 2006). New models are required.

## 1.2 Ecosystem services and their values

The Millennium Ecosystem Assessment (MA, 2005) thoroughly examined the benefits people receive from the functions of ecosystems ("ecosystem services"). Based on the work of over 1300 of the world's leading scientists, the assessment found that over 60 per cent (15 of 24) of the ecosystem services examined are being degraded or used unsustainably; and of the five main drivers of the degradation of ecosystem services, climate change was the only one whose impact was increasing very rapidly for all types of ecosystems. UNEP (2012) has brought data on the global environment up to date in its Fifth Global Environmental Outlook (GEO), adding support to the 2005 assessment. The Economics of Ecosystems and Biodiversity (TEEB 2010)



Two men sitting on the banks of the stagnant Yangtse River in Chongqing city, China. **Mark Horn / Getty Images**

provided an economic case for conserving biodiversity and ecosystem services, showing that the benefits far exceed the costs, but this critically important message has not yet been as influential as it deserves to be in redirecting budgetary allocations.

The situation calls for urgent action. In addition to the multiple risks posed by climate change, the GEO 2012 and IPCC (2013) confirmed other worrying trends:

- Wetlands, including rivers, lakes, peat lands and marshes, are among the most seriously disrupted ecosystems; water withdrawals, habitat loss and fragmentation, and pollution by excess nutrients, sediments, salts, and toxins have significantly impaired ecosystem function and caused significant greenhouse gas emissions in most major drainage basins, with some large rivers even failing to reach the sea;
- In the arid parts of the world, a large, growing, and poor population often contributes to a vicious cycle of water scarcity, cultivation on marginal lands, overgrazing, and overharvesting of trees;
- Tropical forests, a major carbon storage system, are being over-harvested and cleared for agriculture, threatening both the global climate and local well-being and leading to an irreversible loss of biodiversity, degradation of soils, and disruption of water flows;

- Some climate models project that the cumulative residual land sink may turn into a residual land source of CO<sub>2</sub> in the course of this century.

Some of these trends contribute to climate change, while others will be exacerbated by it. Global warming, especially in the Arctic, could release even more greenhouse gases with the melting of permafrost, and sea level rise driven by climate change has already forced some coastal communities to relocate. Recent droughts have affected food production in North Africa, the Middle East, North America, Central Asia, and Australia, leading to increasing food prices (exacerbated by other factors such as biofuel mandates that consume increasing amounts of the corn/maize crop and increased meat consumption that is consuming 50 per cent of protein crops as animal feed). Tropical storms are becoming more ferocious and economically damaging, as anticipated by climate change scientists, even as the pattern of rainfall becomes less predictable. Substantial climate change impacts on forest ecosystems and large-scale dieback may be observed as early as 2025 (Vergara and Scholz, 2011). And disastrous floods are swamping North America, Europe, China, Brazil, Indonesia, India, and Australia (among others, see [www.globaldisasterwatch.com](http://www.globaldisasterwatch.com)) at an unprecedented rate.

While no single weather event can be attributed to climate change and damage results to an extent

from poor planning, the pattern of these events is unmistakably leading toward an uncertain and challenging ecological future (IPCC, 2007). These negative carbon feedbacks (e.g. maladapted forests dying from anthropogenic climate change and releasing even more CO<sub>2</sub>) would be one of the most obvious tipping points humanity needs to anticipate and prevent in order to contain climate change rate and magnitude within viable ranges (Barnosky et al., 2012).

The ecological and resource crises that modern societies currently face are far more serious than the recent financial crisis, as they threaten the foundation of the economic system and continued human development. The problems have been long recognized, but are now becoming acute. The UN Secretary-General's High-Level Panel on Global Sustainability (2012) concluded that the current economic model is "pushing us inexorably towards the limits of natural resources and planetary life support systems".

### 1.3 The evolution of REDD+

Sustaining the prosperity that the public has come to expect will require a rapid transition to a greener global economy that decouples unsustainable resource consumption from human well-being. History indicates that humans generally have not been good at dealing with incremental problems with long lead-in times. Instead, people (and governments) tend to act only when an issue becomes too acute to ignore. However, such procrastination means that many options for productive solutions are no longer available (or much more expensive) and the likelihood of arriving at sub-optimal, even irreversible, outcomes becomes greater.

The 1992 Earth Summit in Rio de Janeiro adopted, among other measures, three critically important conventions, the United Nations Framework Convention on Climate Change (UNFCCC), the UN Convention on Biological Diversity (CBD), and the UN Convention to Combat Desertification (UNCCD). These ambitious international agreements, with virtually universal coverage, have taken important, though still insufficient, steps toward sustainable development. Each of them calls for the preparation of national plans to address the objectives of the respective convention, and funding has followed for developing countries from both bilateral and multilateral sources (especially through the



Flooded homes after hurricane in Barquita, Santo Domingo.  
Marvin del Cid / Getty Images

Global Environment Facility). Many organizations of the United Nations system, the World Bank, regional development banks, many bilateral agencies, and nearly all governments have supported the implementation of these conventions along with numerous other initiatives aimed at achieving the objectives of sustainable development.

Despite the ambitious commitments, the 2012 Global Environmental Outlook warns about the slow pace of progress toward finding forms of development that improve human well-being without significantly depleting natural resources. At the 2012 Rio Conference, more voices were raised in support of a new approach to achieve sustainable development, known as a "Green Economy" (described in more detail in Chapter 2).

A Green Economy depends on healthy forests because of the many valuable ecosystem services they provide, beginning with carbon sequestration but including numerous others that will be discussed in this report. With proper incentives and oversight, sustainably managed forests theoretically could provide wood and fiber on an ongoing and renewable basis for biomass-based energy and use in building and construction materials, pulp, paper and packaging board, newsprint and tissue products, all of which are also reusable and recyclable. New and innovative uses of fibre are quickly emerging, including in the fields of electronics, food, pharmaceuticals, chemicals, biofuels and



REDD+ discussions at the Global Landscape Forum at COP 19 for UNFCCC in Warsaw, Poland (Dec 2013).

Neil Palmer (IWMI) / CIFOR

bioplastics, with sustainable forest management the key strategy to increase fibre production as demand for forest based “green” business solutions expands (WWF, 2012).

Forests also support the world’s richest bank of terrestrial biodiversity and support the livelihoods of some 1.6 billion people (though the entire global population gains at least some benefits from forests). But the forests are also facing some daunting problems. According to the Millennium Ecosystem Assessment (2005), forests have effectively disappeared from 25 countries and more than 90 per cent of the former forest cover has been lost in a further 29 countries. Globally, the tropical forests are not being managed sustainably, with a total forest loss averaging about 13 million hectares per year between 2000 and 2010 (FAO, 2011).

This continued clearing of forests represents a major anthropogenic source of carbon dioxide to the atmosphere, second only to fossil fuel combustion. Contributing 12-20 per cent of the global emissions of carbon dioxide, especially from the burning of forests growing on peat soils (Van der Werf et al., 2009), forests have received considerable attention from the UNFCCC, giving rise in 2005 to an initiative called REDD (Reducing Emissions from Deforestation and forest Degradation in developing countries). In 2010, the initiative was expanded to REDD+ to include the role

of conservation, sustainable management of forests, and enhancement of forest carbon stocks as part of its original climate mitigation mandate.

For REDD+ to achieve its objectives, it must form part of a large diversity of other investments aimed at supporting an enabling environment for sustainable land use. Some of these investments may be needed before REDD+ can be fully implemented, for example by supporting new legislation, clarifying land tenure, and implementing policies that will ensure that the forest-dwelling poor are included increasingly in decision-making processes as well as in any benefits arising from REDD+ activities. Linking REDD+ to such investments can help leverage action toward sustainable forestry and sustainable land-use.

By providing benefits beyond climate mitigation (the so-called “Non-Carbon Benefits”, including poverty alleviation, biodiversity benefits, ecosystem resilience and the links between adaptation and mitigation), REDD+ becomes part of a cluster of sources of financial support to sustainable forestry and sustainable landscapes that provide multiple benefits to society. REDD+ investments and revenues cannot be the sole source of support to such efforts, but by providing a mechanism to account and pay for the climate mitigation ecosystem services of forests, it provides foundations from which to co-finance and jointly manage the multiple objectives that

lead ultimately to sustainable development. Building on current systems of international development assistance flows, REDD+ can be part of a new system that provides carbon payments for performance across a wide range of development activities.

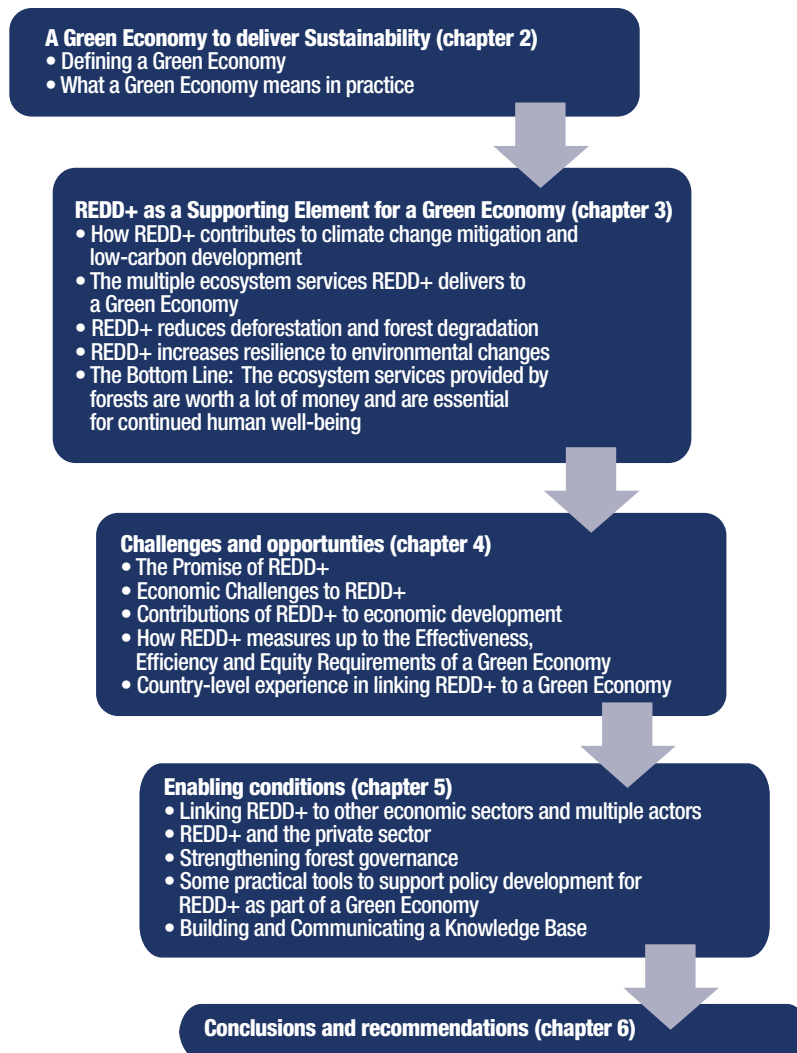
## 1.4 REDD+ and a Green Economy

The value of forests and land use in the context of natural capital is often included in the discussions about a transition to a Green Economy, but the full potential of forests and REDD+ to support a Green Economy is rarely elaborated. REDD+ builds on the efforts of

the Millennium Ecosystem Assessment (2005), The Economics of Ecosystems and Biodiversity (TEEB, 2010), and the work of the United Nations Forum on Forests (UNFF, 2013a), though none of these have provided the direct link to a Green Economy that is the focus of this report. The preceding paragraphs indicate the contributions that this report intends to explore to help correct this oversight.

The basic concepts that this report examines are that **REDD+ is unlikely to work without a greening of the global economy; REDD+ Readiness activities are already being implemented and offer insights into how a low carbon, Green Economy could**

Figure 1.2 The Structure of the report





**function; and treating REDD+ as a key element in a Green Economy will lead more quickly to positive outcomes that can contribute to sustainable development.** All of these will contribute to the overall objective of leveraging REDD+ investments to help support the Green Economy agenda.

The Green Economy is an emerging concept that seeks to put sustainable development into operation and achieve economic, social and environmental gains (chapter 2). REDD+, if carefully designed, can build on many of the traits of a Green Economy: it can lead to low-carbon development; deliver multiple ecosystem services; reduce deforestation and forest degradation; and increase resilience to environmental changes (chapter 3). Implementing REDD+ through different strategies can involve different challenges and opportunities (chapter 4). In order to make REDD+ a supportive element of a Green Economy, REDD+ implementation requires a mix of policy instruments, whose choice needs to be informed by sound planning and active support from

many interest groups, including the private sector (chapter 5).

This report is an initial effort to outline some of the many links between REDD+ and a Green Economy and suggests options about how these links might be strengthened. It brings together insights from the existing literature to consolidate conceptual issues, presents country-based examples of progress, and highlights the potential challenges and opportunities of including REDD+ in the transition to a Green Economy.

The target audience of this report includes the stakeholders and decision-makers in land use and economic development planning, including governments, international agencies, the private sector (both national and multinational companies), and even the general public. The report concludes by identifying some of the challenges remaining and suggesting how REDD+ can make greater contributions in support of sustainable development as part of a truly Green Economy.

## Key Messages

**For policy makers:** REDD+ protects natural capital, which is vital for continued provision of the ecosystem services that economies require. Decisions taken at the November 2013 Conference of Parties of UNFCCC paved the way for the full implementation of REDD+ activities on the ground.

**For the Green Economy:** REDD+ readiness is already well advanced and offers insights for the transition to a Green Economy. Significant progress has been made on key issues such as equity, safeguards, and nationally appropriate options.

**For business leaders:** The impact of current economic growth pathways is depleting natural capital in a way that is unsustainable and damaging for economic, environmental, and social prosperity in the future.

**Note from the Editor:** The term 'Green Economy' is used throughout this document for simplicity, rather than referring to the multitude of ongoing or potential transitions to greener economies at national and local level. A transition to a Green Economy will necessarily take many different forms in many countries, depending on national and local priorities and local contexts. The concept of a Green Economy ('an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities', as defined by UNEP) is used in this report as an ideal to strive towards, which will need to build on many local and national efforts to build greener economics and ensure inclusive green growth. The term Green Economy is usually capitalized unless citing text where the term is used in lower case.

Healthy forest scene: Gede  
Pangrango, West Java.  
Ricky Martin / CIFOR

# CHAPTER 2

A Green Economy to  
deliver sustainability

# A Green Economy to deliver sustainability

## 2.1 Defining a Green Economy

UNEP defines a Green Economy as one that 'results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive' (UNEP, 2011a). Alternative definitions of a Green Economy or 'Inclusive Green Growth' put more emphasis on continued economic growth (see Box 2.1.), but all move towards development that raises levels of environmental protection, while being socially and economically beneficial. Often this is based on principles of sustainable production and consumption. **A Green Economy goes beyond a low-carbon development path by considering social and environmental dimensions and natural resources more broadly as sources of wealth, job creation and prosperity.**

A Green Economy is an evolving concept whose achievement remains far in the future. This ideal is global in nature, as indicated by the discussions at Rio+20,

and would represent the sum total of all economic activity. But of course every country will have its own priorities, its own set of human and natural resources, its own history and culture, and its own approach to a Green Economy. It is undoubtedly more pragmatic to refer to "greener economies" to recognize both the gradual nature of the "greening" and the multiple ways that economies will embrace the greening process as they address their current realities. But as a matter of convenience and consistency, and recognizing that a Green Economy remains an ideal, this report will use the term in its capitalized form to emphasize its importance (except when quoting others who use the lower case).

Thus the global economy will take many steps toward a Green Economy, sometimes stumbling along the way and sometimes taking steps backward. But many, even most, countries are already taking their own steps to reduce carbon production and increase investment in natural capital, and the Green Economy may already comprise up to 5 per cent of global GNP, including investments in renewable energy, green jobs, green-labeled products, energy-efficient devices, and so forth (AtKisson, 2013).

### Box 2.1 Some other definitions of a Green Economy

- A Green Economy is one that results in improved human well-being and reduced inequalities, while not exposing future generations to significant environmental risks and ecological scarcities. It seeks to bring long term societal benefits to short term activities aimed at mitigating environmental risks. A Green Economy is an enabling component of the overarching goal of sustainable development (UNCTAD, 2011).
- A Green Economy is a resilient economy that provides a better quality of life for all within the ecological limits of the planet (Green Economy Coalition, 2011).
- A Green Economy is an economy in which economic growth and environmental responsibility work together in a mutually reinforcing fashion while supporting progress on social development (International Chamber of Commerce, 2011).
- The Green Economy is not a state but a process of transformation and a constant dynamic progression. It results in human well being and equitable access to opportunity for all people, while safeguarding environmental and economic integrity in order to remain within the planet's finite carrying capacity (Danish 92 Group, 2012).



Iron ore mine in  
Amazon Basin.  
Jacques Jangoux /  
Getty Images

## 2.2 What a Green Economy means in practice

This report builds on the UNEP definition of a Green Economy as one that supports economic development that is **low in carbon and other environmental impacts, efficient in the use of natural resources, resilient in managing economic and ecological risks** through natural capital, and **socially inclusive in benefiting all groups** of society and involving them in making decisions that affect their well-being. This integrated approach is critical for building an economy that can adapt to changing conditions while improving human well-being. Figure 2.1 shows how forests are treated in a Green Economy as compared to the standard economy.

The governments of some developing countries may contend that they need to extract natural resources at an

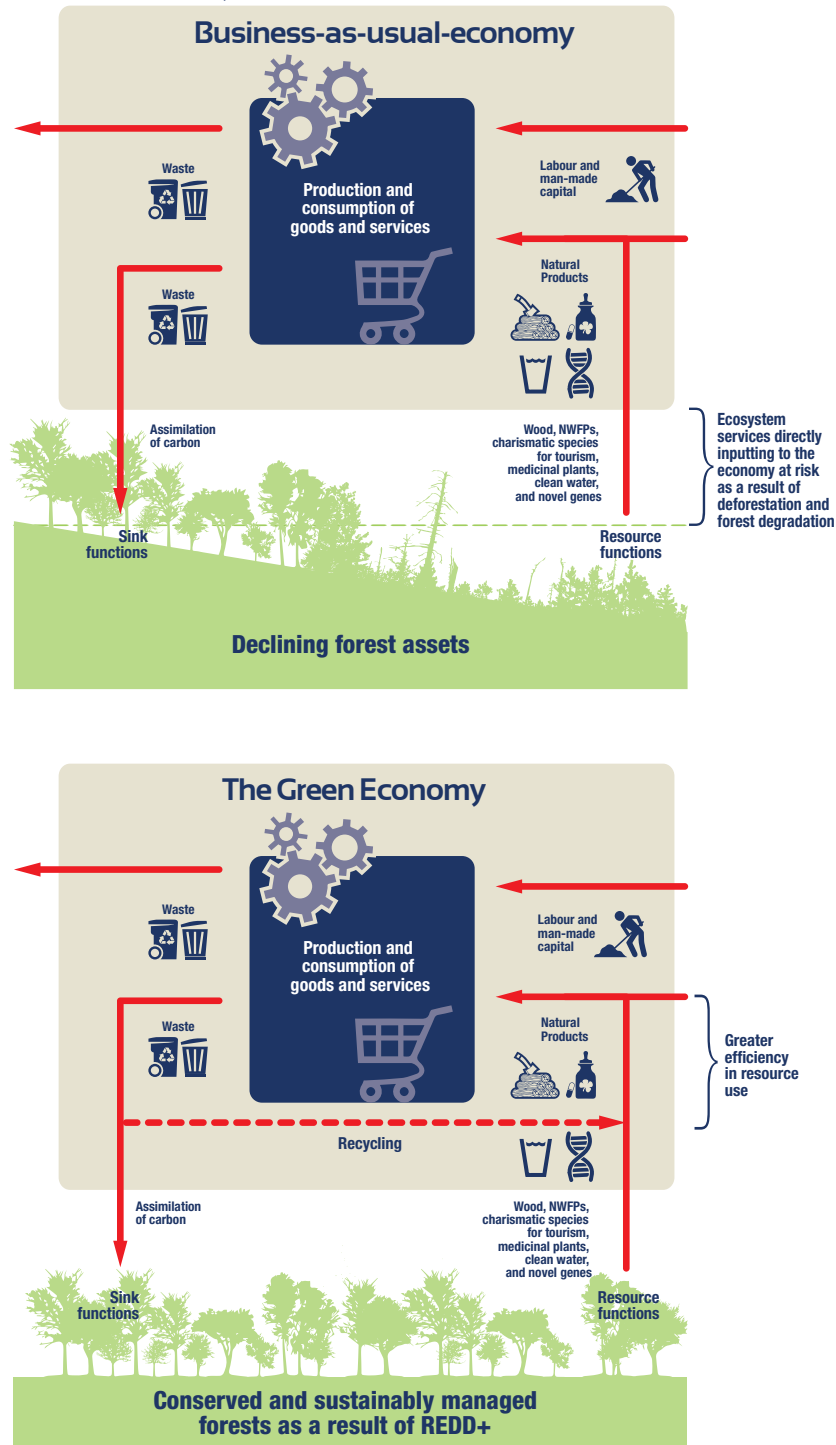
excessive rate to grow their economies, often driven by demand from more developed economies. But a Green Economy requires that ultimately human development needs to be decoupled from the unsustainable consumption of natural resources and align with the long-term functioning of ecosystems, although prudent investment of the gains made from natural resource use can of course support this transition. Such a transition will require considerable international cooperation. The kinds of measures that need to be broadly adopted include **cross-sectoral planning and resource management, innovations in resource extraction, use and recycling systems, more efficient use of renewable resources** (“more crop per drop”), and market signals that **give appropriate values to ecosystem services** (UNEP, 2011a).

A Green Economy also supports sustainable development through its policy focus on increasing or shifting public finance and private sector capital towards the emerging green sectors (such as renewable energy) and the greening of brown sectors (for example, improving the technology in cement production). The intent of a shift in investment (Figure 2.2.) is to transform national economies (and ultimately the global economy) so that growth is generated by green economic activities and, perhaps more important, seeking ways to ensure that the **benefits of growth are equitably shared**.

As with traditional economic theory on comparative advantage, many options are available to implement a Green Economy strategy, all of them with some level of trade-offs between local, immediate benefits and long-term benefits (Barbier, 2012; The World Bank, 2012). No one-size-fits-all approach will work in every country because of the variation in needs, problems and priorities, so strategies need to be tailored to fit national and local circumstances. A new model of changed investment patterns (Figure 2.2) will need to be adapted to national and local conditions.

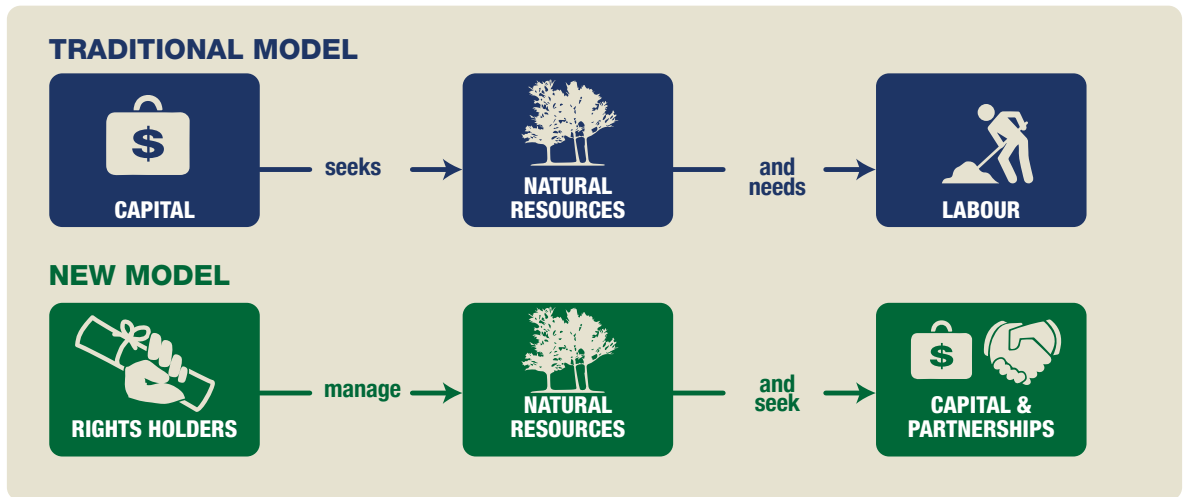
Figure 2.3 shows how a Green Economy strategy can build on policy planning and analysis and various policy instruments that catalyze public and private investments in different sectors, including manufacturing, waste, construction, transport, energy, tourism, water, fisheries, agriculture and forests (UNEP, 2011a). Policy instruments that promote green innovation and investments can comprise a mix of measures, such as **institutional reforms** (e.g. land tenure), **regulations** (e.g. norms and standards, including safeguards), **information**

Figure 2.1 A comparison of the role of forests in the business-as-usual-economy and the Green Economy



SOURCE: UNEP-WCMC adapted from OECD (2011)

Figure 2.2 Changing the pattern of investment



SOURCE: Elson (2012)

**policies** (e.g. eco-certification, public disclosure, public marketing and branding, education campaigns), **risk mitigation** (e.g. guarantees), **fully integrating environment and climate** in economic planning policies (through Strategic Environmental Assessments, for example) and **pricing, fiscal and trade policies** that get the incentives right (tradable permits, taxes and subsidy reform).

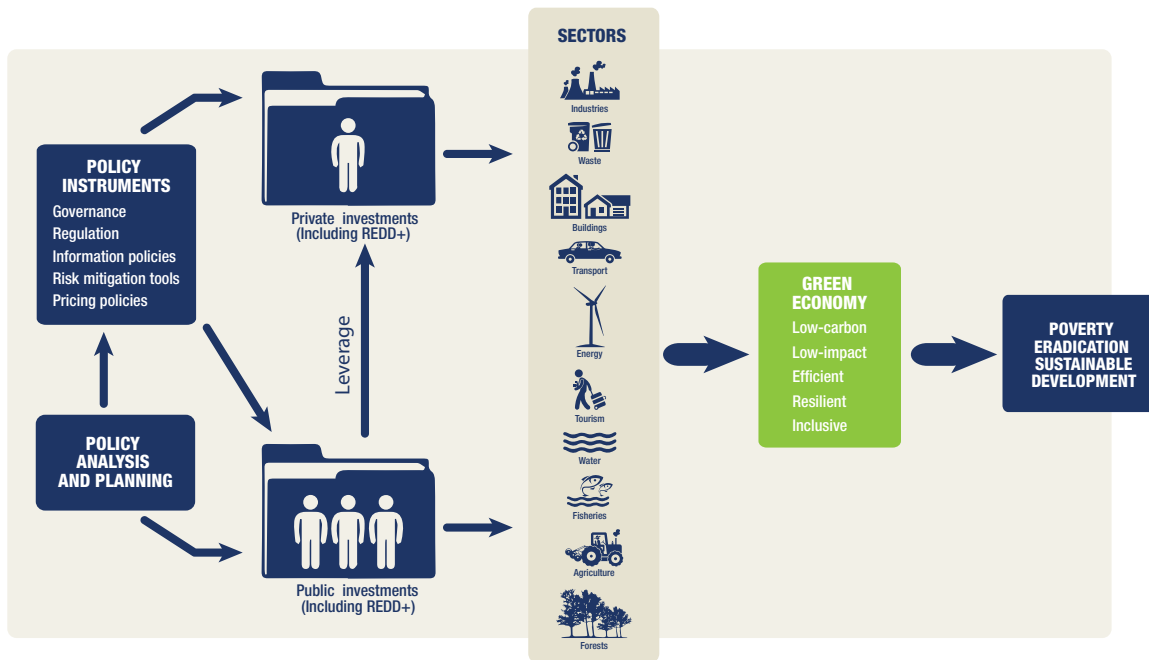
Promising steps toward a Green Economy are already being taken at many levels (see chapters 3 - 5). Learning from these efforts will help inform governments about how they can move more quickly from an ultimately futile or counterproductive business as usual situation toward a more sustainable future that is based on the principles of a Green Economy. REDD+ can be one of the political, economic and know-how catalysts for such progress.

Green economy transformations in relevant sectors need to involve different actors and require investments from both public and private sectors. Public funds can be directly invested in relevant sectors to overcome disincentives (e.g. knowledge gaps) or capital bottlenecks (e.g. high up-front financing needs in the case of renewable energy and energy efficiency investments). By doing so, they can leverage greater private investments in these sectors. Private investment depends on policy instruments (institutional reforms, regulation, information policies, risk mitigation tools, pricing policies) that create an enabling environment for a green economy transition. Policy analysis and planning can inform the choice of policy instruments and promote public investments in green economy sectors. (Based on UNEP, 2011; OECD, 2011; World Bank, 2012).



A luxury car is stranded in floodwater in Jakarta's central business district. From wealthy suburbs to riverside slums and gleaming downtown business blocks few areas were spared following heavier than usual rainfall in January 2013. Ed Wray / Getty Images

Figure 2.3 How a Green Economy strategy can operationalize sustainable development




SOURCE: Based on UNEP (2011a); OECD (2011); The World Bank (2012)

## Key Messages

**For policy makers:** A Green Economy goes beyond a low-carbon development path by considering social and environmental dimensions and natural resources more broadly as sources of wealth, job creation, and prosperity – key features of economic prosperity.

**For the Green Economy:** REDD+ is set up to contribute to a range of the policy reforms identified here that would support the transition to a Green Economy. These include institutional reform, fiscal incentives, and cross-sector coordination.

**For business leaders:** A Green Economy places high value on natural capital and equity, as does REDD+. In practical terms, a stronger policy signal can be expected across a range of policy instruments that support this transition.

A close-up photograph of a young girl's hands holding a small green seedling in a biodegradable pot. The background is blurred, showing other people in a natural setting. The lighting is warm and natural, highlighting the vibrant green of the plant and the texture of the soil and pot.

Rosita, a three year old girl, showing a seedling to be planted, Sumatra, Indonesia.

Ricky Martin / CIFOR

# 3

CHAPTER

REDD+ as a supporting element for a Green Economy



# REDD+ as a supporting element for a Green Economy

## 3.1 Introduction

REDD+ is still in its early stages of development, and many of the 49 UN-REDD partner countries are at the initial stage of development known as “REDD+ Readiness” (where most international funding has been allocated to date). It is intended that this stage will be followed by “REDD+ Implementation” and then “Performance-based Payments.” Here, the term “REDD+ activities” is used to cover all three stages. The “REDD+ mechanism” is the expected final design of the process that ultimately will be approved by the UNFCCC Parties, and that is hoped to promote the changes in investment that will be required to build a significant green dimension into the global economy.

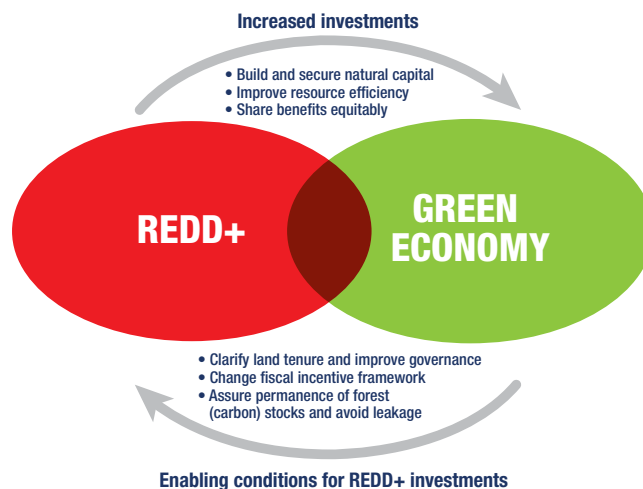
REDD+ could support the transition to a Green Economy in many ways, especially by demonstrating the value of natural capital in the global economy (for a national example, see UNEP, 2012a). This will help change the pattern of investment and incorporate natural capital in economic policies rather than treating the environment as an externality (Figure 3.1).

It is designed primarily for developing countries whose forests are at risk, but Table 3.1 shows that the wealthier countries and those with economies in transition can also benefit from including some of the approaches of

REDD+, such as the use of cleaner fuels, promoting low carbon production by the private sector, reducing land/ agricultural emissions and improving resource efficiency. In short, REDD+ is an entry point for the more complex evaluation of low-carbon development pathways that will enhance the chances that land use is sustainable.

Ultimately, global partnerships will need to be formed to provide the enabling environment for a Green Economy (synchronizing trade and fiscal frameworks to create a level playing field and fair ‘green competition’). Existing global processes and instruments need new mandates so that they can deliberately incorporate elements of a Green Economy. National governments need to renew commitments for equitable sharing of domestic benefits arising from a Green Economy, and promote conditions that enable this to actually happen while ensuring that initial burden is equitably shared (for example, when considering how the estimated US\$ 480 billion in annual fossil fuel subsidies can be substantially reduced and instead re-directed towards climate change adaptation and mitigation, including REDD+). This chapter will focus on the contributions that sustainable forest management can make to both a Green Economy and REDD+, beginning with carbon and climate change, but then expanding on the multiple additional benefits delivered by forests and other ecosystems.

**Figure 3.1 Some potentially mutually beneficial relationships between REDD+ and a Green Economy**



**Table 3.1 How REDD+ can support the transition to a Green Economy**  
(Low, medium and high refer to the potential level of support that REDD+ could provide)

MAJOR TRAITS OF A GE TRANSITION	REDD+/SFM IN DEVELOPING COUNTRIES WITH AT RISK FORESTS	SFM AND SUSTAINABLE CONSUMPTION IN RICH COUNTRIES, AND EMERGING ECONOMIES
Transition to sustainable renewable energy	<b>Medium to high:</b> particularly in countries where currently unsustainable firewood collection is a major cause of forest degradation <b>Examples:</b> energy access through renewables, improved cook-stoves, firewood plantations	<b>Medium:</b> Carbon impacts can be included in life-cycle analysis of renewable energy policies & procurement agreements. <b>Examples:</b> Sustainable production of wood for energy, and biofuels
Transition to low carbon production	<b>Medium to high:</b> particularly in countries where unsustainable agriculture is a major cause of deforestation <b>Example:</b> agroforestry, sustainable agricultural practices, developing green industries in rural areas to add value	<b>Low to medium:</b> if countries with large agricultural sectors take up LULUCF mitigation <b>Examples:</b> agroforestry, sustainable agricultural practices
Increase resource efficiency, particularly reducing unsustainable demands on the environment	<b>Medium to high:</b> particularly in countries where unsustainable agriculture is a major cause of deforestation <b>Example:</b> agriculture intensification and use of degrade land would reduce pressure on forests	<b>High:</b> Reducing the ecological footprint of unsustainable demand from rich countries and large emerging economies is a key component of a successful REDD+ and of a Green Economy transition (green procurement) <b>Examples:</b> Change in consumption patterns away from meat, buy certified products, green procurement, ban import of illegal forest products.
Acknowledge and reward the provision of ecosystem services	<b>Medium to high:</b> important to compensate rural populations for the legitimate opportunity costs of REDD+ and to enhance the provision of non-REDD+ ES <b>Example:</b> PES schemes	<b>Low to medium:</b> important to compensate rural populations for the opportunity costs of forest conservation and to enhance the provision of ecosystem services <b>Examples:</b> PES, buying of offsets, nature in agricultural landscape, maintenance of historical landscapes
Improve human wellbeing through economic growth but also through more equitable distribution of opportunities and rewards	<b>Low to Medium:</b> If done right REDD+ can become an important source of income for poor rural communities (still a minority of the poor population of developing countries). <b>Examples:</b> community based REDD+ programs, PES for indigenous and local communities	<b>None to low:</b> Even so, it should be noted that reducing impacts of the transition for relative poor in mature economies and securing their access to natural resources are becoming important social issues

SOURCE: Pablo Gutman based on P. Gutman (2007)

### 3.2 How REDD+ contributes to climate change mitigation and low-carbon development

Climate regulation is one of the ecosystem services identified by the Millennium Ecosystem Assessment (2005), and the one that arguably has received most attention (for example, it led to REDD+). But while deforestation and forest degradation (including through forest fires) release about 12-20 per cent of the global emissions of greenhouse gasses, forest vegetation and soils remain major repositories of carbon (Figure 3.2). These two critical factors provide powerful arguments for reducing deforestation and forest degradation and promoting sustainable forest management, leading to biodiversity conservation.



Drought in Tefe, Amazonia, along Amazon River; prolonged drought can result in unprecedented die off of key plant and tree species.  
Rodrigo Balela / Getty Images

It is worth recalling the conclusion of the Fourth Assessment Report of the IPCC on the importance of sustainable forest management to climate change: “In the long term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual yield of timber, fiber or energy, will generate the largest sustained mitigation” (IPCC, 2007). The societal challenge and opportunity now faced is to design and implement REDD+ activities that will promote the practice of sustainable landscape

management (based on the relationships between forests and agriculture) at a sufficient scale to meet the multiple needs of society (see Box 4.1 for more details on the landscape scale). In addition, further societal climate and carbon benefits can be optimized by the wise use and reuse of the products that sustainable forest management generates, including substitution for higher energy and carbon-intensive products, thereby supporting development of “greener” low carbon and bio-based economies.

Figure 3.2 Carbon stored in forests, using FAO ecozones

	Tropical rainforests	Tropical peat forests	Other tropical forests <sup>1</sup>	Sub-tropical forests	Oceanic temperate forests	Other temperate forests <sup>2</sup>	Mangroves	Boreal forests	Montane boreal forests	Boreal peat forest	Total
Current forest area M ha	1090	44	740	330	30	400	15	730	410	496 <sup>6</sup>	4285
Total above and below ground biomass (Mg C/ha)	145±53	206 ± 100	80±45	53±49	208±131	60±25	218±173	48±24	13±10	7±6	
Soil carbon <sup>4</sup> (Mg C/ha)	75	200 <sup>5</sup>	50	60	80	55	72	272 (est.) <sup>3</sup>	74 (est.) <sup>3</sup>	858 (est.) <sup>6</sup>	
Total carbon (Mg C/ha)	230	406	130	113	288	115	290	320	320	862	
Percent of atmospheric carbon <sup>7</sup>	32.5	2.3	12.5	4.8	1.1	6.0	0.6	30.3	17.0	55.5	162.6

<sup>1</sup> Includes moist deciduous, dry, and montane forests.

<sup>2</sup> Continental and montane forests

<sup>3</sup> Back-calculated from Kurz and Apps (1999) who estimated that boreal soils contain 85% of the total boreal carbon, using 48 Mg/ha as 15%.

<sup>4</sup> Soil to a depth of 1 m using IPCC (2006) default values unless specified .

<sup>5</sup> From: Hirano et al. (2012) depth >3 m

<sup>6</sup> Calculated from Tamocai et al. (2009) for total area of discontinuous plus sporadic permafrost (i.e., peatland forest) and considers soil depth >3 m

<sup>7</sup> Atmospheric carbon = 770 Gt (IPCC 2007)

**SOURCE:** Based on FAO (2010), Hirano, T. et. al. (2012), IPCC (2006), Kurz, W.A., and M.J. Apps. (1999), Pan Y. et. al. (2013), Pan, Y. et. al. (2011), Nasa (2010)



Misty rainforest  
at Dawn, Borneo.  
Frans Lanting /  
Getty Images

Some countries are already implementing climate-related elements as part of REDD+ activities, issuing carbon certificates from REDD+ pilot projects that are being traded on the voluntary carbon market (Peters-Stanley, Hamilton and Yin, 2012; Enternmann and Schmitt, 2013). The Kasigau Corridor REDD+ project in Kenya issued the first REDD+ offsets in 2009 (Verified Carbon Standards, VCS) on behalf of 4,800 landowners and communities, with the main buyers coming from the private sector, including Microsoft, BNP Paribas and La Poste. The US\$ 2 million annual income is being spent on community development, such as water projects. Charcoal burning has been reduced by an estimated 70 per cent in the region, as a contribution to mitigation, but poaching of wildlife remains a problem so some of the other benefits have yet to be realized (Peters-Stanley, 2013).

Figure 3.2 provides a comprehensive overview of total above and below ground biomass, soil carbon, and total carbon stored, and compares the latter to the per cent of atmospheric carbon. It shows that tropical and subtropical forests together contain over half the

total amount of carbon contained in the atmosphere, a further indication of why REDD+ is so important to carbon sequestration and storage.

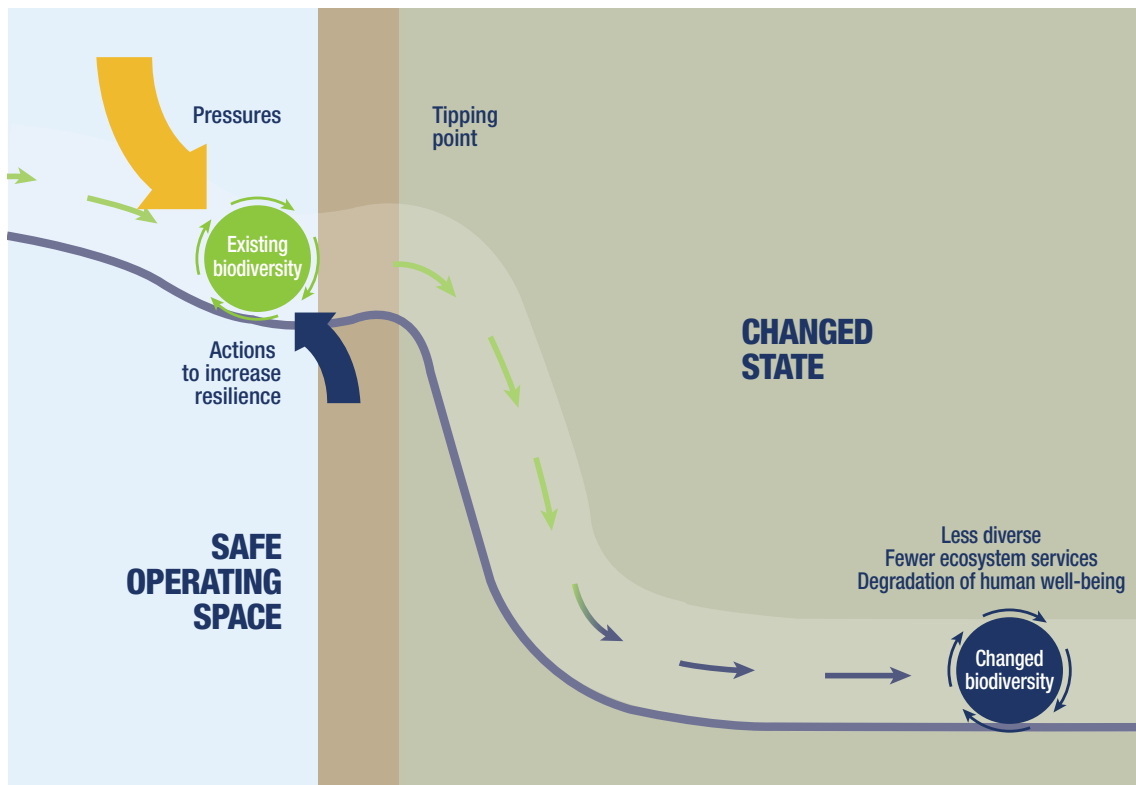
However, forest ecosystems function according to their own logic: they are highly interconnected with many ecosystem processes responsible for their resilience. Ecological ‘tipping points’ exist, that if surpassed, could change forests relatively suddenly and dramatically into a different and often degraded ecological state (Figure 3.3). Such tipping points can occur as a result of deforestation and forest degradation especially if coupled with climate change (e.g. Thompson et al. 2009, 2012). Large parts of the Amazon forest, for example, could change into an open savannah woodland, with a much lower carbon storage and decreased biodiversity, if deforestation surpasses 20 per cent of its overall area and the climate warms beyond 2°C (Phillips et al., 2008, 2009; SCBD, 2010). In other words, if greenhouse gas emissions are not reduced sufficiently overall to forestall climate change, forest carbon could be released at a much larger scale, despite REDD+ activities. This imperative to stay within the 2°C target represents a

fundamental link between the emerging concepts of REDD+ and a Green Economy transition.

For REDD+, dealing with carbon emissions is only part of the climate issue. When sustainably produced biomass is used as bioenergy, it can result in lower life cycle greenhouse gas emissions than those emitted by fossil fuels. This implies that biomass would replace fossil fuels, which seems unlikely in the foreseeable future, judging from current levels of exploitation and the current and projected use of biofuels as reported by UNEP (2009). Sustainably managed forests can also help ecosystems adapt to climate change, especially if the forests contain their full components of biodiversity (i.e. diversity in species, stand structures and landscapes thereby giving them the greatest range of options for adapting to change), are as large as possible so that they cover multiple climatic zones, and are linked with other forests and other types of ecosystems through landscape management (thereby allowing gene flow that can help promote adaptation to change).

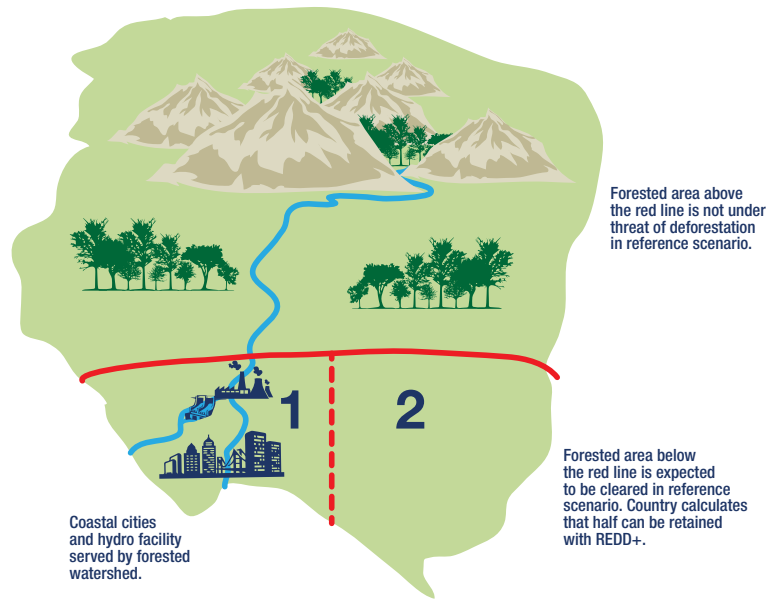
As part of the agreement between the governments of Indonesia and Norway, the province of Central Kalimantan (on the island of Borneo) has been chosen as an initial priority for investment of REDD+ funding. In order for a successful transition from the current resource-intensive and carbon-heavy economic development pathways to a future greener economy, carbon emissions from land use must be addressed across several sectors and within the often complicated policy frameworks and regulatory processes that guide land use (Provincial Government of Central Kalimantan, 2011). Although facing some methodological challenges, the Central Kalimantan Green Growth Plan uses an evaluation of emissions from current economic activities as the basis for modelling more environmentally and socially sustainable growth opportunities. Using bilateral aid to focus REDD+ investments on near-term policy and institutional reforms to support long-term growth in a large-scale jurisdiction could become a model for the transition to green growth in the tropics.

**Figure 3.3 The limits of REDD+ as a carbon offset mechanism**



SOURCE: CBD (2010)

Figure 3.4 The climate change mitigation benefit of options 1 and 2 for forest retention is similar, but the water quality and sediment control benefit of option 1 is much higher



SOURCE: UNEP-WCMC

### 3.3 The multiple ecosystem services REDD+ delivers to a Green Economy

When governments are seeking pilot or priority areas for REDD+ activities, it is essential to consider the full range of ecosystem services beyond carbon storage and sequestration. The infograph at the end of this report on page 88 provides an overview of REDD+ benefits that could be generated across the landscape, if the planning of REDD+ is optimized to achieve multiple benefits.

To provide an example of a non-carbon benefit of REDD+, the model presented in Figure 3.4 illustrates two options for a REDD+ implementation project of equivalent size and biomass, showing that forest 1 is the preferable choice because of the watershed benefits in addition to those of carbon sequestration and storage. A map based on real data from Central Sulawesi, Indonesia, shows areas where high carbon storage coincides with steep slopes that should in any case be kept under forest cover because of the ecosystem services linked to soil and water (Figure 3.5).

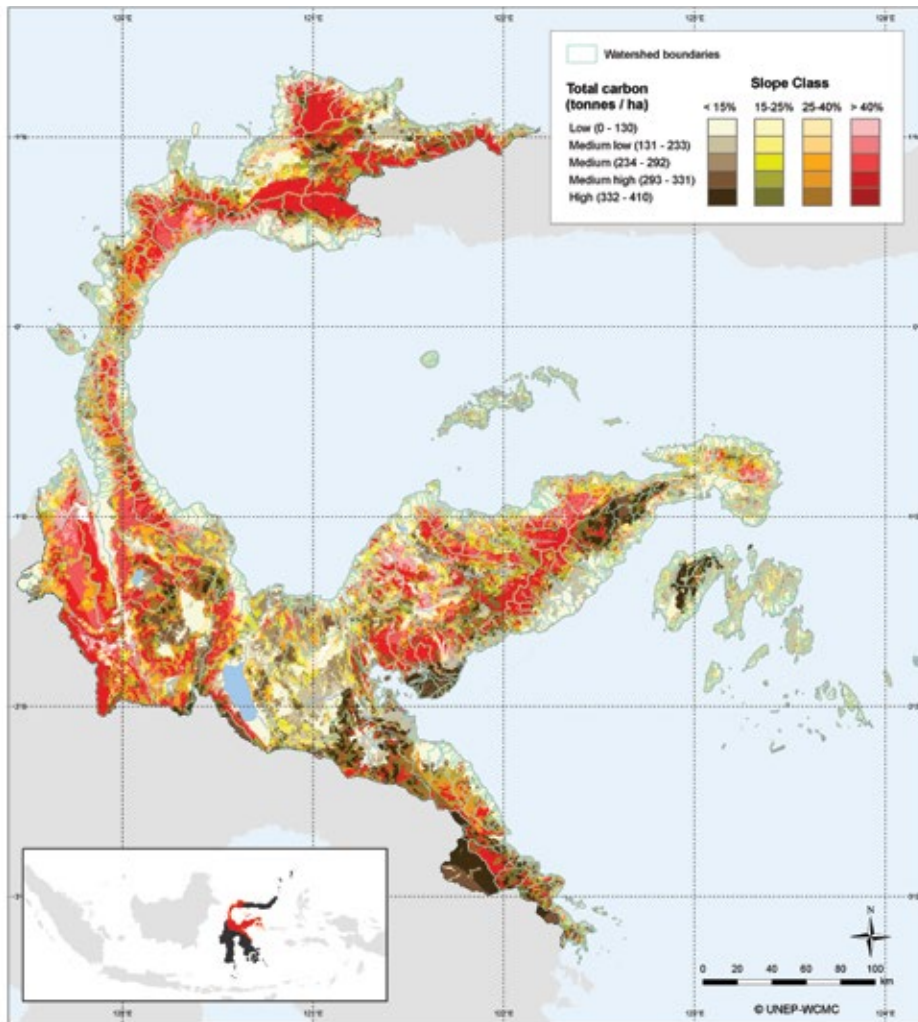
In addition to climate regulation, forests protected by REDD+ activities can deliver many other ecosystem services, divided by the Millennium Ecosystem Assessment into provisioning, regulating, cultural, and supporting services. The multiple values of these services are discussed in *The Economics of Ecosystems and Biodiversity* (TEEB, 2010), but in a sense, these services are beyond a price because they are essential to life on Earth. Many of the ecosystem services beyond climate regulation are directly relevant to REDD+ and a Green Economy, and some of them are discussed here. The main challenge is how the multiple ecosystem services delivered by a natural forest stand up against the short-term opportunity costs of mining, palm oil production, or logging. Considering ecosystem services at a landscape scale can help clarify longer-term objectives and sustainability, thereby clarifying the tradeoffs that may appear very different at the short-term and local scales.

**Water-related ecosystem services.** Forests and other ecosystems make valuable contributions to sustaining water-related ecosystem services. When rainwater flows from hills and mountains into streams and rivers,

forest-covered areas help keep water pure as the porous soils filter water and tree roots stabilize soil, reducing erosion (Bruijnzeel, 2004; FAO 2005; Aylward and Hartwell, 2010). Forest land cover reduces soil erosion rates to between 0.37 t/ha and 63.8 t/ha lower than on lands under shifting cultivation (Chomitz and Kumari, 1995). This reduces sedimentation of watercourses, so the river water is suitable for consumption with fewer expensive treatment processes (Walling and Fang, 2003). The stabilization of soils by forests also

helps prevent sediment accumulating in rivers and at dams, thereby avoiding disruption of river transport and electricity production and the subsequent need for dredging (Aylward and Hartwell, 2010; Arias, Cochrane, Lawrence, Killeen and Farrell, 2011). Sediment removal can represent up to 70 per cent of operational costs of dams for hydropower projects in the tropics (Bernard, de Groot, and Campos, 2009), thereby increasing the cost of electricity and potentially promoting higher-carbon options.

**Figure 3.5 Map of Central Sulawesi indicating where areas of high carbon coincide with steep slopes (an important factor in soil erosion). The significant amount of darker red and brown indicates how protecting forest carbon and limiting soil erosion can be mutually reinforcing and help identify where REDD+ projects could be located.**



SOURCE: UNEP-WCMC



Woman selling her produce at Dintor weekly market, East Nusa Tenggara, Indonesia.

Aulia Erlangga / CIFOR

The benefits from more efficient use of forests are widely distributed, beginning with the people living in the forest but extending downstream. Turbid rivers can have a negative impact on fish populations (Bojsen and Barriga, 2002), adversely affecting the livelihoods of fishing communities and increasing the price of fish for consumers. Benefits can reach distant cities that depend of the clean flow of water; 33 of the world's 105 largest cities (such as Rio de Janeiro, New Delhi, Nairobi, and Jakarta) obtain a significant amount of their water from protected areas that could be potential sites for REDD+ investments (Dudley and Stolton, 2003).

Forests well managed under a REDD+ activity can also help regulate the amount of water reaching rivers and reduce the risk or magnitude of flooding (Bradshaw, Sodhi, Peh, Kelvin and Brook, 2007). Thus, settlements located downstream from an area with good forest cover may be at less risk of destructive flooding than settlements located downstream of slopes with a high degree of deforestation. This resilience provides a buffer and insurance to economic assets as the global climate continues to change and weather extremes become more common.

**Some provisioning services of forests.** Forests protected by REDD+ activities are directly relevant to the socio-economic development of rural communities, both avoiding harm through avoiding forest destruction and generating additional benefits by retaining productive forests whose benefits continue to flow on a sustainable basis. Selective and sustainable felling of selected tree species can provide important material for construction or charcoal production/firewood (over 2 billion people use wood-fuel for cooking, and wood provides over 80 per cent of energy needs for some communities), but forests can offer much more than this.

They also provide non-timber products, such as medicinal plants, edible fungi, fruits, nuts, seeds, oils, fibres (which can be woven into baskets, yarn or fabric), ornamentals (such as orchids) and resins (Hoare 2007). The income from these products can often help boost local livelihoods significantly (Ndoye, Awono, Preece and Toirambe, 2007; Pattanayak and Sills, 2001), and Sullivan (2002) estimated that non-timber forest products can generate some 4 million person-years of employment annually, along with US\$ 14 billion in international trade and far more in local subsistence



benefits (though these are usually not given market values). Such figures indicate that sustainably harvested non-timber forest products can provide more sustainable economic benefits than forests used for logging only, and a greater share of the benefits go to the rural poor.

FAO (2013) has recently summarized the contribution of forests and trees to food security and improved nutrition. Forests provide substantial food directly, in the form of fruits, nuts, honey, leaves, mushrooms, insects, and bush-meat. In West Africa, over 4 million women earn about 80 per cent of their income from the collection, processing, and marketing of oil-rich nuts collected from shea trees (*Vitellaria paradoxa*) that occur naturally in the forests. Tree foods provide some 30 per cent of rural diets in Burkina Faso, and many rural people in tropical countries depend on trees for livestock fodder. In the Sahel, farmer-managed natural regeneration of forests has increased the yields of sorghum and millet, and contributes to dietary diversity and increased household incomes.

**Ecosystem services related to genes and species.**

Many of the provisioning ecosystem services, such as food, timber, and genetic resources, are supported by biodiversity, the variability between living organisms at gene, species, and ecosystem levels (UNCBD, 1992; Dickson and Osti, 2010; Miles, Dunning, Doswald and Osti, 2010). Forests provide habitats for many unique types of plants and animals, some of which are now endangered (IUCN 2013). Many governments have laws protecting such species; and many people value the existence of these species and are willing to pay for their survival (called “existence value” by economists). High carbon stocks are strongly correlated with the richness of mammal, bird and amphibian species (Strassburg et al., 2010), so the potential biodiversity benefits of REDD+ activities should not be surprising (Grainger et al., 2009; Harvey, Dickson and Kormos, 2010; CBD, 2011).

Forests often contain plants that contain unusual genes that can be valuable as source materials in the development of new crops or pharmaceutical products (Mendelsohn and Balick, 1995). Plants have contributed to the development of at least 25 per cent (and up to 50 per cent) of all prescription drugs (World Resources Institute 2013).

The pollination service provided by insects (wild bees, butterflies, moths, flies, beetles and wasps), birds,

bats, squirrels, and even primates (Ricketts, Daily, Ehrlich and Michener, 2005; Olschewski, Tschardt, Benitez, Schwarze and Klein, 2006) is worth billions of dollars annually to farmers. Seed dispersal by wild animals is essential for maintaining the full diversity of wild populations of plants, and thereby the health of ecosystems. Such dispersal can also help forests adapt to climate change by moving their seeds to new habitats. Many forest species (ranging from tigers preying on crop-raiding pigs and monkeys, birds preying on harmful insects, and ants preying on smaller pests) also provide for the natural control of crop pests, and trees near cropped land can provide habitat for many of these beneficial species (Philpott and Armbrrecht 2006).

**Forest tourism as a cultural service.** Forest protected areas are visited annually by millions of people (Naidoo and Adamowicz 2005), most coming from within the country. These visitors help to redistribute wealth from urban areas to forests that may be the site of REDD+ activities. At the international level, tourism is the biggest export earner for 60 countries (World Tourism Organization 2004) and among the top five export



Destroying and depleting tropical forests may result in humanity losing highly useful medicines yet to be discovered. Fewer than 1% of known plants have been fully analysed for their potential pharmacologic composition.

Tetra Images / Getty Images



Forest degradation in river catchment areas enhances soil erosion, additional heavy sediment load discharges can develop 'Dead Zones' due to oxygen depletion and death of riverine/marine life. Java Island, Indonesia.

Mangiwau / Getty Images

earners for over 150 countries (WTTC 2010), indicating its value. The economic multipliers for tourism can be relatively high and have a positive effect on the incomes of the poorest households (Klytchnikova and Dorosh 2012). International ecotourism in 2009 earned about US\$ 60 billion (UNWTO 2010). The ecotourism market has grown three times faster than the global tourism industry as a whole (LOHAS 2010), and countries with biodiversity-rich forests protected by REDD+ activities could use this consumer demand to earn additional income.

### 3.4 REDD+ reduces deforestation and forest degradation

"Development" has often been translated into converting forests to other uses that may seem more profitable. In some cases, and certainly in historical terms, converting forests to farms has been highly beneficial,

but as forests continue to be lost or degraded, their marginal value is increasing, especially in terms of the services they provide, and "uneconomic deforestation" has become a major international concern because it is releasing carbon into the atmosphere and degrading other ecosystem services.

Reducing deforestation and forest degradation through REDD+ activities means that all of the ecosystem services that native forests provide to society can be maintained (though the level of each may vary under different management scenarios). Without REDD+ some of these services could be lost, possibly forever (Portela and Rademacher, 2001). REDD+ will be successful only if a series of policy and economic decisions that address the drivers of forest over-exploitation, even far away from a project activity, are also addressed. For example, a main driver of the loss of tropical forests on peat soils in Borneo and Sumatra is external demand for palm oil, as a biofuel or for food production; even "sustainable" palm oil that is certified as environmentally friendly is

implicated in this significant and continuing deforestation (Griffiths, 2010), often called “indirect land use change” (ILUC). These larger issues need to be addressed by a Green Economy.

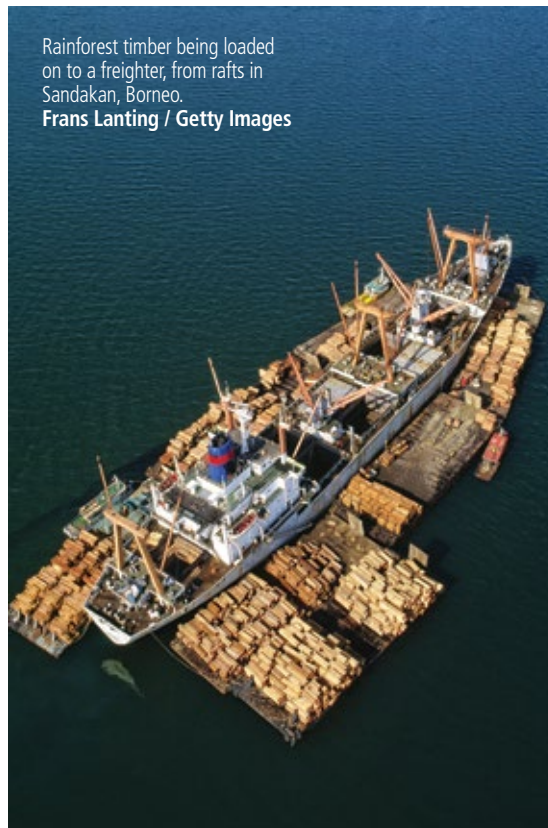
Illegal logging and illegal agriculture is widespread in the tropics, making it difficult to provide precise baseline figures about forest status and trends. This is a complex topic and its details are beyond the scope of this paper. However, it is clear that combatting illegal logging deserves sufficient attention under REDD+ and a Green Economy transition, because an estimated US\$ 30-100 billion per year are lost to local and natural economies due to illegal harvesting and trade of timber (Nellemann and Interpol, 2012).

Many countries already have reasonably comprehensive forest legislation, regulations, and policies to guide efficient use of forest ecosystems, but problems have often arisen in implementing these. REDD+ can provide new funding to enhance the implementation of these policies where appropriate. For example, REDD+ could be a useful Green Economy tool to link forest governance reform with conflicting land-use policies (The Forests Dialogue, 2012). This is further discussed in Chapters 5.2 and 5.4.

### 3.5 REDD+ increases resilience to environmental changes

The resilience of forest ecosystems is defined as their ability to recover after shocks or stress so they can maintain function and structure (Pelling, 2011); this definition could apply to other types of ecosystems as well. Ecosystem resilience therefore provides a form of insurance that decreases the probability of future losses in services from the ecosystem in question (Baumgärtner and Strunz, 2009), thereby enhancing the resilience of human communities as well. The resilience of forests can also help avoid reaching planetary boundaries, also called “tipping points”, critical transitions that will lead to new ecosystem states from which no return is likely (Scheffer, 2009; Barnosky et al., 2012). Biodiversity loss, climate change and global nitrogen cycles may have already exceeded planetary boundaries (Rockström et al., 2009), and maintaining sufficient forest cover is essential to avoid other boundaries from being breached.

Resilience is conceptually important because irreversible damage or sudden collapse can lead to substantial



Rainforest timber being loaded on to a freighter, from rafts in Sandakan, Borneo.  
Frans Lanting / Getty Images

losses in human well-being, and it can be very expensive or impossible to restore and recover the ecosystems that have been substantially degraded (TEEB, 2010b). Such resilience affects the long-term viability of REDD+, and the role of reducing forest degradation has been highlighted in this regard; intact forests are more resilient than degraded and fragmented forests (Thompson et al., 2009; Miles et al., 2010).

Naturally occurring forests may also be more resilient than planted forests (Miles et al., 2010). Forests in good condition with many native species (of both animals and plants) can better adapt to extreme natural events and so will be more likely to continue to provide a range of functions than overexploited forests or plantations (Elmqvist et al., 2003). Plantations and degraded forests are often more vulnerable to extreme weather conditions or pest outbreaks. Thus mature forests can also help adapt to climate change impacts, when weather extremes are expected to become more common and the distribution of pests, diseases and harmful non-native species will be altered (Thompson

et al., 2009). In the past, adaptation and resilience have been under-emphasized concepts in discussions about climate change, but in a time of more erratic climates they will become fundamental pillars for social well-being and economic development.

Ecosystem-based adaptation to climate change is a high priority in many developing countries where the impacts are already being felt (Ayres and Huq 2008). REDD+ can help countries invest in early climate change adaptation through addressing degradation of resources and by doing so securing the services and resilience provided by forests. This will put them in a stronger position to reduce the risks associated with climate impacts. Forests are going to need to adapt to climate change, and new management approaches (such as granting tree tenure to farmers) and silvicultural practices can be significant measures that could be supported through REDD+.

Finally, forests provide a safety net of goods and services in times of crisis, so protecting forests can be seen as a type of investment in a natural insurance policy. When the full costs of converting mangroves and other coastal ecosystems into shrimp ponds, for example, are calculated, maintaining the natural ecosystems makes far more economic sense (MEA, 2005). This point is dramatically demonstrated through the role of coastal vegetation in protecting the coastal zone against storm surges and tsunamis (McIvor et al., 2012; EJF, 2006). Therefore, REDD+ activities should work within existing national adaptation strategies (Somorin, 2010) to ensure that REDD+ has substantial positive impacts on the adaptive capacity of local communities (Locatelli, Evans, Wardell, Andrade and Vignola, 2011), and especially the poor.

### 3.6 The Bottom Line: The ecosystem services provided by forests are worth a lot of money and are essential for continued human well-being

The benefits provided by tropical forests are estimated at US\$ 6,120-16,362 per hectare per year (TEEB, 2009) if environmental services are appropriately valued. One of the implications of the idea of ecosystem services has been the concept of payment for these services

(PES), which is now a working policy instrument in numerous countries. Ideally, PES works by creating a market or price for a well-defined ecosystem good or service, or a land use supporting that service, and clearly identifiable providers and buyers that can enter into a voluntary contract (Wunder, 2005). But in other cases, the full package of ecosystem services is seen as a public good, deserving of public investment; China, for example, is investing billions of dollars in a variety of PES initiatives (Liu et al., 2008). Elsewhere, PES schemes have emerged in watershed protection, for example to pay upstream users for improved downstream water quality (Perrot-Maitre, 2006), as well as for biodiversity and landscape preservation in the European Union.

At least in theory, a viable PES scheme should lead to policy changes by the host government that give PES solid legal and regulatory support that includes it as a recurrent part of the funding mechanisms available to support biodiversity conservation and sustainable use of its components. PES could be a useful source of co-financing for governments seeking innovative sources of finance, and thereby a source of economic resilience. These residual funds can potentially be invested to initiate REDD+ activities in order to pave the way for performance-based payments. However, each circumstance needs to be considered on its own merits and consider whether other measures, such as regulations, may promote the same outcome at lower cost.

REDD+ is an outstanding example, perhaps the most widespread one, of a PES scheme, with the payments being made for the services of climate regulation, primary production, conservation of genetic resources, fresh water, and others. By providing the initial funding, REDD+ can demonstrate the concept of PES very clearly to decision-makers, who could then apply the concept more widely. The concept of bundling different PES should be explored more in the context of REDD+ and related pilot projects. Often, it might be other objectives, such as watershed management or wildlife conservation, which provide the initial investment for setting up a functioning PES scheme, and REDD+ payments can be added to the portfolio to strengthen the economic case for conservation, sustainable management or restoration of forests.

In short, REDD+ activities could enable a country to maintain its forests, recognizing them as important

natural capital assets that provide valuable ecosystem services, while potentially receiving an income from carbon sequestration. Such a development opportunity, now within reach through REDD+ support, opens up the potential for countries to take a leap ahead towards the new paradigm of green growth and build PES as a foundation of a Green Economy. Further,

'natural solutions' (i.e. potable water and avoided dam siltation in forested watersheds) are important potential outcomes of REDD+. These avoid the need for expensive investments in infrastructure (and on-going running and maintenance costs) to deliver the same function (Emerton and Bos, 2002), and free up those funds for more productive use in economic development.

## Key messages

**For policy makers:** The natural capital of forests can produce extraordinary levels of wealth through resources, ecosystem services, and a variety of market and non-market products. REDD+ is a holistic approach to address the broad spectrum of drivers of forest loss, and to enhance forest ecosystem services.

**For the Green Economy:** REDD+ has particular relevance to sustainable energy, low carbon production, increasing resource efficiency, and provisioning of ecosystem services – all essential elements of a Green Economy.

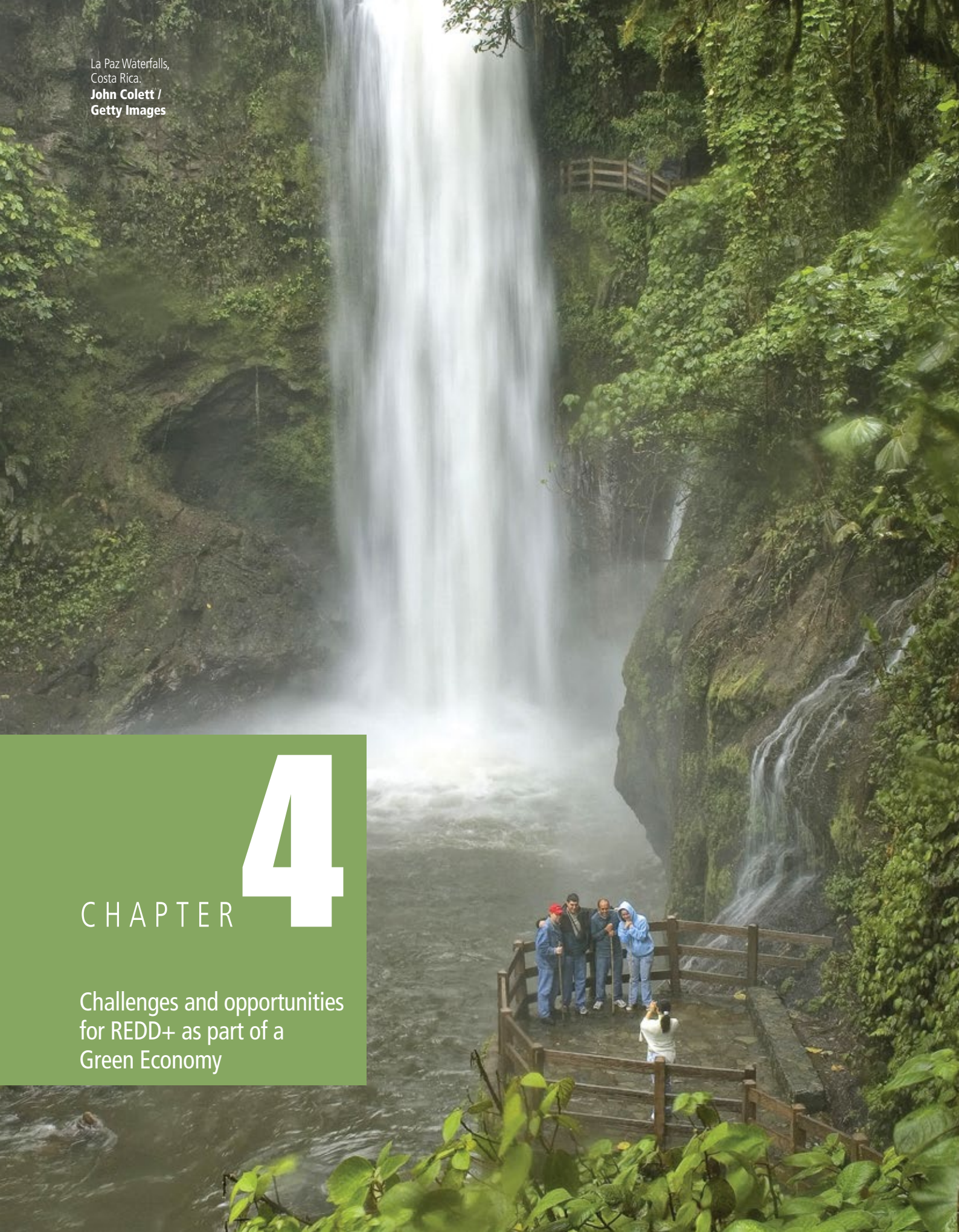
**For Business Leaders:** Protecting the sustainable wealth generated by the natural capital of forests reduces risk and exposure to environmental and climatic change. REDD+ provides numerous business opportunities, including moving from agriculture to agroforestry, or managing forest concessions in ways consistent with REDD+.

La Paz Waterfalls,  
Costa Rica.  
**John Colett /  
Getty Images**

# 4

CHAPTER

Challenges and opportunities  
for REDD+ as part of a  
Green Economy



# Challenges and opportunities for REDD+ as part of a Green Economy

## 4.1 The promise of REDD+

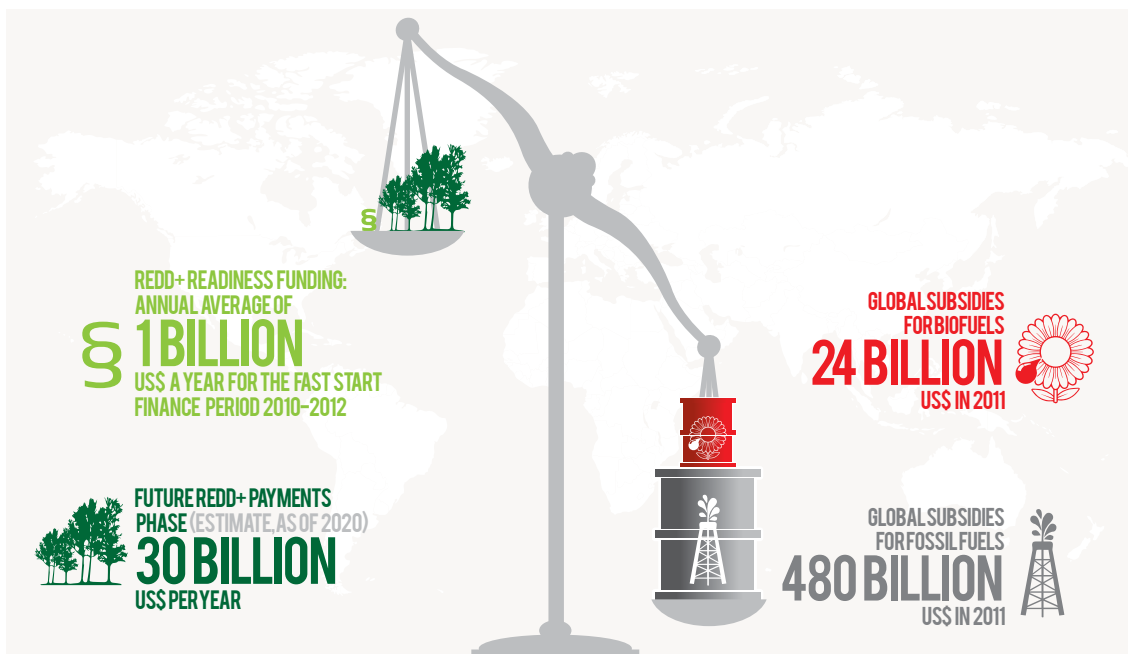
Chapter 3 showed some of the ways that REDD+ can contribute to the main elements of a Green Economy. Figure 2.3 showed that in order to follow an environmentally sustainable and socially inclusive development path, Green Economy strategies require collaboration across many sectors in the economy. At least in principle, REDD+ could be implemented by a mix of policy instruments, governance principles, and incentives aimed at changing production, consumption and investment decisions and decision-making processes that are part of green transformations in multiple sectors. REDD+ and a Green Economy thereby can be mutually reinforcing: REDD+ is **unlikely to work without a greening of the global economy**, while REDD+ can be an **important contributor to a transition to a Green Economy**.

REDD+ is still in its early stages, so data on implementation and achievements on the ground are

scarce, but early indications (such as those discussed in section 4.5.) are that it can provide a catalytic source of finance for transforming forest management towards a Green Economy paradigm. To date, about US\$ 6.27 billion has been allocated by the global community in public financing for REDD+ activities, according to 2012 data reported by donor countries providing information to the REDD+ Partnership's voluntary REDD+ database. This figure should be taken as the minimum allocation, as many other sources are not included in this database. However, only a modest proportion of this allocation has actually been spent, and the time period over which it would be spent is uncertain.

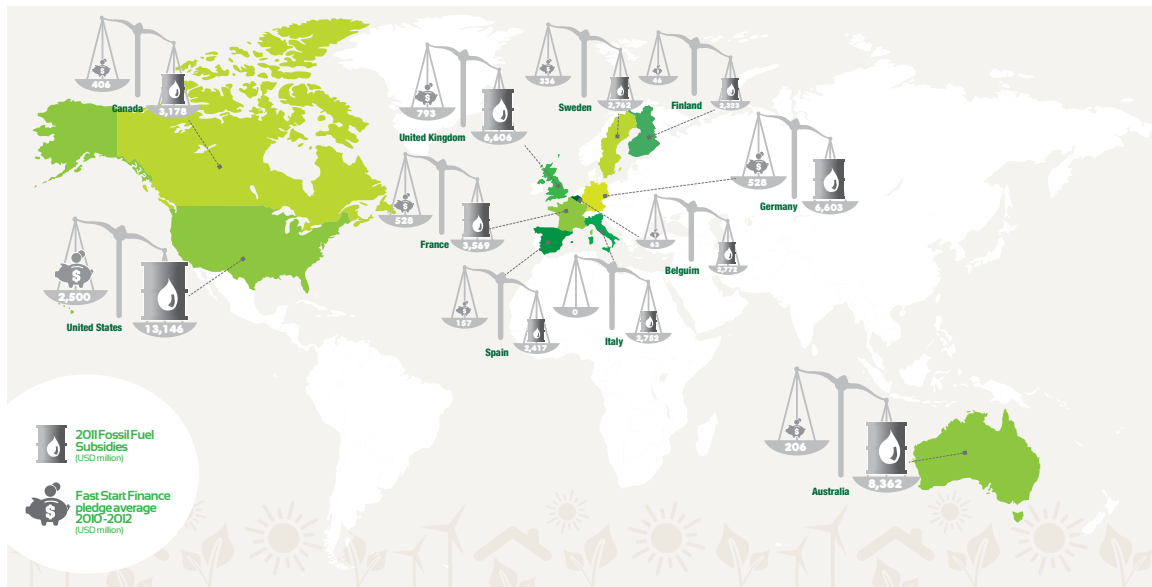
This sounds like a lot of financial support, especially when coupled with the hope or even expectation, that as much as US\$ 30 billion per year may become available by 2020. But such levels of funding pale in comparison with the US\$ 480 billion spent subsidizing fossil fuels in 2011 that are significant producers of greenhouse gases, or even the US\$ 24 billion spent in 2011 subsidizing

Figure 4.1 REDD+ and contradicting fiscal incentives



SOURCE: GCP (2012); IEA (2012); IISD (2012); IMF (2013); Voluntary REDD Database (2012)

Figure 4.2 Climate change funding versus fossil fuel subsidies, OECD countries



SOURCE: ODI (2013)

biofuels (Figures 4.1 and 4.2). Harmful fiscal incentives (i.e. those that are directly undermining climate change or biodiversity objectives) should be revised and possibly re-directed towards REDD+ payments. This revision of incentive frameworks and subsidies should be done in a way that social benefits accrue to those in actual need of support, i.e. the rural poor and other marginalized groups. REDD+, by its nature as a scheme to support mostly rural communities, can possibly equally or better fulfill the objectives of social cohesion and rural development as current subsidy schemes. This should be further explored and analyzed.

Given sufficient support, REDD+ can demonstrate significant benefits from investments by governments and the private sector, helping to justify greater allocations. For example, REDD+ can help strengthen a sustainable landscape approach through integrated land use planning that accounts for the trade-offs between alternative land-use objectives, such as carbon sequestration and storage, natural habitat protection, and timber, food and bioenergy production (Barbier, 2012). Addressing the drivers of deforestation and forest degradation can involve measures for improved crop and livestock management and agricultural intensification, as well as changing consumption patterns and increased efficiency in the energy, construction, and manufacturing sectors that would reduce pressure on forest lands.

REDD+ has significant potential to contribute to sustainable development, and it can fairly be seen as one of the first approaches (along with the accelerating transition to renewable energy in many countries) to illustrate concretely an aspect of the emerging Green Economy. Table 4.1 indicates how some of the challenges can be matched with opportunities for REDD+ to earn a prominent role in the Green Economy, drawing on five of the most important building blocks to implement REDD+, namely building a strong knowledge base and planning tools, building strong political will, improving forest governance, improving coordination among sectors and policies, and ensuring sustainable finance.

## 4.2 Economic challenges to REDD+

The contribution to climate change mitigation from REDD+ activities can be measured, or at least estimated, by the potential emission reductions. Estimates of these avoided costs of climate change are highly debatable, as it is impossible to know with much certainty what would have happened without any climate change mitigation. Estimates necessarily include assumptions on climate sensitivity as well as on socioeconomic and policy uncertainties when they establish and aggregate impacts on agriculture, coastal areas, human health and



## Box 4.1 The importance of a landscape approach to REDD+

A landscape is a cluster of local ecosystems with a particular configuration of topography, vegetation, land use, and settlement. The size of a landscape can vary considerably, from the vast reaches of the taiga or Amazonian rainforest to the smaller watersheds of Europe. The success of a REDD+ activity is likely to be limited if it focuses at just a forest plot or farm level, but could be far more influential if it is linked to a larger landscape that includes multiple land uses and interests. While the scale of the landscape will vary with the conditions, for the purposes of REDD+ it should be sufficiently large to sequester a significant amount of carbon, maintain biodiversity and ecosystem services, support agricultural production sustainably, and contribute to improved livelihoods among local people.

The focus of a REDD+ activity may cover only part of such a landscape, but the effects of the activity will be felt far more widely. Its contributions to climate mitigation may be felt globally, while many of the “non-carbon” benefits, such as sustainable management of forests, support for pollinators, watershed protection, and conservation of biodiversity, will be felt locally or regionally throughout the landscape. Many ecosystem services, especially those providing water-related benefits from REDD+ activities, will be felt in the larger landscape. Using a landscape approach will also enable a broader community of interests to contribute to ensuring that the REDD+ activity is sustainable and is providing the wide benefits that are expected. The landscape scale can be addressed through clarifying jurisdiction, cross-sectoral planning, and government policies designed with scale in mind.

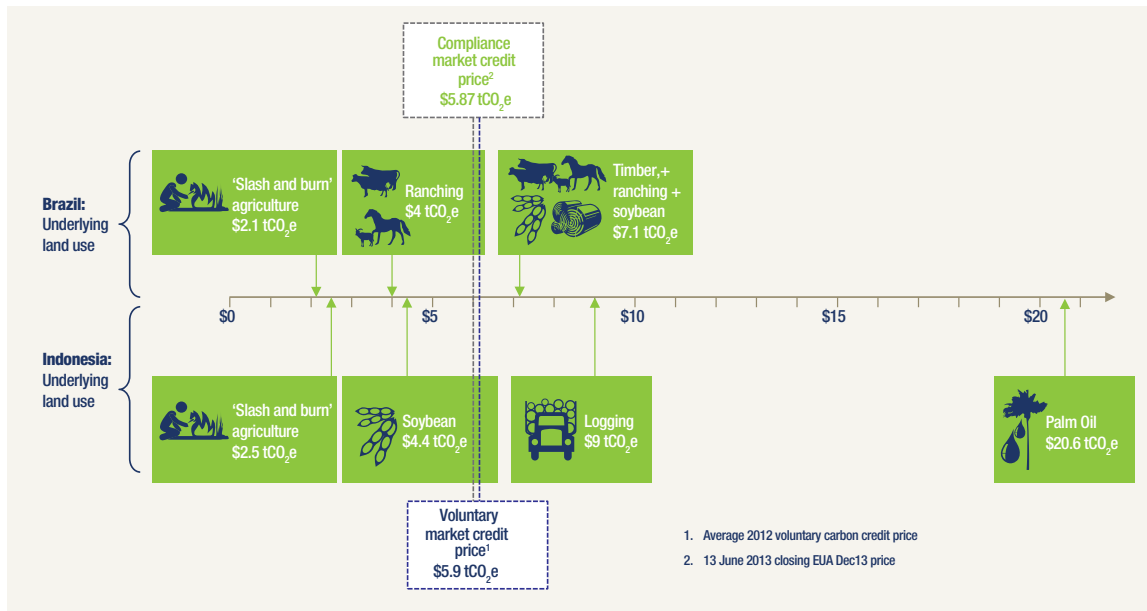
A recent IUFRO report concludes that “if REDD+ is to succeed, related interventions need to consider wider dynamics outside forests and consider the broader landscape. An integrated landscape approach can better embrace both conservation and development objectives, and increase synergies among multiple local, regional and global societal objectives” (IUFRO, 2012).

But a landscape approach is not sufficient when many of the drivers of resource degradation are international. Landscape approaches at the national level therefore need to be supported by international measures in support of sustainable management of natural resources.

**Table 4.1 Potential challenges and opportunities of integrating REDD+ into a green economy transition**

	CHALLENGE	OPPORTUNITY
<b>Strong knowledge base and tools for planning</b>	Data and methodological limitations in understanding of forest contributions to the national economy can push forests down the policy agenda. A lack of information can also limit the application of economy-wide land use planning tools.	Strengthening knowledge can generate greater political will by demonstrating the multiple contributions of REDD+, and can feed into emerging tools to manage potential conflicts and trade-offs with other land uses and policy priorities, particularly with the advent of big data and real time satellite imagery.
<b>Good political will</b>	Politically sensitive trade-offs are inherent in a change in the status quo, and forests have not traditionally been seen as a high priority in national development planning.	REDD+ could provide new incentives for forest conservation that can increase political will and go some way to overcome interests and incentives that run counter to REDD+ and green economy objectives.
<b>Appropriate forest governance</b>	Acting to clarify tenure, foster broad participation and effect good law enforcement are longstanding challenges in forest conservation. Accelerated progress towards appropriate forest governance may require national recognition of REDD+ and a green economy as a development rather than an environmental issue.	Similar networks and institutions are likely to be engaged in both REDD+ and a green economy transition. Complementary systems can be designed, and build on those emerging under REDD+ to reduce overlap and unnecessary complexity and transaction costs.
<b>Policy alignment and cross-sectoral coordination</b>	REDD+ and green economy objectives sit within a number of national policies, strategies and action plans in a diversity of sectors, but policy alignment and cross-sectoral coordination can be hard to achieve in practice.	Where REDD+ can be integrated into green economy planning and investments, more strategic planning of investments could reduce the overall costs of progress were they pursued separately.
<b>Adequate finance</b>	Current limits on public finance and limited engagement of private sector in REDD+ at present, provide a challenge in raising sufficient finance to integrate REDD+ within a green economy transition.	The integration of REDD+ in a green economy transition could aid private sector engagement through sharing lessons on the application of safeguards to reduce risk and increase investor confidence.

Figure 4.3 Carbon prices and land uses in two REDD+ countries



SOURCE: PricewaterhouseCoopers adapted from Olsen, N. and J. Bishop (2009), Intercontinental Exchange (2013), Ecosystem Marketplace (2012)

mortality, ecosystems and biodiversity loss, for example (Tol, 2005; Nordhaus, 2008; Watkiss and Downing, 2008). The standard measure is the price of greenhouse gas emissions, usually calculated as carbon emissions. Many countries or localities have put a carbon pricing scheme into place (often called a “carbon tax”), and emissions trading schemes have established prices for carbon/greenhouse gas emissions. The resulting prices have been highly volatile, not to mention controversial.

Therefore, the market price/valuation of carbon is a serious issue for any initiative, such as REDD+, that is linked to the price of carbon (Figure 4.3). When the price drops too low, the incentives for sustainable forest management may weaken, perhaps significantly. Without greater certainty over the market price, other land use options provide lower risks. The issue of carbon price helps to explain why many governments continue to expand oil palm plantations even at the expense of climate and biodiversity. It also indicates that stopping deforestation may require that the price of carbon will need to be higher than the current voluntary market credit price, and that other values beyond carbon will also need to be included in the calculation of the total value of forests. The issue will undoubtedly be central to future negotiations at the UNFCCC, and perhaps even UNCTAD and the World Trade Organization.

It may be that the majority of the public is simply unwilling to pay the true social and environmental costs of carbon emissions, at least under current conditions when the payments (such as carbon taxes) are not clearly and convincingly linked to action addressing climate change. A major problem has been that the supply of carbon credits (Verified Carbon Standards) has exceeded the demand for them, thereby depressing prices for REDD+ credits. This issue also indicates the importance for REDD+ to consider the full range of economic values that are provided by biodiversity-rich natural forests, or even by degraded lands that could be converted to forests. **The focus solely on carbon credits sells forests short.**

Any climate mitigation and other benefits of REDD+ should be considered relative to the costs of delivering the enhanced benefits of REDD+. These could include the opportunity costs of forgone revenues from other land uses; the up-front capacity building costs and implementation costs; and on-going costs of continued forest protection and monitoring, reporting, and verification of emission reductions.

Stern (2007) estimated that the opportunity costs of forest protection, meaning the foregone income from an alternative land use, in eight countries representing 46 per cent of global deforestation would be about

US\$ 5 billion per year. In 2008 these figures were revised upward to US\$ 7 billion per year as a result of higher commodity prices (Eliasch, 2008), though some of these costs have again declined. These opportunity costs of land reflect the economic incentives promoting deforestation that need to be overcome to keep forests standing, and some have suggested that payments for REDD+ should be tied to such opportunity costs of land (Wertz-Kanounnikoff, 2008; Pagiola and Bosquet, 2009; White and Minang, 2011).

The estimate of the opportunity costs of land, however, has limitations (Grieg-Grann, 2006; 2008; Angelsen, 2010). In particular, opportunity cost estimates at this global scale are based on broad assumptions about crop types and market prices over time, and rarely reflect crop or soil heterogeneity at a more local scale. They often fail to consider the costs of the loss or decline of forest-based ecosystem services as a result of deforestation, which are estimated in the tens of billions of dollars annually (TEEB, 2010b). Estimates of opportunity costs may also fail to consider the subsistence and cultural values of forests or the lack of secure land tenure in many forested nations (see section 5.4). On the other hand, countries such as Brazil have used parameters such as water availability and proximity to roads to estimate opportunity costs per ton of carbon, which can be a useful tool (though social dimensions remain challenging)(Figure 4.4).

The costs of up-front capacity building and implementing REDD+ measures (commonly called "transaction costs

of REDD+") can be substantial. Eliasch (2008) estimated that capacity building for REDD+ would cost US\$ 4 billion over five years in 40 forest nations, and for 25 countries, the transaction costs to administer REDD+ payments could be US\$ 233-500 million per year, with monitoring costs of US\$ 7-17 million annually. Eliasch did not estimate the forest protection measures, however, recognizing that the costs of REDD+ implementation will vary by country and depend on the existing sociopolitical context as well as the drivers of deforestation to be addressed. But as REDD+ becomes better established, experience from implementing projects could well result in best practices being defined and adopted.

The cost estimate mostly used in this report has been developed in 2012 for the Convention on Biological Diversity for achieving the forest-related Aichi Targets (Targets 5, 7, 11 and 15 of CBD decision X/2, which cover the sustainable management, conservation, and restoration of the world's forests, thus overlapping to a large degree with the aims of REDD+). This cost estimate is US\$ 30 billion per year (GCP, 2012).

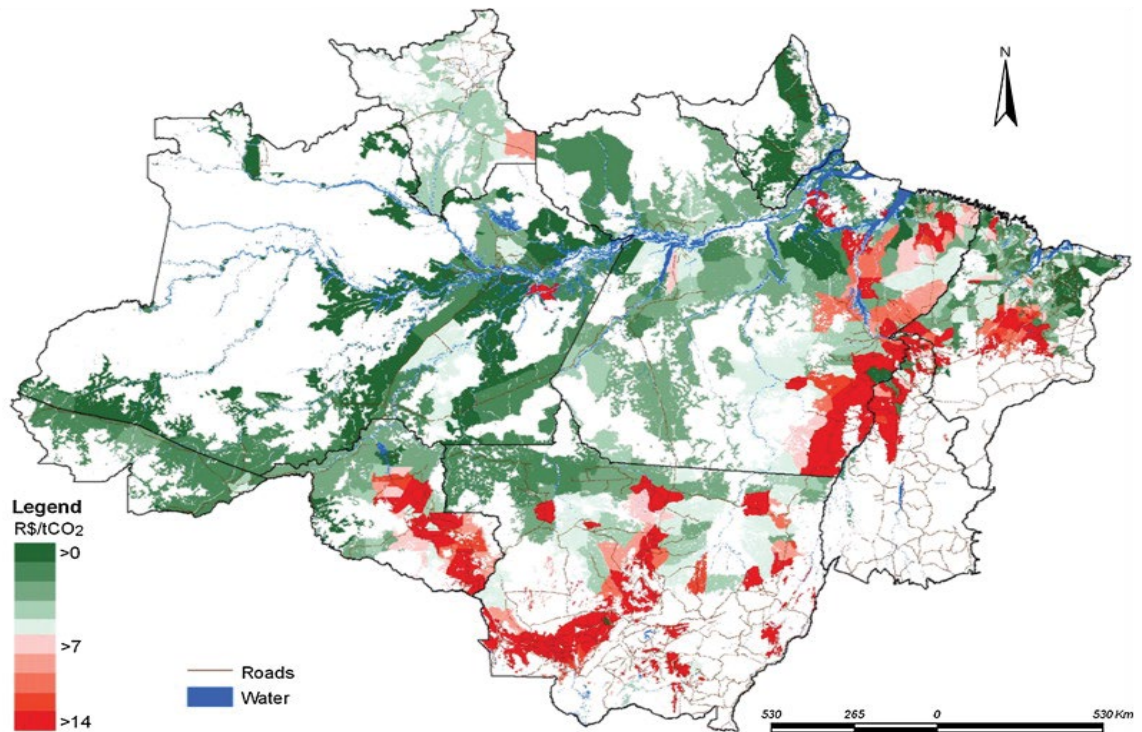
### 4.3 Contributions of REDD+ to economic development

Once issues of carbon valuation have been addressed (though experience indicates that prices will always vary, as with other commodities), the issue then becomes carbon trading, and how this can help REDD+ meet



Landscape mosaic, Haliman Salak NP, West Java, Indonesia. **Kate Evans / CIFOR**

Figure 4.4 Spatial distribution of REDD+ opportunity costs of CO<sub>2</sub> in the Brazilian Amazon



SOURCE: Boerner et al. (2010)

its objectives. Drawing from experience from many commodity markets, a danger that needs to be addressed is that intermediaries rather than producers are likely to gain control of the REDD+ market, leaving governments and local forest owners to gain only a modest portion of the capital flows. This mechanism design issue needs to overcome potential inefficiencies and inequities that already characterize land-use in many low-income countries, so that the position of forest rights-holders (especially among the poor) are protected (Elson, 2012). For example, REDD+ activities could distinguish between small holders and large corporations, with very different social implications.

REDD+ activities can be designed to ensure the interests of local people, for example by supporting sellers' cooperatives (such as for sustainably harvested non-timber forest products) that will give them greater power in the market. The urgency of this correction is indicated by the rejection of a REDD+ project in Panama in June 2013 by one of the country's leading traditional indigenous authorities, the Guna General Congress (Potvin and Mateo-Vega, 2013) and the withdrawal of the country's coordinating body for indigenous

peoples (COONAPIP) from the UN-REDD Programme. The UN-REDD Programme responded by undertaking a full investigation of its National Programme, and the Programme acknowledged the need to realign the national activities to make them more inclusive of indigenous peoples. The National Programme was re-opened in December 2013 through a renewed agreement between the UN-REDD agencies, the government, and the indigenous people's organizations. This has yielded important lessons for the full and effective participation of indigenous peoples and local communities in REDD+.

**The implementation of REDD+ could create new economic opportunities for local communities and indigenous peoples, and this should be a major objective as REDD+ matures.** In addition to making direct payments to conserve carbon (that is, to avoid deforestation or forest degradation), other possibilities may serve the same ends. For example, national REDD+ strategies may include measures to create alternative sources of income, such as the marketing or further processing of sustainably harvested timber and non-timber forest products (see section 5.3, below). Which

specific REDD+ activities (that is, how to do REDD+) are most appropriate for a country depends on national conditions and preferences and local contexts, such as the drivers of deforestation and forest degradation (CIFOR 2009). Some actions may only be suitable in specific locations, depending on biophysical (e.g. topography, land cover) and socio-economic factors (e.g. property rights, existing land designations) (see Figure 4.5).

**Employment is a critically important dimension** of the economics of a Green Economy and REDD+, as a response to poverty-related deforestation and

forest degradation. REDD+ activities leading to income or employment either directly or indirectly indicates multiple benefits. International Labour Organization studies have illustrated that greening certain sectors of the economy can potentially lead to a significant increase in direct and indirect employment (ILO, 2009). They recommend policies aimed towards creating low carbon, employment intensive, poverty-reducing growth – all characteristics of a Green Economy. However, the evidence on the impacts that investment in greening an economy has on jobs is mixed, and will depend on the choice of policies adopted (Bowen, 2012).

**Figure 4.5 Positive and negative impacts on various forest values as a result of alternative REDD+ approaches**

APPROACH	IMPACTS ON						Costs	Ease of measuring carbon benefits
	Carbon	Biodiversity	Soil	Water	NTFPs	Livelihoods		
<b>REDUCING DEFORESTATION</b>								
Maintaining natural forest and preventing conversion	+++	+++	+++	+++	+++	---	\$	***
Promoting the use of non-timber forest products (NTFPs) at sustainable harvesting levels to provide alternative livelihoods	□	-	□	□	□	++	\$	*
Intensification of agriculture (annual or tree crops) with conventional methods using high energy and chemical input, to decrease conversion pressure	---	---	---	---	---	++	\$	*
Change from conventional agriculture to organic farming to decrease conversion pressure by increasing profitability	+	+	++	++	□	++	\$	*
<b>REDUCING FOREST DEGRADATION / SUSTAINABLE MANAGEMENT OF FOREST</b>								
Change from conventional logging to Reduce-impact Logging (RIL) in production forest	+	+	++	++	+	+	\$	**
Enrichment planting in moderately degraded/logged over forest	++	+	+	+	++	++	\$	**
Fire control to prevent fire through raised awareness and increased enforcement in the forest areas at risk	+	+	+	+	+	+	\$	**
<b>ENHANCING FOREST CARBON STOCKS</b>								
Rehabilitation of significantly degraded land through (assisted) natural regeneration	+++	++	+++	+++	+++	++	\$	***

KEY	IMPACTS		Costs	Ease of measuring carbon benefits
	Positive	Negative		
High	+++	---	\$\$\$	***
Medium	++	--	\$	**
Low	+	-	\$	*
Neutral	□			

Shading indicates degree of certainty



SOURCE: Epple & Thorley (2012)

An estimated 13.7 million people were employed in the formal forest sector globally in 2010 (FAO, 2011) (with at least 40 million more in the informal forest sector). This represents up to 2 per cent of the total workforce in some forest-rich developing countries such as Gabon, Guyana, Malaysia and Suriname. In terms of economic significance, the forestry sector provides 2 per cent of GDP in tropical Africa, including up to 11.1 per cent in Central African Republic and 17.7 per cent in Liberia (FAO, 2011). Concerns over poorly maintained forest stocks threaten the sustainability of this industry; for example, calculations in Ghana predict a 68 per cent drop in gross value of production between 2012 and 2020 if governance and management are not improved (Mayers, Birikorang, Danso, Nketiah and Richards, 2008). Therefore, REDD+ activities supporting good governance and improved forest management could help sustain an economically important sector and provide viable alternatives for those whose employment is at stake.

More specifically, a review of the early impact of 41 REDD+ projects indicated that they had generated over 1,500 jobs, as well as funding over 100 scholarships and the construction of numerous schools (Lawlor, Madeira, Blockhus and Ganz, 2013). Further benefits are expected as the projects mature.

In terms of job creation, Nair and Rutt (2009) calculated that a stimulus package in sustainable management of forests could provide an additional 10 to 16 million jobs globally at an estimated cost of US\$ 36 billion. The majority of the early jobs would be provided in developing countries through afforestation and reforestation, maintenance of managed forests, forest conservation, and agroforestry, all forest management options included within REDD+ as well as rehabilitation of wetlands. The jobs created in the forest sector are also relatively labour intensive and low in capital requirements compared to other sectors, making them attractive investments when seeking to green an economy (Bowen, 2012; FAO, 2009). An average of 75 forestry and timber-processing jobs are created for each 1,000 ha of sustainably managed forest established (Grulke, Tennigkeit and Vogt, 2010). Over the longer term, increased employment in the forest production and the non-timber forest product sector could be anticipated.

In considering potential benefits of REDD+ for income, the contribution of the informal forest sector is vital. It

is estimated that formal employment comprises only between one third and half of forest sector jobs (ILO, 2001; Lebedys, 2004; UNFF, 2013a). The protection and development of a broad range of forest-based livelihood strategies is, therefore, a key element of many country strategies to implement REDD+.

Arriving at a total figure of employment and income created or at risk from REDD+ implementation would be a complex undertaking, given the lack of data on the informal forest sector and the complexities of identifying a business-as-usual case for comparison. For example, converting a carbon-rich forest to other uses may generate employment and income (Imori, Guilhoto, David, Gutierrez and Waisman, 2011). This further emphasizes that REDD+ activities must be designed with full consideration of national development and food security objectives that enable agricultural development to continue without becoming extensive and thus requiring forests to be cleared. Agricultural intensification provides numerous economic and social opportunities as well as risks (Figure 4.6).

#### 4.4 How REDD+ measures up to the Effectiveness, Efficiency and Equity requirements of a Green Economy

To earn the support of planners, economists, and the general public, a Green Economy needs to include elements that are effective, efficient, and equitable (Stern, 2008).

In the REDD+ context, **effectiveness of climate mitigation** can be measured by the amount of emissions reduced or removals increased by REDD+ activities and **effectiveness of forest sustainability can be measured by reduced rates of deforestation** and lower rates of biodiversity loss (or even reversal of these rates, as would happen in a truly Green Economy).

**Efficiency** measures the costs of these reduced emissions or increased removals as compared to other options for doing so (Angelsen, 2009). REDD+ activities are based on reducing emissions in ways that meet the cost-efficiency demands of a market-oriented system, while also providing benefits to stakeholders with legal rights to the resources and those who are actually achieving emissions reductions. Meeting these criteria would help REDD+ contribute to a Green Economy, but finding ways to measure the other dimensions of REDD+



Man carrying dried grasses /palms for thatching in Wae Rebo, Indonesia.

**Aulia Erlangga / CIFOR**

remains a challenge that, once met, could demonstrate far greater contributions to a Green Economy.

The definition of **equity** in the context of REDD+ has been a concern, both with respect to distributional equity (allocations of costs, risks and benefits of implementing REDD+) and procedural equity (processes for decision making and dispute resolution (McDermott et al., 2011). These concerns have led to the development of REDD+ as it is now, with many principles designed to address equity issues. Allocation of REDD+ investments include compensating stakeholders based on costs incurred, rewarding low-emitting forest stewards for sustainable use, and creating alternative livelihoods for the poor. Safeguards and the principle of free, informed and prior consent are central to the process. Research shows that ensuring equity is context-dependent and some REDD+ projects are inherently more or less equitable than others (Corbera, Brown and Adger, 2007). Equity may be easier to measure for the non-carbon dimensions of REDD+, helping to demonstrate its social benefits.

Studies of how early REDD+ activities have contributed to effectiveness, efficiency, and equity (the “3E” criteria) outcomes have shown mixed results (Pham et al., 2013; Angelsen and McNeill, 2012; Murdiyarso, Brockhaus, Sunderlin and Verchot, 2012; Sunderlin and Sills, 2012). For example, meeting the “3E” criteria often requires tradeoffs in the design and decision processes of REDD+ benefit-sharing mechanisms, some of which may raise some concerns. Several of the key points have been highlighted by Luttrell et al. (2013), and suggest some areas requiring further attention as REDD+ activities are developed further:

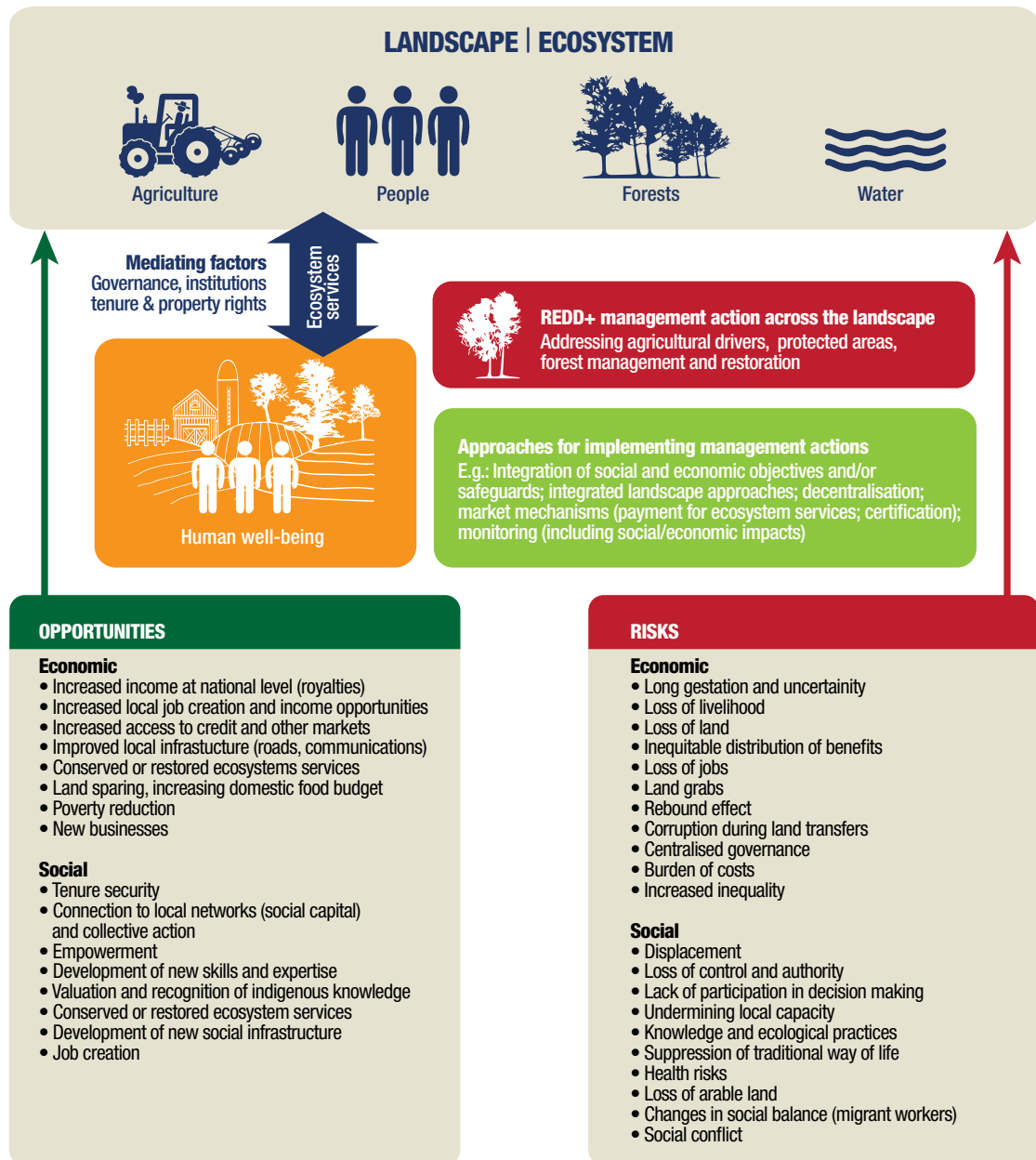
- Basing REDD+ benefit-sharing mechanisms on legal rights can disadvantage the poor, as these forest users seldom possess legally recognized rights to land and/or forest products, often because of the high costs of obtaining legal recognition (Colchester et al., 2006). Further, in some REDD+ activities, large-scale land users (such as timber and oil palm concessions) targeted by the project are legal while many of the smaller-scale activities that were excluded from the project because they had no legal recognition.



Liquefied shea butter is filtered before being packaged in Leo, Burkina Faso.

**Ollivier Girard / CIFOR**

Figure 4.6 Economic and social impacts of REDD+ management actions on different stakeholders within a landscape



SOURCE: Adapted from Parrotta, Wildburger & Mansourian (2012)



- The effectiveness and efficiency objectives of REDD+ may result in its investments rewarding large-scale actors – the dominant emitters in many contexts – for reducing carbon emissions that start from a baseline of high emissions. In addition, revenue sharing schemes under large-scale agriculture and forestry land uses have seldom delivered equitable benefits to local communities (Assembe-Mvondo, Brockhaus and Lescuyer, 2013; Pham et al., 2013). As REDD+ becomes broader, many outcomes beyond maximizing carbon returns will also be recognized as desirable.
- Policy debates at the international and national levels often call for REDD+ activities to support indigenous groups and other forest users that have a record of responsible forest management. The dilemma for REDD+ is that additionality cannot be proven in many of these low-emission regions because the baselines are so low. Despite the strong rhetoric, rewards for forest stewards are scarce within current benefit sharing mechanisms except in some projects in Brazil and Peru (Pham et al., 2013).
- Current policy discussions promote greater REDD+ investment flow to the poorest communities. In addition to the social and ethical aspects, this reflects a pragmatic concern that REDD+ projects are unlikely to be effective if they do not involve local people in their implementation and if REDD+ is not equitable, it will not be perceived

as fair (Börner and Wunder, 2008). Perceptions of inequity can undermine the effectiveness, legitimacy (Peskett, 2011; Costenbader, 2010), and sustainability of REDD+, thus leading to increased conflict (Mohammed, 2011) and a higher risk of failure.

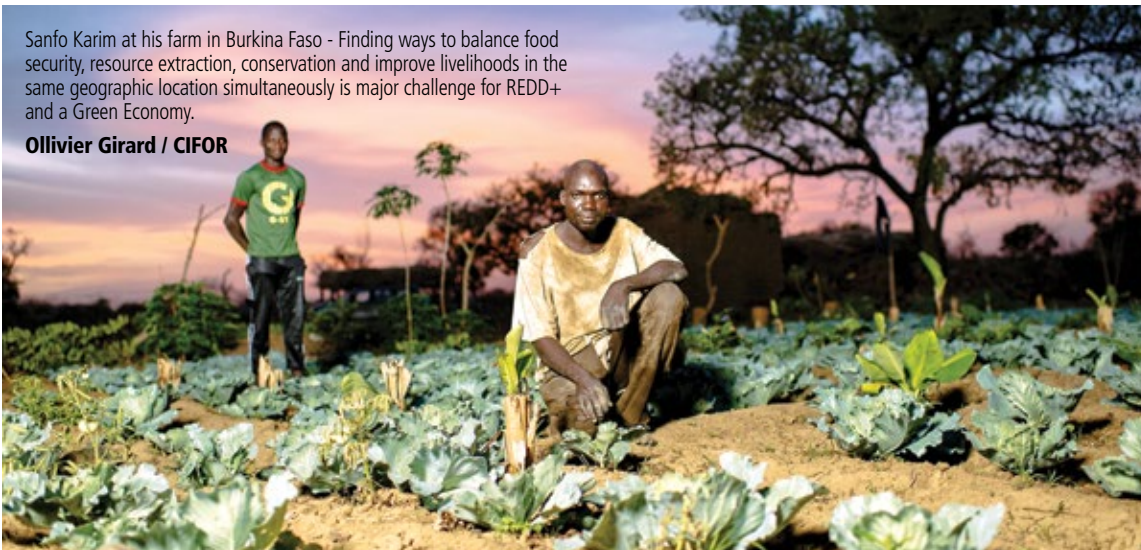
**In terms of effectiveness, governments and others involved in REDD+ have agreed that it is more effective to focus on the natural forests that are rich in carbon and biodiversity rather than those forests where emissions can be reduced at the least cost.** If the focus is solely on carbon, then plantations will be far more attractive even though they provide far fewer ecosystem services than do natural forests. **This is where the multiple benefits of REDD+ will need to enter the equation more in the future than they have in the past.** Such issues will need to be addressed squarely as REDD+ moves more into its implementation phase.

## 4.5 Country-level experience in linking REDD+ to a Green Economy

The most effective way to demonstrate the value of linking REDD+ to a Green Economy is to provide evidence from on-the-ground experience. Given the reliance of many developing countries on its natural resources (World Bank, 2004; 2010a), it is not surprising that some countries have explicitly recognized

Sanfo Karim at his farm in Burkina Faso - Finding ways to balance food security, resource extraction, conservation and improve livelihoods in the same geographic location simultaneously is major challenge for REDD+ and a Green Economy.

**Ollivier Girard / CIFOR**



Green Economy elements in REDD+ planning and implementation (Table 4.2). Vietnam has been linking planning to REDD+ implementation, as outlined in the Viet Nam Green Growth Strategy.

In Indonesia, the US and Indonesian governments initiated a US\$ 28.5 million debt swap program in 2012 to support REDD+ programs across three Districts in East and West Kalimantan. The programme will support the development of forest conservation and sustainable land use activities that will be carried out by civil society organizations, and supported by District planning

and policy procedures by the local governments. The program targets Districts with high forest cover and high threat from deforestation, using REDD+ support to design future development activities that do not drive additional forest loss. REDD+ finance is seen as an incentive for sustainable land use in remote Districts that often do not benefit from large-scale investments, and the direct engagement of civil society in the governance mechanisms is expected to ensure adherence to social safeguards and equity principles that are fundamental to a Green Economy.

**Table 4.2 Country-level links between REDD+ and a Green Economy**

COUNTRY	EXAMPLES OF LINKS BETWEEN REDD+ AND A GREEN ECONOMY
<b>Democratic Republic of the Congo</b>	<ul style="list-style-type: none"> <li>• DRC has developed a 'REDD+ to a green economy' scenario as part of its analysis of policy reforms required for REDD+ with stakeholders and the Ministry of Planning, providing an example of what such transformation based on REDD+ investments could mean</li> <li>• DRC's REDD+ Framework Strategy finalised in 2012 also includes direct reference to the importance of a green economy in REDD+ planning and processes</li> </ul>
<b>Ethiopia</b>	<ul style="list-style-type: none"> <li>• Ethiopia has situated its 'REDD Readiness Wheel' within its Climate Resilient Green Economy initiative explicitly incorporating REDD+ within the initiative that seeks to coordinate the main sectors of the economy to develop an environmentally sustainable growth path in Ethiopia (FDRE, 2011)</li> <li>• Participatory forestry management is part of Ethiopia's poverty reduction strategy and will be extended across the country, which has the potential to contribute towards emission reductions as well as to greater empowerment and social equity</li> <li>• Ethiopia has recently secured funding from the World Bank's Forest Carbon Partnership Facility to continue to develop its national REDD+ strategy</li> </ul>
<b>Guyana</b>	<ul style="list-style-type: none"> <li>• Guyana's Low Carbon Development Strategy (LCDS) makes specific reference to REDD+ as one of two goals in its transition to a green economy (Republic of Guyana, 2013)</li> <li>• In 2012, Guyana established a Conservation Trust Fund with objectives to protect ecosystems, maintain carbon stocks, and benefit local communities. It has also established the Guyana REDD+ Investment Fund (GRIF) to finance activities identified under the LCDS. The fund is receiving performance-based payments for REDD+ from Norway.</li> </ul>
<b>Indonesia</b>	<ul style="list-style-type: none"> <li>• Indonesia plans to cut greenhouse gas emissions by 26% by 2020 while growing the economy by 7% annually. A large portion of emission reductions is likely to come from REDD+ activities</li> <li>• The Master Plan for the Acceleration and Expansion of Indonesia's Economic Development illustrates a strong REDD+ contribution (Rol, 2011)</li> <li>• Indonesia is collaborating with the UN-REDD Programme to link its REDD+ efforts with its overarching goal of transitioning to a green economy</li> <li>• Indonesia's investment plan as part of the World Bank's Forest Investment Programme makes explicit links to realising the goals of a green economy and green growth in the pursuit of REDD+</li> </ul>
<b>Kenya</b>	<ul style="list-style-type: none"> <li>• Recent environmental valuation work in Kenya highlights the impact of forest ecosystem change to the national economy</li> <li>• A Kenya Forest Service Report, with UNEP support, linking the value of montane forests to the economy has also stimulated the establishment of a steering committee on forest resource accounting, with efforts to include this accounting in official forest statistics</li> <li>• Kenya's new constitution puts environmental concerns more centrally in government priorities</li> </ul>
<b>Panama</b>	<ul style="list-style-type: none"> <li>• The Forest Carbon Partnership Facility Readiness Preparation Proposal highlights the need to strengthen local capabilities required to promote a green economy at the local level, and the need for resources to encourage productive activities compatible with conservation goals and human development goals, and to incorporate activities into a green economy (ROP, 2009)</li> </ul>
<b>Viet Nam</b>	<ul style="list-style-type: none"> <li>• Viet Nam's Green Growth Strategy (VGGs) recognises the need for increased investments in conservation, development, and efficient use of natural capital. The strategy includes both afforestation and reforestation, as well as REDD explicitly, within its 17 'solutions'.</li> <li>• In preparation of the VGGs, the government, with support of UNDP, assessed all potential forestry related emission reduction options which included REDD related, as well as rehabilitation of wetlands, enhancing tree cover in agricultural landscape and increased use of local species in reforestation activities.</li> <li>• The VGGs foresees in a 10% reduction in GHG intensity with own resources, and 20% conditionally on international resources. REDD and the forestry sector are integral elements and are specifically linked to PES schemes. The VGGs foresees an increase in forest cover to 47% (currently around 42)</li> </ul>

SOURCE: UN-REDD (2013)



Forest burning in the vicinity of Rio Branco, Amazon, to create cattle ranches.

Eco Images / Getty Images

## Box 4.2 Modelling REDD+ in the Democratic Republic of the Congo

With support from UNEP, a Threshold 21 (T21) analysis was conducted in the Democratic Republic of the Congo (DRC), where about 10 per cent of the world's tropical forests and 60 per cent of the forests contained in the Congo Basin are located. This type of analysis includes social, economic and environmental factors to review different governance and payment for ecosystem services (PES) scenarios. Their purpose is to evaluate the potential of REDD+ to meet national REDD+ goals and contribute to a Green Economy.

The study considered four future development scenarios based on activities and goals contained in the national REDD+ strategy, addressing agriculture, energy, forests, governance, demography, land management and financing.

The scenarios combined weak versus strong governance with the presence or absence of PES. Under T21, the REDD+/Green Economy scenario was classified as having strong governance combined with the presence of PES.

In the DRC, the T21 model reveals that the strong governance scenarios will contribute positively to a wealth of social, economic and environmental measures. However, the best and most significant results will be achieved through the successful implementation of the REDD+ / Green Economy scenario, which combines strong governance with PES.

Some of the achievements that could be realized under the REDD+ / Green Economy scenario include:

- An additional 1.5 years added to life expectancy;
- A drop in the unemployment rate to 41 per cent by 2035;
- An increase in the Human Development Index from 0.29 to 0.374;
- An increase in GDP to US\$ 31 billion;
- A reduction in the poverty rate to less than 45 per cent;
- The stabilization of forest cover at around 145 million ha by 2030;
- The reduction of the deforestation rate to 0.21 per cent by 2035; and
- Limiting the loss of carbon stocks to only 1.3 gigatons.



Sumatran Orangutan  
(*Pongo abelii*) hangs from  
a branch with her infant.

**Tom Brakefield /  
Getty Images**

The Government of Indonesia has made a commitment to reduce emissions by 26 per cent from business as usual by 2020 using its own resources, and by 41 per cent with the support of the international community. At least 60 per cent of Indonesia's emissions come from the land use and forestry sectors, which are projected to continue to be the largest emissions contributors in 2020. To achieve its economic growth target, the Government has launched an ambitious economic master plan to create six economic corridors across the archipelago, which it hopes will enable both 7 per cent economic growth and sustainable forest management (RoI, 2012a).

Forests are also explicitly included in Ethiopia's Climate Resilient Green Economy (CRGE) strategy, as 37 per cent of its national greenhouse gas emissions come from the forestry and land use sector (FDRE, 2011). One of the four pillars of CRGE is the protection and re-establishment of forests for providing economic benefits

and ecosystem services. CRGE seeks the protection and expansion of forest carbon stocks through reduced demand for fuelwood via fuel-efficient stoves, increased afforestation, reforestation and forest management. As a participant country of the World Bank's Forest Carbon Partnership Facility and a partner country of the UN-REDD Programme, Ethiopia now has the endorsement and finance to further develop a national REDD+ strategy.

The Democratic Republic of the Congo's REDD+ framework includes direct reference to a Green Economy. Scenario analyses have suggested REDD+ policy reform options and a pathway to 2035, and this exercise generated a 'REDD+ to a green economy' scenario. The exercise raised awareness of the links between REDD+ and a Green Economy, including a variety of stakeholders, among them the Ministry of Planning (see Box 4.2).

## Box 4.3 Incentives for REDD+: The case of Acre State, Brazil

### Introduction

Approved in 2010, the Brazilian state of Acre's System of Incentives for Environmental Services (SISA) law is one of the first comprehensive REDD+ laws to cover an entire state. It aims to achieve poverty alleviation and environmental conservation jointly through the creation of a legal foundation for valuing a range of ecosystem services and providing positive incentives to sustainably manage these. The law's incentive schemes intend to distribute benefits among all major segments of the rural population, including small-scale producers, harvesters of non-timber forest products, traditional riverine communities, indigenous peoples, and large-scale producers. Through a nine-year voluntary property certification scheme, small-scale producers agree to maintain their forest estates in return for technical and financial support. To enter into the scheme, landholders must adopt a management plan that provides the basis for land-use planning. Plans are then monitored for compliance through a combination of satellite and on-the-ground monitoring.

### Results

The support provided under the law includes a combination of upfront investments in sustainable farming as well as a range of cash and non-cash benefits that are conditional on performance against the management plan. It is still too soon to tell how effective this model is, but preliminary satellite monitoring reveals that families have largely upheld their commitment to not deforest or use fire, and the scheme has been credited with helping reduce the incidence of forest fires during the 2010 drought. Monitoring the effectiveness of the scheme is difficult, as it requires monitoring on both a landscape and a property scale.

### Lessons learned

Multiple stakeholder engagement leads to more diverse perspectives. While under consideration, the proposal was made public through the state government portal and was sent for review to hundreds of people, including indigenous and rural producers, the representatives of more than 72 domestic and international organizations, and 174 individuals, including 30 indigenous leaders, 50 farmers and 85 technical organizations (EDF, no date). Because diverse stakeholders were a part of the planning process, the final law reflected diverse perspectives and could meet the needs of each of the players.

**SOURCE:** WWF, 2013

## Key Messages

**For Policy Makers:** An increasing number of countries have Green Economy or green growth plans that clearly articulate the role of protecting forests and other natural capital, and are supporting the role in a variety of ways.

**For the Green Economy:** REDD+ can be an effective, efficient and equitable policy option that simultaneously contributes to protection of natural capital and economic development.

**For Business Leaders:** REDD+ may not be a financially viable investment if a company is concerned only with carbon because market valuation of carbon does not match its social values. However, the full range of economic values of forests indicates far higher values and potential rates of return on investment. Bundling of Payments for Ecosystem Services represents a new investment opportunity, reflected by an emerging asset class for integrated landscape management.

Logger working with a logging company which is FSC certified; part of a sustainable forest management project aimed at improving the lives of the local tribal people and conserving the forest, Guyana.

Simon Rawles / Getty Images

# 5

CHAPTER

Enabling REDD+ to support  
a Green Economy

# Enabling REDD+ to support a Green Economy

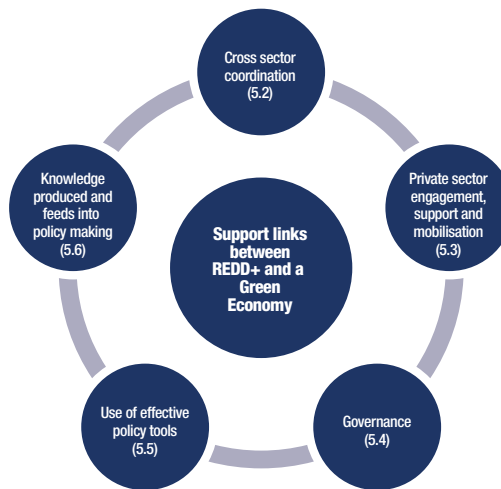
## 5.1 Introduction

Designing a REDD+ mechanism that will build broad support within a transition to a Green Economy at the national level requires identifying the policy instruments to build an enabling environment for sustainable forest management and REDD+ investments. Policy choices must then be informed through cross-sectoral coordination and policy alignment, appropriate forest governance, good political will, adequate finance, and a strong knowledge base (Table 4.1). A mix of policy instruments is needed to enable REDD+ to support a Green Economy and the choice of these instruments needs to be informed by sound policy planning and analysis. The following discussion will suggest some policy options for enabling REDD+ to deliver multiple benefits to a Green Economy far into the future, though further analysis and experience undoubtedly will lead to additional measures that could be adopted.

And it is worth repeating that the diversity of challenges faced by countries around the world calls for a diversity

of responses, with the common factor being that they have been through careful analysis and have earned the necessary political support.

**Figure 5.1 How REDD+ will build numerous enabling factors for a Green Economy**



### Box 5.1 Policy actions from developed countries to reduce global forest decline

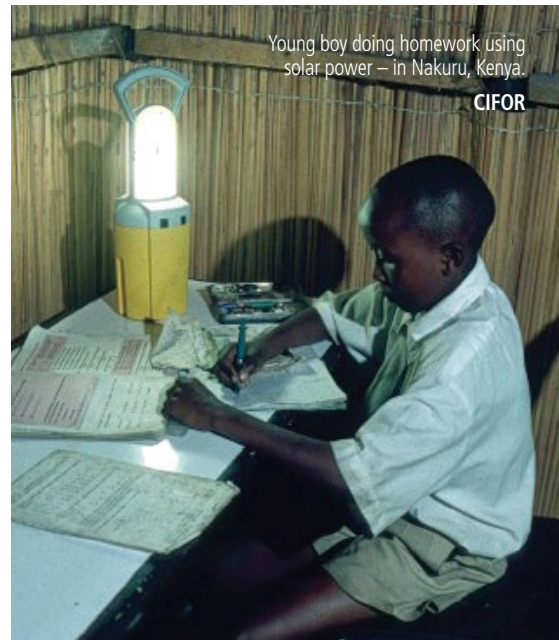
Most policy interventions from developed countries to reduce global forest decline have focused on timber, but similar approaches could be applied to agricultural commodities and other products driving deforestation. Legislation outlawing trade in illegal timber includes the US Lacey Act, the Australian Illegal Logging Prohibition Bill, and the EU Timber Regulation (UNEP, 2013; Walker, Patel, Davies, Milledge and Hulse, 2013). The EU Timber Regulation came into force in 2013, and it prohibits operators in Europe from placing illegally harvested timber and products derived from illegal timber on the EU market. This is a key element of the EU's Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT). FLEGT, published in 2003, aims to control illegal logging, improve forest governance, and strengthen demand for responsible wood products through a series of interventions within the EU and with timber-producing countries, including Voluntary Partnership Agreements designed to build capacity and improve enforcement (UNEP, 2013). Notwithstanding the very considerable challenges to effective implementation of these and other initiatives, they are important policy tools for greening the supply chain and building enabling conditions for REDD+ in a Green Economy. However, the largest policy action that is required from developed countries to make REDD+ a success will be to ensure that sufficient demand and financing exists for the Emission Reductions generated by REDD+.

## 5.2 Linking REDD+ to other economic sectors and multiple actors

One of the keys to success for a Green Economy is to promote collaboration among different sectors that have common interests in resources and ecosystem services, such as the delivery of clean water, or the benefits of sustainable forestry. REDD+ activities will have implications for a large group of people and institutions, given the need to harmonise REDD+ efforts with, for example, energy, mining, and agriculture policies (Graham, 2011). Box 5.2. indicates the breadth of groups interested in REDD+ and a Green Economy, suggesting a potentially powerful constituency; the interests indicated are only examples and are not intended to be definitive.

One way of building a stronger economic case for REDD+ is to highlight its potential links to numerous other sectors (as shown in Figure 5.1). But in practice this has been hard to achieve (Bird and Dickson, 2005; McConnell, 2008). Analysis of sector coordination in Uganda found that without a strong political imperative for coordination, the perception that the costs of coordination are too high to justify the rewards could continue to hamper sector coordination for REDD+ (Brickell, McFarland and Mwayafu, 2012). A major country needs assessment carried out in 2012 jointly by the UN-REDD Programme and the Forest Carbon Partnership Facility (FCPF) found that ‘very urgent’ support was needed in 52 per cent of countries for the identification of major inconsistencies between the objectives of the REDD+ strategy and other sectors (such as transport, agriculture, energy, mining, and tourism) and ways to address them. Over 60 per cent noted a very urgent need to assess how existing laws, policies, programmes and practices provide incentives that promote deforestation and forest degradation (UN-REDD and FCPF, 2012). Analysis of Readiness Preparation Proposals (RPPs) indicates that 66 per cent identify challenges in cross-sectoral interventions that pose risks for REDD+ implementation (Williams, 2013).

The various stakeholders listed in Box 5.2 have multiple interests in REDD+, sometimes converging and sometimes diverging. The responses of these stakeholders to the risks and opportunities of REDD+ (see Figure 3.1) can be expected to be highly variable,



as each seeks to enhance its benefits. Working with multiple stakeholders to identify common interests will be an important strategy in the success of REDD+.

These challenges are both technical and political (ODI, 2012). REDD+ as part of a Green Economy can help to break sectoral silos and bring different actors together on the same green stage and develop more comprehensive green and low carbon action plans. It can provide political and economic incentives for low carbon development strategies. For example, the USAID climate change strategy requires that all of their REDD+ investments need to be linked to such strategies. Moreover, REDD+ can mobilize public and private investors and earn greater private sector finance to support green transitions toward a sustainable future. It can provide an incentive that changes the economic decisions that drive private sector behavior, leveraging increasing amounts of private sector capital towards REDD+ and Green Economy goals.

Integrating REDD+ within planning and investments for a Green Economy could nurture many opportunities for mutual benefits, show how they could be implemented, and put into place institutions that enable cross-sector collaboration. Bringing these multiple interests together at an early stage can reduce the proliferation



## Box 5.2 Major interest groups involved in REDD+ and a Green Economy

**Local communities and indigenous peoples** directly dependent on forests for their well-being. They may be interested both in short-term and medium-term benefits, such as biodiversity conservation, improved livelihoods and a more stable supply of key forest products or alternative sources of energy if reduction of firewood consumption is expected. They will also be concerned about any long-term impacts that REDD+ may have on their traditional way of life.

**The private sector.** Across many landscapes, the private sector is the main driver of land use change. The State may continue to play an important regulatory role, but private investment – small farmers, local SMEs, international companies – is increasingly influential in land allocation, extension, technology, food production, and other activities throughout the life cycle of forest products. On the demand side, the enlightened self-interest of CSR and industry leadership is an increasingly powerful tool for improving the sustainability of supply chains; and institutional investors have become more interested in diversifying their portfolios to include investments in natural capital.

**Governments of tropical forest countries.** Their interests will focus on national development and how REDD+ can contribute, capacity building, and linking REDD+ to other sustainable development activities. Adaptation will be important to them.

**Governments of temperate forest countries.** Their interests will be focused on the carbon sequestration role of forests, and how domestic forest management initiatives might help address their own development issues. Some may be seeking to link their legislation on international forest issues to REDD+. Others may seek to reduce their unsustainable demand for forest-based natural resources from developing countries and seek to reestablish their own forest economy.

**Governments investing in REDD+.** Their interests will be in transparency, cost-benefit ratio in terms of carbon, avoiding leakage, conserving biodiversity, alleviating poverty, and the global benefit of limiting carbon emissions

**Financial institutions.** The World Bank, the regional development banks, pension funds, and private financial institutions will be interested in investing in REDD+, provided a viable business case can be made for doing so.

**The Conference of Parties to the UNFCCC.** Having approved a REDD+ mechanism, all governments will be paying close attention to the effectiveness of the investments being made, with a view to addressing important issues yet to be resolved. They may hope to expand the programme if it shows positive results and apply its lessons to other sustainable development and climate change links.

**Relevant research organizations and academia.** These include the CGIAR network, and several UN agencies, and many universities and national forest research agencies. They will be seeking ways to meet the objectives of climate change mitigation and adaptation; sustainable forest management through REDD+; and examining REDD+ for possible additional applications.

**UN-REDD Programme and wider UN system.** It will be seeking to learn lessons from the practical application of REDD+ investments, building capacity to implement REDD+ activities, and promoting links to other UN forest and climate change programmes.

**Relevant international programmes.** Many are already interested in activities that have some overlap with REDD+. Such organizations include (as a partial list) the World Bank, the Global Green Growth Institute, the International Tropical Timber Organization, the UN Forum on Forests, Forest Stewardship Council, Consumer Goods Forum, Climate, Community and Biodiversity Alliance, and Voluntary Carbon Standard.

**Civil society.** The general public may be interested in issues of transparency, good governance, equity, rights, and conservation, especially when public funds are being allocated to REDD+. The rural poor will be especially concerned that their rights are fully recognized in the implementation of REDD+.

**Forestry, wood, and natural resources related worker unions and associations.** They may be particularly interested in the green jobs aspect related to sustainable land-use and forestry in a Green Economy transition.

of institutions and thereby the transaction costs of pursuing REDD+ within a Green Economy. It can also provide a platform to share REDD+ experience and tools. A possibility is to integrate carbon into the planning process and provide sectors and administrative entities with greenhouse gas emissions targets, as in Indonesia and Viet Nam.

Another means of promoting international cooperation on REDD+ and a Green Economy is through the REDD+ safeguards agreed by the UNFCCC parties in Cancun in 2010. They could be applied or adapted where necessary to suit the social objectives in the context of contributing to a Green Economy transition. Established safeguards can also help reduce investor risks by setting clear rules, as evidenced by the prominence of social and environmental standards in the voluntary forest carbon markets (Jagger et al., 2012; Peter-Stanley et al., 2012). The clear pursuit of a Green Economy could also reduce REDD+ investment risks of non-permanence and of simply moving deforestation elsewhere (“leakage”) (Sukhdev et al., 2010).

The direct and indirect drivers of deforestation emerge from a multitude of sectors, so cross-sectoral coordination among ministries and agencies is essential to a national solution (Peskest and Brockhaus, 2009; Graham, 2011; Kissinger, 2011). But some of the indirect drivers may be international in scale, making it difficult for any single country to address. Coordination mechanisms at the national planning level may include Poverty Reduction Strategy Papers (PRSPs); national development plans; environment, agriculture, mining, and energy policies; low-carbon development strategies; National Adaptation Plans of Action (NAPAs); and National Biodiversity Strategies and Action Plans (NBSAPs). The key to success for many of these is in their cross-sectoral approaches. Finding international solutions will be more challenging.

The Forests Dialogue (2012) has sought to integrate REDD+ with broader development goals from the early stages by developing the capacity of communities to participate in REDD+ (“REDD+ Readiness”). This would include, for example, **addressing issues of indigenous rights and poverty** as a means of giving REDD+ legitimacy at both local and national levels. Drawing on discussions in Brazil, Ghana, Guatemala, Ecuador, and Cambodia, the Forest Dialogue concluded that:

- International supporters of REDD+ should broaden their scope **beyond carbon to cater to**

**local needs** and be integrated with other pro-development funding streams aimed at forest-dependent people;

- They should adopt a **landscape-based approach** that would enable the multiple values of forests to be realized and enable REDD+ to be integrated into broader development and land-use strategies that include poverty and food security;
- A rush to implement REDD+ risks entrenching existing tenure and governance, which are often detrimental to the rural poor. **Two-way information flows** can ensure that local needs are met, and that the international supporters are well informed about the on-the-ground realities of the rural poor; and
- The effectiveness of REDD+ will depend on a **benefit distribution system** that **reaches the forest-dependent rural poor**.

High-level political support can create a powerful incentive for coordination by making transparency a fundamental government policy, and then providing the resources required to overcome the cost implications of cross-sectoral coordination, both in money and time. Such coordination would be cost-effective in the long run by making government actions more efficient, effective, and equitable.

### 5.3 REDD+ and the private sector

The ‘private sector’ is a broad term that covers a heterogeneous group of actors ranging from smallholders in developing countries to large multinational corporations and carbon project developers. From land use change, forest management and commodity supply chains to corporate social and environmental responsibility and investments in REDD+ projects, private sector interests are at the heart of a Green Economy, and crucial to the success of REDD+ (see Henderson et al., 2013 for more information on this topic from UN-REDD).

The interests of the private sector range from the impact of policies to reduce emissions on existing land-use practices to finance institutions looking to profit from selling credits in the voluntary and compliance carbon markets. REDD+ is tightly bound with sustainable forest management, a key practice to generate long-term profits from renewable biomaterials production. This

has generated interest in REDD+ from sectors including forestry, pulp and paper, project implementers, financial institutions, and others.

Further interest is being directed to the increasing demand for biomass for energy purposes. Forest biomass for energy represents a renewable energy source only when it is sustainably produced, with harvest matched to the rate of growth of the trees. Residues from forestry and agriculture are already broadly used as energy source in combined heat and power (CHP) plants. In this sense REDD+ plays an important role as an enabler for the use of sustainably produced biomass for energy. Progress to scale up this renewable source of energy needs to be included in carbon neutrality advocacy to ensure that sustainably produced biomass and the generated biogenic CO<sub>2</sub> does not increase the atmospheric concentration of CO<sub>2</sub> (IEA, 2010; WBCSD, 2013).

Many parts of the private sector see clear commercial benefits in building sustainability into the way they do business. A recent survey of global CEOs (PwC, 2013) showed that they are intent on securing the long-term availability of natural resources, with 52 per cent concerned about rising energy costs as a threat to growth prospects, with global energy demand set to grow more than one-third between now and 2035. On this path, greenhouse gas emissions will soar and energy will become thirstier. Water consumption for energy production is set to grow at twice the rate of energy demand, due to more diversity in the energy supply. Add a trend toward greater interactions between fuels, markets, and prices and the result is vulnerability to global energy market fluctuations (World Energy Outlook 2012).

Corporate interests go beyond carbon, to include the multiple goods and services that forests provide. The danger of a unique focus on carbon sequestration is that forest plantations, which are constantly growing and therefore sequestering carbon, will be of greatest interest; the focus will be on fast-growing species that will yield the highest profits from carbon credit markets. This again raises the point that REDD+ must include the multiple benefits of forests. From the perspective of the private sector, companies will seek to secure the resources they will need, and seek to make energy efficiency and water conservation measures pay off in both cost and reputation; 48 per cent of CEOs plan to increase efforts to reduce their company's environmental impacts, but such intentions remain voluntary.

The World Business Council for Sustainable Development, a CEO-led organization of over 200 leading companies, has been a leader in seeking to create a sustainable future for business, society, and the environment. Its position is that of all the options for responding to climate change, forest-related mitigation measures are among the most practicable and cost-effective, thereby providing broad corporate support to the principles of REDD+ (WBCSD, 2010).

Greater engagement from the private sector across the broad interests of the forest sector is likely to depend on demonstrating and enhancing the opportunities presented by Green Economy transitions and responding to policy reforms and price signals that include carbon but consider the full range of benefits from forests (FIP, 2013; UNEP, 2011a) (Table 5.1).

The financial crisis beginning in 2007 opened a window of opportunity: the investment climate for sustainable land use, reforestation of previously forested land that is no longer viable for agriculture, agroforestry and sustainable forest management-orientated funds became more favourable, accompanied by a greater willingness to consider natural capital investments. Although the favourable investment climate for 'doing things differently' is now waning as economies recover, an important shift has taken place and a natural capital-based asset class has gained in status and profile. Private sector actors took advantage of this, and new initiatives were launched that went far beyond a narrow interest in carbon sequestration (see Box 5.3.).

Institutional investors have become more interested in diversifying their portfolios to include sustainable forestry and agriculture investments, in response to increasing consumer interest and shareholder demand (Table 5.1). Bishop, Kapila, Hicks, Mitchel and Vorhies (2008) have provided business models that focus on investments into the conservation and sustainable use of biodiversity and ecosystem services. While some corporations may continue to focus especially on logging and speculation on increasing land prices, others are taking a broader perspective. Their attention has been fostered by factors including:

- The coming on stream of credible, reassuring standards and safeguards reducing legal risks (such as the UN-REDD's Social and Environmental Principles and Criteria, based on the UNFCCC safeguards);

**Table 5.1 Pros and cons of forest investments**

PROS		CONS	
<b>Annual internal rate of return</b>	Attractive return on investment (between 8 and 12%)	<b>Cash flow profile</b>	High initial investment; relatively long time lag for returns
<b>Conservation of value</b>	Long-term maintenance of value; low volatility; very low risk of complete loss of investment	<b>Long running nature of the investment</b>	Long-term capital lock-up; difficulties regarding early exit (difficult valuation of assets)
<b>Diversification</b>	Highly recommended for portfolio diversification; not correlated to other products/ asset classes of capital market	<b>Track record</b>	Relatively young asset class; limited experience with product
<b>Positive external effects</b>	Positive ecological and social impacts; "charismatic" asset	<b>Risk assessment</b>	For outsiders, risk assessment is very difficult

SOURCE: Grulke et. al. (2012)

### Box 5.3 An asset management approach to sustainable landscape management

New pathways for investing private capital in sustainable land use are being increasingly endorsed by institutional investors. They bundle together mutually reinforcing revenue streams based on a community landscape perspective. These holistic models include both forest protection and the sustainable intensification of agricultural land that is already under production. Addressing both deforestation and the drivers of deforestation, they generate revenue through REDD+, certified commodities, ecotourism, and other types of payments for ecosystem services. These multiple revenue streams diversify the investments, reducing the financial risks for both the communities and the external investors. More fundamentally, these approaches can address poverty and lead to a long-term green economy transition based on sustainable land use rather than inefficient and unsustainable exploitation of natural resources. Carefully structured funds that are supported by financial mitigation mechanisms such as advance market commitments (AMCs) play an important role. Such approaches have been taken by the Althelia Fund, Dasos Timberland, the Moringa Agroforestry Fund, and others.

- The stronger articulation of the business case for natural capital investments. From a financial perspective, forest assets have proven to be low in volatility and to have low correlation to other asset classes. Institutional investors have already devoted an estimated US\$ 50 billion to the forest asset class globally (Brand 2012);
- A greater appreciation of the other benefits that these investments can deliver, such as generation of rural employment, climate mitigation and adaptation, and safeguarding of biodiversity; and
- Prudent diversification (reflecting realism about the currently limited position of REDD+ in the market).

Other parts of the private sector are doing very well under the status quo and are under strong pressures to continue, for example through external purchasing

pressure and investment. Figure 5.3 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), and infrastructure. It shows that REDD+ needs an integrated approach that builds on different sources of funding and sectors relevant to forests while demonstrating the multiple benefits of them. The figure also highlights how the economic use of forests can be shifted to a more holistic and sustainable approach and become a pillar of the Green Economy, through a combination of efficiency gains and more fundamental step changes, particularly by:

- Increasing efficiency and inducing changes in the sectors that drive deforestation (higher land

efficiency in agricultural production, greater exploitation of already deforested land, shifts from conventional agriculture to agro-forestry and a greater focus on tree-crops, and investments outside of forests);

- Enhancing land efficiency in the production of conventional forest products, such as timber, fibre and other non-timber products; and
- Establishing markets and creating monetary value for forest-based ecosystem services that, despite their tremendous value to societal and economic well-being, remain formally unvalued.

Private actors, investors and financial institutions re-thinking their own behaviour patterns can shift the way today's forests are over-exploited, using all three changes listed above.

Institutional investors represent a trillion dollar finance pool. They are made up of different institutions and different instruments are deployed at different stages (early / late), magnitudes and timeframes (short-term / long-term) of investment, and for different levels of risk (see Figure 5.2). It is vital to think about the supply chain of finance in order to be able to identify the specific gaps and challenges in the financing of REDD+, and to pinpoint where the optimum point of intervention might be (i.e. on the incentive side, supply side of finance, or on challenges relating to the demand side of activities like REDD+). If the full range of sources illustrated in Figure 5.2 become interested in REDD+, the initiative would be greatly strengthened.

**Linking Commodity Roundtables with REDD+.** Some 15 Commodity Roundtables have been established to date, each a multi-stakeholder forum bringing together growers, producers, transformers, retailers and NGOs. The most active at present are the RSPO (palm oil); Bonsucro (sugar); RSB (biofuels); RTRS (Soy); and GRSB (Beef). Development is relatively swift: during the first three years of the RSPO, more than 13 per cent of world production of palm oil has been certified. During its first six months, 1.4 per cent of world production of ethanol and sugar from sugarcane was certified under Bonsucro. Complying with the principles and criteria established by the roundtables can be expensive, especially when farmers must restore forests on their degraded lands or forego their legal right to clear their privately-owned forests. Premiums for achieving this sustainability status, when paid to certified producers by commodity



Coffee bean trees in East Nusa Tenggara, Indonesia - preserving forestry fragments around farms boosts crop yields raising average coffee income due to more frequent bee visits and natural pollination.

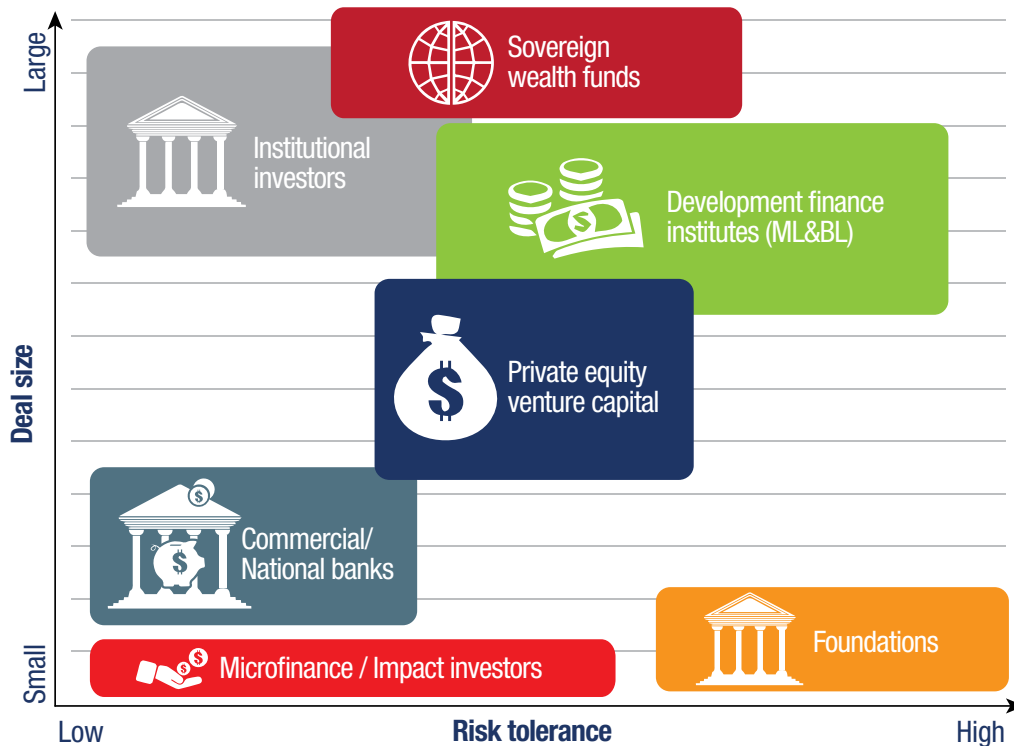
Aulia Erlangga / CIFOR

buyers, are modest, and monitoring performance can be costly.

In developing REDD+, engagement with farmers and livestock producers has proved to be challenging. But without this, it may be difficult to slow forest conversion to agricultural crops and grazing land – the main cause of tropical and sub-tropical deforestation. Several organizations, including the IPAM Consortium in Brazil, Proforest, Aliança da Terra, Global Canopy Programme, and the National Wildlife Federation are building bridges between REDD+ and the Commodity Roundtables (RT-REDD), recognizing that both processes can be mutually strengthening: success of REDD+ is limited by a lack of engagement of farmers, while success of the commodity roundtables is limited by the high costs of farm certification. A consortium has been engaged to overcome these limitations, seeded with a US\$ 4.2m grant from NORAD, with the goal of implementing five pilot activities and two large scale demonstration activities that will test how to link these two approaches and be scalable.

**The role of corporate social and environmental responsibility.** Markets are driving change: consumers are increasingly interested in stronger and more transparent standards. Responding to this demand, corporate social and environmental responsibility

Figure 5.2 Different scales of investors and funders according to the size of the deal and the level of risk associated with it



SOURCE: Adapted from Dalberg (2012) and Henderson (2013)

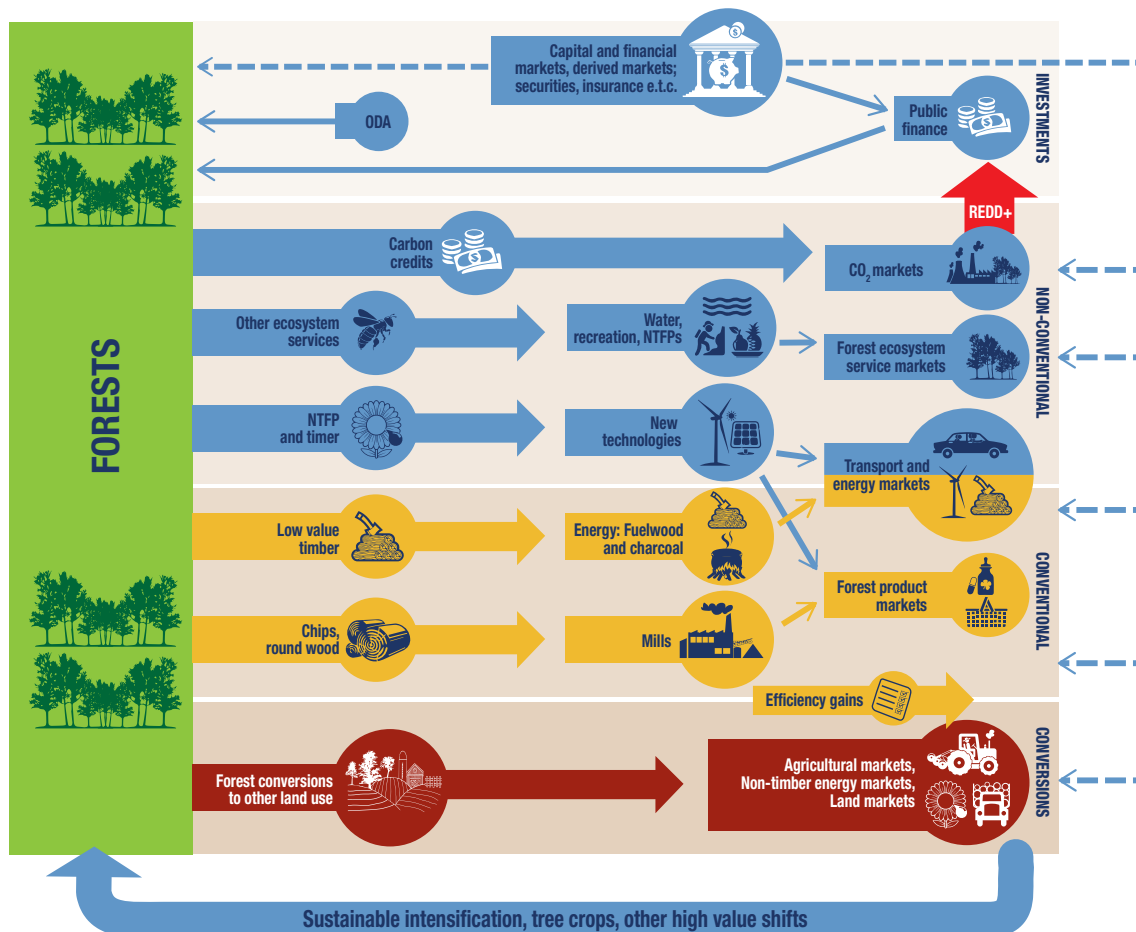
is an increasingly powerful tool for improving the sustainability of supply chains. Major companies are adopting requirements for sustainable production and responsible sourcing across many forest-risk commodities. Private sector producers, many of which are small and medium enterprises (SMEs), are often active players. For example, some 70 per cent of the timber used by the furniture industry in Indonesia is grown in small, community or privately owned woodlots. The Consumer Goods Forum (CGF), an industry network with 400 members across 70 countries representing companies with combined annual revenues of some US\$ 3 trillion, has pledged to help achieve zero net deforestation by 2020. CGF's approach signals a shift in demand from soft commodities towards more certified sustainable commodities as well as forest carbon offsets. Unilever, the world's largest buyer of palm oil, has committed to sustainably source all its raw materials by 2015, though this carries the hazard that more palm oil plantations will be created at the expense of

mature forests rich in biodiversity; certification remains a voluntary measure with only weak enforcement. The Panama Canal authority is designing a biodiversity and forest restoration project to answer freshwater supply challenges, financed by market mechanisms such as carbon credits and REDD+ (WBCSD, 2010b). And investment banks are seeking to create multimillion-dollar REDD+ investment funds (Bernard et al., 2012). Figure 5.3 illustrates the links between forests and financial institutions, to which should be added the important potential of mixed agroforestry landscapes that may blur the boundary between forests and non-forests.

Despite these promising trends, **it seems likely that REDD+ will be successful in the long term only if the private sector finds sustainable forest management to be an attractive investment.** Gledhill et al., (2011) provide five principles for encouraging private sector action and engagement in REDD+. These include:

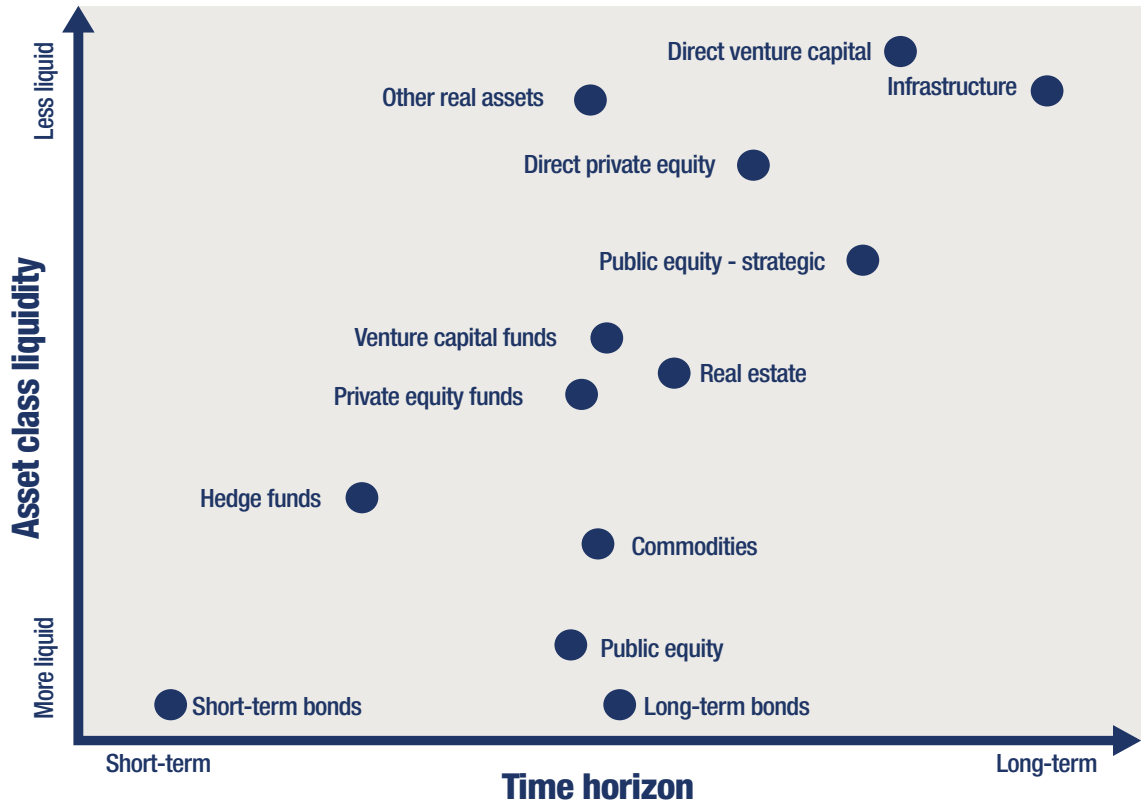
- Maximise leverage.** Public funds invested in REDD+ should seek to leverage the maximum investment of private sector finance, though leverage ratios can be expected to vary from one activity to another. Public funds used for certification costs, for example, would leverage a different amount of private investment than the use of public funds that guarantee the price of REDD+ credits.
- Focus on the drivers of deforestation and degradation.** For REDD+ to be successful, incentives, disincentives and enabling measures will need to reach the actors responsible for addressing the drivers of deforestation and at the appropriate scale. Making demand - and supply-side interventions mutually reinforcing will enhance possibilities to affect drivers. Coordinated efforts within entire sectors or focused on key commodities, aided by supportive government policies and financial incentives directing investment and lending to progressive practice, hold potential to significantly change commodity production, thereby reducing deforestation pressures over the long term.
- Link payments to results.** This principle of private sector investment needs to be extended to the public sector, whose funds should provide incentives to private sector activities in a competitive manner that produces measurable results, such as reductions in emissions, protection of biodiversity, and reduction of poverty levels.
- Encourage demand-led approaches.** The private sector responds to demand from consumers, so public support for private sector investment in REDD+ should be based on

Figure 5.3 Framework of links between forests, forestry and financial institutions



SOURCE: Prabhu, R. after Aulisi et al. (2008), personal communication

Figure 5.4 Investor time-frames: Asset class liquidity vs. Time horizon. REDD+ could fit into many of these, depending on the design of the REDD+ activity



SOURCE: Adapted from WEF (2011)

opportunities that have been identified by open discussion between local people, government agencies, and potentially interested private companies. Governments could promote private sector investment beyond carbon, such as subsistence agriculture, forestry, and marketing of non-timber forest products, drawing on the skills, knowledge and networks of the private sector.

- **Avoid crowding out.** Donor investments in REDD+ should support private sector investment rather than crowding it out. Donor agencies should address market failures and risks, leaving other needs to the private sector. This would increase efficiency and give a clear focus to public financing while encouraging the private sector.

## 5.4 Strengthening forest governance

Success for REDD+ requires a framework of natural resource governance that is transparent, fair and efficient (Kanowski, McDermott and Cashore, 2011). Many of the “REDD+ Readiness” activities have sought to develop such governance, indicating the central role that governance plays as a tool for REDD+ in a Green Economy. The success of REDD+ will depend heavily on addressing a wide range of the elements of good governance of forests (Barbier and Tesfaw, 2012; Springate-Baginski and Wollenberg, 2010).

Forest governance is the process of making decisions, rather than the decisions themselves, and therefore covers the range of actors and interests affecting forest management. Poor forest governance has low transparency, a lack of accountability, and low participation of forest-dwelling people in decision-making. It also has poor capacity and coordination in



management and administration of forests, which can lead to corruption and illegal forest conversion and use, as well as conflicts over ownership and access rights (WRI, 2009).

Good forest governance has the opposite characteristics, being highly transparent, accountable, skillful in management and administration of forests, and open to participation of stakeholders in policy discussions. Good forest governance can reduce conflicts over forest resource use and will also underpin any distribution of benefits from REDD+, as well as the transparency and accountability of REDD+ activities. Indicators for assessing forest sector governance build on principles of transparency, participation, accountability, coordination and capacity to address key issues of forest tenure, land use planning, forest management and forest revenues and incentives (WRI, 2009).

The principle of stakeholder participation is central to the success of REDD+ activities (Box 5.2). Full and effective participation allows stakeholders to be involved in formulating and implementing policy processes, making institutional arrangements, and setting management priorities (Forsyth, 2009; Springate-Baginski and Wollenberg, 2010). It helps build trust and acceptance among relevant stakeholders with different interests, thereby reducing the risks of failure (Forsyth, 2009; Peskett, Huberman, Bowen-Jones, Edwards and Brown, 2008). REDD+ can benefit from initiatives that have already proven their effectiveness in areas important to successful REDD+. The governance model represented by the Model Forest approach has been applied in dozens of landscapes around the world over the past twenty years (Elbakidze, Angelstam, Sandstorm and Axelsson, 2010). Its key features include working at a landscape or ecosystem scale with a stakeholder group that is as complex and the land uses and values that landscape. The voluntary and consensus-based approach of the stakeholder interactions in the model forests aims at improving adaptive capacity to deal with uncertainty and change. Its focus on partnerships and networks enriches the ecosystem approach advocated by the Convention on Biological Diversity (Lobo, 2006).

Poor forest governance will have negative consequences for environmental, social and economic goals, so the investments in REDD+ Readiness can help to catalyze one of the foundations of a Green Economy. Illegal forestry, for example, although difficult to quantify, could be worth between US\$ 30 and 100 billion per

year, amounting to 10-30 per cent of the world wood trade (Nellemann and Interpol, 2012). Poor forest governance may also lead to political instability, income disparity and the loss of biodiversity and habitats, which will work against the ultimate objectives of a Green Economy and REDD+ (FAO and ITTO, 2009). Gender considerations, as agreed within the UNFCCC Cancun decision, are also necessary under forest governance given the heavy dependence of women on forests for their livelihoods (UNFF, 2013a).

**Land tenure is a fundamental forest governance issue.** The legitimacy of REDD+ depends on legal clarity over which institutions have the authority to make decisions, who has the right to participate in the decision process (Luttrell et al., 2013), who has tenure and rights over forests, and ultimately who receives REDD+ payments. This boils down to whose rights will be secured in the interest of tenure reform under REDD+ (Larson et al., 2013).

The issue of forest tenure has received unprecedented attention under REDD+. The United Kingdom's climate change minister has stated, 'Securing fair land tenure must be the foundation of REDD', justified by both ethics and business. In a very strong pro-business context, the chair of Indonesia's REDD Task Force stated, 'Finding the appropriate land tenure arrangement is a prerequisite for sustainable development and livelihoods' and strongly recommended recognizing customary rights in forests (both quotes from Larson et al., 2013).

Since most individuals and communities living in tropical forest regions do not have formally designated rights to forests, how these rights are defined at project and national levels will determine the equity of forest carbon projects. The larger actors tend to be favored by government bureaucracies and current policies (Duchelle et al., 2013; Sunderlin et al., 2013). Serious conflicts over tenure insecurity are not easy to resolve, and piecemeal project interventions are insufficient in the absence of broader national policies. Demands from external forest users are particularly difficult to address when these are tied to national economic development and are highly profitable to some (for example, foreign investment in palm oil plantations).

Still, REDD+ has been used by some policy makers to promote land rights of local people. For example, changes in Brazil, under initiatives pre-dating REDD+, have led to potentially effective and equitable REDD+, largely because REDD+ project proponents have given

high priority to clarifying land tenure at their sites through coordination with ongoing national efforts to link land tenure reform with environmental compliance (Duchelle et al., 2013).

Forest tenure is more fragile in many other countries, with contradictory legal frameworks and competing claims to forest lands (for example, Resosudarmo et al., 2013). Tenure security is a necessary condition for REDD+, but is not sufficient: in Indonesia, for example, strengthening tenure alone cannot guarantee effectiveness unless REDD+ can successfully compete with other land uses that lead to deforestation and forest degradation (Larson et al, 2013).

Addressing insecure tenure as one of the underlying drivers of deforestation and land degradation often requires a deep reconsideration of national development policies, which can face a wall of opposition from ‘business as usual’ interests in forests. Policy network analyses in 2011–12 in Brazil, Cameroon, Indonesia, Tanzania, and Viet Nam (Rantala, 2012) found that the coalitions that challenged existing ‘business as usual’ tended to be relatively weak compared to the dominant and more powerful coalitions supporting

the status quo on tenure issues. Elite capture remains a major problem in all cases and at all levels (Pham et al., 2013), but clarifying land rights can help protect indigenous peoples from land-grabbing by companies from outside of the region/country (Anseeuw, Alden, Cotula and Taylor, 2012). The extent to which REDD+ can foster opportunities for more fundamental tenure reforms is still an open question, but a noble ambition. This underlines the need for a wider green economy transition, as this will broaden the range of stakeholders promoting clear and transparent solutions to open land tenure questions.

## 5.5 Some practical tools to support policy development for REDD+ as part of a Green Economy

**Developing alternative sources of income.** REDD+ activities tend to be easiest where tenure is clear and an effective governance structure is in place. In forests that lack these characteristics and contain resident communities who depend on the forests for their



Climate Change Human Sign at Saint Kilda Beach. [www.live.org](http://www.live.org)



Sustainable forestry and agricultural investment – smiling children next to a mango plantation in Volta region, Aboasa, Ghana.

Max Milligan / Getty Images

continued well-being, REDD+ will need to balance avoided deforestation and forest degradation with alternative sources of income. Simply providing cash from REDD+ is unlikely to be acceptable to most forest-dwellers, who value their cultural ties to the forest. But where the forest-dwelling people have been left without basic government services, the provision of schooling, health care, and security may open new opportunities for them that can encourage sustainable forest management.

Designing more sustainable solutions needs to draw on the wisdom of the resident peoples, who often have their own ideas about how to manage forests sustainably. Energy is one substantial challenge, since wood remains an important source of energy for people who live in forests (and for over 3 billion people worldwide), though not all of this wood comes from natural forests and much may be sustainably harvested (Lele, 2013). Where REDD+ seeks to reduce the harvest of firewood from some parts of a forest, alternatives need to be provided.

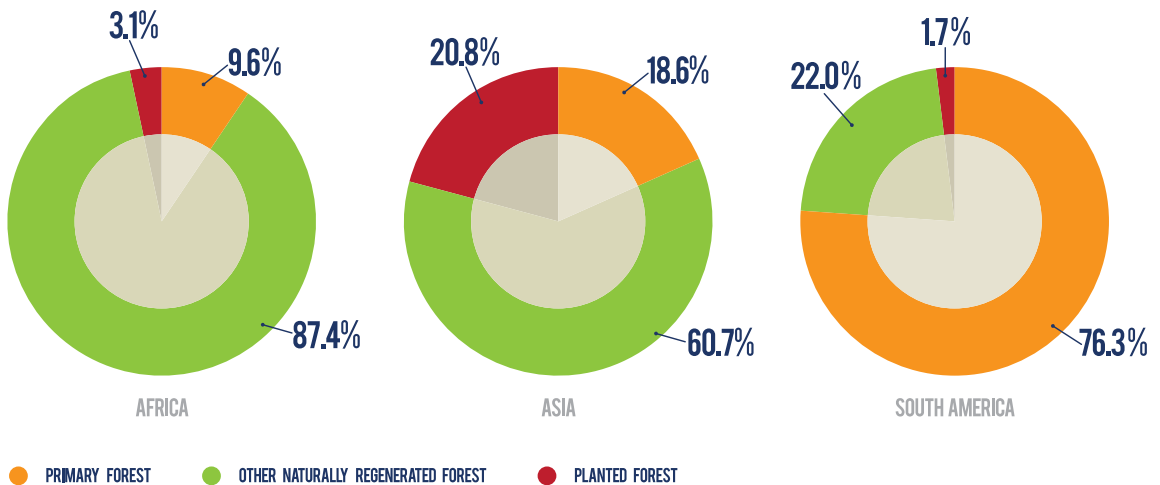
For example, some parts of the landscape that contains a REDD+ activity may be suitable for the planting of fast-growing plantations for firewood

production, at the sacrifice of some other ecosystem services. Improving the design of wood-burning stoves can reduce demand, and alternative sources of energy (such as methane for biogas, and other renewable energy sources (solar electricity) could also be promoted.

But forests mean more than just firewood to the local people, so it may also be possible to design sustainable approaches to harvesting forest products, such as seeds, nuts, essential oils, fibres, honey, medicinal plants, and other products that can be harvested in ways that are consistent with the management objectives of the forest. Improved access to markets, labeling, guaranteed prices, and other forms of support may be suitable. Statistics on the value of such markets are elusive because of their great variability, but FAO (1990) estimated annual exports from Brazil at US\$ 110 million in 1987, and exports of gum arabic from Sudan at US\$ 62.5 million in 1988. De Beer and McDermott (1996) discussed the economic value of non-timber forest products in Southeast Asia, and consider the value to be substantial but highly variable between communities.

Non-consumptive uses are also worth exploring. The success of forest-based ecotourism in parts of Amazonia,

Figure 5.5 Proportion of forest types (primary, naturally regenerated forest, or plantations) in each region, 2010. Only the 'planted' forest receives no special protection under the UNFCCC Cancun safeguards.



SOURCE: FAO Global Forest Resources Assessment (2010)

India, Indonesia, and Kenya indicate the high value of this alternative source of income and employment.

Improved agroforestry that can store carbon and deliver multiple other benefits can often be a key to reducing deforestation and forest degradation, requiring some capacity building, development of markets, introduction of new crops, and other such steps. This report is not the place to explore such options in detail, but rather to indicate that when REDD+ limits access to some resources or ecosystem services, appropriate ways of compensating for opportunity costs need to be included as part of the activity. This may require a landscape-scale approach, where some areas are zoned to conserve mature forests (and therefore qualify for REDD+ activities) and other areas are zoned for agroforestry, grazing, and other forms of agriculture that are designed to be sustainable. Partnerships with development agencies will often be helpful to REDD+ activities that seek innovative ways of improving the well-being of forest-dwelling peoples, improving their level of nutrition without the necessity to harvest bushmeat (for example).

**Establishing REDD+ safeguards.** The issues of multiple benefits and safeguards are closely linked. Under the UNFCCC, governments have agreed that REDD+ should provide social and environmental benefits, and have developed a list of 'Cancun safeguards' that can ensure that these benefits are

kept in mind in the implementation of REDD+. These safeguards apply to primary and naturally regenerated forests (Figure 5.6). While safeguards can have different meanings and purposes for different stakeholders, the underlying objective is to prevent undue harm to people and their environment from REDD+ activities, while aiming to enhance benefits.

As illustrated from experience in the Brazilian Amazon, when no national policy framework is guiding the safeguarding measures, civil society groups can step in to address potential social and environmental risks of REDD+. While it is still challenging to empower indigenous peoples and local communities to a position where they can protect their interests against powerful companies or state actors, a bottom-up approach at least gives them a stronger voice (WWF, 2013).

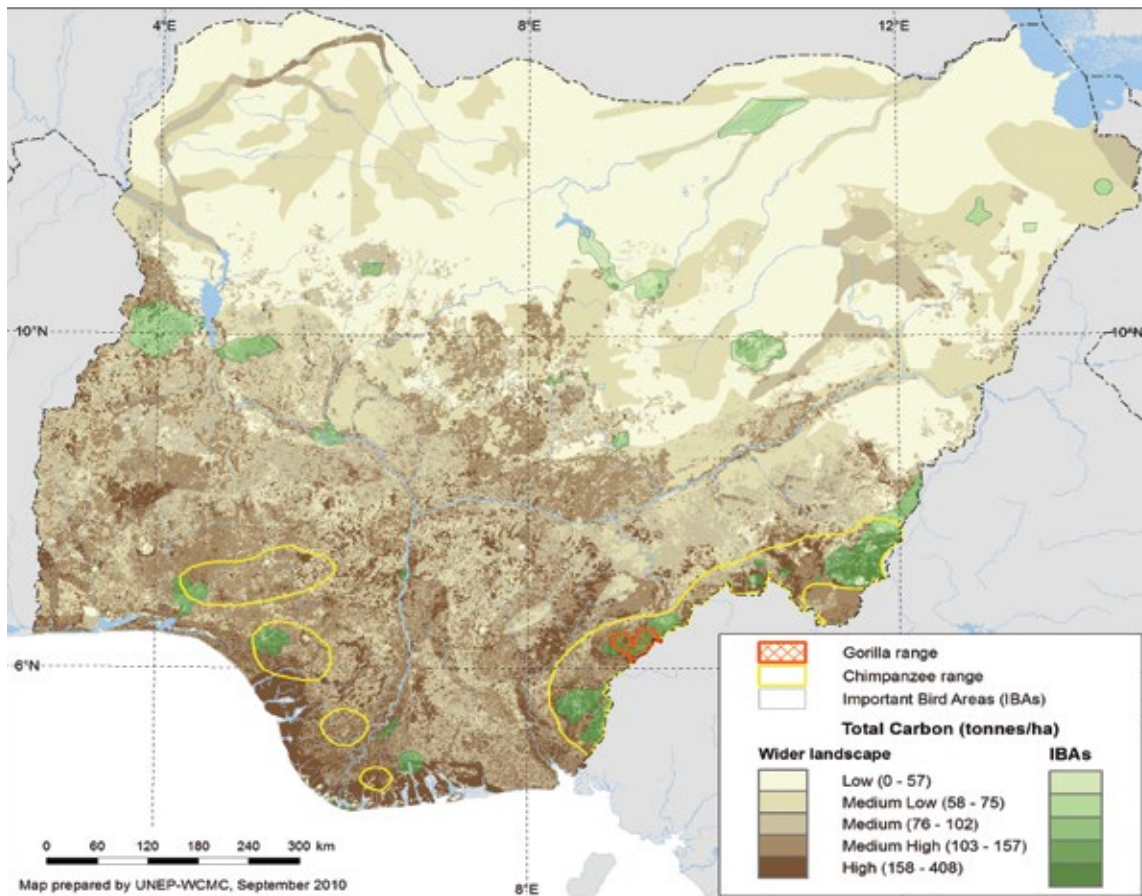
A large influx of REDD+ funding has the potential to support or worsen corruption in some countries, again arguing for transparency and broad consultation (Transparency International 2012). Implementing national policies for REDD+ to ensure the Cancun safeguards are met is crucial to the successful delivery of positive REDD+ outcomes. Many UN-REDD Programme tools are available to support national safeguards, such as adopting an integrated land-use planning approach to the implementation of REDD+ to assist in application of the Cancun safeguards (for example, protecting natural forests from conversion).

**Planning and analysis to ensure multiple benefits from REDD+ through a landscape approach.** REDD+ is often seen as a mechanism for delivering multiple benefits, but a key issue is who is going to gain what benefits. Consistent with Green Economy principles of supporting economic resilience and social inclusiveness, REDD+ offers new opportunities to change the status quo to benefit the rural forest-dwellers (The Forest Dialogue, 2012).

The success of REDD+ will depend to a substantial degree on the selection of appropriate locations for implementing actions (Blyth et al., 2012). Careful planning is needed to prevent the production or extractive activities simply shifting to other communities or ecosystems ("leakage") (Miles and Kapos, 2008). However, it should also be recognized that international commodity chains introduce a transboundary dimension



**Figure 5.6 Mapping of carbon (t/ha) in important bird areas and the wider landscape in Nigeria, with gorilla and chimpanzee ranges and important bird areas (IBAs) also identified**



SOURCE: Ravilious et al. (2010)

that is difficult or impossible to address at the local or even national level.

This raises the issue of scale, which is why many are approaching REDD+ as part of a landscape approach that involves a mosaic of natural and human-modified ecosystems that are managed in different ways to provide a range of benefits from alternative forms of land uses (see Box 4.1). Increasingly, planners are recognizing that the landscape scale provides an appropriate way to address the multiple demands that are being made on land and resources. If a REDD+ activity is included within a larger landscape, it can contribute various services beyond carbon storage, helping to conserve forests, providing non-timber forest products to the rural poor, and supplying high-quality water to downstream agricultural lands.

Operational examples of the landscape approach in practice are rare but those that exist are valuable potential laboratories that REDD+ proponents can draw upon to accelerate REDD+ application. The two decades of experience from the International Model Forest Network in landscape-level planning and management from boreal to tropical regions has shown that such efforts can be very effective in breaking down the typical “silo” approach between and among government agencies and broader stakeholder and community groups, reducing conflict and leading to greater consensus on priorities and actions to support them (Whittle, 2005; Pettit, 1997).

Spatial planning can also identify where forests are performing, or could perform, multiple functions that are important for local or regional communities (Epple, Williamson and Thorley, 2012), or where new activities, such as eco-tourism, might best be located. An important evolution in spatial planning is the incorporation of cost data. For instance, Marxan is a software tool that enables finding spatial solutions that meet several biodiversity targets at minimal cost (Game and Grantham, 2008). Under the UN-REDD Programme, UNEP-WCMC has explored how Geographic Information System (GIS) tools can address REDD+ planning questions, for example in identifying where specific REDD+ activities may be feasible and desirable (Figure 5.6).

When a country wishes to include multiple benefits in a REDD+ plan, it will need to clarify the aims of REDD+ in relation to existing social and environmental goals. A useful next step is to quantify and map indicator data that

represents these priorities. The UN-REDD Programme’s “Exploring Multiple Benefits” toolbox and mapping manual can assist in mapping carbon and bringing it together with other relevant data on biodiversity and multiple benefits, with the aim of raising awareness on the potential for different benefits, and informing land use planning. These maps can be combined with those showing the value of various forest ecosystem services and indices of biodiversity to produce decision support material on the potential for REDD+ activities to deliver multiple benefits. It may then be useful to quantify their value (Bromley, 1995; Bergh, 2002). The ultimate aim is to identify the potential for enhancing multiple benefits and minimizing trade-offs when undertaking REDD+ activities.

Detailed spatial analysis, which may involve collecting additional ecological or socio-economic data, will give greater confidence in identifying the best options and locations for delivering multiple benefits. The detail of analysis using tools like those described above will depend on REDD+ priorities and existing data availability. External support can help countries with this analysis and with building capacity, which may then be of use more widely in land use planning.

Central governments can use policy tools to stimulate local governments, business and forest dependent communities to invest in carbon. These tools can include the setting of carbon targets (and related taxes if these are not achieved), fiscal tools (through land related taxation), subsidies and other fiscal related tools

## 5.6 Building and communicating a knowledge base

REDD+ and the Green Economy require new knowledge and effective communication. The IPCC is providing the consensus on the major climate-related issues, with its Fifth Report issued in late 2013. It draws primarily on peer-reviewed literature, and numerous journals are devoted to publishing research that is highly relevant to REDD+ and a Green Economy. Many issues still need to be addressed. Among these are:

- **Measure climate change impacts and costs more accurately and cost-effectively.** Judging from the range of prices of carbon on international markets, the increasing insurance costs in

vulnerable areas, and many other uncertainties, more work on the economics of climate change seems well justified. Greater diversity in approaches, following the fundamental principles of sound science, needs stronger support. Issues such as the interaction between mitigation and adaptation will influence any calculations of benefits, and will be essential to the success of REDD+. The feedbacks, delays and non-linearity in changes in ecosystems, and therefore any tipping points (Laurance et al., 2011), and the risk preferences of users and the economic context are also critical factors that deserve more academic study in order to make stronger links between ecosystem services and human adaptation to climate change (e.g., Quaas and Baumgärtner, 2008; Baumgärtner and Strunz, 2009; Derissen, Quaas and Baumgärtner, 2011).

- **Develop metrics for adaptation.** Much of the discussion about REDD+ has been on carbon sequestration and storage, not least because a straightforward metric could be used to determine effectiveness: amount of carbon stored. Adaptation is part of the same package with mitigation, but receives far less attention at least partly due to the difficulty in measuring the benefits of adapting to climate change. This is no easy matter, and calls for a significant investment in research in many forest types. But within current limitations, establishing a baseline and time period for measuring the benefits of adaptation over the costs of not acting remains a challenge that must be met if REDD+ is to meet its potential.
- **Identify and quantify the multiple benefits of forests.** The growing demand for land means some deforestation could be inevitable, though it could be matched by reforestation (as in China). Research can help identify options that can ensure that any change in forest cover provides the maximum overall benefits to society, while imposing the least costs. Planners need data from researchers to identify areas of forests with high carbon storage, as well as those areas that deliver multiple benefits from ecosystem services such as conservation of high biodiversity, provision of water quality or flood protection services, or social values that are beyond a monetary price. By identifying the best use of forests through a transparent and participatory process, it should be possible to ensure that the

full costs and benefits are taken into account and that the most important areas can be managed in the most appropriate way, often through support from REDD+. To meet this aim will require urgent research, both ecological and socio-economic, to identify the value of ecosystem services to local populations, as well as sustainable harvest rates.

- **Developing new approaches to equity.** Issues of what benefits go to which stakeholders also need research attention, perhaps based on the incentives for stakeholders to participate in REDD+ activities. A mapping of incentives can promote cross-sectoral engagement, inclusion of the private sector, and social inclusiveness. Some basic scientific questions on ecological functioning also need answering. Efforts in this area must be strongly supported if evidence-based decision-making is to continue being an effective guide to REDD+ activities.
- **Seek better data on the employment implications of REDD+ and a Green Economy.** Many governments, communities, and companies are interested in a better understanding of employment and income created or at risk from REDD+ implementation. Research should collect data on the informal forest sector and address the complexities of identifying a business-as-usual case for comparison. The employment implications of converting a carbon-rich forest to other uses, the role of employment as part of agriculture (a main driver of deforestation and growth in low-



Building community Knowledge Base,  
In the field - Sebastião Lima da Silva and family speaking with  
CIFOR researchers Amy Duchelle and Kaline Rossi.  
Kate Evans / CIFOR

income countries), and related issues need to be quantified if the full implications of REDD+ are to be understood. Data should also be sought regarding the impact of biofuels and agricultural development on employment, rural development and poverty reduction, considering different characteristics of crops, production methods and local market conditions (Peskett, Slater, Stevens and Dufey, 2007).

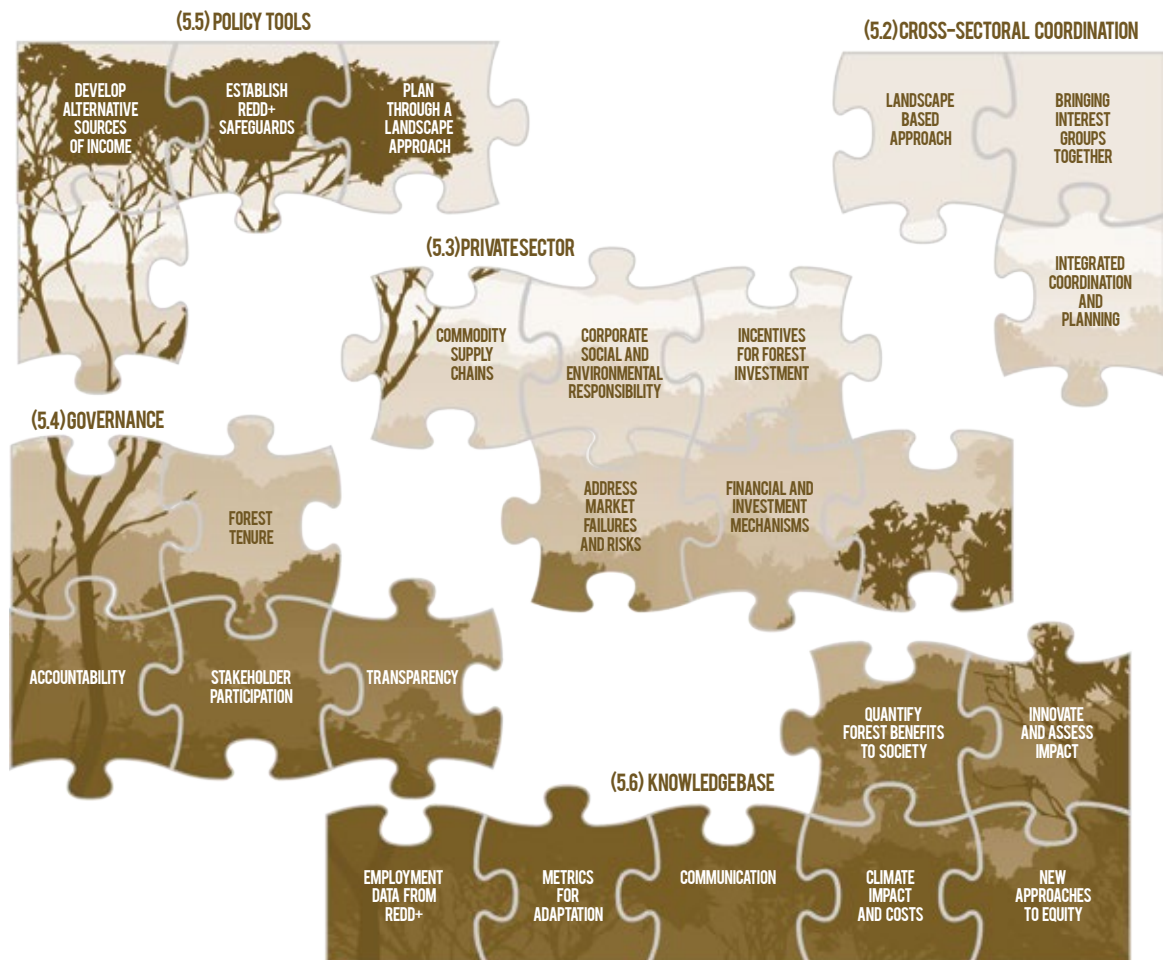
- **Assess the impact of innovative policies.** Many of the reports on REDD+ recommend innovative policies; indeed, many argue that such policies are essential to the success of REDD+. This suggests that REDD+ activities should be designed as research projects, with clear hypotheses, data to be collected, assessment of the data, and

wide reporting of the results. Research could include approaches for determining investment priorities, and the risks of doing so. The results of such research can help improve the design and implementation of future REDD+ investments.

- **Design innovative forest management practices** that support both profit generation and capital appreciation of forest stocks, while also providing benefits to forest dwelling people. Reduced impact logging methods and certification processes should be designed to help conserve the remaining old-growth forests that can be significant stores of carbon.

Communication with the full range of stakeholders identified in Box 5.2 is essential if REDD+ is to succeed

Figure 5.7 Enabling REDD+ to support a Green Economy





in reaching its potential as an important part of the Green Economy. The reluctance of some rural communities, especially indigenous peoples, to engage actively with REDD+ is an indicator of insufficient communication. Reaching out to this range of stakeholders is no simple matter, since each may require a somewhat different approach. But the principles of transparency, open communication, and incorporation of local knowledge into decision-making will surely help. Significant tools will be the social media that are now becoming widespread in virtually all countries. And the usual approaches of education campaigns, eco-labelling or eco-certification, and branding of products from sustainably managed forests could all play a role.



Center for International Forestry Research (CIFOR) researchers and Universidad Nacional Amazónica de Madre de Dios (UNAMAD). Students measuring Brazil nut tree to examine impact of selective logging on Brazil nut production near Puerto Maldonado, Madre de Dios, Peru.

**Marco Simola / CIFOR**

## Key Messages:

**For Policy Makers:** Linking REDD+ to other economic sectors could help build an economic case for investment, and support cross-sectoral action to protect forests.

**For the Green Economy:** Delivering REDD+ requires cross-government cooperation, engagement of the private sector and other stakeholders, and mobilizing finance – all enabling factors for a Green Economy transition.

**For Business Leaders:** Governments with Green Economy plans and that support REDD+ are clearly articulating their vision of future national development. This should build confidence when investing in ways aligned to these principles.



# 6

CHAPTER

Conclusions and  
recommendations

Tall Bamboo cane forest  
– East Nusa Tenggara, Indonesia.  
Aulia Erlangga / CIFOR

# Conclusions and recommendations

This report has sought to review conditions, opportunities and experience to date in implementing REDD+ and how it could be a significant contributor to a Green Economy. REDD+ is still a relatively new approach, so many of the report's conclusions and recommendations should be taken as preliminary and subject to further elaboration as experience from practical implementation is gained from more countries. The report has led to five major conclusions, supported by more detailed recommendations for implementing the conclusions.

## **Conclusion 1** The Green Economy provides a useful framework within which REDD+ can prosper. Improved coordination among governments, international agencies, and the private sector dealing with these issues is essential.

Governments, international agencies, and other investors should significantly increase coordination to create an enabling environment that stimulates trust between REDD+ investors and proponents and other investors in sustainable rural landscapes. Linking REDD+ to a Green Economy will require a convergence of multiple outcomes that requires multiple sources of support and that demands a stakeholder-supported enabling policy environment. For example, governments can take advantage of REDD+ performance-based and verifiable and accountable systems to provide lessons learned to Green Economy initiatives such as inclusive wealth accounting and the UN-endorsed System for Environmental Economic Accounting (SEEA).

The concept of a Green Economy potentially has leverage to drive broader policy reforms and changes in business-as-usual economic interests; it provides new economic incentives and investments, new information and new actors, interests, and coalitions. It addresses wider societal drivers of deforestation and provides new tools to address these, such as a green fiscal framework, sustainable public procurement, and new commodity standards embracing certification and fair

trade. All of these fit well with REDD+ and successful implementation of REDD+ activities can demonstrate the Green Economy in action. While getting REDD+ up and running may require donor and government funding that is focused on carbon sequestration, long-term success in reducing deforestation and delivering multiple benefits will require many sources of funding that are based on meeting the wide range of demands for forest goods and services, from domestic and international sources.

REDD+ can be most successful when it is supported by an enabling environment that includes Green Economy elements such as good governance, law enforcement, land tenure reform, sustainable supporting financial mechanisms, and equitable distribution of benefits. REDD+ activities must be designed with full consideration of national development and food security objectives, providing numerous economic and social opportunities as well as posing some risks in its implementation. More generally, implementing REDD+ within a Green Economy context requires a strong knowledge base and demands new planning tools that value natural capital, strong political will, improved forest governance, better coordination among sectors and policies, and sustainable finance. Success in these areas will facilitate progress towards sustainable natural resource management, and building natural capital.

Policy instruments that promote green innovation and investments in support of REDD+ and a Green Economy should comprise a mix of measures. These can include institutional reforms (e.g. land tenure), regulations (e.g. norms and standards, including safeguards), information policies (e.g. eco-certification, public disclosure, public marketing and branding, education campaigns), risk mitigation (e.g. carbon buffers, mandatory insurance, guarantees), and pricing policies that get the incentives right (tradable permits, taxes and subsidy reform).

The long-term success of REDD+ and a Green Economy depends on active participation by the private sector. Action and engagement in REDD+ by the private sector needs public support such as appropriate regulations and incentives to maximize leverage; a focus on the



Timber with Forest Stewardship Council logo ready for export from the Republic of Congo.

Johannes Refisch / UNEP

drivers of deforestation and forest degradation; linking payments to results; encouraging approaches led by consumer demand that may go beyond carbon and focus on, for example, “green products”, biodiversity through ecotourism and other such industries; and public support along with donor investments that may focus more on long-term sustainability than short-term financial profit.

**Conclusion 2** To date, REDD+ activities have focused mostly on reducing greenhouse gas emissions from forests, but REDD+ needs to expand to give significantly greater attention to benefits beyond carbon.

Governments will recognize that climate change remains a major risk for both people and the planet. Carbon sequestration remains an essential service provided by forests and was the initial focus of many governments in REDD+ due to questions of feasibility of measuring and monitoring the success of REDD+ activities. The 2013 report of the Intergovernmental Panel on Climate

Change has provided even stronger support for action to address climate change, of which REDD+ is an important example. At the same time, UNFCCC Parties and other REDD+ stakeholders increasingly recognize the potential multiple environmental, social and economic benefits from REDD+. This includes the mutually reinforcing role between REDD+, adaptation to climate change, and a Green Economy transition. But REDD+ needs to go far beyond carbon to address these additional benefits, and seek ways to quantify them.

The concepts of natural capital and ecosystem services have helped decision-makers realize that forests are more than just a place where trees grow to store carbon. The multiple values of forests are now starting to receive the attention they deserve, though many of these values are not yet reflected in markets or the decision-making processes of policy makers. Therefore, measures need to be put into place to identify and communicate the many benefits that forests provide to people so that the multiple values of forests are better reflected in decisions that affect national well-being. Continuing erosion of the natural capital represented by forests will undermine the foundation of economic growth, while maintaining natural capital at sufficient levels will be a key component of a Green Economy as well as providing long-term secure access to forest resources.

Seeking forest benefits beyond carbon makes REDD+ activities more complex, and could even imply short term trade-offs with its climate change mitigation objective. Yet an excessive preoccupation with fast-track mitigation at the expense of delivering immediate local forest benefits in REDD+ planning and resilient ecosystems is short-sighted and conflicts with the principles of safeguards. Giving the full range of benefits full consideration from an early stage is essential, since failing to account for both carbon and non-carbon benefits properly could lead to an underestimation of the importance of REDD+ to a national economy and thus a missed opportunity to attract investments and to enhance the benefits of properly managing a key national asset.

REDD+ is a knowledge-intensive approach that requires effective communication to all interested parties. The necessary knowledge can come from forest-dwelling people, foresters, politicians, social scientists, and many others. Such knowledge is needed to measure climate change impacts and costs more accurately and

convincingly, ensuring that the costs and benefits are equitably distributed. Adaptation to climate change is urgent and often of greater interest to local people than the longer-term concerns about sequestration; but metrics for measuring adaptation need to be developed. The multiple benefits of forests need to be identified and quantified, to the extent possible, leading to better assessment of the impacts of innovative policies. And finally, the full implications of REDD+ need to be communicated openly and clearly to all those concerned, giving particular attention to the forest-dwelling people who will be most directly affected.

**Conclusion 3** Equitable sharing of the benefits of REDD+ is likely to increase the sustainability of its impact by building support among a wider variety of stakeholders.

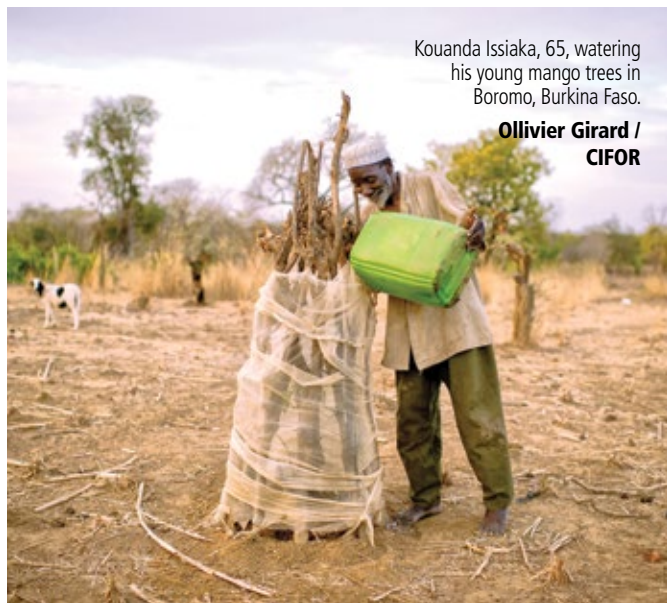
Different outcomes (positive or negative) are important to different stakeholders and over different time scales. Therefore, ensuring that REDD+ activities consider the perspectives of all stakeholders and future generations will require consultations with the relevant stakeholders and long-term planning on the values of potential social and environmental benefits of REDD+. Representing the needs of local communities enhances the chance that their well-being could be improved under REDD+ activities. Government agencies should design REDD+ activities that create new economic opportunities for local communities and the forest-dwelling people who are interested in participating in REDD+, but have received insufficient attention to date. They are often in the best position to implement efforts to prevent forest degradation and promote sustainable management of forests; they have also shown that they can collect reliable data on the carbon contained in their forests, with minimal training.

The issue of forest tenure is central to the successful implementation of REDD+, as well as to a Green Economy transition. Most of the world's tropical forests have unclear or contested land tenure, and most governments largely retain statutory rights to forest land. REDD+ implementation requires the clarification and strengthening of land tenure and property rights, including the recognition of customary rights on forested land. Such clarification can build on local interests and will determine accountability in the delivery

of carbon stocks as well as the distribution of benefits from financial transfers from REDD+. The risk of forest-dwelling people losing tenure to large commercial interests needs to be addressed under REDD+ activities.

REDD+ safeguards are essential to ensuring that forest-dwelling peoples are empowered to participate in decision-making and earn their fair share of benefits. When new activities are proposed in environments that have long been occupied by small communities (as is often the case in tropical forests), the resident peoples are often left out of the process, with more powerful forces gaining the vast majority of benefits. The Cancun safeguards established by the UNFCCC are designed to ensure that social and environmental benefits are provided to indigenous and local communities. These safeguards could also inform other Green Economy investments related to natural resource use. They can offer a standard that can be used to promote progress by oversight groups and other interested parties.

To ensure that equity issues are well addressed, governments should implement REDD+ in a considered, step-by-step process. A rush to implement REDD+ risks entrenching existing tenure and governance, which are almost always detrimental to the rural poor. All REDD+ activities should be designed and managed in a transparent manner, with constant feedback from experience so that policies can adapt to changing conditions.



Kouanda Issiaka, 65, watering his young mango trees in Boromo, Burkina Faso.

**Ollivier Girard / CIFOR**

REDD+ national implementing agencies should re-direct national and local-level efforts to support positive outcomes at multiple scales that leverage environmental, social, and economic resources from both levels. The first generation of REDD+ initiatives has tended to focus on national-level policy processes and local-level pilot projects, with little interaction between the two. These initiatives demonstrated the need for cross-scale coordination to address issues such as tenure, benefit sharing and monitoring, and the tenacity of vested interests and institutions opposing change to business-as-usual. Lessons learned to date underline the importance of addressing new forms of coordination among scales and stakeholders, and integrating REDD+ into broader development and land-use strategies. This would have the additional benefit of providing REDD+ with a stronger base from which to determine tradeoffs and complementarities at the national and international levels.

**Conclusion 4** The success of REDD+ depends on the balance between conserving forest ecosystems and maximizing carbon sequestration; this balance needs to be informed by solid science.

Governments and others involved in REDD+ need to determine the appropriate balance between a focus on the natural forests that are rich in carbon and biodiversity and those forests where emissions can be reduced and carbon stored at the least cost. This is where the multiple benefits of REDD+ will need to enter the equation more in the future than they have in the past. Such issues will need to be addressed squarely as REDD+ moves further into its implementation phase, lifting REDD+ to a landscape planning platform that balances multiple land-use objectives across perspectives reaching 5, 10, 30, 50 or 100 years into the future. The interests of agriculture, forestry, biodiversity, fisheries, cities, industry, and others need to be part of comprehensive land use planning.

REDD+ in a Green Economy context can best be approached at a landscape scale. The body of knowledge to determine geographic priorities for REDD+ activities has grown considerably over recent years and shows that many benefits are provided in areas that are remote from the forests, such as downstream cities whose water depends on intact forests or markets that depend

on sustainable production of forest products. A mosaic of natural and human-modified ecosystems that are managed in different ways to provide a range of benefits from alternative forms of land uses often seems to be the most effective approach, and the most appropriate scale for REDD+ to support a Green Economy. That said, many commodity chains are international and may require intergovernmental collaboration to be managed sustainably. The slow progress to date on climate change or international trade indicates the difficulties that need to be overcome, so seeking national solutions at the landscape scale seems to most practical solution for the immediate future.

Governments could also embed risk-reduction strategies into REDD+ results-based payments through comprehensive and transparent risk assessment processes and buffer approaches. REDD+ could improve both the present net uptake of CO<sub>2</sub> in forests, and the longevity of their accumulated carbon stocks in an expanded area of forests. Doing so would promote benefits beyond carbon sequestration while improving the stability, efficiency and predictability of positive carbon incentives.

**Conclusion 5** The main challenge for REDD+ in coming years will be to generate the estimated US\$ 30 billion per year required to support performance based payments at an effective level . A stronger engagement of the private sector, and revised national incentive frameworks are needed to meet this challenge. The Green Economy can support both.

REDD+ is attempting an unprecedented new compact between rich and poor nations, and between the public and private sector, to generate the first-ever global-scale Payment for Ecosystem Services scheme. While the amount that is required to enable REDD+ to be fully effective (US\$ 30 billion per year) may sound large in the usual context of the stakeholder groups associated with REDD+ (mainly local and indigenous communities, conservationists, and land-users), the amount will be spread among many countries and landscapes. It is also informative to consider this funding in terms of current national economies. For example, REDD+ payments of



Fisherman casting net in  
Situ Gunung, Sukabumi,  
West Java, Indonesia.

**Ricky Martin / CIFOR**

US\$30 billion per year represent only a tiny proportion of the annual Gross World Product (GWP) of US\$ 71,830,000 billion in 2012 (CIA 2012a), and can be compared to official development assistance of US\$ 133 billion in 2011 (OECD 2012). The governments of seven countries (China, France, Germany, Italy, Japan, United Kingdom, and USA) had annual expenditures exceeding US\$ 1 trillion in 2012 (CIA 2012b). Among the major oil companies ExxonMobil earned US\$ 452,926 billion in 2012 (profits of US\$ 41 billion), Royal Dutch Shell earned US\$ 484,489 billion (profits: US\$ 30.9 billion), and Gazprom earned US\$ 157,833 billion (profits US\$ 44.5 billion) (CNNMoney 2012). And compared to the US\$ 480 billion per year currently spent on fossil fuel subsidies (IMF 2013), REDD+ would require less than 7 per cent of these subsidies to be fully funded.

Shortage of money cannot be used as an excuse for not supporting REDD+ at the level required. Instead, the funding challenge for REDD+ needs to be seen in light of the opportunities for investing in sustainable development, and divesting from unsustainable development. This process of changing unsustainable finance into financing sustainable change is one of the main pillars of a Green Economy transition.

REDD+ needs to move from a bold pilot project into the mainstream of a new paradigm of funding flows. This new paradigm will reward sustainable development, and discourage 'business as usual' depletion of natural capital at the expense of wider societal gains. Setting the right mix of incentives for sustainable forest management and REDD+ at a national scale and combining this with disincentives for unsustainable practices that contribute to climate change, will be a major gain both for REDD+ and for the wider transition to a Green Economy.

The world needs a Green Economy and is already taking some promising steps toward decoupling resource consumption from improving human well-being. Many governments, at national, provincial, city, and village level, are seeking greater efficiency and equity in how energy, transportation, manufacturing, agriculture and other sectors deliver economic goods and services. REDD+ is well-placed to be a catalyst that can demonstrate the multiple benefits of putting the principles of a Green Economy into practice. These benefits include combining global benefits of climate change mitigation and adaptation with local to regional benefits of sustainable forest management to provide a foundation for the global transition to a Green Economy.

## Glossary of terms used

**Adaptation:** the ability of people (individuals or society as a whole) to withstand adverse impacts of climate change. This can be through making changes to the design and management of infrastructure, as well as changes to daily activities. It can also come about through the use of natural capital to find natural solutions. Adaptation is very closely related to resilience.

**Benefits:** the positive outcomes for the well-being of individuals, or society as a whole, associated with a course of action.

**Ecosystem services:** the beneficial (to humans) products and activities that come about as a result of the functioning of ecological systems; such as food, fibre, clean water, carbon sequestration, pollination of crops by bees and other insects, or aesthetically pleasing landscapes for example.

**Ecosystem functions:** the roles that an ecosystem performs as a result of natural ecological processes; from which ecosystem services are derived.

**Governance:** the act of governing or making decisions. The quality of governance is often compared to a standard of 'good governance'. It relates to sound management, coherent policies and processes, as well as respecting the rule of law.

**Landscape:** A mosaic of natural and/or human modified ecosystems, with a characteristic configuration of topography, vegetation, land use, and settlements that is influenced by the ecological, historical, economic and cultural processes and activities of the area.

**Natural capital:** comprises Earth's natural assets (soil, air, water, flora and fauna), and the ecosystem services resulting from them, which make human life possible.

**Natural solution:** a response to an adverse situation where people deploy natural assets instead of built or manufactured assets. For example, flood control through forests rather than engineered defences.

**Sustainable Forest Management:** Sustainable forest management as a dynamic and evolving concept aims to maintain and enhance the economic, social and environmental value of all types of forests, for the benefit of present and future generations.

**Resilience:** the ability of a system to withstand external shocks (e.g. as a result of climate change) to an extent that the systems itself is not threatened. This can also include social systems.

**Values:** the positive effects (which may be potential as well as currently realised) that humans perceive to be associated with an entity. They could come from the services provided by an ecosystem which are considered to be important. Some of these could have a monetary valuation figure attached to them (to enable a comparative analysis with costs, for instance), but other values will be extremely difficult for people to think of in monetary terms.



# MULTIPLE BENEFITS OF REDD+ IN THE LANDSCAPE

**CURRENTLY AN AREA THE SIZE OF 25 FOOTBALL FIELDS IS BEING DESTROYED EVERY 60 SECONDS<sup>1</sup>**  
**REDD+ WILL ENSURE THAT FORESTS AND TREES ARE MORE HIGHLY VALUED IN DECISION-MAKING**

REDD is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. "REDD+" goes beyond addressing deforestation and forest degradation, and aims to make forest management and land-use more sustainable within the landscape, and promote conservation and restoration of forests.

When REDD+ prevents the loss or degradation of forest, this will result in multiple benefits in addition to protecting or enhancing carbon stocks. These include 'ecosystem-based benefits' such as

conservation of forest biodiversity, water regulation, soil conservation, timber, forest foods and other non-timber forest products.

Various factors affect the extent to which these benefits are delivered: the type, location and condition of the forest involved, which REDD+ activity is undertaken, how it is implemented, and the dependence of the local population on forest resources. REDD+ can also lead to direct social benefits, such as jobs, livelihoods, land tenure clarification, carbon payments, enhanced participation in decision-making and improved governance.

## BIODIVERSITY

FORESTS ARE THE HABITAT FOR **77%** OF GLOBALLY THREATENED BIRDS<sup>2</sup>

## PHARMACEUTICALS

PLANTS CONTRIBUTE TO THE DEVELOPMENT OF AT LEAST **25%** OF ALL PRESCRIPTION DRUGS<sup>3</sup>

## NON-WOOD PRODUCTS

FROM FORESTS CAN GENERATE **4 MILLION** PERSON-YEARS OF EMPLOYMENT ANNUALLY<sup>4</sup>

## BIG CITIES

**33 OF THE WORLD'S** 105 LARGEST CITIES OBTAIN THEIR FRESH WATER DIRECTLY FROM PROTECTED AREAS<sup>5</sup>

## TOURISM

ECOTOURISM GENERATES USD **77 BILLION** IN ANNUAL REVENUE GLOBALLY<sup>6</sup>

COSTA RICA ALMOST DOUBLED ITS FOREST COVER IN A PERIOD OF **25 YEARS**, REINFORCING ITS GREEN IMAGE AS THE BASIS FOR ITS TOURISM INDUSTRY<sup>7</sup>

## TRADE

TRADE IN TIMBER AND OTHER FOREST PRODUCTS, IS ESTIMATED AT USD **330 BILLION** PER YEAR<sup>8</sup>

## FOREST RESTORATION

IN NORTHERN TANZANIA IT TOOK ONLY 15 YEARS TO RESTORE 2 MILLION HECTARES OF FOREST AND AGRICULTURAL LAND, **DOUBLING** HOUSEHOLD INCOME<sup>9</sup>

## FLOODING

FORESTS CAN HELP REGULATE THE AMOUNT OF WATER REACHING RIVERS AND REDUCE THE RISK OR MAGNITUDE OF FLOODING<sup>10</sup>

## WETLANDS

ARE VALUED TO PRODUCE USD **2,800** PER HECTARE OF ECOSYSTEM SERVICES EACH YEAR<sup>11</sup>

## MANGROVES

ARE ESTIMATED TO SUPPORT 30% OF FISH CATCH AND ALMOST **100%** OF SHRIMP CATCH IN SOUTH-EAST ASIAN COUNTRIES<sup>12</sup>

## INDIGENOUS PEOPLES

**60 MILLION** INDIGENOUS PEOPLE DEPEND ON FORESTS<sup>13</sup>

## FOREST COMMUNITIES

FORESTS CONTRIBUTE TO THE LIVELIHOODS OF **1.6 BILLION** PEOPLE WORLDWIDE<sup>14</sup>

## ENERGY CONSUMPTIONS

OVER **2 BILLION** PEOPLE USE WOODFUEL FOR COOKING AND/OR HEATING<sup>15</sup>

## FISHING

INTACT FOREST AND BUFFER ZONES AROUND RIVERS AND LAKES CAN REDUCE SEDIMENTS, BENEFITTING FISH POPULATIONS<sup>16</sup>

## ELECTRICITY PRODUCTION

UP TO **70%** OF OPERATIONAL COSTS OF HYDROPOWERDAMS COME FROM SEDIMENT REMOVAL<sup>17</sup>

**46%** OF KENYA'S POWER SUPPLY IS GENERATED BY HYDRO POWER WHICH DEPENDS ON THE COUNTRY'S FOREST WATERSHEDS<sup>18</sup>

## POLLINATION

FOREST-BASED WILD POLLINATORS ARE WORTH **BILLIONS** OF DOLLARS ANNUALLY TO FARMERS<sup>19</sup>

## FOOD SECURITY

TREE FOODS PROVIDE SOME **30%** OF RURAL DIETS IN BURKINA FASO<sup>20</sup>

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# MULTIPLE BENEFITS OF REDD+ IN THE LANDSCAPE

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# About the International Resource Panel

The International Resource Panel (IRP) was established to provide independent, coherent, authoritative and policy relevant scientific assessments on the use of natural resources and the resulting environmental impacts from the full life cycle perspective, while also contributing to a better understanding of how to decouple economic growth from environmental degradation.

The Panel contributes to the Science-Policy interface by bringing together eminent scientists from around the world with multidisciplinary expertise alongside a steering committee composed of governments, international organisations, business associations and civil society organizations. It serves as a platform for dialogue between these actors, providing the experts with an insight into the knowledge gaps of actors while at the same time providing policy makers and other stakeholders with policy-relevant science as a basis for developing sustainable development policies. The Secretariat is hosted by the United Nations Environment Programme (UNEP).

The information contained in the International Resource Panel's reports is intended to be evidence based and policy relevant, informing policy framing and development at national and regional levels as well as informing international processes such as Rio +20 and the development of the Sustainable Development Goals.

Since the International Resource Panel's launch in 2007, 10 assessments have been published, covering biofuels; priority economic sectors and materials for sustainable resource management; metals stocks in society, their environmental risks and challenges, their rates of recycling and recycling opportunities; water accounting; city-level decoupling; global land use, and the state and potential for decoupling resource use and related environmental impacts from economic growth.

The work of the Panel is characterized by systems thinking and a life-cycle perspective in analyzing resource issues. Following its establishment the Panel first devoted much of its research to issues related to the use, stocks and scarcities of individual resources. Building upon this knowledge base, the Panel has now begun to examine systemic approaches to resource use, such as the direct and indirect (or embedded) impacts of trade on natural resource use and flows, cities as societal nodes for resource flows, and the resource use and requirements of the global food system and in particular its role as a node for resources such as water, land, and biotic resources on the one hand and the varied range of social practices that drive the consumption of food on the other. Other ongoing work streams include the development of a material flow database and analysis; an assessment of the environmental impacts of greenhouse gas mitigation technologies; evaluation of soil potential; an assessment of technologies and policies for decoupling economic growth from natural resource use and environmental degradation; and scenarios for future resource use, including inter-linkages between resources.

# About the UN-REDD Programme

The UN-REDD Programme is the United Nations collaborative initiative on Reducing Emissions from Deforestation and forest Degradation (REDD) in developing countries. The Programme was launched in 2008 and builds on the convening role and technical expertise of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and the United Nations Environment Programme (UNEP). The UN-REDD Programme supports nationally-led REDD+ processes and promotes the informed and meaningful involvement of all stakeholders, including Indigenous Peoples and other forest-dependent communities, in national and international REDD+ implementation.

The Programme supports national REDD+ readiness efforts in 49 partner countries, spanning Africa, Asia-Pacific and Latin America, in two ways: (i) direct support to the design and implementation of UN-REDD National Programmes; and (ii) complementary support to national REDD+ action through common approaches, analyses, methodologies, tools, data and best practices developed through the UN-REDD Global Programme. By January 2014, funding for these two streams of support to countries totaled US\$ 217.5 million.

Countries with UN-REDD National Programmes (January 2014): Bolivia, Cambodia, Colombia, Democratic Republic of the Congo (DRC), Ecuador, Indonesia, Nigeria, Panama, Papua New Guinea, Paraguay, the Philippines, the Congo, Solomon Islands, Sri Lanka, the United Republic of Tanzania, Viet Nam and Zambia.

Other partner countries (January 2014): Argentina, Bangladesh, Benin, Bhutan, Cameroon, the Central African Republic, Chile, Costa Rica, Côte d'Ivoire, Ethiopia, Gabon, Ghana, Guatemala, Guyana, Honduras, Kenya, the Lao Peoples' Democratic Republic, Madagascar, Malaysia, Mexico, Mongolia, Morocco, Myanmar, Nepal, Pakistan, Peru, South Sudan, the Sudan, Suriname, Tunisia and Uganda.



# Building Natural Capital: How REDD+ Can Support a Green Economy

The United Nations approach for Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD) under the UN Framework Convention on Climate Change was strengthened in 2008 with the addition of sustainable management of forests and conserving and enhancing forest carbon stocks to the scope of activities. This expanded approach is known as REDD+. With the adoption of the 'rulebook' for implementation of REDD+ in 2013 at the 19th Conference of the Parties to the UNFCCC, REDD+ is gaining momentum and seeks to attract more public and private investments.

Drawing on the experience of REDD+ to date, and benefitting from other approaches to sustainable resource management, this report, on the current status and future potential of REDD+, describes the many benefits of forests and other ecosystems as a way of demonstrating that forests have multiple values beyond carbon sequestration and indeed are a foundation for sustainable societies.

In doing so it provides a summary of the elements necessary for integrating REDD+ into a Green Economy, providing policymakers with innovative ideas for supporting economic development while maintaining or increasing forest cover. Those promoting a Green Economy can see how REDD+ can add important momentum to their efforts, especially complimenting pro-poor strategies. Business leaders will learn how REDD+ and the Green Economy can improve investment conditions, leverage their investments, and ultimately increase long-term returns on investments. Students and the general public will increase their understanding of why REDD+ and the Green Economy together provide a new pathway to sustainable development that benefits all countries.

The report advocates placing REDD+ into a larger landscape-scale planning framework that can, and should, involve multiple sectors (especially those that are driving deforestation, sometimes inadvertently). This would go beyond forests to also serve the needs of energy, water resources, agriculture, finance, transport, industry, trade, cities, and ultimately all sectors of a modern economy. REDD+ would thereby add value to the many other initiatives that are being implemented within these sectors. No longer simply an intriguing pilot effort, REDD+ would take its place as a critical element in a Green Economy.

Reflecting on the efforts already underway in some countries, the report closes by suggesting some of the next steps in what will surely be a long process of societies adapting to new conditions: REDD+ will need to be part of the social response to increasing agricultural and forestry outputs to meet future needs, while at the same time enhancing conservation of forests and ecosystem services.

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United Nations Environment Programme  
PO Box 30552, 00100  
Nairobi, Kenya  
Tel: (254-20) 7621234  
Email: [unepubs@unep.org](mailto:unepubs@unep.org)  
Web: [www.unep.org](http://www.unep.org)



For more information, contact:

International Resource Panel  
Secretariat  
**UNEP DTIE**  
**Sustainable Consumption and  
Production Branch**  
15, rue de Milan  
75441 Paris CEDEX 09  
France  
Tel: +33 1 4437 1450  
Fax: +33 1 4437 1474  
Email: [resourcepanel@unep.org](mailto:resourcepanel@unep.org)  
[www.unep.org/resourcepanel](http://www.unep.org/resourcepanel)

**UN-REDD Programme Secretariat**  
International Environment House  
11-13 Chemin des Anémones  
CH-1219 Châtelaine  
Geneva, Switzerland  
Tel: +41 229 178 946  
Email: [un-redd@un-redd.org](mailto:un-redd@un-redd.org)  
[www.un-redd.org](http://www.un-redd.org)



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