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Hyderabad, India 8-19 October 2012

Item 4.1 of the provisional agenda*

THE LITTLE BIODIVERSITY FINANCE BOOK

Note by the Executive Secretary

INTRODUCTION

1. The Executive Secretary is circulating herewith, for the information of participants in the eleventh meeting of the Conference of the Parties, *The Little Biodiversity Finance Book, A guide to proactive investment in natural capital (PINC)*. This is part of the several information documents that have been prepared to further substantiate information provided in document UNEP/CBD/COP/11/14/Rev.1.
2. The fourth meeting of the Ad Hoc Open-ended Working Group on Review of Implementation of the Convention, through paragraph 5 (b) of its recommendation 4/2 requested the Executive Secretary to collaborate, as appropriate, with expert teams such as the High-Level Panel on Global Assessment of Resources, to develop proposals outlining how the funding gap for each Aichi Biodiversity Target can be bridged using the most appropriate funding sources while also considering synergies. The assessment contained in this book is prepared by the Global Canopy Programme to assist key stakeholders to compare existing and future options for biodiversity and ecosystem finance.
3. The document is being circulated in the form and language in which it was received by the Secretariat.

* UNEP/CBD/COP/11/1.

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In order to minimize the environmental impacts of the Secretariat's processes, and to contribute to the Secretary-General's initiative for a C-Neutral UN, this document is printed in limited numbers. Delegates are kindly requested to bring their copies to meetings and not to request additional copies.



The Little Biodiversity Finance Book

A guide to proactive
investment in natural
capital (PINC)

3rd Edition



The Global Canopy Programme is an alliance of 37 scientific institutions in 19 countries, which lead the world in forest canopy research, education and conservation. Today, our three main programmes - in science, policy and finance aim to define and explore the range and economic value of forest ecosystem services and to share our findings with decision-makers in government and finance.

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Convention on
Biological Diversity



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We are continually aiming to improve the Little Biodiversity Finance Book and your feedback is welcome.

Please send comments to Matt Leggett
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DR. BRAULIO FERREIRA DE SOUZA DIAS, EXECUTIVE SECRETARY OF THE CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

Biodiversity is critical both for its intrinsic value and the key role it plays in providing the essentials of life – food and fibre, fuel and medicines, air and water purification, pollination of plants and crops, and many more. It is no exaggeration to say that our quality of life will suffer tremendously if we continue to lose biodiversity at the current rate, which is estimated to be up to 1,000 times higher than the natural extinction rate.

Yet, despite its intrinsic value and the importance of biodiversity to human wellbeing, the far-reaching consequences of biodiversity loss are not adequately reflected in the national economic indicators affecting the levels of financing currently being spent on biodiversity. The lack of sufficient financial resources has thus become one of the main obstacles to achieving the Convention on Biological Diversity's objectives and the 2020 Aichi Biodiversity Targets of its Strategic Plan.

Recognizing this, the Conference of the Parties to the CBD, at its ninth meeting (COP-9), adopted a strategy for resource mobilization to enhance international financial flows and domestic funding for biodiversity. Following this, Parties agreed to 15 indicators for monitoring the implementation of this strategy and requested information on the use of the indicators in collection of information on expenditures related to biodiversity. To assist the Parties apply the indicators and conduct national assessments, the Secretariat put together a preliminary reporting framework.

Drawing on this information, COP 11 at its upcoming meeting in Hyderabad, India, in October 2012, is expected to adopt targets for mobilizing the financial resources needed to implement the Strategic Plan.

We are increasingly seeing encouraging signs of new and innovative ways of biodiversity financing, including both market-based and non-market-based mechanisms with full respect to the rights of the custodians of biodiversity. For example, Ecuador has generated over USD 3 million per year for the conservation of native forests through its 'Socio Bosque' programme, a national incentive scheme which covers more than 882,000 hectares and has benefitted more than 90,000 participants since its establishment in 2008. Such initiatives, which exist in many countries, need to be recorded and scaled up and replicated widely.

The Little Biodiversity Finance Book is an excellent sourcebook for recording all these efforts and provides a global assessment of current available financing for biodiversity. It provides a simple and easy introduction to existing financial mechanisms in support of biodiversity. As such, it will be an indispensable tool, for understanding the variety of financing options being used for meeting the three objectives of the Convention for both newcomers to this field and national and international policy makers. Clearly, no task could be more timely or important. As the slogan of the International Year of Biodiversity 2010 reminds us: *Biodiversity is life... biodiversity is our life.*



THINK PINC: WHY PROACTIVE INVESTMENT IN NATURAL CAPITAL IS GROWING.

We first published this book during the UN Year of Biodiversity in 2010, to shed light on how much money was being spent globally on protecting biodiversity and what could be done to scale it up by 2020. Our findings showed that governments, the private sector and civil society were spending tens of billions USD annually on actions which directly or indirectly benefitted biodiversity but the need, however, seemed to be in the hundreds of billions USD. How could this gap be bridged?

This 3rd and significantly revised edition of the Little Biodiversity Finance Book is launched at the beginning of the UN Decade of Biodiversity (2011-2020), and ahead of the 20th Anniversary of the UN Conference on Environment and Development in Rio, 'The Earth Summit'. At the first summit in 1992, the world faced up to its environmental responsibilities through the creation of the UN Convention on Biological Diversity, the UN Convention to Combat Desertification, the UN Framework Convention on Climate Change, and the World Business Council for Sustainable Development. This was a remarkable achievement at the time, but twenty years on, have these measures really worked? Whilst huge progress has been made in some areas, such as significant expansion in the protected areas network globally, biodiversity loss has not been halted, CO₂ concentrations in the atmosphere are rising sharply, and degradation of productive land is rampant. So what is not being tackled?

Is it that we do not recognise the intrinsic existence value of nature? It was this that drove much of global thinking up to the first Rio Earth Summit. Evidence since then suggests that a recognition of this value alone cannot save nature. Conservation has proved no match against consumerism, and giant agribusinesses are now responsible for more and more of global deforestation. We do not pay the true cost of the products we consume. A kilo of beef in Brazil does not embed the climate costs of deforestation caused by its expanding cattle industry. Palm oil in cookies consumed in America, or used in cosmetics in Europe, do not price the loss of Orangutan habitat in Asia. In the language of economics, Nature's 'price signal' in global markets does not appear on a Bloomberg terminal.

Without a price signal valuing nature's services, investors and businesses are enjoying a \$4 Trillion "free lunch" on biodiversity, ecosystem services and natural capital, to paraphrase Pavan Sukdhev's words. To put it another way, our economy is pursuing a "business case to extinction" because the value of nature underpinning the delivery of climate, food, water, energy and health security is unaccounted for. A more utilitarian view of biodiversity as a provider of ecosystem services has gained considerable momentum in the last decade, especially with the adoption of the REDD+ mechanism under the UNFCCC as a means of reducing emissions from deforestation and degradation in developing countries. However, this approach too carries dangers.

Would the commodification of nature's services lead to nature's demise? It seems unlikely: countries rich in natural assets might be able to trade their services locally or globally, delivering new funds for biodiversity protection, maintenance and restoration. Or would external elites capture this ecosystem service value, and remove control of the asset from its rightful owners, to the detriment of all but themselves? Not necessarily: ownership can still be retained whilst ecosystem services are priced and traded. Where natural capital is concerned, such as tropical forests, defining ownership can be hard, corrupt or even an alien concept. But this is not always the case and countries that resolve these issues, can create real opportunity.

Looking ahead to Rio+20, much focus is now shifting on to creating a roadmap towards a fairer and more sustainable economy. What may emerge is growing support behind the concept of 'Proactive Investment in Natural Capital' or PINC (Trivedi et al, 2009) not as a brake on development, but as a driver of prosperity for biodiversity superpowers.

At the heart of the PINC concept is this: valuing one ecosystem service, like carbon sinks, is not enough, we need to value and price as many as possible, if not all, of nature's goods and services. Or to put it another way, all of the mechanisms discussed in this book must be utilised if we hope to capture as much of nature's value as possible.

This holistic view of the economics of natural capital offers huge potential for poor countries rich in natural assets. It implicitly argues for the value of nature and the services they provide to be transparently accounted for in the world economy, and thus explicitly calls for significant investment to be raised and delivered to maintain both. Far from relying on carbon alone as the prime measure of nature's services, as in REDD, this concept blends revenue streams from a wide range of ecosystem services and goods, with forestry, agriculture or other sectors, into a sustainable investment opportunity. In this book, we offer a guide to PINC, not only charting the current status of biodiversity finance globally, but reviewing 17 mechanisms which could raise up to \$160 billion per year in 2020.

This goal cannot be achieved, however, without rapidly applied political will and more ecosystem-friendly legislative frameworks. The huge pools of private sector finance will not change their direction whilst price signals continue to favour the destruction and degradation of nature, rather than its restoration and maintenance. This paradigm shift could happen if governments, business and the private sector move towards understanding, embedding, reporting on and eventually accounting for natural capital use across all products and services. This approach is advocated by finance sector signatories (banks, investors, insurance) to the Natural Capital Declaration who have committed to integrating natural capital considerations into their future investment and lending decisions. The World Bank's WAVES Initiative promotes wealth assessment and valuation of ecosystem services on a national basis for Governments and The Leadership Compact for Natural Capital offers a similar approach for the Corporate Sector. Together, they offer a future road map to remove the invisibility of nature in sustaining our present and future world economy.

If we do this, we can all develop a "business case for survival".

Andrew W. Mitchell
Founder and Director
Global Canopy Programme



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HOW DOES THIS BOOK HELP?

With hundreds of billions of dollars needed for development and climate change mitigation and adaptation, it initially seems a difficult task to finance biodiversity at the level required. The Little Biodiversity Finance Book aims to dispel this impression by clearly laying out options for financing biodiversity and ecosystem services and by highlighting the need and potential for synergies not only between financing mechanisms, but also between financing sources earmarked for development, climate change and biodiversity.

The aim of the Little Biodiversity Finance Book is to help key stakeholders including governments, NGOs, the private sector, indigenous peoples and local communities to compare existing and future options for biodiversity finance in a clear and consistent way. To do so, this publication introduces an overarching framework that organises financial mechanisms under three main headings: revenue generation, delivery and institutional arrangements. These modules can be thought of as independent building blocks that can be arranged in a 'mix and match' approach, choosing the most suitable options from each module to create a more effective, efficient, and equitable financial system.

To allow assessment and comparison of the various options within each module we present a set of common criteria, derived from core principles that have emerged within the biodiversity negotiations and the considerable background work by NGOs, IGOs and policy makers. These criteria have been presented graphically using icons that are introduced within each section and shown on the inside back cover for quick reference.

As a non-partisan analysis, the Little Biodiversity Finance Book does not favour one proposal over another. We do hope, however, that our work will aid understanding and encourage dialogue on this vitally important yet globally unrecognised and unrewarded area. This publication is an attempt to understand and evaluate the range of options for financing biodiversity and ecosystem services.

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UNDERSTANDING BIODIVERSITY

WHAT IS BIODIVERSITY?

Biodiversity in its broadest sense is the richness of life on earth. Biodiversity is defined under the Convention on Biological Diversity (CBD) as: “The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.”¹

Biodiversity occurs at all levels - genetic, species, and ecosystem – and it is often best illustrated by considering the wide variety of plant, animal, and microorganism species that exist across the planet. To date, around 1.8 million different species have been discovered and documented, but this number only scratches the surface; estimates of the total number of species on earth and in the oceans range from 2 - 100 million, with a best working estimate of around 8 to 9 million different species alive on our planet (Vié et al., 2009).

In addition to biodiversity this publication will refer to two additional concepts: natural capital and ecosystem services (ES). These terms are often used interchangeably by practitioners and those engaged in the field, and are defined here for clarity.

NATURAL CAPITAL

In general terms, ‘capital’ is defined as the stock of materials that exists within a system at any given time (Costanza et al., 1997). Some common forms of capital are financial capital, man-made capital and social capital. Natural capital is the stock of natural materials in an ecosystem. The important concept within all forms of capital, however, is that when put to use they yield a flow of goods and/or services (Costanza and Daly, 1992); much as an investor will use financial capital to generate profits, a stock of trees or population or fish will provide a future flow of timber or food.

ECOSYSTEM SERVICES

Like man-made capital - such as a power station that provides electricity, or a water treatment facility that improves water quality - natural capital provides a vital flow of ecosystem goods and services. Ecosystem goods and services are functions of an ecosystem that directly or indirectly benefit human wellbeing (Daly and Farley, 2004, Voltaire and Royer, 2004).

Ecosystem goods are portions of the natural capital itself - such as timber or fish - that are harvested from ecosystems. *Ecosystem services* are flows of services such as watershed protection or climate regulation that can be derived from natural capital. For simplicity and following standard terminology we will refer to both ecosystem goods and ecosystem services as ecosystem services throughout this publication.

BIODIVERSITY

Biologically diverse ecosystems provide a greater flow of ecosystem services than non-diverse systems (Hooper et al., 2005, Flombaum and Sala, 2008). The provision of finance to support biologically diverse ecosystems – or alternatively to support the biodiversity of a stock of natural capital – therefore ensures the reliable provision of ecosystem services from the world’s stocks of natural capital. This, by extension, ensures that the stock of natural capital and the services they provide are more resilient to changing physical environments - a necessity in the face of widespread impacts of climate change.

Conversely, investments in the provision of ecosystem services alone could have a negative impact on the provision and sustainability of the flow of other ecosystem services into the future. Where human intervention in an ecosystem aims to maximise provision of a service, it can often have a negative effect on biodiversity, leaving the system less resilient, more vulnerable and lowering the provision of other services. For example, reforestation replacing natural forest with monoculture plantations provides an ecosystem good but decreases the biodiversity. Forest areas with lower biodiversity are likely to have less resilience to climate change, and will provide less sustainable flows of ecosystem services into the future.

Much as a financial investor might diversify their portfolio of assets, it is thus important to maintain the biodiversity of our natural capital, ensuring the provision of ecosystem services. Investing in natural capital in such a way that it maximises biodiversity, finance can maximise the protection, enhancement and restoration of natural capital, and the ecosystem services that flow from them.

¹. The CBD uses the term biological diversity which for simplicity we will shorten to ‘biodiversity’ throughout this publication.

WHAT IS THE VALUE OF NATURAL CAPITAL?

Despite the importance of natural capital, humanity continues to destroy ecosystems at an alarming rate, resulting in a substantial and largely irreversible loss in biodiversity (Sukhdev, 2008). Various estimates have been put forward for the value of natural capital and ecosystem services. Perhaps the most often quoted monetary value is that put forward by Costanza et al. (1997), who estimated the world's natural capital and ecosystem services to be worth on average USD 33 trillion per year. Although this estimate was widely recognised (even by its critics) as an important catalyst for better understanding the value of nature, it received significant criticism for the approach and methods used (Toman, 1998; Pearce, 1998; Bockstael et al., 2000). Much of the criticism arose from the authors' attempt to value the total global stock of natural capital.

More recently a study commissioned by the European Commission looked at the monetary value of biodiversity loss due to not meeting the 2010 biodiversity target (Braat and ten Brink, 2007). The study conservatively estimated that the loss of ecosystem services and biodiversity is valued at around USD 740 billion per annum and if biodiversity continues to be lost at the projected rate, the accumulated cost of ecosystem services lost since 2000 could grow to USD 20 trillion in the year 2050.

Whilst these studies highlight the enormous value of protecting natural capital (or the cost of *losing* it), neither provide an estimate for the *cost of protecting* natural capital. There have been relatively few studies over the years on the cost of protecting biodiversity and ecosystems services generally. Table 2 shows the range of estimates that have been put forward to protect natural capital over differing timescales and geographical scales.

Earlier estimates of the cost of protecting biodiversity focused on adequately financing the current global network of protected areas (PAs) and expanding it to be ecologically representative². Whilst adequate financing of PAs is a crucial component of a global biodiversity conservation strategy - particularly to protect the most rare and vulnerable ecosystems - natural capital cannot be conserved if conservation activities are confined to protected areas (IUCN, 2010). Many ecological and ecosystem processes occur

ACTION	TARGET ³	TIMEFRAME (YR)	SCALE (USD BN/YR)
Expand PA network ³	15% of all terrestrial PAs		4-13
Expand PA network ⁴	15% of all terrestrial ecosystems	10	18-27.5
Expand PA network ⁵	15% of all terrestrial ecosystems and 30% of all marine ecosystems	30	45
Global biodiversity protection ⁶	Conservation of majority of world's biodiversity	30	300
Protect all biodiversity outside protected areas ⁷	Maintain biodiversity in the human-dominated environment	-	290
Total ecosystem protection ⁸	In the context of climate change	-	355-385

over scales far larger than that of PAs: many species are ill-suited to conservation in PAs and PAs are also vulnerable to edge effects and impending climate change (James et al., 2001). There is also a strong co-dependence between people's wellbeing and the sustainable provision of ecosystem services that goes far beyond PAs; a wealth of research has demonstrated the dependence of society on ecosystem services that arise near and far from PAs, at the local, regional, and global scales (see page 16).

The cost of a fully comprehensive global conservation program - to sustainably manage agriculture, forests, freshwater, coastal and marine ecosystem - is difficult to precisely calculate, but has been estimated at around USD 290 billion per annum (IUCN, 2010, James et al., 2001). The cost of halting deforestation in developing countries alone is in the range USD 25 - 185 billion per annum (Parker et al., 2009, UNFCCC, 2007). As a comparison, IUCN have proposed a target of providing USD 300 billion per year to finance the conservation and sustainable use of biodiversity (IUCN, 2010b).

Clearly, the cost of protecting natural capital is in the order of hundreds of billions of dollars annually. Although a significant portion of that cost may be funded through the private sector through the sustainable supply of ecosystems good and services (Gutman and Davidson, 2008) it will certainly require strong policy and public sector support to realise this level of funding. Whilst these costs seem high, the costs of inaction are far greater; if we continue to destroy biodiversity and ecosystems at the current rate we will lose ecosystem services worth 10-100 times the cost of protecting them⁹.

Table 2. Estimated annual costs of protecting natural capital (all values in USD billions per year)

² PAs currently cover approximately 13.4% of terrestrial biomes and for marine biomes cover 12.1% of coastal environments, 4.1% of shelf environments, 5.9% of territorial seas and 0.5% of high seas (Coad et al, 2009).

³ (Bruner et al., 2004)

⁴ (James et al., 2001)

⁵ (Balmford et al., 2002)

⁶ (IUCN, 2010b)

⁷ (James et al., 2001)

⁸ (Berry, 2007)

⁹ Taken from an article by Juliette Jowit in the Guardian newspaper quoting Pavan Sukhdev . (Jowit, 2010).

THE STORY SO FAR...

The Convention on Biological Diversity (CBD) is a global, legally binding treaty for the conservation and sustainable use of biodiversity. The CBD was established in 1992 at the UN Conference on Environment and Development, also known as the 'Earth Summit' held in Rio de Janeiro. The CBD is one of the three "Rio Conventions" along with the UN Framework Convention on Climate Change (UNFCCC) and the UN Convention to Combat Desertification (UNCCD).

The CBD came into force at the end of 1993, and has three main objectives: the conservation of biodiversity; the sustainable use of its components; and the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

In its preamble, the Convention recognises the importance of new and additional financial resources in addressing global biodiversity loss, and specifically highlights that "special provision is required to meet the needs of developing countries"¹⁰. All Parties to the Convention are asked to provide financial support and incentives for national activities intended to achieve the objectives of the Convention, and per Article 20 developed country Parties are required to provide "new and additional financial resources" to enable developing country Parties to meet the costs of implementing such activities¹¹.

However, since the Convention entered into force, the decisions of its Conference of the Parties (COP) have repeatedly emphasised that a lack of available finance remains a primary obstacle to achieving the Convention's objectives. At COP 9 in Bonn in 2008 the Parties adopted a resource mobilisation strategy to enhance funding for biodiversity, including exploring new and innovative funding. The Parties also provided guidance to the Global Environment Facility (GEF), the Convention's sole financial mechanism¹².

At COP10 in Nagoya in 2010, Parties agreed to the adoption of a new ten year Strategic Plan for Biodiversity (2011-2020). The plan is intended to guide international and national efforts to meet the objectives of the Convention, and also to act as a framework to guide the entire United Nations system. Past action to support

biodiversity focused narrowly on addressing the direct pressures causing biodiversity loss and intervening directly to improve the state of biodiversity. The new Strategic Plan is intended to catalyse a broader approach that addresses the underlying drivers of biodiversity loss and incentives to protect the benefits provided by well-functioning ecosystems.

At the heart of the Strategic Plan are the Aichi Biodiversity Targets (see page 24). These are twenty headline targets organized under five strategic goals: addressing the underlying causes of biodiversity loss; reducing the pressures on biodiversity; safeguarding biodiversity at all levels; enhancing the benefits provided by biodiversity; and providing for capacity-building. The targets will be implemented primarily through activities at the national or subnational levels with supporting action at the regional and global scales. National biodiversity strategies and action plans (NBSAPs; see page 118) are the key instruments for translating the Strategic Plan to national circumstances.

Further outcomes from COP 10 also re-emphasised the importance of improving the understanding of financial mechanisms for biodiversity. Parties were invited to submit information on mechanisms, and were called to share lessons learned on biodiversity financing more broadly. There was an increased emphasis on removing financial incentives detrimental to biodiversity (including, but not limited to, harmful subsidies) while promoting the use of positive financial incentives (including, but not limited to, market-based incentives). Parties were asked to better define their funding needs, to assess the value¹³ of their biodiversity and its components, and prepare NBSAPs.

Financial support for the Strategic Plan is provided under the framework of the resource mobilization strategy, and Parties are expected to define targets and mechanisms through which financial resources can be identified at COP 11. A further important stepping-stone in implementation of the Strategic Plan will be the publication of the fourth Global Biodiversity Outlook which will provide an assessment of the status of biodiversity worldwide and is due for release in 2014.

¹². The four year programme of the GEF was adopted in Decision IX/31

¹³. Defined in the advanced final unedited text (dated 2 November, 2010) as "intrinsic, ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic" values

¹⁰. Stated in the preamble to the Convention (<http://www.cbd.int/convention/articles.shtml?a=cbd-00>).

¹¹. From Article 20 of the Convention (<http://www.cbd.int/convention/articles.shtml?a=cbd-20>).

CURRENT SCALE OF FINANCE

GLOBAL ESTIMATE AND WHAT CHANGED

Before we look at ways to scale up biodiversity finance, it is first important to look at how finance is currently being spent. Based on what can be accounted for, the global scale of funding for biodiversity and ecosystem services in 2010 is estimated to have been USD 51.5-53.4 billion. This estimate is USD 15 billion higher than previous estimates, but it is still significantly lower than what is likely needed to secure the world's biodiversity. This is primarily due to increases in funding for four generation mechanisms.

ODA: The scale of bilateral aid with biodiversity as a significant marker increased from an estimated disbursement of USD 3 billion in 2007 to USD 6.25 billion in 2010 (both values in constant USD 2010), in part due to an increase in ODA and in part due to a greater percentage of aid receiving a marker for biodiversity.

Government Funding: Without a formal global review, funding from government budgets for biodiversity is still one of the most difficult sources of biodiversity finance to precisely estimate. Year on year, however, more information is being collected to permit improved estimates of governments' conservation-related funding. As such, the biodiversity funding through general government budgets in 2010 is estimated to be about USD 25.6 billion.

Agricultural Subsidies: Clearer information on agricultural subsidies has become available since the second version of the LBF. New information gives much greater detail on the current level of both subsidies designed to support biodiversity goals as well as subsidies that are likely not environmentally friendly. As such, agricultural subsidy reform has been included as a separate mechanism in this updated version. Between the US and EU, agricultural subsidies with the primary goal of supporting environmental public good provision was around USD 7.8 billion.

Greening Commodities: The scale of certified agriculture markets and marine fisheries is difficult to estimate, but more rigorous research is now available that indicates a larger market size than previously estimated, due both to market growth and better information. Additionally, the area of forests under certification for timber is increasing. This means that the estimate of USD 3.2 billion has increased to USD 6.6 billion in 2010.

	Generated		Delivered		Sources/data
	Developed	Developing	Developed	Developing	
Direct					
Direct Ecosystem Service Fees	<0.1	<0.1	<0.1	<0.1	Stanton et al., 2010
Direct Biodiversity Fees	0.1	0.2	0.1	0.2	Bovarnick et al, 2010; WDP, 2011
Offset Markets	2.1-3.7	0.4	2.0-3.6	0.5	Madsen et al, 2011; Diaz et al, 2011
Bio-prospecting	<0.1	0	0	<0.1	WWF, 2009; INBio, 2012
Subtotal	2.3-3.9	0.7	2.2-3.8	0.8	
Indirect					
Green commodities	6.4	0.2	4.0	2.6	Ecosystem Marketplace, forthcoming; UNECE and FAO, 2010 and 2011; FSC, 2008; FAO, 2012
Other Market					
Auctioning of allowances	<0.1	0	0	<0.1	ICI, 2012
Non-Market					
Domestic budget allocation	15.0	10.6	15.0	10.6	Walls et al, 2009; James et al, 1999; Stanton et al, 2010
Agricultural Subsidy Reform	7.8	0	7.8		Monke and Johnson, 2010; Cooper et al, 2009; Stanton et al, 2010
ODA	6.2	<0.1	0	6.3	OECD, 2012; Castro and Hammond, 2009; Strecken, 2009
Debt-for-nature	<0.1	0	0	<0.1	US State Department, 2012
Philanthropy	1.5-1.8	0	0.5-0.6	0.9-1.1	Gutman and Davidson, 2008; Financial Statements of various international conservation NGO
Subtotal	30.5-30.8	10.7	23.3-23.4	17.8-18.0	
Total	39.3-41.2	11.5	29.5-31.2	21.3-21.5	

Table 3 Current flows finance for ecosystem services and biodiversity in developed and developing countries (all values in USD millions per year)

WHERE IS FUNDING DELIVERED?

Around 78% of the world's biodiversity finance is generated in what are traditionally considered developed economies, while about 22% is generated in emerging or developing economies. Nearly 19% of all biodiversity finance - approximately USD 9.8 billion - is transferred internationally and delivered in emerging and developing economies, in roughly even proportions to Africa, Asia and Latin American and the Caribbean (LAC). After this transfer, 59% of biodiversity finance is delivered in developed economies, while 41% is delivered in emerging or developing economies.

That picture becomes starker when we see that the world's largest chunks of biodiversity finance is delivered in the US, China, and Europe. Just a few major government spending programmes (or groups of programmes) in the USA, Europe and China account for 51% of the global biodiversity finance that we can account for:

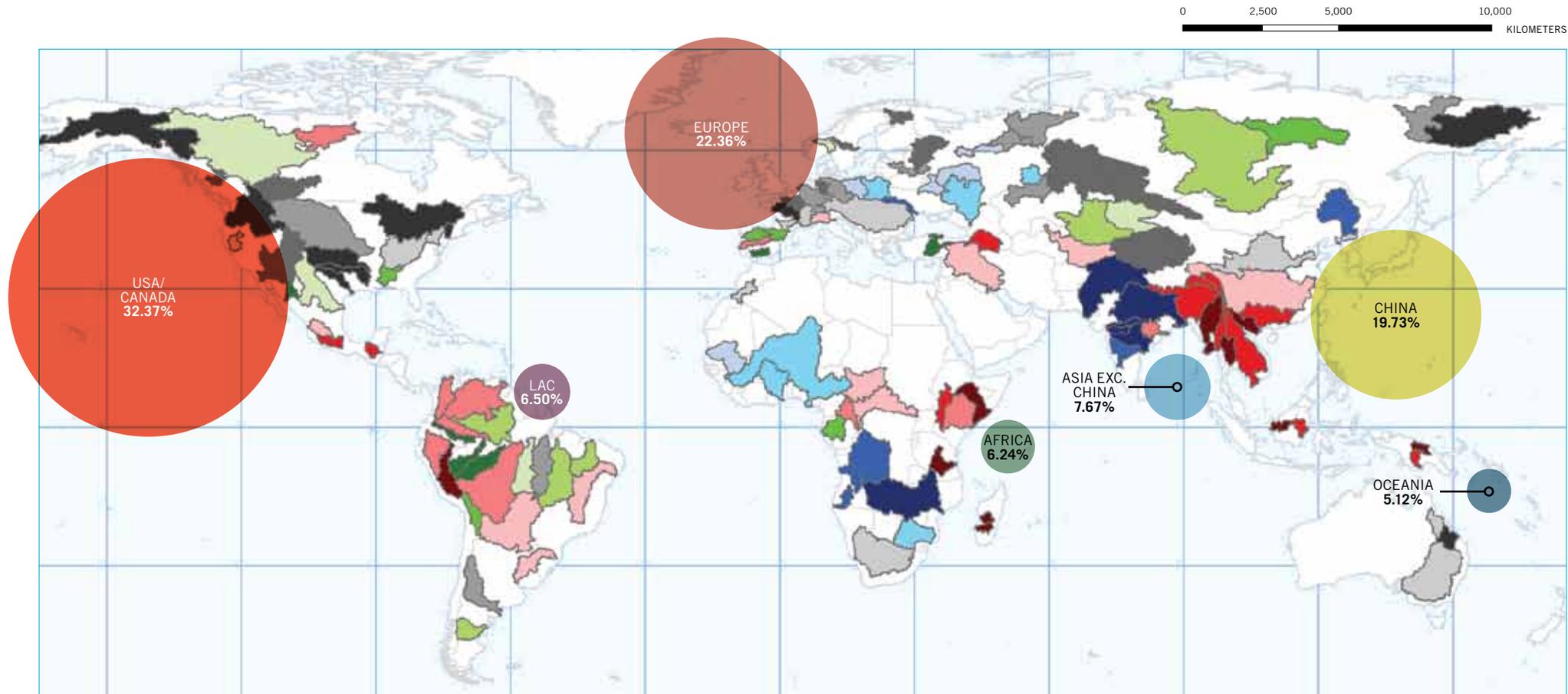
- USA: The greatest amount in the US is from the US Farm Bill, which was ex-ante estimated to spend USD 4.1 billion on conservation programmes in 2010 (Monke & Johnson, 2010), with an additional USD 5.3 billion budgeted for other conservation programmes through the federal or state governments (Walls et al, 2009).
- China: USD 7.8 billion was spent by the government in 2008 on various conservation programmes focused on water, forests, and agricultural land (Stanton et al, 2010), and it is assumed that this level of funding was maintained, or perhaps even increased, in 2010.
- EU: In addition to funding for protected areas, which is likely in the range of USD 5 billion, an estimated USD 4.3 billion was budgeted for 2010 spending on agri-environmental schemes (both EU and national co-financing; Cooper et al, 2009).

In addition to these large chunks of government spending, the majority of finance raised through direct and indirect ecosystem markets is delivered in these same regions, but particularly in the US, Canada and Europe:

- Biodiversity offsets: By far the largest market for biodiversity offsetting is in the US.
- Green commodities: Over 88% of forest area that is certified is in the US, Canada and Europe (including Russia), while at the very minimum at least a quarter of certified agricultural production also occurs in these regions.

In contrast, two economically developing but highly biodiverse regions, Africa and LAC, each receive a little over 6% of the world's biodiversity finance. Asia receives significantly more, but this is primarily due to the effect of China, and the remainder of the region is on par with Africa and LAC and receives a little over 7% of the biodiversity finance that can be accounted for.

Overall, the picture is clear: the majority of global biodiversity finance is delivered in the world's largest economies. Unfortunately, although those places do have important biodiversity to protect, the majority of the world's biodiversity exists in LAC, Africa, and Asia (excluding China), which receive far less biodiversity finance. Additionally, populations in these latter regions are more directly dependent on ecosystem services for their well-being and livelihoods, so the need to preserve the natural environment is far more acute. But with many rapidly growing economies still developing the governance of their natural environment, pressures on biodiversity also tend to be more imminent. But even in regions such as the EU—that are highly developed, have relatively high levels of environmental governance, and have large amounts of biodiversity finance—the 2010 biodiversity targets were not met.



**FIGURE.1
GLOBAL BIODIVERSITY
VS. FINANCE DELIVERED**

Map showing current biodiversity finance delivery in 2010 distribution estimates overlaid with high priority areas for ecosystem services, and global priority areas for biodiversity.



The map background data shows country priority watersheds for ecosystem services provision (e.g flood mitigation, fresh water provision) combined with biodiversity hotspots, important ecoregions and endemic bird areas (EBAs).

The boxed scale identifies four categories: Mutual-high priorities (MHP; red) for priority protection of both ecosystem services and biodiversity; high priorities for

protecting ecosystem services (ESP; blue); high priorities for protecting biodiversity (BCP; green); and mutual-low priorities (MLP; gray/black) for protecting both ecosystem services and biodiversity. White areas were not included in the original analysis.

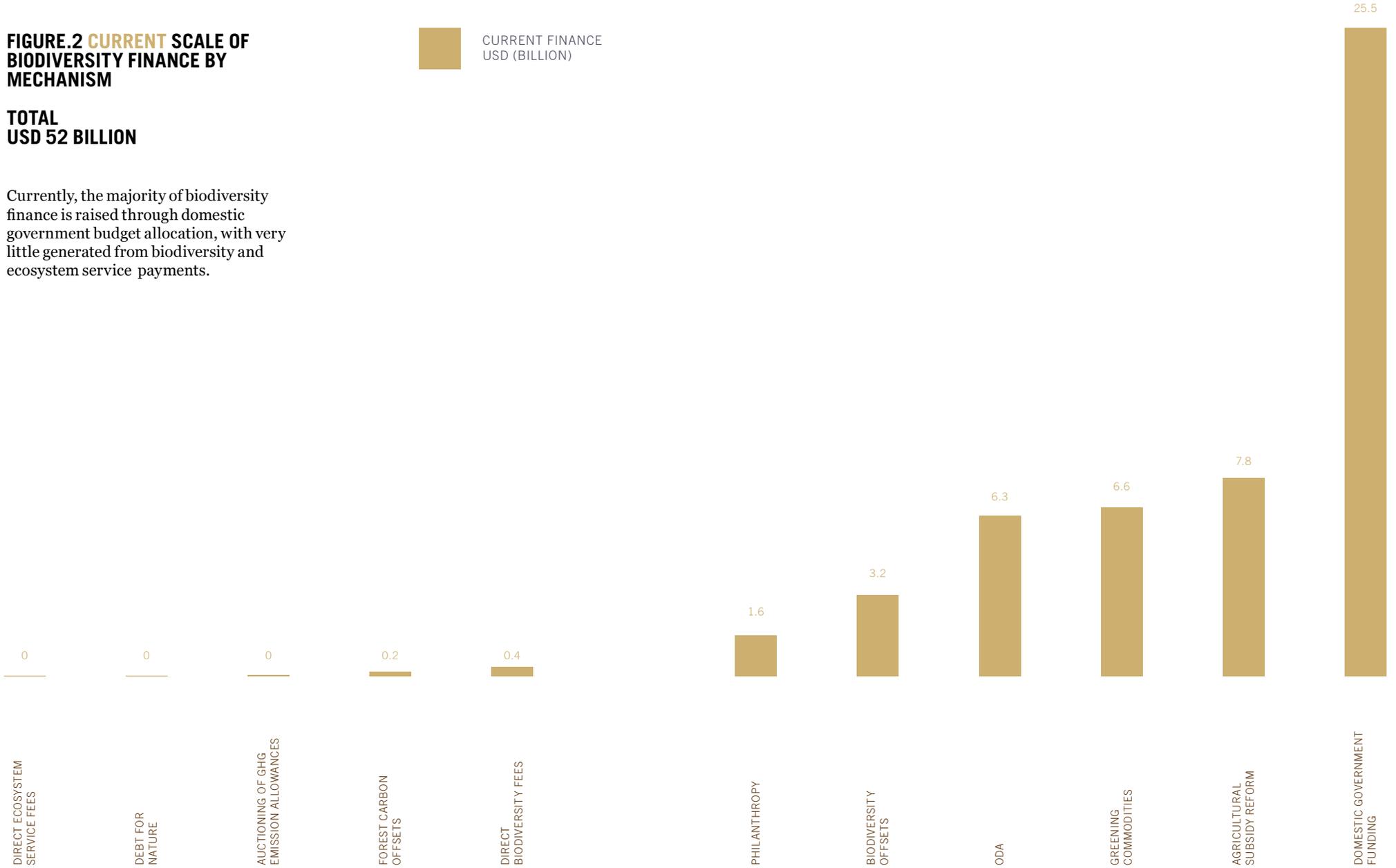
Gary W. Luck, Kai M.A. Chan, John P. Fay. *Conservation Letters*, Vol 2, issue 4, August 2009, p. 179-188.

FIGURE.2 CURRENT SCALE OF BIODIVERSITY FINANCE BY MECHANISM

CURRENT FINANCE USD (BILLION)

TOTAL USD 52 BILLION

Currently, the majority of biodiversity finance is raised through domestic government budget allocation, with very little generated from biodiversity and ecosystem service payments.



HIGH INCOME

LOW INCOME

FIGURE 3. BIODIVERSITY FINANCE: WHERE IS IT DELIVERED?

This diagram shows the percentage of finance delivered in high or low income countries, and the percentage of finance for biodiversity which is transferred from high income to low income countries.

TOTAL FINANCE AVAILABLE:
100%

TRANSFER TO LOW INCOME:
19%

DELIVERED IN HIGH INCOME:
59%

TRANSFER TO LOW INCOME:
19%

DELIVERED BY LOW INCOME:
22%

TOTAL DELIVERED IN LOW INCOME:
41%

THE OVERARCHING FRAMEWORK

THE BUILDING BLOCKS

In order to better understand financial mechanisms for biodiversity, we present here a framework comprised of three basic modules:

Generation: How is finance raised?

Delivery: How is finance delivered?

Institutional Arrangements: How are decisions made?

Individually, these modules represent a discrete area of the financial system and when combined they describe the overall framework for how a financial mechanism might work.

MIX AND MATCH OPTIONS

This book is accordingly divided into three sections to correspond with the three modules shown above. Each section will provide an analysis and summary of the various options that exist under these three modules.

The proposals presented within one module potentially impose constraints on options in other modules. For example, the use of a market mechanism under revenue generation would be incompatible with a grant for delivery of finance. When viewing the proposals as a group, however, there are a number of different 'mix and match' options; for example, the decision to use the auctioning of allowances to generate revenue can, broadly speaking, be addressed separately from the question of whether to use grants or concessional loans to deliver finance.

To provide a quick reference to the different modules of the framework, the colours for the three modules shown below are used throughout this guide, **green will always signify generation, blue: delivery and brown: institutional arrangements.**



Figure 4. Building blocks of a financial mechanism



GENERATION

UNDERSTANDING GENERATION

The first chapter of this publication examines the range of options that have been put forward to generate finance for biodiversity and ecosystem services.

THE STATE OF PLAY

The majority of biodiversity finance is currently being generated through traditional sources of finance including government budget allocations, official development assistance (ODA) and philanthropy.

The current scale of finance is insufficient to meet the hundreds of billions of dollars needed for biodiversity worldwide. There is therefore an urgent need for the international community to develop new and innovative sources of finance to address the 'gap' in national and international biodiversity financing.

A BRIEF HISTORY

The Convention on Biological Diversity lays out clear responsibilities for developed countries to provide financial resources for the conservation and sustainable use of biological diversity and the equitable sharing of benefits arising from its use.

Under Article(s) 8(m) and 9(e), Parties to the Convention are required to cooperate in providing financial and other support, particularly for developing countries, for in-situ and ex-situ conservation, and particularly for the establishment of conservation facilities in developing countries.

Critically, Article 20(2) of the Convention also requires developed country Parties to provide "new and additional" financial resources to enable developing country Parties to meet the agreed full costs of implementing measures to meet the objectives of the Convention.



GENERATION FRAMEWORK

CRITERIA

The diagram opposite presents a framework to analyse and understand the different mechanisms that can be used for revenue generation. The framework comprises six revenue generation criteria as follows:

Scale: How much money will be raised?

Timeframe: Over what period?

Level: At what level is finance aggregated?

Market: Through what type of mechanism?

Contributor: Who will pay? Who should pay?

Value: Why will they pay?

Using these criteria allows us to compare individual mechanisms and to collectively see areas of convergence and divergence. The following pages provide an explanation of these criteria and show how they can be used to understand mechanisms for revenue generation. The criteria are based in part on the requirements set by the CBD in relation to the provision of financial resources. Article 20 (2) refers to the need for financial resources to be adequate, predictable and timely.

The following pages provide an explanation of these criteria in relation to the principles outlined above and show how these criteria can be used to understand proposals for revenue generation.

Figure 5. A framework for understanding revenue generation proposals

GENERATION

PRINCIPLE			
ADEQUATE	TIMELY	PREDICTABLE	MOTIVATION
CRITERION			
SCALE How much money will be raised?	TIMEFRAME Over what period?	LEVEL Is finance raised through the private sector, national governments or international governmental organisations?	VALUE Is generation based on use of nature or non-use values?
		SOURCE From where will money be generated?	PAYER Is finance generated from the polluter or beneficiary?

220-440
USD bn

SCALE

The first step in understanding revenue generation options is to know how much money could be raised by a given mechanism. The scale shown for each proposal is an estimate (in billions of USD) of how much revenue the mechanism could generate on an annual basis.

Options: Numeric value in billions of USD

An essential requirement of any revenue generation mechanism is its ability to deliver adequate financing for biodiversity and ecosystem services. Whilst no single mechanism is likely to generate adequate finance to meet the billions of USD required to finance biodiversity, it is nonetheless important to understand how much finance a given mechanism might contribute.

The question of how much finance will be raised is closely related to *when* that money will become available and how *predictable* the source of finance will be. These questions will be addressed further in the timeframe and level components of this framework respectively.

The scale criterion will use a numeric value (in billions of USD) representing annual flows of finance by 2020. The scale will either be a single number (indicating the best estimate of finance in 2020), or a range from a low-end estimate (which assumes some policy intervention) to a high-end value (with significant policy intervention).

TIMEFRAME

The timeframe describes the period when financing from a mechanism is likely to be available.

Options: Short-term (<2015), Medium-term (2015-2020), Long-term (>2020)

Another key component for revenue generation is that finance for biodiversity and ecosystem services is made available in a timely manner. Financial resources can be generated in either the short, medium or the long term (as defined above).

Certain activities such as capacity building and demonstration projects will require finance in the short term, whereas other actions such as the implementation of a fully integrated biodiversity market will take longer to achieve.

As discussed under the scale criterion, it is unlikely that any one mechanism proposed here would be sufficient to deliver the scale of financing required across all three timeframes. It will be essential though, that financial sources and timeframes are matched to delivery needs so that adequate financing is available in a timely manner for developing countries to act on biodiversity and ecosystem conservation.



ADDITIONALITY OF BIODIVERSITY FINANCE

A key requirement for biodiversity is that revenue is new and additional. Whilst this term is central to the consideration of revenue generation it is often poorly defined and used symbolically within finance discussions. The main concern is that finance for biodiversity does not displace public funds that are otherwise intended for long-term commitments such as the support of development and climate change in poor countries. As such a useful departure point is to define additionality in meaningful language that addresses the concerns of the development community (Brown et al., 2010).

ADDITIONAL TO THE 0.7% ODA TARGET

The first definition of additionality is that finance is additional to the 0.7% ODA target. This approach would be relatively straightforward to implement and would be supported by the development and climate community as it would not divert existing funds away from this goal. Politically this would be less acceptable to many donor countries as they are already not meeting their aid targets.

ADDITIONAL TO HISTORICAL ODA LEVELS

This second definition would set a reference level as a base year for ODA spending (e.g. 2010) and finance above this amount would be counted as additional. This approach would be less straightforward to implement as existing data on ODA is at best imprecise and it could potentially divert significant flows of finance from the 0.7% target for aid. It would also be more advantageous to countries that have not yet met their ODA commitment and is therefore unlikely to be politically acceptable for both donor countries and the development community.

ADDITIONAL TO HISTORICAL ODA BUT CAPPED

A further option building on the previous definition would be to only allow a percentage of future ODA commitments to be met through biodiversity finance. This approach would limit the amount of aid finance that could be diverted through new ecosystem commitments, thereby addressing some of the development concerns of definition 2, but it would still favour countries that have historically not met their ODA commitments. This would also be politically challenging to implement as it would be difficult to choose an appropriate percentage for the cap.

ADDITIONAL TO HISTORICAL BIODIVERSITY FINANCE

This option would use a similar approach as definition 2 but would treat biodiversity finance as additional only if it is above previous spending on biodiversity. The key to this approach is that biodiversity finance could not be used towards ODA, i.e. there would be a decoupling of accounting between these two agendas. Technically this would be the most challenging option to implement as it would require new accounting and tracking systems. In addition, biodiversity and development finance have significant overlaps that need to be harnessed where possible.

Based on (Brown et al., 2010)

LEVEL

The level criterion describes whether revenue will be generated by a mechanism that is implemented by the private sector or by the public sector (either nationally or internationally).

Options: Private, National Public, International Public

Broadly speaking revenue generation mechanisms can be implemented by a private organisation, by local and national governments, or by a public body at the international level. The level at which revenue is generated will have important implications for both the adequacy and predictability of biodiversity finance.

Private finance is defined here as revenue that is generated through a mechanism implemented in the private sector¹⁴. Private finance can use voluntary mechanisms (see e.g. green commodities on page 79 or direct ecosystem services fees on page 66) or can be driven by national or international policy regulation. The key to *private finance* is that the finance raised does not enter the hands of the public sector.

Public sector finance is similarly defined as revenue that is generated through a mechanism controlled by a public body and can be divided into national and international sources of finance. **National** level mechanisms raise finance that is initially generated by local or national governments, and include general taxes and natural capital levies (see page 82). **International** mechanisms raise finance that is initially generated at a supranational level and include a financial transaction tax (see page 88) and debt-for-nature swaps (see page 96).

Revenue generated at the national level is often considered to be an unpredictable source of international finance due to the domestic revenue problem (see page 54). Whilst revenue generation at the international-level is, in theory, a simple solution to this issue, it faces political challenges, as contributing countries have historically preferred to maintain visibility and control over their contribution to international finance.

PRIVATE NATIONAL



INTERNATIONAL



¹⁴. Whilst other mechanisms might generate revenue from the private sector (i.e. a tax on aviation) if this revenue is generated through a national or international policy then this is considered to be public finance.

REVENUE CAPTURE AND THE DOMESTIC REVENUE PROBLEM

Biodiversity finance faces two key challenges when revenue is raised through national government mechanisms. The first is often referred to as revenue capture, which occurs when national governments use revenue that is generated from biodiversity finance mechanisms for other policy priorities.

Development agencies and national governments have traditionally discouraged earmarking government revenues because it reduces flexibility in the use of domestic revenue. Whilst this argument is relevant for general taxes and levies that indiscriminately raise finance (as discussed under the “payer” criterion, see page 56), it is less applicable to mechanisms that are directly linked to ecosystem use; earmarking revenues raised through environmental mechanisms for environmental purposes can have significant political and economic advantages (OECD, 2005). For example, polluter-pays mechanisms, such as a natural capital levies (see page 82) or the national auctioning of allowances (see page 66), can receive increased political and public acceptance if they are being used explicitly to finance sustainable development activities. Similarly revenue generated through beneficiary-pays mechanisms such as direct ecosystem services fees (see page 86) should be used to ensure the continued provision of those ecosystem services being paid for.

The second issue for biodiversity finance is a variation of political capture known as the domestic revenue problem. The domestic revenue problem arises when money that is intended for international purposes enters national-level budgets. Due largely to the competing concerns of other national interests, domestic revenue is less likely to be transferred to international causes as it is seen to be nationally owned (Müller, 2008, Doornbosch and Knight, 2008). Although governments can set aside revenue that is generated nationally for international purposes, this funding is still unpredictable as both national policies and national circumstances can change.

A potential solution to these problems is to use off-budget funding streams (Müller and Gomez-Echeverri, 2009). Keeping revenue that is intended for public use off-budget makes it relatively simple later on for governments to disburse this revenue for its intended use. Another partial solution to the issue of political capture is to implement mechanisms through the private sector or intergovernmental organisations. Since these financing streams are outside the direct hands of national governments they are also less likely to be re-appropriated. Government action is still required, however, to ensure that private-sector mechanisms are effective (e.g. certification standards for green commodities) and international mechanisms must consider other pressing international issues in the allocation of their finance.

SOURCE

The source criterion defines the differing relationship between the market, industry or sector from which finance is raised and the provision of biodiversity. It is key to note that the source criterion is not defined by “markets” because the mechanisms in this book necessarily involve the creation of environmental commodity markets; but because it is possible to raise finance from global markets, industries and sectors of all types.

Options: Direct Market, Indirect Market, Other-market, Non-market

Direct market mechanisms create a link between the beneficiary/polluter of biodiversity or ecosystem services and the provider of those services. For example, a biodiversity offset market (see page 73) links degraders of ecosystems with protectors of other natural habitats¹⁵.

Indirect market mechanisms raise finance by implicitly linking the value of biodiversity and ecosystem services to more traditional markets, creating indirect markets for ecosystem services. For example, green commodities (see page 79) bundle consumer demand for ecosystem services and biodiversity into international markets for commodities such as coffee or tea. The provision of biodiversity is a prerequisite for the generation of finance under *direct* and *indirect market* mechanisms.

Other-market mechanisms do not predicate their existence on the provision of biodiversity, and have a wide variance in their relationship to biodiversity. For example, a tax on all financial transactions (where the financial market is the other-market) is independent of the biodiversity impact of the transaction; whilst a natural capital levy placed on a mining company (where mining is the other-market) is dependent on the biodiversity impact of the company’s operations. These options (discussed on pages 80-89) have the potential to raise large-scale finance for biodiversity and ecosystem services, but are generally considered to be less politically feasible to implement than direct or indirect options.

Finally the **non-market** option includes mechanisms that generate revenue from traditional sources of finance (e.g. ODA and Philanthropy on pages 93 and 97). Since many of these options are government driven, the delivery of biodiversity and ecosystem service benefits is often determined by the channel of delivery.



¹⁵. Whilst direct mechanisms are currently limited in scale due to the voluntary nature of these markets, these mechanisms might be scaled up if a compliance regime could be established to pay directly for ecosystems.



PAYER

The payer criterion indicates whether finance is generated from the beneficiary of biodiversity and ecosystems services or the polluter that degrades them.

Options: Polluter, Beneficiary, Indiscriminate

Biodiversity finance mechanisms have traditionally been grouped under two categories: polluter-pays or beneficiary-pays.

Mechanisms that impose a payment on the **polluter** are deemed to follow the ‘polluter-pays principle’. The basic idea behind this principle is that the price of a man-made good or service should fully reflect the total cost of production, including any costs borne from degrading the natural environment. An organisation paying to offset the loss of biodiversity caused by building their new manufacturing plant is a common example of a polluter-pays mechanism. Traditionally, polluter-pays mechanisms have followed some form of governmental or international regulation (Pearce, 2004). Many innovative financing options are now emerging, however, that fall under voluntary arrangements whereby either by increased consumer awareness, corporate social responsibility (CSR) or risk mitigation strategies.

The other category of mechanism under this criterion is ‘beneficiary-pays’ in which revenue is generated from the **beneficiary** of biodiversity or ecosystem services. Examples of beneficiary-pays mechanisms are direct ecosystem services fees (see page 66), which are traditionally local arrangements whereby downstream land users pay upstream land users not to pollute, or global arrangements in which developed countries pay poorer countries to adopt more environmentally friendly technologies (Pearce, 2004).

If the polluter and the payer icons are both greyed out this indicates that a mechanism raises finance **indiscriminately** from polluters and beneficiaries. For example, a financial transaction tax (page 88) would raise finance from any financial transaction irrespective of the motivation behind it.

VALUE

The value criterion indicates whether finance is generated for the *use* of biodiversity and ecosystem services or for some other (*non-use*) reason.

Options: Use, Non-use, Indiscriminate

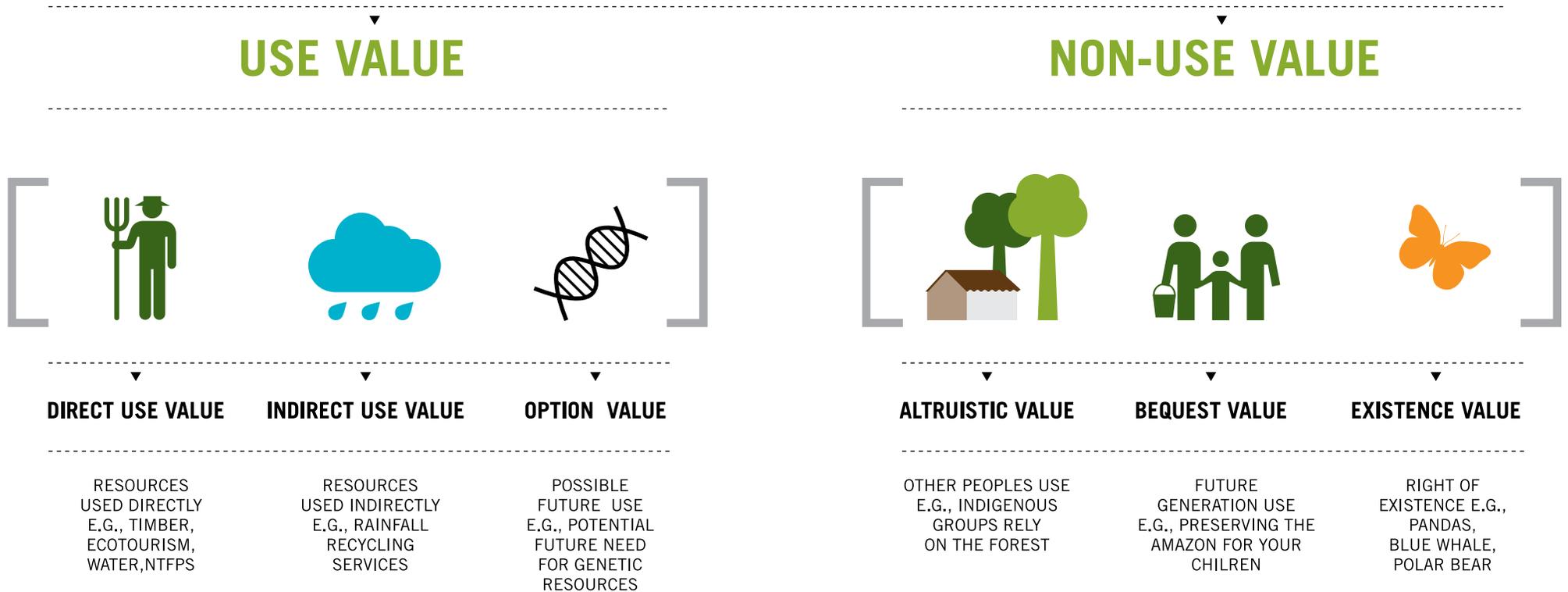
Biodiversity and ecosystem services are valuable to many people for many reasons (see for example page 16 on the forest eco-utility). For reasons of quantification and understanding, these values are often classified in terms of use or non-use values (see Figure 6).

Mechanisms based on **use** values raise finance from actors that will directly use the ecosystem they are paying for, e.g. direct ecosystem services fees (see page 66), or as compensation for the degradation of an ecosystem, such as offset markets (see page 73). Mechanisms based on **non-use** values raise finance primarily from motivations that are not derived from the use of an ecosystem, e.g. philanthropy (see page 97). In reality finance will have a mix of motivating reasons, but mechanisms are categorised here based on the primary motivation of each mechanism.

If the use and the non-use icons are both greyed out this indicates that given mechanism, it is **indiscriminate** as to whether finance is raised based on use or non-use values. Again, a financial transaction tax (see page 88) provides a good example since it would raise finance from any currency transaction irrespective of the motivation behind it.



FIGURE 6. TOTAL ECONOMIC VALUE



Adapted from (Smith et al., 2006)

GENERATION PROPOSALS

A GUIDE TO REVENUE GENERATION PROPOSALS

SCALE

20–30
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



The following pages present a guide to 17 mechanisms to generate finance for biodiversity using a common framework. Whilst other studies have presented a broader array of mechanisms than those presented here¹⁶, these often include entries that can be consolidated into a single mechanism. Finally, we have only represented mechanisms here that are generally accepted to be politically feasible within the context of environmental conservation.

Each mechanism is analysed using the framework presented above and is represented graphically using the icons shown overleaf. These icons represent the main options from the analytical framework, and have been grouped into their respective criteria.

The icons will be presented to the side of each proposal in an 'icon bar' shown here on the left. Not all proposals aim to define all of the criteria of the framework. To simplify matters, all icons in the icon bar will be greyed out by default¹⁷. For example the hypothetical 'icon bar' shown on the left indicates that the scale is USD 20 - 30 billion per year, the time frame is in the short- and medium-term and the finance is raised at the international level through a beneficiary-pays, non-use, other market mechanism.

The mechanisms presented here have been grouped by the source criterion (see page 5). Direct market mechanisms are presented first, followed by indirect market, other-market and non-market mechanisms. This grouping is a consequence of the fact that as finance generation is scaled-up in the future scenarios, less traditional sources of finance – sources that have a relationship with private sector markets, sectors and industries of all types – represent a greater proportion of the total possible finance generation. It is therefore instructive to consider the scaling-up of finance generation in the context of these groupings, the use of which is an outcome rather than an input to the book

Furthermore, mechanisms within a group contribute to biodiversity conservation and sustainable use in a similar way. Direct and indirect mechanisms both contribute to the conservation and sustainable use of natural capital through the mechanism itself. Other market and non-market mechanisms on the other hand do not necessarily provide biodiversity and ecosystem benefits.

Finally, mechanisms under each group share similar ways in which to scale up finance. Broadly speaking, supply-side regulation, demand-side regulation, political coordination and political will are respectively the major drivers for scaling-up finance from direct, indirect, other- and non-market mechanisms.

KEY TO GENERATION ICONS

TIMEFRAME

SHORT-TERM MEDIUM-TERM LONG TERM



LEVEL

PRIVATE NATIONAL INTERNATIONAL



SOURCE

DIRECT INDIRECT OTHER-MARKET NON-MARKET



PAYER

POLLUTER BENEFICIARY



VALUE

USE NON-USE



16. See e.g. Gutman and Davidson, 2010 and reviews cited therein

17. See notes above for Payer and Value

DIRECT MARKET MECHANISMS

The first group of mechanisms presented here all generate revenue for the provision of either biodiversity or ecosystem services. The following direct market mechanisms will be discussed in this section:

- Direct ecosystem service fees
- Direct biodiversity fees
- Cap-and-trade market
- Offset market
- Bioprospecting

In all of these examples, revenue is generated through a payment from either the beneficiary (e.g. user fees) or the polluter (e.g. biodiversity offsets) to the provider of biodiversity and ES. Since revenue generation is directly linked to the provision of biodiversity and ES, these mechanisms tend to be voluntary and private sector in nature, in which end users find it in their economic (or social) interest to pay for the conservation or sustainable use of biodiversity and ecosystem services.

In France, for example, Nestle Waters have implemented several longstanding voluntary PWS schemes in which the water utility pays upstream land owners to switch to less polluting activities, thereby improving the quality and security of the water supply (Perrot-Maitre, 2006). For voluntary PWS schemes to be successful they need to be in the interest of both upstream polluters and downstream users.

While direct market mechanisms are currently dominated by project-level, voluntary, private sector arrangements, examples also exist of municipal-level and national-level government-mediated schemes. In these cases, the government acts as an intermediary, collecting revenue from the downstream users to secure the benefit of the biodiversity from the upstream providers. Examples include the Quito water utility in Ecuador, Mexico's programme of payments for hydrological environmental services (see page 68) or Belize's user fee for biodiversity (Conservation Finance Alliance, 2003).

DIRECT ECOSYSTEM SERVICE FEES

SCALE

0.05–2
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



Direct ecosystem service fees are payments (or other positive incentives) made by ecosystem service beneficiaries directly to ecosystem service providers for the continued flow of those services. Direct ecosystem service fees are arrangements where the beneficiary pays and the ecosystem services that flow to them are not wholly public but are to some degree captured by those beneficiaries. It is important to note that direct ecosystem service fees do not involve the creation of an offset or credit.

The most common example of direct ecosystem service fees are payments for watershed services (PWS), where downstream water users pay upstream landholders to carry out sustainable land practices and so increase the quantity and quality of water running downstream. Direct ecosystem service fees are often voluntary arrangements where these users find it in their economic interest to pay. For example, in PWS, payments are often made by beverage companies, municipal governments, hydroelectric generators or through household water use fees (Stanton et al., 2010). Direct ecosystem service fees can be government mediated, for example, when legislation is implemented to generate new and additional finance through the introduction or increase of water fees (see e.g., Mexico case study on page 68). It is important to note that many PWS schemes are not simply government-mediated, but government-funded, meaning that finance is not raised through a specific mechanism, but allocated from domestic government budgets as discussed on page 92. Thus the current finance for direct ecosystem service fees is relatively low at USD 5 million, the majority of which is from Costa Rica's PSA (see page 94).

Increasing the scale of direct ecosystem service fees will depend on downstream beneficiaries (or the organisations that represent them) understanding the direct-use values of ecosystem services. The uptake of tools designed for corporate ecosystem service valuation by companies, municipalities, utilities, farmers' associations, and so on, is an important step for the expansion of that understanding (see e.g. Hanson et al., 2007).

DIRECT BIODIVERSITY FEES

Direct biodiversity fees (commonly called “user fees”) are payments for access to or direct use of biodiversity and are a widely used mechanism for raising biodiversity finance. Direct biodiversity fees are mostly generated through tourism and recreation activities in areas with high conservation value and are typically implemented at the project level through entrance fees to national parks, and licences and permits, but can also be implemented at the national level¹⁸.

To deliver benefits to the environment there need to be clear policies in place to direct funds generated towards biodiversity and ecosystem service provision. In the case of the Belize conservation fees (an additional fee on the normal airport departure tax), revenue goes directly to the ‘Protected Area Conservation Trust’ (PACT) that operates independently from national government (Conservation Finance Alliance, 2003).

The current finance for user fees is USD 368 million. This is based primarily on an extrapolated average revenue for global protected areas (PA) of USD 0.21/ha, which is in turn based on PA revenues generated in twenty Latin American countries surveyed by Bovarnick et al. (2010). The revenues generated for PAs include entrance fees, concessions, usage licenses, PES, and more.

SCALE

0.5–2
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



¹⁸. As taxes at airports, hotels, etc. For example, Belize imposes a USD 3.75 conservation fee at the airport, in addition to their normal US\$11.25 airport departure tax.

CASE STUDY

PES FROM LOCAL TO NATIONAL SCALES

Whilst payments for ecosystem services (PES) have traditionally been implemented at the project level, examples of PES schemes are emerging that have been scaled up to the national level. This is perhaps due to a growing awareness of the regional and national benefits of ecosystem services.

LOCAL: QUITO WATER FUND, ECUADOR¹⁹

Quito is one of the many major cities in the world that depend on upstream ecological reserves for its water supply; with about 80% of the city's drinking water coming from the Antisana and Cayambe-Coca ecological reserves and Cotopaxi National Park. In 2000 the Ecuadorian government established the Quito Water Fund (*Fondo para la protección del Agua*; FONAG) as a trust fund to support conservation activities in these reserves and related watersheds to protect Quito's water resources.

FONAG receives contributions from a blend of public and private sources including a private brewing company, a water bottling company, and the municipal water and electrical utilities of Quito²⁰. To date, FONAG has achieved an endowment of USD 6 million and has invested USD 2.3 million in watershed conservation, while leveraging USD 7 million in additional contributions to the projects financed. The fund provides a successful model for other cities around the world where water supply is dependent on the sustainable management of upstream land. Similar funds are being developed throughout the world, including other cities in Colombia, Ecuador and Peru.

The two major lessons from FONAG, echoed by other watershed conservation and PES experience around the world are, firstly, that programme proponents must raise awareness of the importance of watershed protection by tangibly demonstrating the value of upstream land management to downstream water users. Secondly, with that value demonstrated, the key ecosystem service beneficiaries must be identified, prioritised and informed of why they should contribute funds to the PES programme and how they can do so.

NATIONAL: MEXICO'S PAYMENTS FOR HYDROLOGICAL SERVICES²¹

Water scarcity is one of Mexico's most pressing environmental challenges. Nearly all of the country's 188 most important aquifers are overexploited or at full capacity. To address this issue, in 2003, Mexico established a programme of payments for hydrological environmental services (*Pagos por Servicios Ambientales Hidrológicos*; PSAH). The programme aims to secure Mexico's water supply by paying locals to conserve well-preserved forests that are at risk of deforestation.

The PSAH programme maintains a direct link between ecosystem service buyers and providers on a national scale by raising revenue from national water fees²². The fees have raised on average USD 27.3 million annually (equivalent to approximately 4% of total water revenues) and have been used to directly finance the PSAH programme.

As the PSAH programme was the first such national PES mechanism to be implemented in Mexico it had to overcome two key challenges. The first hurdle was to earmark the revenues from the scheme to pay for forest conservation. A related issue was that some officials perceived water scarcity as a problem of man-made infrastructure, not natural capital.

Following a scientific study that highlighted the importance of forests in some areas, and applying the precautionary principle for the rest of the country, Mexico's PSAH programme overcame the second hurdle – lack of scientific understanding – and went ahead. It is now working alongside Mexico's Programme of Payments for Carbon, Biodiversity and Agro-forestry Services (PSA-CABSA, established 2004) as an integral component of Mexico's biodiversity finance policy.

19. Based on (Stanton et al., 2010);(Arias et al., 2010); (FONAG).

20. The water utility contributes 1% of total water sales to the fund and is an example of direct ecosystem services fees. Additional funds are generated through philanthropy and ODA and are given to support other environmental and social benefits of the conservation projects beyond protection of watershed services.

21. Based on (Muñoz-Piña et al., 2008).

22. Mexico's water bodies are considered national property, so the government is allowed to charge for their use.

CAP-AND-TRADE MARKET

SCALE

USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



Biodiversity and ecosystem service cap-and-trade markets involve the trade or exchange of *allowances* within a national or sub-national market. Allowances essentially give polluters the right to negatively impact biodiversity or ecosystem services; they can be based on measurements of the level of ecosystem service impacted by the polluter (e.g. tonnes of carbon emitted or level of nitrogen emitted into watercourse), an area of habitat impacted (e.g. hectares of forest) or the status of one or more species of interest. Under a cap-and-trade market, the total number of allowances allocated to entities within a market is capped to limit the overall impact on the environment. Polluters within that market can then either mitigate their impact directly or trade allowances with another entity that has a surplus of allowances.

An example of ecosystem service cap-and-trade markets are the water quality trading (WQT) programs popular in the US. WQT programmes traded USD 11 million in 2008 (Stanton et al., 2010) and with significant government action this figure could increase by one or two orders of magnitude globally by 2020 (Ecosystem Marketplace, 2008).

Examples of biodiversity cap-and-trade mechanisms (also known as tradable rights) include tradable development rights (TDRs), individual fishing quotas (IFQs), and territorial use rights for fisheries (TURFs). Cap-and-trade mechanisms for fisheries are used extensively, with IFQ transactions estimated to total USD 5-10 billion globally (Ecosystem Marketplace, 2008).

The scale of finance under a cap-and-trade mechanism is difficult to estimate. The figures referred to above represent secondary transactions in a cap-and-trade market, and are not indicative of the scale of finance invested in abating impacts on biodiversity. The two most important factors for both the scale of finance and the environmental effectiveness under a cap-and-trade mechanism are the strictness of the overall cap and the method of allocation of allowances. Placing a strict cap on allowances incentivises polluters to take stronger actions to reduce their impact on biodiversity and ecosystem services, and innovative mechanisms for the allocation of allowances including auctions can raise additional biodiversity finance (see page 84).

COMPLEMENTING CLIMATE AND BIODIVERSITY FINANCE

Currently forest loss accounts for around 15% of global carbon dioxide (CO₂) emissions (Van Der Werf et al., 2009), and the loss of biodiversity is costing at least USD 740 billion per annum, and that cost is increasing each year (Braat and ten Brink, 2007). REDD is an international mechanism being negotiated under the United Nations Framework Convention on Climate Change (UNFCCC) to reduce emissions from deforestation and forest degradation in developing countries. The basic idea behind REDD is simple; countries that are willing and able to reduce emissions from deforestation should be compensated for doing so (Scholz and Schmidt, 2008).

REDD negotiations have come a long way since the idea was first proposed under the UNFCCC at COP 11 in Montreal in 2005. Parties to the climate Convention now broadly agree on the framework for a REDD mechanism and a draft text was all but agreed in Copenhagen in 2009. If an international mechanism is successfully agreed under the UN climate change negotiations, it would be a significant and unprecedented step forward in the fight against deforestation and the broader fight against climate change. In general, a well-designed REDD mechanism is likely to deliver substantial benefits for biodiversity and ecosystem services since reducing deforestation and degradation implies a decline in habitat destruction and thus in biodiversity loss (Karousakis, 2009). Some elements of the REDD mechanism, however, if not designed correctly, may create potential risks - or perverse outcomes - for biodiversity, for example the current definition of forests under the UNFCCC fails to recognise the conversion of natural forest to plantations, a practice that result in significant losses in biodiversity and ecosystem services.

Under the Bali Action Plan²³ REDD was given the broad objective to “*promote co-benefits and complement the aims and objectives of other relevant international conventions and agreements*” of which a notable example is the CBD (Karousakis, 2009). The current negotiating text under the UNFCCC²⁴ is more explicit and includes safeguards that should be taken under consideration when designing and implementing REDD, one of these aims specifically to address the issue of converting natural forests to plantations.

If REDD is to fully meet the objectives of the CBD, however, the CBD should develop a set of guidelines for national stakeholders on how to mainstream biodiversity considerations into the implementation of REDD (Benick et al., 2010). In addition the CBD could outline a series of efforts that can be undertaken which would help to incorporate biodiversity co-benefits into REDD in an efficient and informed manner.

There are two basic ways in which REDD finance and biodiversity finance can work together. Firstly, by improving our understanding of the spatial distribution and overlaps of ecosystem services and biodiversity hotspots with climate change multiple policy goals. Some areas that could be prioritised are forests, agriculture, peatlands and coastal zones (CBD, 2010b). Secondly, biodiversity finance can be used to stimulate additional climate finance by reducing the incremental cost of mitigation and adaptation activities in developing countries in areas that have high marginal costs.

23. The Bali Action Plan can be found online at http://unfccc.int/files/meetings/cop_13/application/pdf/cp_bali_action.pdf
24. See the final negotiation text that emerged from Durban

CASE STUDY

BUSINESS AND BIODIVERSITY OFFSET PROGRAMME (BBOP)

Biodiversity offsets provide a way to achieve better conservation outcomes than typically result from project planning. Companies using a biodiversity offset go beyond traditional mitigation of impacts and take responsibility for the full biodiversity impact of projects by planning for 'no net loss' of biodiversity. Biodiversity offsetting is a mechanism for raising new and additional ecosystem financing from the private sector, which can help governments achieve the conservation targets they have adopted in national biodiversity strategies and action plans.

More than thirty countries have laws requiring biodiversity offsets, while some are exploring policy frameworks for offsets, and many others currently require some form of compensatory conservation. Clear guidance by government through biodiversity offset policy offers companies legal certainty, efficiency and cost savings in the planning process, and flexibility in how to achieve agreed conservation goals.

But what about when a country has no law or the law regarding biodiversity offsets is unclear? In the absence of a policy requirement for no net loss, companies can undertake voluntary offsetting, usually delivered in the form of one-off bespoke offsets. Companies that choose to do this are generally companies with a footprint on biodiversity that represents a distinct business risk for them, such as companies involved in mining, oil and gas, hydropower, wind power, road projects, railways, housing development, tourism and some forms of agriculture. Governments, financial institutions, and civil society increasingly expect these types of companies

to take full responsibility for their biodiversity impacts. Biodiversity offsets offer a way to do that by ensuring no net loss of biodiversity and improving outcomes for local communities, thus reducing operational and project development risks, while maintaining a company's licence to operate.

The Business and Biodiversity Offsets Programme (BBOP) is an international collaboration of more than seventy-five companies, governments, financial institutions and civil society organizations that are developing best practice in following the mitigation hierarchy: avoid, minimize, restore and offset. The aim is to help organisations achieve at least a zero net loss or at best a net gain of biodiversity. BBOP published a Standard on Biodiversity Offsets in January 2012 that enables auditors and assessors to gauge the quality of mitigation measures, including biodiversity offsets, and helps offset developers to plan, design, implement and monitor offsets using best practices. BBOP will test this Standard over the next few years and intends to build a Community of Practice to share practical experiences, skills and lessons learned amongst the broad network of professionals working in this space.

Forest Trends
<http://bbop.forest-trends.org>

OFFSET MARKET

Offset markets are arrangements in which the polluter pays for the negative impact they impose on the environment by purchasing credits or offsets. The Clean Development Mechanism is an example of an offset market²⁵. In an offset market a credit or offset representing the right to pollute is generated when an organisation avoids polluting. A polluter can then purchase this credit to meet their (voluntary or legal) obligations to offset the negative impact they impose on an ecosystem. Offset mechanisms must establish a business-as-usual level (known as the baseline) before a credit can be awarded.

The most important offset markets with respect to biodiversity finance are the voluntary forest carbon market and biodiversity offsetting (see page 73). Forest carbon markets collectively raised USD 150 million in 2009 (Hamilton et al., 2010), 171 million in 2010 and could generate USD 7 billion in 2020 (Eliasch, 2008) should compliance markets fall in to place. Biodiversity offsets raised at least USD 2.4-4 billion in 2010 and could generate USD 5.2-9.8 billion in 2020.

Whilst some level of revenue can be raised through voluntary mechanisms, regulation is required to increase the scale of finance that can be raised through these schemes (EFTEC et al., 2010). This would take the form of a compliance market, with the most prominent being the development of an international REDD+ market. Stalling the development of an early market in REDD+ credits is a lack of demand. As a potential remedy, temporary demand can be created using an Advance Market Commitment (AMC), whereby a government provides a large pool of capital to invest in at least one, possibly many, REDD+ projects. The AMC could provide functions such as a price floor or co-investor, thus acting as a source of demand for credits, or at the very least, a guarantor of demand.

The single most important factor for a baseline-and-credit mechanism is the strictness of the baseline. If baselines are set too low then offsets can be generated that offer no real benefit to the environment. Similarly if baselines are set too high, there will be less incentive for offset providers to sustainably manage their resources.

SCALE

6–17
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



²⁵. See <http://cdm.unfccc.int/index.html> or The Little Climate Finance Book.

BIOPROSPECTING

SCALE

0.4–2.1
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



26. <http://www.cbd.int/abs/>

27. The Nagoya Protocol on Access to Genetic Resources and Benefit Sharing: What is New and What are the Implications for Provider and User Countries and the Scientific Community? E. C. Kamau, Fedder B. and Winter G. (2010). <http://www.lead-journal.org/content/10246.pdf>

28. The range is based on the average net present value of \$14/ha based on the global total number of species and \$60/ha based only on species present in biodiversity hotspots; a 10% discount rate was used to estimate annual values

Bioprospecting is the search within natural ecosystems for genetic information that may be commercially valuable. Bioprospecting agreements between governments and pharmaceutical companies or academic institutions grant the firms exclusive rights to screen ecosystems for potential pharmaceutical compounds. In return, firms compensate governments up-front and usually share a portion of the profits if any commercial product is developed.

Although conservationists initially hoped that bioprospecting could increase conservation finance, few successful and sustainable bioprospecting agreements have been reached. The largest hurdle to an increase in the scale of bioprospecting agreements is an understanding of the value of naturally occurring genetic resources that can be used to overcome biological problems (i.e. pest, plagues and pathogens). A widely quoted example is the National Biodiversity Institute (INBio) of Costa Rica, which raises approximately USD 4.2 million annually from grants and contracts with research institutions and companies (WWF, 2009).

At COP10 in 2010, Parties agreed to the 'Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization'²⁶. Parties to the Convention now have a legal obligation to ensure benefits from the use of genetic resources are shared equitably. The protocol also requires user countries to introduce legal, administrative or policy measures to ensure compliance²⁷. As a result, pharmaceutical companies have identified that costs of procuring genetic resources will increase, whilst the emphasis placed on the inclusion of community stakeholders should enable a wider distribution of fees.

The most comprehensive theoretical estimate of the value of bioprospecting to pharmaceuticals is USD 0.4-1.9 billion per year across the world's 34 biodiversity hotspots (Costello and Ward, 2006)²⁸. There is still room, however, for bioprospecting to raise more biodiversity finance, between 0.4 – 2 billion in 2020, considering it is estimated that 25-50% of pharmaceutical products are derived from genetic resources (Ten Kate and Laird, 1999) in a global market worth around USD 640 billion in 2006 (TEEB, 2009a).



INDIRECT MARKET MECHANISMS

The second group of mechanisms generate revenue by linking the value of biodiversity and ecosystem services to traditional markets, such as coffee, beef or timber, thereby creating indirect markets for ecosystem services and biodiversity. Within this section only one mechanism is presented that encompasses a broad range of activities that seek to internalise ecosystem degradation in the production of sustainable commodities that are collectively referred to as:

- Greening commodities

Greening commodities includes three broad groups of certified products: certified timber, certified fisheries, and certified agriculture. Revenue is generated through an additional payment (or premium) from the buyer of a product or commodity that is passed through the supply chain to the producer. Other forms of revenue generation that incentivise green commodities such as agricultural subsidy reform (see page 98) and positive tax incentives (see page 144) are discussed separately. Buyers of these commodities are ultimately individual consumers, but intermediaries often play a key role in the supply chain. For example, in the last decade Starbucks has been working with Conservation International (CI) to develop sourcing guidelines and practices for sustainable coffee called Coffee and Farmer Equity (CAFE)^{29a}. The costs of these are ultimately passed on to the consumers, who pay a small increase in the price of a cup of coffee.

Few examples exist of government driven regulation for green commodities. The EU is developing green public procurement legislation and several European governments, including the UK, have implemented domestic legislation that restricts public procurement of timber to independently verifiable sources (e.g. FSC) or from a licensed FLEGT partner^{29b}.

It is often more difficult to ensure that biodiversity is being adequately provided for using this mechanism. The provision is often ensured through independent certifiers, such as Rainforest Alliance (see page 78), or the roundtables for sustainable palm oil (RSPO), responsible soy (RTRS) and sugar (Bonsucro).

^{29a}. http://www.scs-certified.com/retail/rss_starbucks.php

^{29b}. <http://www.cpet.org.uk/files/TPAN%20April%202010.pdf/view>

CASE STUDY

RAINFOREST ALLIANCE CERTIFIED COFFEE

The coffee tree is a thin understory tree native to East African rainforest. As it was introduced in other parts of the world, it was traditionally farmed through agroforestry production systems under existing canopy. A push for intensification of agriculture in the 1970s, however, removed a lot of that canopy and many coffee systems became less sustainable monocultures.

Promoting a return to sustainable coffee production is a crucial tool in biodiversity conservation. Coffee is farmed on over 10 million hectares worldwide, almost all of which occurs in one of the world's thirteen biodiversity hotspots. Shade-grown coffee can be used to protect watersheds, serve as wildlife corridors, and act as buffer zones to protected areas. It also provides additional ecosystem services such as non-timber forest products and carbon sequestration.

By certifying production, the ecosystem services provided by sustainable coffee production can be bundled and sold with the commodity of coffee across global scales. While the price premium for these services varies, buyers often pay 10-12 cents per pound more for certified coffee, which is about 10% of the value at the farm gate. Sales of Rainforest Alliance certified coffee were estimated to total 100,000 metric tonnes in 2009, meaning farmers received around USD 22-26 million in return for the ecosystem services they provided that year.

Most coffee producers get certified because they want improved markets access and better prices. Beyond improving income, certified production also requires producers to become better farm managers, improves worker conditions, and strengthens social and economic networks. So certified production can have a profound impact on improving both the environmental and social benefits of that production. With more than 25 million people in the tropics dependent on coffee production, it is clear that certification is an important tool for sustainable development.

Leif Pedersen, Rainforest Alliance
<http://www.rainforest-alliance.org/certification>

GREENING COMMODITIES

Green commodities generate finance directly from consumers by applying a price premium to goods that are produced using biodiversity-friendly methods. A common example is shade-grown coffee, which is produced under a canopy of tropical trees, rather than in a deforested field to provide habitat for tropical species along with other ecosystem services such as climate change mitigation (see page 78). When consumers purchase a green commodity, they pay a certain price for the consumption of the private good (for example drinking coffee), and an additional price premium for the provision of the public good (in this case the sustainable use of biodiversity and ecosystem services). The great innovation of green commodities is that by bundling environmental benefits into commodity markets, ecosystems services can be traded on the global scale of the markets in which they operate.

The potential scale of finance from green commodities is significant. For green commodities to be successful, however, there needs to be complementarity between environmental and production goals and markets for green commodities need to be large enough to support a price premium for public goods (Kotchen, 2005, Kotchen, 2006). Compared to other green products, therefore, agricultural (including marine) and timber commodities are a promising policy option, since sound environmental practices often lead to sustained commodity production in the long-term. Moreover, agricultural and timber markets operate at a national to global scale. Global retail sales of certified agricultural and timber products accounts for over USD 64 billion and could reach USD 190 billion by 2020 (Ecosystem Marketplace, *forthcoming*). Only a fraction of the total market value, however, will be available to finance biodiversity and ecosystem services on the ground. By 2020 certified products could generate new and additional biodiversity finance of around USD 10.4 – 30 billion annually to compensate farmers for implementing more sustainable agricultural practices³⁰.

SCALE
10.4–30
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



³⁰. This figure is based on an estimated 5-10% price premium on all certified agricultural goods.

OTHER-MARKET MECHANISMS

The third group of mechanisms presented here all generate revenue by imposing regulation on markets, sectors and industries that do not directly benefit biodiversity and ecosystem services, and vary in their relationship to biodiversity. Other-market mechanisms are dependent on regulation for their existence, and so are public sector revenue streams. Given the vast pools of finance that exist in global markets, sectors and industries, the range of other market mechanisms that have been proposed by environmental and developmental NGOs is extensive. For the sake of simplicity, however, only those mechanisms that are current within international policy discussions are summarised in this section. The mechanisms presented here are:

- Natural capital levy
- Auctioning of emission allowances
- Maritime levy
- Financial transaction tax
- Levy on insurance premiums

Since other-market mechanisms all generate revenue through regulation on markets, sectors or industries that do not have clear or direct relationships with biodiversity, these mechanisms are politically far more challenging to implement, and with a few exceptions are not yet being implemented at scale.

Furthermore, as can be seen above, other market mechanisms range in their relationship to biodiversity and ecosystem services. A natural capital levy generates finance directly from the unsustainable use of biodiversity and ecosystem services, whereas a financial transaction tax or levy on insurance premiums are completely unrelated to natural capital. Mechanisms that are more closely related to natural capital can receive increased political and public acceptance if they are being used explicitly to finance sustainable development activities, whereas mechanisms that operate within markets that are unrelated to biodiversity and ecosystem services are more challenging to make a compelling argument for allocating the revenues generated under these mechanisms to natural capital.

NATURAL CAPITAL LEVY

SCALE

USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



A natural capital levy is a fee, charge or tax that either places a price on the extraction of renewable natural resources (e.g. fee on timber extraction) or activities that negatively impact the provision of biodiversity or ecosystem services (e.g. development tax). Following the polluter-pays principal, natural capital levies attempt to internalise the cost of ecosystem degradation by placing a cost on activities that generate profit from that degradation. Pricing the use of natural capital has a two-fold effect: it raises revenue that can then be used for investments in biodiversity and ecosystem preservation, and also reduces the overall direct use (or degradation) of natural capital. As such, any levy that is implemented needs to balance these effects to achieve the desired outcome.

Although the potential scale of revenue from natural capital pricing is difficult to estimate, it could be substantial. For example, in the 1990s both Guinea Bissau and Mauritania received 30% of government revenues from the fishing sector (OECD, 2005). Similarly, governments only capture approximately 15-30% of the profit (i.e. resource rents) associated with forest resource extraction (OECD, 2005) leaving 70-85% in the hands of the private sector and significant potential for increasing government revenues.

Importantly, however, compared to other mechanisms for raising biodiversity finance, levy revenues are particularly susceptible to both government capture and are often politically difficult to introduce. In many cases, however, natural capital levies do not need to be introduced; they simply need to be better enforced. For example, in Tanzania, USD 100 million is lost every year due to lack of enforcement in the charcoal sector (World Bank, 2009).

Natural capital levies will be relevant for both countries that are rich in renewable or 'living' natural capital and countries that have rapidly developing industrial or agricultural sectors. Since the former often tend to be low-income countries, support may be required to ensure that this mechanism does not negatively impact economic development.

NATURAL CAPITAL BONDS

Public or private institutions that need to raise large-scale, up-front finance often do so by selling bonds in to the global bond markets, worth around USD 100 trillion. A bond is a tradable financial security that allows organisations to borrow large amounts of finance from the global capital markets and pay it back over a pre-specified term, which can be as long as 10-30 years.

Bonds have been used for centuries and are a familiar financing mechanism in many sectors, including water, energy, development and health. Climate bonds have seen increasing use in recent years to finance investments in climate change mitigation and adaptation, and in some cases forest projects have been included in the portfolio of investments underlying climate bonds, as with the World Bank's Green Bonds (Reichelt, 2010). Bonds, however, do not quite fit the class of generation mechanisms as defined in this book. This is because a bond is not strictly a mechanism for generating finance but one for raising upfront capital that must later be repaid.

Considering the scale of finance needed to meet biodiversity goals, bonds specifically dedicated to natural capital investments – as opposed to climate-friendly infrastructure, for example – could be a key component of a strategy to sustain the world's biodiversity and ecosystem services. Issuing or supporting the issue of natural capital bonds will allow public and international organisations to direct large amounts of finance to biodiversity, while mechanisms that recognise the value of natural capital and could support the payback of the bond are implemented.

For example, bonds that would raise finance for investments in standing forests and transforming the drivers of deforestation have received particular attention in recent years, in part based on the expectation that a global REDD+ mechanism will be implemented.

Although no natural capital bonds have yet been issued, there is potential to use them to raise on the order of USD tens of billions each year. Innovative debt offerings for development have increased steadily since the late 1990's, reaching USD 11.3 billion in 2008 (Girishankar, 2009). Additional USD billions of climate bonds have also been issued, including USD 3 billion issued by the World Bank in total since 2008 (World Bank, 2012). Perhaps most importantly, however, is that multiple classes of investors are becoming far more aware of the risks and opportunities compelling them to invest in sustaining the world's natural capital.

A natural capital bond could take many different structures, but those structures are primarily defined by 1) the type of mechanism used to generate funds that will pay back bond investors, and 2) whether the bond is held on or off the financial accounts of the issuing organisation. Potential investors will likely accept or reject a particular bond structure depending on who issues the bond and where the finance raised will be invested.

For more information see: <http://www.globalcanopy.org/projects/understanding-forest-bonds>

AUCTIONING OF EMISSIONS ALLOWANCES

SCALE

1.5–7.3
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



The national or international auction of greenhouse gas emissions allowances is a new and additional source of finance for biodiversity and ecosystem services that has been discussed under the UNFCCC. Assigned amount units (AAUs) are tradable units derived from an Annex I Party's emissions target under the Kyoto Protocol. They may be counted by Annex I Parties towards compliance with their emissions targets and are equivalent to 1 tCO₂e. Under this mechanism, a percentage of assigned amount units or allowances could be withheld from national or international quota allocations and auctioned via an appropriate institution. At the international level, the auction process could be open to both Annex I governments with national or regional commitments and private compliance buyers with obligations under a national cap and trade system. Nationally, the process for selling or auctioning allowances can vary and several options have been proposed under national or regional Emissions Trading Schemes (ETSs).

The key feature of this mechanism is that it would require either national governments or private sector compliance buyers to pay for their allowances instead of being allocated them for free. There are many reasons both economically and environmentally why auctioning allowances is preferable to giving them away. Since there would be a price associated with allowances, auctioning would avoid the generation of windfall profits and would generate revenue that can then be earmarked towards further environmental actions. Auctioning allowances would also avoid market distortions between newcomers and incumbents and would stimulate further emissions reductions under a cap.

The scale of revenue from auctions will depend on several factors including the demand for allowances within an ETS, the percentage of allowances auctioned and the percentage of revenues allocated to international biodiversity and ecosystem services. Current finance from auctioning allowances is USD 44 million. Based on current estimates the national or international auctioning of allowances might raise USD 21.5–7.38 billion annually for biodiversity finance by 2020.

INTERNATIONAL FINANCE: FROM THE “A” TO “BCD”

Over the past two decades, the discourse on **aid** has evolved to focus on three critical and interrelated objectives. Firstly, halting global **biodiversity** loss is the core focus of the UN Convention on Biological Diversity (CBD) and encompasses conservation and sustainable use of ecosystems across a broad landscape of protected areas and human-affected landscapes. Secondly, climate change has been described as the greatest market failure the world has ever seen. Enshrined under the UN Framework Convention on **Climate Change** (UNFCCC), 192 countries focus their efforts on ways to limit global warming and to adapt to the effects of climate change. Thirdly, international **development**, which aims to end poverty, is enshrined in the Millennium Development Goals (MDGs), which range from halving extreme poverty to providing universal primary education, all by the date of 2015.

Reaching each of these targets will require significant amounts of financing, most of which will need to be delivered in developing countries: IUCN is calling for OECD countries to contribute around USD 120 billion in international biodiversity assistance; the World Bank estimates that by 2030, developing countries will need an additional USD 280 billion to mitigate and adapt to climate change; and the UN Millennium Project estimates that – on top of the needs for ecosystem preservation and combating climate change – achieving the MDGs will require additional finance of USD 133 billion by 2015.

Even if we reach the **Aid** target of 0.7% of gross national income, achieving all of the targets for **Biodiversity, Climate and Development** in developing countries will require 2–3 times more. Whilst developing countries will be able to meet some of the challenge domestically, significant international finance will still be needed. Meeting these goals is in the interest of all nations. To achieve them will require the coordination of international finance in both the generation of revenue and the delivery of these funds. International mechanisms, such as the auctioning of allowances, a financial transaction tax and a tax on international aviation or shipping, have the potential to raise vast sums of finance and do not suffer from the revenue capture problems of domestic government financing or ODA (see page 93). Implementing them in a timely and effective manner, however, will require strong political will, and international coordination among the champions of biodiversity, climate change and development goals.



MARITIME LEVY

Maritime emissions accounted for 2.2% of global CO₂ emissions in 2005 and are expected to rise by 50% by 2020³⁰. Currently these emissions are excluded from any international climate change agreement and several proposals have been put forward to internalise the emissions resulting from international shipping. Placing a cap or levy on maritime emissions would not only reduce emissions from this sector but it could also raise up to USD 32 billion in international finance for biodiversity, climate change and development (see page 85).

Three main proposals have been put forward to raise revenue for the international shipping sector (Parker, et al., 2009)³¹. The first is a global sectoral Emission Trading Scheme for shipping. The second option would impose a 1% levy on maritime transport freight charges operated by developed countries and 0.1% levy on developing countries. The final option would be to impose a tax on bunker fuels for refuelling ships. As discussed on page 85, money generated from a maritime levy would be in competition with mitigation, adaptation and development goals. The estimate of 0.15 – 1.7 billion assumes that 25% of available finance would be allocated to biodiversity and ecosystem services.

Whilst these mechanisms have the potential to raise significant finance they are unlikely to have an impact on global maritime trade (Project Catalyst, 2009). Around USD 12 trillion worth of goods were traded in 2008, of which about 80% was transported by sea, meaning that a USD 32 billion tariff on the maritime sector would be equivalent to less than a 0.5% price increase.

SCALE

0.2–1.7
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



³⁰. Taken from analysis by McKinsey and Co. (Project Catalyst, 2009) and the WRI CAIT database <http://cait.wri.org>

³¹. The options put forward are not additive (i.e. only one of them could be implemented internationally).

FINANCIAL TRANSACTION TAX

SCALE

3.8–16.2
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



Originally suggested by James Tobin, the Tobin Tax was proposed as a tax on wholesale currency transactions. The purpose of the Tobin tax was to reduce foreign currency speculations (Harmeling et al., 2009). There is uncertainty within the literature, however, over whether such a tax would reduce or increase exchange rate volatility (UNFCCC, 2007). More recently the EU has considered a financial transaction tax on equities, bonds, derivatives, currencies and combinations thereof.

The scale of revenue that could be generated through a financial transaction tax will depend on the tax rate and how the tax will be implemented (e.g. on all transactions or end-of-day open positions), the types of products for which it will apply (e.g. excluding bond issuance for capital raising or currency trading) and in the estimated change in trade volumes due to introduction of the tax (UNFCCC, 2007). There appears to be consensus within the literature that a tax rate of 0.1% or lower should be used to minimize the loss of liquidity and adverse impacts on the trade volume and market structure, for the transactions where this type of volumetric reduction is not the stated aim, e.g. this is the aim for high frequency trading in the EU.

The adoption of a financial transaction tax could generate USD 3.8-16.2 billion using EU-wide tax rates of 0.1% through to rates of 0.05% on global transactions³². Although it is widely accepted that a financial transaction tax is technically feasible, there is uncertainty around how it could be implemented and enforced (UNFCCC, 2007). The biggest challenge for this mechanism will be reaching a political consensus (Nissanke, 2003).

32. The high and low estimates shown in the icon bar use tax rates of 0.01% and 0.02% respectively assume that 25% of available finance would be allocated to biodiversity finance.

LEVY ON INSURANCE PREMIUMS

SCALE

0–0.8
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



A levy on insurance premiums is a new and innovative proposal to generate finance for biodiversity. Ecosystems services and biodiversity play a vital role in our global economy (see page 16) and the loss of these services currently cost as much as USD 740 billion per annum. That cost will continue to increase if we continue to lose biodiversity and ecosystems at the current rate (Braat and ten Brink, 2007).

Given the high degree of dependence between man-made capital and natural capital, placing a tax or levy on insurance premiums to protect our biodiversity could prove a cost effective mechanism. An insurance levy has been proposed in various formats including a levy on the catastrophe element of insurance premiums to protect rainforests (The Prince's Rainforests Project, 2009). Very few applications have emerged to date.

The scale of finance that could be generated through an insurance levy is difficult to predict and will depend on which markets are included, and the level of taxation applied. Given the low political uptake of this mechanism, future scales of finance could feasibly be zero. On the other hand, in the event of it gaining political momentum, research carried out by the Prince's Rainforests Project (PRP) suggests that a levy of 4.5% on the catastrophe element of insurance premiums would generate around USD 0.83 billion per annum³³ in 2020, assuming 25% of finance generated is delivered to biodiversity and ecosystems.

33. It would also be possible to use a much smaller levy across all policyholders to generate the same level of contribution.

NON-MARKET MECHANISMS

The final group of mechanisms presented here generate revenue from traditional forms of finance, referred to as non-market based, or related, sources. With the exception of philanthropy, non-market mechanisms are public sector mechanisms relying on regulation for their implementation. The options that are discussed are:

- Domestic budget allocation
- Official Development Assistance
- Debt-for-nature swaps
- Philanthropy
- Agricultural subsidy reform
- Fossil fuel subsidy reform

Non-market mechanisms can generate revenue from a range of sources, including activities that directly impact biodiversity or ecosystem services (e.g. agricultural subsidy reform) and finance that is unrelated to natural capital (e.g. debt swap programmes or revenues generated from the general tax base). As with other market mechanisms, these mechanisms differ from direct and indirect market mechanisms because they do not create a direct link between the polluters/beneficiaries of biodiversity and ecosystem services and the providers of those services. Agricultural subsidy reform, for example, might generate revenue through a reform of unsustainable practices but the finance need not necessarily be delivered to secure those ecosystems. The allocation of finance with all non-market mechanisms is primarily a question of political will (and public opinion) and these mechanisms therefore tend to vary with political cycles.

In Mexico, for example, the amount of finance that has been generated through the carbon tax has remained fairly constant, but the amount that has been hypothecated to biodiversity and ecosystem services has varied considerably since the programme's inception.

DOMESTIC BUDGET ALLOCATION

SCALE

28.1-35.8
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



Currently, the largest source of finance for biodiversity and ecosystems is domestic government spending (see page 29). Finance raised from domestic budget allocation is the contribution of national and local governments to domestic biodiversity conservation and ecosystem services provision. It is important to note that whilst many of the other innovative mechanisms discussed here could be used domestically, this mechanism refers specifically to the allocation of finance from general government budgets.

The current scale of domestic finance is around USD 25.6 billion per annum³³, about 55% of which is spent in the US, Canada, Europe and China. This estimate includes finance delivered to protected areas, as well as what can be accounted for of finance delivered through major national and sub-national government-funded payments to private landholders (which are also generated through the closely-related mechanism of agricultural subsidy reform, see page 98).

In most of the world, domestic spending on environment protection remains flat (CBD, 2010a) and further increasing the allocation of national and subnational budgets to biodiversity and ecosystem services faces the hurdle of being in competition with other domestic interests including energy security and health. As discussed in the introduction, however, biodiversity and ecosystem services play a vital role from local to global scales in underpinning national and regional economies and livelihoods. It is therefore in the interest of national and local governments to preserve their natural capital, and governments will often seek to raise domestic revenue to finance biodiversity and ecosystem services.

Although some of that increase may come from greater budget allocations, more of it will likely be raised through other mechanisms that are specifically implemented to raise biodiversity finance and more directly link revenue generation to the provision of biodiversity and ecosystem services.

33. Includes protected area funding based on James et. al (1999)

OFFICIAL DEVELOPMENT ASSISTANCE (ODA)

SCALE

8.3-19
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



Official Development Assistance (ODA) is voluntary finance given by national governments to developing countries to promote and implement development. But due to the large overlap between environmental and developmental goals, ODA often delivers finance for the environment. A small percentage of ODA does have the primary goal of supporting the conservation or sustainable use of biodiversity. ODA that supports the conservation or sustainable use of biodiversity as a primary or secondary objective is referred to as *biodiversity-related aid*.

Biodiversity-related ODA is primarily bilateral aid, but a portion also arises from aid delivered by multilateral institutions such as the Global Environment Facility (GEF) and UN Programmes, or multilateral trust funds. Similar to domestic budget allocation (see page 92), biodiversity-related aid arises primarily through contributions from national government's general budgets. Many of the national-level generation mechanisms outlined below might be implemented in OECD countries and once raised the revenue could be delivered in developing countries and accounted for under ODA commitments. Careful accounting is required to ensure that finance raised through innovative mechanisms is 'new and additional' (see page 52), and that finance is not double-counted or a displacement of ODA commitments.

In 2010, an estimated USD 6.3 billion³⁴ of biodiversity-related bilateral aid was disbursed to developing countries, while an estimated additional USD 0.3 billion of biodiversity-related grants were disbursed by GEF, UNEP, UNDP, and World Bank Trust Funds³⁵. That is a significant increase from 2009 when an estimated USD 3.8 billion was disbursed through bilateral aid. That increase is based, to some degree, on the increase in bilateral aid from 2009 to 2010, but is also due to the fact that biodiversity-related aid represents an increasing percentage of total accounted-for bilateral aid, from around 3% in 2008 to 6% in 2010. Assuming the steady, slow increase in all aid is maintained, and the percentage of it that is biodiversity-related remains at this higher level, biodiversity-related aid could easily increase to USD 8.3 billion by 2020.

34. Based on data from the OECD Creditor Reporting System

35. Data from Steckhan, 2009; Sobrevila, 2010; financial statements of UNEP; and GEF replenishment documents

CASE STUDY

COSTA RICA'S PSA

Costa Rica is world renowned for its experimentation with innovative policy to protect its natural resources. In 1996, Costa Rica enacted the Forest Law 7575, which introduced incentive-based measures to compensate forest owners for the conservation of forest functions that provide environmental services to society (De Camino et al., 2000). The law explicitly recognised four environmental services provided by forest ecosystems: (i) mitigation of greenhouse gas emissions; (ii) hydrological services, including provision of water for human consumption, irrigation, and energy production; (iii) biodiversity conservation; and (iv) provision of scenic beauty for recreation and ecotourism. To secure these services, a system of payments for environmental services (*Pagos por Servicios Ambientales*; PSA) was introduced. The PSA programme is managed by the National Forestry Finance Fund (*Fondo Nacional de Financiamiento Forestal*; FONAFIFO) and compensates owners of forests and forest plantations for conserving, managing or restoring forests.

REVENUE GENERATION

Prior to introducing the PSA programme, there was concern over Costa Rica's high rates of deforestation and dwindling timber supplies. In response, the government introduced a series of forest certificates to encourage timber plantations. These were essentially positive tax incentives financed by the government's general budget. The Forest Law built on this foundation, but introduced two crucial changes. First, the justification for paying forest owners was no longer for timber (an

ecosystem good), but rather for the provision of ecosystem services. Secondly, the source of financing was changed from the government budget to an earmarked tax and payments from beneficiaries.

The PSA programme receives revenue from three main sources. Firstly, the Forest Law earmarked 3.5% of the revenues from a **fossil fuels tax** for use by the PSA programme³⁶. The fossil fuel tax provides about USD 10 million a year to the programme, equivalent to about a quarter of the total revenue for the PSA. Another portion of revenue is raised from the international community, through **ODA** and **philanthropy**, to secure the biodiversity benefits of the PSA programme. Because these sources were never intended to be ongoing, efforts to collect revenues from **tourism** and establish an **endowment fund** are being explored. The third main source of revenue is a **levy on water payments**. This mechanism previously relied on voluntary water agreements with large water users including hydropower companies, agribusinesses, a bottling company, and a hotel company. In 2005, however, the government revised its water tariff structure and introduced an additional conservation fee. That fee raises around USD 19 million annually, 25% of which is used for the PSA programme (with 50% for the Ministry of Environment and Energy's Water Department and 25% for Protected Area financing). Finally, some financing is generated intermittently through large agreements to pay for **forest carbon credits**.

DELIVERY

The PSA programme delivers finance through performance-based payments (see page 135) to landowners across the country. Payments for forest protection, management, and regeneration are made over a three-year period, while agroforestry payments are made over five years and reforestation payments made over 10 years (Daniels et al., 2010). By 2008 over 10,000 contracts had been issued under the PSA programme, with USD 206 million paid out to private landowners (an average of USD 17.2 million per year since 1997; Porras, 2010a) protecting 668,369 hectares of land (Daniels et al., 2010).

The programme has been challenged, however, to demonstrate equity in its application. Poor farmers have faced high transaction costs and difficulty in securing contracts, with larger operations securing contracts on a first-come, first-served basis (Porras, 2010a). Acting on these concerns, the PSA went through a series of changes in 2004 to lower barriers to participation for the poorer farmers with smaller landholdings. One change made was to give preference to applicants from regions with a low Social Development Index (SDI). These regions are now well represented in the allocation of PSA, and represent 25% of all contracts (Porras, 2010b).

Although there have been limited efforts to create a truly 'pro-poor' PSA system, the PSA system is associated with significant benefits at local, national and global levels, including the protection of the quality of water, carbon sequestration, conservation of biodiversity, health and infrastructure improvement, and the reduction of poverty in certain areas (Hartshorn et al., 2005).

INSTITUTIONAL ARRANGEMENTS

The Forest Law mandated that FONAFIFO - a semi-autonomous institution with independent legal status - collect revenues and implement the PSA programme. FONAFIFO's status gives it a relative degree of autonomy in making personnel decisions and in managing funds, but it remains subject to a variety of governmental restrictions. Its governing board includes a representative from the private sector, but is dominated by three representatives from the public sector, representing the Ministry of Environment and Energy, the Ministry of Agriculture, and the National Banking System. Further, the Ministry of Finance must approve FONAFIFO's budget.

Based on (Brown and Bird, 2010) and (Pagiola, 2008)

³⁶ Fiscal Reform Law No.8114 introduced in 2001 reduced FONAFIFO's share of fuel tax revenues to just 3.5%, but guaranteed this amount. (pp. 713 in Pagiola, 2008)

DEBT-FOR-NATURE SWAP

SCALE

0.02–0.3
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



Under debt swaps, contributing countries agree to cancel a portion of the (non-performing) debt obligation of a recipient country in exchange for an investment in projects in that country. Swaps allow highly indebted countries the possibility to relieve a portion of their debt that they are unlikely to ever repay in full, but with a commitment to improve provision of public goods within the country. In the case of debt-for-nature (DfN) swaps, the finance raised is used for biodiversity conservation. Debt swaps are already being used to finance environmental conservation and health projects in many developing countries (Doornbosch and Knight, 2008, Ruiz, 2007).

In the 1990s, when DfN swaps were at their peak, they raised around USD 100 million a year (Pearce, 2004)³⁶. The volume of DfN swaps dropped dramatically around 2000, but has increased again in recent years through the US Tropical Forest Conservation Act that generated around USD 18 million in 2010, with current US commitments averaging around USD 28 million annually in 2012-2014 (USAID, 2006). Although DfN swaps raise relatively small scales of finance compared with other mechanisms, there is some scope to increase the use of this mechanism by increasing the use of multilateral debt through organizations such as the World Bank (Pearce, 2004) to link a greater proportion of debt reduction to conservation outcomes³⁷.

Two major risks of DfN financing are currency and political risk (WWF, 2009). Local currency devaluation or inflation can reduce the real cash value of conservation commitments. There is also a risk that revenue received by debtor governments will not be spent on conservation but will be captured by national government agencies for other purposes. To avoid these risks, DfN financing is usually delivered through a conservation trust fund (see page 174) with measures taken to hedge currency risk.

³⁶. Based on an average of data from 1987–2003 that includes leveraged finance but excludes a single abnormally large deal in Poland.

³⁷. Up to 2007, conditional debt swaps have directed USD 7 billion for domestic development (Ruiz, 2007.)

PHILANTHROPY

Philanthropy as a source of finance includes contributions from private foundations, business-related foundations, and conservation NGOs such as The Nature Conservancy and the World Wildlife Fund. Large philanthropic foundations generate revenue through an initial endowment that is managed in perpetuity (Persson et al., 2009). The finance available for charitable distribution from these endowments is directly dependent on the success of the commercial investments made by the foundations, since the investment returns are then used to deliver philanthropic grants. Conservation NGOs on the other hand generate revenue from a variety of sources including subscription fees, foundations and government contributions.

The scale of finance available from grants is not likely to be large. For example, in 2007 the Bill and Melinda Gates Foundation distributed in total around USD 1.9 billion in charitable grants and the Rockefeller Foundation's long-term intention is to provide the equivalent of around USD 225 million in grants annually (Persson et al., 2009). Although these figures represent only a sample of private sector philanthropy, they go to a diverse set of priorities beyond biodiversity financing; therefore only a fraction of these flows are likely to go towards biodiversity and ecosystems. The combined annual budget of five international environmental NGOs was estimated as USD 2 billion before the financial crisis of 2008, while the expenditure of eight international environmental NGOs was estimated at USD 1.5–1.8 billion in 2010³⁸.

Whilst the sustainability and predictability of philanthropic grants from the private sector is difficult to estimate, it appears to fluctuate in the range of USD 1–4 billion. Although private philanthropy is unlikely to deliver finance at the same scale as other sources of private finance it can be used for activities that offer no or low returns on investment.

SCALE

1.6–4
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



³⁸. The estimates used here comes from Gutman and Davidson, 2008 but is not considered to be a precise estimate of philanthropic finance.

AGRICULTURAL SUBSIDY REFORM

SCALE

7.8–16.8
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



Agricultural subsidies are introduced to promote economic growth, secure employment and increase production of agricultural commodities. While these are understandable policy objectives, agricultural subsidies are often harmful to biodiversity and ecosystem services. In the context of biodiversity, agricultural subsidy reform has two related aims.

The first aim is to reduce or remove existing subsidies that discriminate against sound environmental practices (OECD, 2005), such as support conditional on crop production, which often incentivises clearing natural habitat or increasing the use of polluting inputs (TEEB, 2009). Removing these subsidies would reduce negative environmental impacts and free-up finance that can be used elsewhere. It is difficult to precisely define which subsidies are environmentally harmful, but it is estimated that agricultural subsidies that are very unlikely to have a direct environmentally positive aim totalled around USD 350-400 billion globally in 2010.

The second aim is to use agricultural subsidies to incentivise the provision of biodiversity. If subsidies are environmentally harmful, outlived their purpose, or are not cost-effectively reaching their stated objective, reducing just a small percentage of the estimated non-environmentally friendly subsidies would free-up USD tens of billions that could be re-directed as biodiversity finance. Both the US and EU have increasingly shifted the structure of their agricultural subsidies over the past decade, reducing the types of production supports that are generally assumed to be environmentally harmful, or at least not environmentally positive. At the same time they have increased funding for agri-environmental programmes. In 2010 it is estimated that in the US and EU, agricultural-related subsidies aimed at improving environmental practices totalled around USD 7.8 billion (Monke and Johnson, 2010; Cooper et al, 2009).

To achieve the win-win of reducing environmental impacts and incentivising environmental positives, there will need to be clear policies in place to ensure that at least some finance recovered from the reduction of environmentally harmful subsidies is redirected towards environmentally positive activities.

FOSSIL FUEL SUBSIDY REFORM

Similar to agricultural subsidies, fossil fuel subsidies are aimed at the objectives of promoting economic growth, securing employment and increasing energy accessibility. Such subsidies, however, “are a hurdle to combating climate change and achieving more sustainable development paths” (UNEP, 2008), and so also have a negative impact on biodiversity and ecosystem services. Fossil Fuel Subsidy Reform, similar to Agricultural Subsidy Reform (see page 98), thus seeks to reduce or remove existing subsidies that are harmful to the environment and potentially redirect some of the freed-up funds as biodiversity finance.

In contrast to Agricultural Subsidy Reform, however, the political feasibility of hypothecating the funds gained from reducing fossil fuel subsidies towards biodiversity and ecosystems is lower than would be the case for a reduction in agricultural subsidies. This is partly because a reduction in fossil fuel subsidies is not necessarily related to an improvement in local ecosystems and biodiversity, and partly because a reduction in fossil fuel subsidies is more likely to be redirected towards subsidies for renewable energy. Using conservative estimates, where no more than 5% of reduced fossil fuel subsidies are directed towards biodiversity and ecosystems, a reform of these subsidies could raise between USD 1-4.1 billion annually.

Fossil fuel subsidies are estimated to have totalled USD 410 billion in 2010 globally and projected to reach USD 660 billion without any reform (IEA, 2011). Largely underpinned by G20 and APEC efforts, since early 2010, many countries have started or planned fossil-fuel reforms.

SCALE

1–4.1
USD bn

TIMEFRAME



LEVEL



SOURCE



PAYER



VALUE



GENERATION CONCLUSIONS

DIRECT MARKET MECHANISMS

CURRENT SCALE OF FINANCE

The estimated current scale of finance for direct market mechanisms is USD 2.9-4.5 (averaging 3.7) billion per annum. The majority of this finance comes from offset markets (USD 2.5-4.1 billion), predominantly through biodiversity offsets (USD 2.4-4.0 billion) and forest carbon markets (USD 0.2 billion). Currently, due to the relatively high technical and institutional capacity required to implement biodiversity offset programmes, the majority of these schemes operate domestically within developed countries.

The remaining USD 0.4 billion in direct market finance is primarily direct biodiversity fees with a relatively minor amount of finance generated by direct ecosystem service fees or bioprospecting.

FUTURE SCALE OF FINANCE

By the year 2020 direct market mechanisms could generate USD 6.9-23.1 billion per annum. The majority of new and additional finance that could be generated from these mechanisms comes from the potential scaling up of biodiversity offsets and forest carbon offsets, which with increased compliance markets could annually generate up to USD 10 billion and USD 7 billion respectively. Operating on a local level, direct ecosystem services fees and direct biodiversity fees could scale up to around USD 2 billion each. Bioprospecting could scale up within a range of USD millions to billions.

Since direct market mechanisms tend to be project-level, voluntary, and private sector driven, the primary way to scale up finance for these mechanisms is through an increase in environmental regulatory frameworks. The public sector can help to provide this in two ways. Firstly, improved infrastructure for biodiversity and ecosystem service markets would enable suppliers and buyers to interact more effectively. Examples of improving market infrastructure include removing regulatory barriers, implementing disclosure and information requirements, or supporting capacity building.

Perhaps the best example of this is within the forest carbon markets. Markets for forest carbon have been primarily developed by the private sector to meet a demand for forest carbon offsets not yet met through any regulation. The scale of these markets is still relatively small due one particular regulatory barrier: forest carbon offsets are not permitted in compliance carbon markets. The voluntary carbon

markets, which includes forest carbon markets, traded less than 2% of the volume of compliance markets in 2010 (Peters-Stanley et al., 2011). Should governments want to increase the size of forest carbon offset markets, removing this regulatory barrier would likely be the most effective step in doing so. That process may occur through REDD+.

The second way in which regulation serves to increase the scale of finance through direct market mechanisms is by increasing the level of enforcement imposed upon the beneficiaries or polluters of biodiversity. In the absence of regulation, only direct beneficiaries that are keenly aware of their dependency on nature will pay for their use (e.g. Vittel water in France) while the remainder will likely free-ride. Similarly, unless they are keenly aware of risks such as losing their licence to operate, polluters that degrade the natural environment will continue doing so unless they are held liable for that damage and required to rectify it. Environmental regulation can impose a stricter limit of who should pay for biodiversity and ecosystem services and also create frameworks under which everyone who uses natural capital – beneficiaries and polluters – would contribute. The PSAH programme in Mexico provides a good example of how this can work for direct beneficiaries (see page 68). In contrast, compliance biodiversity markets in the US are the most advanced example of making polluters liable for their damage to biodiversity and implementing a market-based solution.

The scale and predictability of finance under direct market mechanisms will largely be a factor of the regulation under which these mechanisms operate. If national and international regulatory frameworks can be established for biodiversity and ecosystem services, these mechanisms could generate significant volumes of biodiversity finance. Given that finance generated through direct markets is largely transacted through the private sector, additional finance raised through these mechanisms would not be subject to government capture, and could also be a relatively predictable source of finance for natural capital. If direct ecosystem services or biodiversity fees are established at the national level, revenue ideally needs to be hypothecated for investments in natural capital in order to maintain predictability.

INDIRECT MARKET MECHANISMS

CURRENT SCALE OF FINANCE

The current scale of finance for green commodities is around USD 6.6 billion per annum. This figure is based on the price premium that producers receive for supplying sustainable commodities in the timber and agricultural markets. The majority of finance for green commodities is generated in developed countries, by consumers of, for example, organic produce or certified coffee.

FUTURE SCALE OF FINANCE

By the year 2020 indirect market mechanisms could generate USD 10-30 billion per annum. To date, revenue generated through indirect markets is mainly a result of voluntary private sector demand driven by consumer awareness for sustainable produce. Most of that demand comes from the US and EU (Ecosystem Marketplace, *forthcoming*). The future scale of finance will continue to depend upon consumer demand for such products, and there are multiple approaches to promoting increased demand, including: certification, directly supporting producers and suppliers, improving market conditions, and perhaps even implementing regulation.

Maintaining the voluntary approach, multiple efforts have been established by public and civil sector organisations to develop and promote certification schemes for biodiversity friendly products, such as Rainforest Alliance (see page 78) or Marine Stewardship Council Certification. Multilateral organisations have more recently established multi-stakeholder approaches that to at least some degree support certification development, but focus specifically on mainstreaming sustainability best practices in commodity production and supply. These include IFC's Biodiversity and Agricultural Commodities Program³⁸ and the UNDP's Green Commodities Facility³⁹. While the IFC tends to support producers and suppliers directly or indirectly through NGO and civil sector programmes, UNDP focuses on supporting national actions to improve the structural market conditions that have traditionally favoured unsustainable commodity production. Various working groups and task forces have also been established by the public and private sector to promote sustainable agricultural commodities.

These types of approaches have seen success. For example, the area of forest under certification continues to increase each year. For agriculture, following recent high profile environmental campaigns in Brazil demanding "zero-deforestation beef and leather," four of the largest Brazilian meatpackers adopted policies to source beef from ranches with no recent deforestation and a number of retail chains and leather brands followed suit. Similarly, in June 2006, Brazilian soy producers, in consultation with the European soy industry and NGOs including Greenpeace, elected to not produce soybeans cultivated on land in the Amazon that had been deforested after July 2006⁴⁰.

As with direct market mechanisms, arguably the most effective form of support would be the application of government regulation to promote the production or import of sustainable commodities. This approach may, however, face challenges either from domestic producers if regulating production, or international producers if regulating import. Further, import restrictions for sustainable products may be open to dispute under the WTO⁴¹. A middle ground may be to establish bi-lateral trade accords between importers and exporters to promote trade of sustainable products, such as seen through the EU's Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan.

38. www.ifc.org/bacp

39. <http://www.greencommodities.org>

40. http://www.taskforcesustainablesoy.org/images/stories/announcement_on_soy_moratorium.pdf

41. The often cited General Exceptions XX(b) and (g) may provide a way around trade restrictions.

OTHER-MARKET MECHANISMS

CURRENT SCALE OF FINANCE

Currently there are only a few examples of revenue being generated from other-market mechanisms. The German government, for example, uses around USD 44 million per year of the proceeds received from auctioning GHG emission allowances to fund international ecosystem-based climate change mitigation and adaptation projects. In Costa Rica, 3.5% of their national fuel tax is used to help fund the national payments for ecosystem services programme (see page 94).

FUTURE SCALE OF FINANCE

Finance generated through other-market mechanisms can only be scaled up through increased national- and international-level regulation. Given the relatively high political nature of implementing these mechanisms and the competition that exists across different global agendas for generated funds, implementation of other-market mechanisms will arguably only succeed with a large degree of political coordination between international agendas. Further, given the recent global recession, the competition for new sources of finance has only been exacerbated. This is highlighted in both the 2009 issuance of Special Drawing Rights, which was used to increase liquidity in developed country economies, but was once proposed by George Soros as a source of finance for climate change, and the current discussions for an EU-wide financial transaction tax, which was put forward as a means to achieve financial stability in the EU (EU, 2011), not a means of generating finance for development or environment as many had hoped (e.g. the Robin Hood Tax Campaign).

Given these competing global priorities it will take a great deal of political will and international coordination to achieve finance at scale using other-market mechanisms. Notwithstanding this caution, there is the potential for some other-market mechanisms to generate significant scales of finance for biodiversity and ecosystem services. Most notably, due to the overlaps between the UNFCCC and CBD agendas in conserving forests, mechanisms that relate to the climate change agenda may provide a potential source of finance for forests.

One example is the increased auctioning of GHG emissions allowances. Under the third phase of its Emissions Trading Scheme (ETS) from 2013 to 2020, the EU is scaling up its use of auctioning of GHG emissions allowances. There is a non-legally binding agreement that member states will use 50% of the revenues generated from their auctions to finance climate change mitigation and adaptation in the EU and developing countries .

It is difficult to estimate the scale of biodiversity-finance that could be raised from other-market mechanisms given the political elements and competition discussed above. However, if coordination between agendas were able to implement or scale up these mechanisms, then conservative estimates indicate that they could generate between USD 5 and 26 billion per annum in biodiversity finance.



NON-MARKET MECHANISMS

CURRENT SCALE OF FINANCE

Non-market mechanisms currently account for around 80% of all biodiversity finance, equivalent to approximately USD 41 billion per annum. This figure is mainly due to the large quantities of finance allocated domestically through domestic budget allocation and agricultural subsidy reform. Because it represents the majority of global biodiversity finance, the geographic distribution of non-market based finance is a major influence on the geographic distribution of all biodiversity finance. Although non-market mechanisms can generate finance delivered to developing countries through ODA or philanthropy, the majority of non-market finance and in turn the world's biodiversity finance, is delivered in the US and Canada, Europe, and China.

Given the low reporting levels of developing country governments in their biodiversity spending, the estimates of domestic budget allocation may be lower than reality. The scale of spending in the US, Canada, Europe and China is so large, however, that it would need to be a gross underestimate to alter the message: these countries generate and receive the majority of the world's biodiversity finance.

FUTURE SCALE OF FINANCE

Finance under non-market mechanisms could be scaled up to between USD 47 and 80 billion per annum by 2020. This scale can primarily be achieved through increasing political will (and public opinion) for biodiversity financing. This will primarily come from governments, but also from private contributors, e.g. philanthropy. A number of initiatives are in place to do just that. These efforts are primarily aimed at understanding and accounting for the value of biodiversity to economies, including TEEB, UN WAVES, and UK NEA.

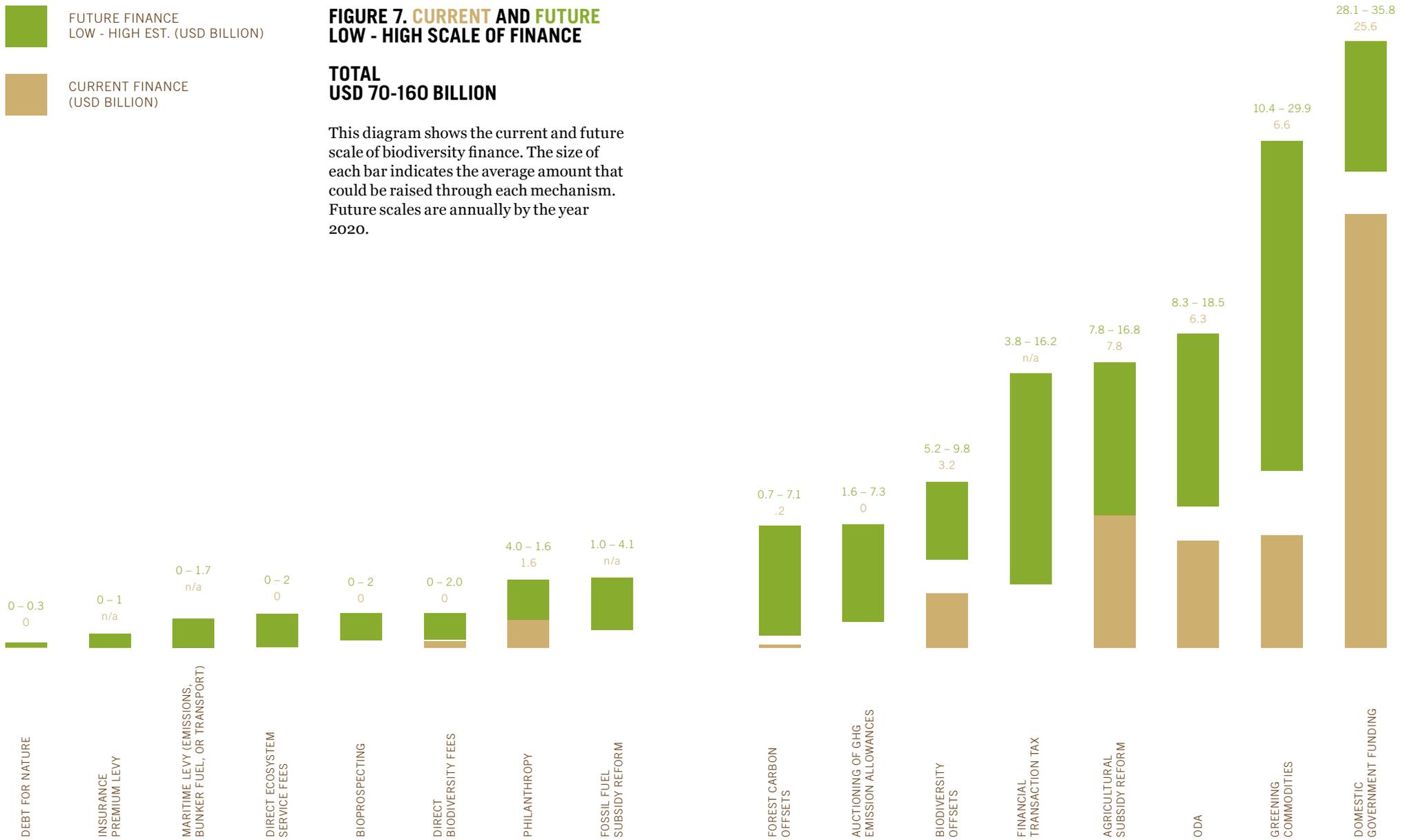
In some cases, a precise account of the value of biodiversity is not necessary, but simply a clear understanding that biodiversity protection is underfunded is sufficient to convince governments to allocate more funding, and with the potential to source finance from non-environment ministries. Research such as the UNDP-led study that showed the shortfall in protected area financing in Latin American countries (Bovarnick et al, 2010) proved that demonstrating a funding gap exists can help to generate more biodiversity-finance.



FIGURE 7. CURRENT AND FUTURE LOW - HIGH SCALE OF FINANCE

TOTAL USD 70-160 BILLION

This diagram shows the current and future scale of biodiversity finance. The size of each bar indicates the average amount that could be raised through each mechanism. Future scales are annually by the year 2020.



**FIGURE 8. GENERATION
CURRENT AND FUTURE LOW / HIGH
SCALE OF FINANCE BY GROUP**

This diagram shows the amount of biodiversity finance grouped by the source criterion. The majority of current finance comes from non-market sources, but as finance is scaled-up, more can come from market-based sources.



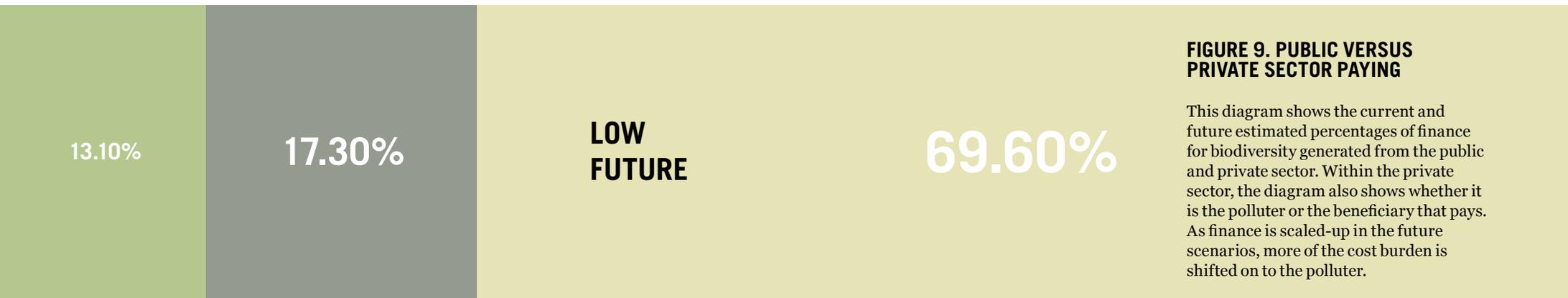
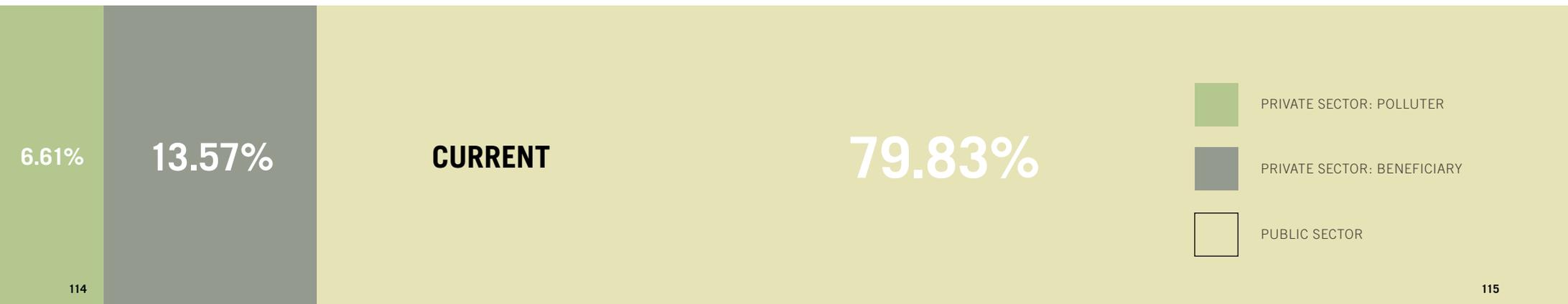


FIGURE 9. PUBLIC VERSUS PRIVATE SECTOR PAYING

This diagram shows the current and future estimated percentages of finance for biodiversity generated from the public and private sector. Within the private sector, the diagram also shows whether it is the polluter or the beneficiary that pays. As finance is scaled-up in the future scenarios, more of the cost burden is shifted on to the polluter.



DELIVERY

UNDERSTANDING DELIVERY

The previous section examined the different proposals for generating finance for biodiversity; this section explores the different options for delivering finance for biodiversity in developing countries. As funds for conservation and sustainable use of biodiversity and ecosystems increase, the international community will need to utilise appropriate financial instruments to deliver funding on the ground.

THE STATE OF PLAY

Public and private sector finance can use a variety of mechanisms including grants, debt and non-financial incentives to deliver financial resources. The applicability of each of the delivery instruments depends upon the intended purpose of the revenue (e.g. national park creation), and the relevant context (e.g. country or regional capacity/institutional arrangements) in which the revenue is being delivered. Currently, finance for biodiversity is delivered in a fragmented approach with very little coordination at the international level outside the Global Environment Facility (GEF). Under the CBD mandate, finance that is delivered through the GEF is done so using unconditional grants (see page 134).

A BRIEF HISTORY

Several articles of the Convention refer specifically to the delivery of financial resources for biodiversity.

Article 21(1) outlines the requirement for a transparent and democratic mechanism for the delivery of financial resources to developing country Parties for the purposes of the Convention, and notes that voluntary contributions from developed countries may contribute to the mechanism. Article 20(3) also states that developed country Parties may also provide financial resources through bilateral, regional and other multilateral channels.

In order to ensure that financial resources for biodiversity and ecosystem services are delivered to priority areas, Parties under the Convention are required to, in accordance with Article 6 of the Convention, develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity. To date, 170 Parties to the CBD (88%) have developed National Biodiversity Strategies and Action Plans (NBSAPs) or equivalent

instruments, and 14 more have them under preparation. Some Parties are also developing biodiversity strategies and/or action plans at the sub-national level.

In addition to the importance of NBSAPs in identifying national level priority areas for finance delivery, the CBD Programme of Work on Protected Areas (PoWPA), adopted at COP 7 in 2004 Decision VII/28, has enabled developing country Parties to identify gaps in national protected area networks, and has supported the Convention and its Parties in establishing an ecologically representative network of protected areas. Parties were guided to begin the PoWPA process by completing a gap analysis of their protected area systems with the full and effective participation of indigenous and local communities and relevant stakeholders by the end of 2006. Through their national gap analyses, which have been largely supported by UNDP and the GEF, countries identified high priority areas to expand or improve their protected area networks. Since 2004, 6000 new protected areas have been established under the PoWPA.

National and sub-national gap analyses such as those under PoWPA are also useful tools for catalysing programmes of work under other UN conventions. For example, it has been suggested that to facilitate early action on REDD, and to avoid duplication of effort, data already accrued for many developing countries within the CBD can be used to determine the best locations to deliver REDD finance (CBD, 2009).

DELIVERY FRAMEWORK

CRITERIA

The diagram opposite presents a framework that can be used to analyse and understand the different options for the delivery of biodiversity finance. The framework comprises four criteria as follows:

Level: At what level will revenue be delivered?

Participation: Which countries can participate?

Theme: What activities can be financed?

Performance-based: Is the provision of funding linked to performance?

Using the above framework allows us to compare individual options and to collectively see areas of convergence or divergence. The following pages provide an explanation of these criteria and how they can be used to understand proposals for the delivery of biodiversity finance.

A further consideration for the delivery of finance is how much finance can be leveraged from other mechanisms and how much biodiversity is delivered per unit cost; i.e. its efficiency (see page 128). These considerations, although not visually represented with an icon, are discussed for each mechanism.

The following pages provide an explanation of these criteria and how they can be used to understand proposals for the delivery of biodiversity finance.

Figure 10. A framework for understanding delivery proposals

DELIVERY

PRINCIPLE

EFFECTIVE / EFFICIENT

EQUITABLE

APPROPRIATE

CRITERION

LEVEL

At what level (project or programmatic) is finance likely to be delivered?

PARTICIPATION

Which countries are most likely to participate?

THEME

What type of activities are appropriate for this particular funding mechanism?

PERFORMANCE BASED

Is the provision of funding linked to emission reduction performance?



LEVEL

The administrative level at which finance for biodiversity and ecosystem services is delivered is an important consideration for developing countries.

Options: National, Project

Finance for biodiversity conservation and ecosystem services provision can be delivered either at the project or the national level. **Project-level** mechanisms can deliver finance to both public and private entities for the implementation of individual activities within a specific location and timeframe, whereas **national-level** delivery mechanisms provide funding for longer-term coordinated planning that typically involves the integration of financial resources into the budget of the recipient country, using the government's existing financial architecture.

The level at which finance is delivered will have important implications for both the effectiveness - in terms of coverage achieved, reduced risk of leakage, country ownership, and coordination with ongoing national development plans - and efficiency of biodiversity finance. National-level delivery mechanisms are more likely to achieve economies of scale and are often associated with reduced transaction costs to both contributors and recipients (Schneider and Cames, 2009). Contributing countries are often unwilling, though, to deliver pooled funding at the national level because of concerns of fiduciary responsibilities related to larger scale funding incorporated into the recipient country's national budget.

Project-level finance on the other hand can often be better evaluated than national approaches and might also be the most appropriate for certain biodiversity and ecosystem service interventions, particularly those that require immediate and urgent action or those that capture a direct local benefit to users. Finally, project-based finance may be more appropriate for countries lacking the institutional capacity to apply national level approaches to finance biodiversity (see the Participation criterion on page 123).

PARTICIPATION

This criterion aims to identify the types of countries that are most likely to benefit from a given delivery mechanism.

Options: Least Developed Countries, Developing Countries, Developed Countries

Due to issues of capacity and governance, the ability to participate in a given mechanism will vary. This criterion uses three groups of countries to define the level of participation: **least developed countries** (LDCs) are a group of countries recognised by the UN as having the lowest performance on indicators of income, human development and economic vulnerability³⁸; **developing countries** are those countries that are not 'least developed' within the group of developing countries defined under the UN³⁹; the final category, **developed countries**, are the developed market economies defined under the UN.

The absorptive capacity of a country is a factor of its ability to receive and utilise resources. For the delivery of finance for biodiversity and ecosystem services there are two important aspects of absorptive capacity: the capacity to design and implement activities; and the necessary procedures and institutions to allow finance to flow to potential end users (Nussbaum et al., 2009). In general the less developed a country is, the less it will be able to implement these two activities at the national level. For that reason, in the short term at least, project-level delivery mechanisms may be more suitable for LDCs. A key focus of biodiversity finance should also therefore be the scaling up of institutional capacity to mainstream biodiversity conservation into national agendas.



³⁸. A list of the least developed countries is available at <http://www.unohrrls.org/en/lde/related/62/>

³⁹. Taken from the List of Country Groupings and Sub-groupings for the Analytical Studies of the United Nations World Economic Survey and other UN Reports accessible at <http://unpan1.un.org/intradoc/groups/public/documents/un/unpano08092.pdf>

CASE STUDY

THE BOLSA FLORESTA

The Bolsa Floresta Programme, in the Brazilian state of Amazonas, is a voluntary programme to reduce deforestation and promote sustainable development by rewarding the communities of the Amazon for its conservation. The programme was established in 2007 by the Government of the State of Amazonas, through its Secretariat for Environment and Sustainable Development, and is implemented by the Amazonas Sustainable Foundation (*Fundação Amazonas Sustentável*; FAS) – an independent and non-profit NGO.

The Bolsa Floresta Program has four main components that support forest-friendly livelihoods and provide incentives for continued forest preservation:

- The **Bolsa Floresta Income** supports sustainable production of non-timber forest products (NTFP) such as nuts, fruits, vegetable oils, wood, honey, fish and others. The goal of the Income programme is to improve the efficiency of production chains, thus allowing more value to flow to the producer. All activities that do not lead to deforestation are eligible for this component.
- The **Bolsa Floresta Social** supports infrastructure improvements related to education, health, communication and transportation. The activities and projects are developed in partnership with government agencies and NGOs. The goal of the Social programme is to break the cycle of deforestation by providing key services that would

otherwise be financed by converting tropical forests to other uses.

- The **Bolsa Floresta Family** is a monthly payment of USD 25 per month⁴⁰ to the mothers of families that live in protected areas that agree to a zero deforestation goal. The payment is not intended to be the main source of household income, but is a supplement to reward households for forest conservation and provision of ecosystem services.
- The **Bolsa Floresta Association** aims to strengthen community-based organisations in the region. It provides additional financial support equivalent to 10% of the amount paid to all families registered in *Bolsa Floresta Family* in each protected area.

GENERATION OF FINANCE

The long-term financial sustainability of the Bolsa Floresta Programme is guaranteed by an endowment fund of around USD 32 million, managed by FAS. The fund was established using grants from three major donors (Government of the State of Amazonas, Bradesco Bank and Coca-Cola Brazil). FAS uses the interest from the fund to pay for the Family component. In 2009, the Bolsa Floresta programme also received USD 10 million from the Amazon Fund that it will earmark to finance the execution of the *Income* and *Association* components. It is estimated that this will benefit approximately 10,000 families across 10 million hectares of state protected areas.

DELIVERY OF FINANCE

Finance under the *Income* component, will be delivered to communities across 15 Protected Areas under the Programme to enhance the effectiveness of their economic activities. An estimated USD 70,000 per Protected Area per year has been set aside for this purpose.

The *Social* component uses non-financial incentives to deliver finance through infrastructure projects such as schools, hospitals and transport networks.

The *Family* component of the Bolsa Floresta Programme currently delivers funds through unconditional grants (see page 134) from an endowment fund managed by FAS. Grants are delivered to the mother of each household - mothers are often better at managing savings and are more likely to use the funds appropriately. Payments are delivered directly to the bank account of individual families registered in the program. The mothers have a bank card, which they can then use when they go to towns or cities.

The *Association* component provides a payment of an equivalent to 10% of the amount paid to all households the Family component (an average of USD 30,000 per year) into the Protected Area and is delivered to the Association by annual work plans.

It is important to mention that all the investments made in the Protected Areas are made in a participatory manner through local workshops, where FAS staff provides methodological assistance and facilitation and community members make investment decisions.

INSTITUTIONAL ARRANGEMENTS

The governance of the Bolsa Floresta Programme is designed to ensure credibility, transparency and participation. Management of the programme, including management of the fund, is coordinated by FAS, which has a board of directors that is representative of various segments of society (government, business, scientific, social and environmental) and a president. Accounting and audit for the programme are performed by third-party organisations and statements of accounts are regularly forwarded to the District Attorney.

Virgilio Viana, João Tezza, Gabriel Ribenboim and Thais Megid Pinto, FAS

<http://www.fas-amazonas.org/en/secao/forest-allowance-program>

40. An exchange rate of BRL 2 to USD 1 has been used throughout.



THEME

The theme criterion outlines the activities that would be appropriate to receive finance under a given delivery mechanism.

Options: Conservation, Sustainable use, Capacity building, Technology transfer

Different activities for biodiversity conservation and ecosystem service provision have varying financial needs and economic returns, and therefore certain types of delivery mechanism may be better suited to certain types of activities. Biodiversity and ecosystem service interventions can be grouped into four themes:

Conservation activities are defined here as activities that have limited (if any) extractive use of the natural capital (e.g. protected areas). In the introduction we outlined the different ecosystem services that are provided by natural capital (see page 16). The conservation theme refers to activities that are focused more on delivering *ecosystem services* and restrict the use of *ecosystem goods*.

Sustainable use focuses on the provision of *ecosystem goods*, but in such a manner that the provision of ecosystem services and conservation of biodiversity are maintained at high levels (e.g. agroforestry). These types of activities are useful for areas where humans have a significant impact on the landscape, such as buffer zones around PAs.

Capacity building activities focus on supporting countries and communities in their ability to carry out the protection of biodiversity and provision of ecosystem services. It can include activities that support improved governance of PAs, market development for green commodities (see page 79), formalising land tenure, and policy reform.

Technology transfer refers to the improvement of technical knowledge related to ecosystem conservation and the sustainable use of natural capital and genetic resources. That includes, for example, scientific knowledge for improving the design of PAs or optimising agroforestry production systems. It also includes more tangible technology transfer, such as systems for tracking illegal timber.

PERFORMANCE-BASED



This criterion answers the question of whether or not the provision of funding is based on performance related to biodiversity conservation and ecosystem service provision.

Options: Performance-based, Non-Performance-based

To a certain degree, all delivery mechanisms are related to performance in the sense that there is an expected output from funding (for example, grants given in support of capacity building activities are based on the expected result that capacity will be built). Performance-based delivery as discussed here, however, means that delivery of finance is *conditional* upon the already executed or expected delivery of ecosystem services or biodiversity conservation. Although payments were the original mechanism to deliver performance-based biodiversity finance, most delivery mechanisms can be designed to be conditional (see *What are PES?* on page 20).

A major question related to conditionality is whether performance is measured indirectly, based on activities that are believed to improve biodiversity conservation and ecosystem service provision (e.g. hectares of habitat reforested at the project level; or success of PA policy reform at the national level), or directly, based on the measurement of actual services delivered (e.g. number of marine turtle hatchlings or tonnes of carbon sequestered). The latter is considered more economically efficient to deliver a specific ecosystem service, but is narrow in scope and may crowd-out concern for other ecosystem services (e.g. concern over climate change crowding out concerns for biodiversity; CBD, 2010). On the other hand, the success of indirect performance measures is dependent on the strength of the relationship between the activity measured and the level of biodiversity conservation and ecosystem service provision.

IMPROVING THE EFFICIENCY OF BIODIVERSITY FINANCE

Efficiency can generally be interpreted in two ways: either in terms of a mechanism's ability to leverage additional forms of finance for biodiversity and ecosystems; or in terms of how much biodiversity is conserved (or ecosystem service provided) per unit cost (economic efficiency). Whilst these two concepts are important considerations for the generation of biodiversity finance, they are of particular importance for the delivery and institutional arrangement of finance.

LEVERAGE

The most commonly understood definition of leverage is the ability to encourage or raise private sector finance and typically applies to public financing mechanisms (UNEP, 2008)⁴¹. A key question for public finance, therefore, is how much private finance can be mobilised by a given amount of public money. Leverage can also be defined as the ability to use resources above and beyond the initial investment, e.g. through the use of a revolving fund, whereby concessional loans are repaid and re-lent. Financial risk mitigation instruments, such as debt guarantees, also offer considerable financial leverage.

EFFICIENCY

Efficiency is generally referred to in terms of output per unit cost and refers to the ability to get more of a desired result per dollar spent. As experience grows in the use of different delivery mechanisms, so does understanding

of the relative efficiency of these tools.

In the context of market-based mechanisms, efficiency can be viewed in two ways. Various environmental markets, including the Clean Development Mechanism under the UNFCCC, have shown us that markets tend towards options that deliver the most output (in this case emissions reductions) per unit cost; the so-called 'low-hanging fruit'. In this context markets can be described as being efficient, as conservation is achieved at the lowest cost. From another perspective, however, markets can be viewed as being inefficient. Project level markets are often attractive to the private sector because they can accrue rents⁴². Under this type of mechanism, therefore, a market would fail to maximise abatement potential and would be inefficient. Several proposals have been put forward including reverse auctions and sectoral mechanisms that aim to overcome inefficiencies in project-based mechanisms (Parker et al., 2009).

Non-market mechanisms may also have different degrees of efficiency. For example, performance-based grants (see page 135) in certain cases might be more efficient than unconditional grants (page 134), and concessional loans (page 136) that use a revolving fund could improve efficiency over other forms of concessional finance.

41. Leverage can also be applied to private mechanisms, for example, the presence of a shade grown coffee company in an area might attract additional finance from a forest conservation project.

42. Rents are the profits that accrue from the difference in price between the marginal abatement cost (MAC) in developing countries and the market price for carbon (which should be the MAC in developed countries).

CASE STUDY COLOMBIA'S BIODIVERSITY FINANCING ROUNDTABLES

Sub-regional and national financing roundtables have been widely recognised as a useful approach to enable multiple donor partners to meet, discuss financing needs, and coordinate their support, based on national priorities for biodiversity and protected areas. These roundtable processes serve to promote and organise counterpart financing for biodiversity-related activities. In June 2010, the Government of Colombia⁴³, in collaboration with the CBD Secretariat's LifeWeb Initiative (see page 176), hosted a biodiversity financing roundtable for their protected area system. In line with the CBD Programme of Work on Protected Areas the roundtable aimed to foster coordination in the establishment and maintenance of a national system of protected areas in Colombia. Specifically, the roundtable served as a forum to examine the needs of and improve cooperation on financing the protected area network in Colombia.

The first roundtable meeting was attended by governments of nine international cooperation partners, the Colombian Ministries of Foreign Affairs and Environment, and the Department of National Planning, as well as three NGOs. Those present conveyed the desire for this forum to become an ongoing process to facilitate financial cooperation for ecosystem-based approaches to sustain biodiversity, address climate change, and secure livelihoods. A second meeting was hosted by the government of Colombia and CBD LifeWeb in October of 2010, in order to sharpen understanding of highest geographic

and thematic priorities, and advance the understanding of different cooperation partners' focus. Some initial specific financial commitments consistent with these priorities were announced at the CBD LifeWeb dinner held at COP10 in Nagoya, Japan, on 24 October 2010. For more information on CBD LifeWeb and financing round tables, see page 176).

<http://www.cbd.int/lifeweb/donors/roundtables/colombia>

43. Through the Presidential Agency for Social Action and International Cooperation and National Parks of Colombia

DELIVERY PROPOSALS

A GUIDE TO DELIVERY PROPOSALS

LEVEL



PARTICIPATION



THEME



PERFORMANCE BASED



The following pages present a guide to eight mechanisms to deliver finance for biodiversity. Each proposal is analysed using the framework presented above and is represented graphically using the icons shown overleaf. These icons represent the main options from the analytical framework, and have been grouped into their respective criteria.

The icons will be presented to the side of each proposal in an 'icon bar' shown here on the left. Not all proposals aim to define all of the criteria of the framework. To simplify matters, all icons in the icon bar will be greyed out by default and only the options that are explicitly relevant to each mechanism will be highlighted in colour.

For example the 'icon bar' shown on the left indicates that the delivery of finance in this hypothetical delivery mechanism would be appropriate for sustainable use and conservation activities at the national level, would be performance based, and least developed countries would not be able to participate easily.

KEY TO DELIVERY ICONS

LEVEL

NATIONAL



PROJECT



PARTICIPATION

LEAST DEVELOPED COUNTRIES



DEVELOPING COUNTRIES



DEVELOPED COUNTRIES



THEME

CONSERVATION



SUSTAINABLE USE



TECHNOLOGY TRANSFER



CAPACITY BUILDING



PERFORMANCE BASED



UNCONDITIONAL GRANTS

LEVEL



PARTICIPATION



THEME



PERFORMANCE BASED



A grant is defined as a transfer made in cash, goods or services for which no repayment is required (OECD, 2009). Given the difficulties in capturing the benefits that arise from the global-public-good aspects of biodiversity and ecosystem services, a substantial portion of biodiversity finance includes grant payments. While grants could be used for a wide variety of biodiversity needs, financial resources that are delivered as grants are likely to be limited, so their use should be targeted.

Grants are typically targeted towards activities that provide a public good that has no (or negative) financial returns for the recipient. Grants are therefore primarily used for conservation activities (i.e. protected areas), capacity building (including policy reform) and technology transfer⁴³. Because of this, grants will play a role within all countries, but will be particularly important to the LDCs that may need finance primarily for capacity building activities. Close monitoring of the use of grants in poor and badly governed countries is needed, however, as grants can have a negative effect on domestic revenue generation in those countries (Odedokun, 2003).

Grants can create significant financial leverage if used for technical assistance as they can help to stimulate other financial flows. The GEF, for example, has an average leverage effect of 1:4 over all focal areas (Pearce, 2004) and also 1:4 for the biodiversity focal area (CBD, 2010a). Whilst grants can be delivered at either the national or project level, the delivery of public finance at the national level is preferred, as it allows integration with national development goals and other forms of revenue.

43. The Global Environment Facility (GEF), which delivers all of its finance through unconditional grants, has four key objectives; the first objective aims to support protected areas, the second targets the incremental costs of mainstreaming biodiversity in the private sector and the final two objectives directly aim to build capacity (see page 162).

PERFORMANCE-BASED PAYMENTS

LEVEL



PARTICIPATION



THEME



PERFORMANCE BASED



Performance-based payments are conditional cash transfers for the provision of ecologically sustainable behaviour. Performance-based payments have emerged as a relatively simple method to *directly* and *conditionally* incentivise sustainable land-use practices. Payments are awarded based on three types of conditionality: either directly *ex post* for a unit of ecosystem service or biodiversity verifiably provided (e.g. payments for tonnes of carbon sequestered), directly *ex ante* for a proxy to ecosystem service or biodiversity provision (e.g. hectares of forest conserved), or *indirectly* for the implementation of policies and measures that protect ecosystems (e.g. payments to enact stricter laws against timber extraction). As discussed when describing the “performance-based” criterion (page 123), the relative efficiency of the latter two approaches depends on the strength of the relationship between the proxy measure or policies implemented and the level of ecosystem service or biodiversity that those actions provide.

Performance-based payments can be implemented at either the project level or the national level. At the project level, they are most often referred to as payments for ecosystem services (PES), which have become popular in recent years. National level performance-based payments are now gaining momentum within international policy, especially through the discussions on financial incentives for REDD. The Norwegian government, for example, has recently pledged USD 1 billion for Indonesia to implement a national strategy to reduce emissions through a moratorium on logging concessions⁴⁴.

The effectiveness of performance-based payments will depend on the establishment of credible baselines, understanding the costs of implementation, customising payments to local dynamics, and targeting agents with credible land claims and clear threats to conservation (Wunder, 2006). At the project level, this means only paying local actors that can best affect conservation objectives and differentiating payments among those who are most likely to deliver conservation benefits. In practice, though, differentiating payments may be difficult to implement due to concerns over equity in delivery.

44. More information on these initiatives can be found at <http://www.miljo.no/climate-and-forest-initiative>.

NATIONAL CONCESSIONAL DEBT

LEVEL



PARTICIPATION



THEME



PERFORMANCE BASED



International public finance can also be delivered through concessional loans (or concessional debt) to governments or public private partnerships. Debt mechanisms involve a transfer of finance from donors to recipients for which repayment by the recipient is required⁴⁵. Public finance loans for ecosystem protection or ecosystem-friendly activities could be delivered at more favourable rates than private sector debt. These loans are referred to as concessional or 'soft' loans.

There are two ways in which concessional loans can be used to finance biodiversity and ecosystem services. Concessional debt can either be simply directed towards ecosystem-friendly activities, or concessionality can be conditional on the provision of ecosystem services or biodiversity (i.e. lower interest rates would be the reward for the conservation or sustainable use of natural capital)⁴⁶.

Although a robust economic appraisal of the effectiveness of loans in delivering environmental objectives has not been carried out, many lessons can be drawn from the use of concessional loans in the delivery of ODA. Concessional loans for development have been most suitable for investments that have some level of financial return, while still being below a threshold that would attract commercial investment (Parker et al., 2009). As such, concessional loans could be used to support projects in nascent biodiversity and ecosystem service markets where financial returns are low.

The use of concessional debt achieves both cost-efficiency and financial leverage as the initial public investment is likely to reduce the investment risks for private finance. Further, some portion of the resources will be repaid, allowing them to be recycled for other purposes. The use of concessional loans will have implications for least developed countries. Loans require a certain level of institutional capacity to manage repayments, and are therefore better suited to countries that have higher GDP, lower levels of debt, and lower risks of economic volatility (Parker et al., 2009).

⁴⁵. The repayment will be of the initial loan (called the principal) and any interest accrued over a fixed period of instalments.

⁴⁶. Depending on the level of conditionality the interest rates for concessional debt can be zero, or even negative. At the extreme, a loan could be convertible to a grant if the contractual conditions for the provision of ecosystem preservation are met (see page 137 for a project-level example).

CASE STUDY

BIO-RIGHTS: CONVERTIBLE MICRO-CREDITS IN INDONESIA

In the 1970s and 80s, expansion of unsustainable aquaculture in the coastal areas of central Java and North Sumatra caused large-scale mangrove degradation resulting in biodiversity loss, collapse of fisheries and erosion. It also increased the vulnerability of coastal areas to storm surges, for example, allowing ecosystems in Sumatra to suffer significant additional damage as a result of the 2004 tsunami. The dwindling natural resource base has led to increased poverty, while mounting pressure on the remaining resources results in further overexploitation to meet short-term needs.

Wetlands International tried to resolve this vicious cycle by implementing Bio-rights initiatives with over 70 community groups, working in close collaboration with local NGOs and CBOs. The Bio-rights approach provides local community groups with access to microcredit to develop alternative, sustainable livelihoods in return for the provision of ecosystem services and/or biodiversity conservation. Community groups may be required, for example, to restore degraded ecosystems or control previously unsustainable resource exploitation. Upon successful fulfillment of a group's obligations, the microcredit becomes 100% concessional and is converted into a payment.

When implementing Bio-Rights in Indonesia, groups of 20-30 people were established and multi-stakeholder dialogues were initiated to discuss options for sustainable community development and ecosystem restoration. These dialogues allowed communities to share their immediate development

priorities while raising local awareness of the importance of sustainable natural resource management. Based on these discussions, Bio-rights agreements were negotiated, detailing community-based restoration measures, sustainable development activities and indicators of success. The contractual obligation for conversion of credit was usually planting mangroves with a seedling survival rate over 70% after 2-3 years. In Indonesia, Bio-rights agreements have been used to plant over 1500 hectares of mangroves along the edges of aquaculture ponds and as protective belts along the coastline. The finance provided was used by communities to develop a range of sustainable development activities including goat farming, crab breeding, seaweed cultivation and other small enterprises. Nearly all communities met their contractual obligations, leading to the conversion of microcredit into payments. Several years after the project, community livelihoods have significantly improved: erosion control and storm protection functions of restored mangroves has significantly reduced vulnerability to extreme events, while local incomes have been directly boosted by improved fish and shrimp stocks and increased fuelwood and fodder supplies. Including the additional resources generated by the development activities, some communities have experienced as much as a threefold rise in incomes.

Pieter van Eijk, Marcel Silvius and Nyoman Suriadiputra. Wetlands International

<http://www.wetlands.org/biorights>

MICROFINANCE

LEVEL



PARTICIPATION



THEME



PERFORMANCE BASED



Microfinance⁴⁷ is the provision of financial services (lending, savings and insurance) to poorer households and communities or small- and medium-sized enterprises that lack access to formal financial institutions. Microcredit currently provides the best-developed microfinance mechanism for delivering biodiversity finance and so is the focus here. Microcredit involves offering small loans to groups or individuals to help build up their assets, establish or develop a business or protect against risks (Agrawala and Carraro, 2010).

Lack of financing is often a major hurdle for poorer communities to transition to more sustainable livelihoods. By financing that transition rather than paying for provision of ecosystem services, it is hoped that once financing stops, reversion to unsustainable activities is less likely. Payments can be used to finance transition costs, but where some financial returns can be expected from the transition, microfinance may be a more efficient mechanism to deliver biodiversity finance.

As with national concessional debt, microfinance institutions (MFIs) can either choose to selectively support sustainable and biodiversity-friendly enterprises (such as eco-tourism and green commodity production)⁴⁸ or incorporate a level of environmental *conditionality* in to lending. Conditionality can be implemented in two ways: either by incorporating conditions for future lending based on current ecosystem preservation (as discussed under ‘*Environmental mortgages*’ on page 139); or by accepting lower repayment when borrowers carry out specified ecosystem preservation activities (as with national concessional debt, see page 136). At the extreme, microcredit could be 100% concessional and converted to a payment when the conditionality is met (see the case study on Bio-rights on page 137).

Whichever model is used, microfinance, if applied correctly, achieves both cost-efficiency and financial leverage. The use of microfinance may, however, require complementary grant-based finance (particularly in developing and least developed countries) to ensure that household and community borrowers have access to profitable markets and repayment is not overly burdensome.

⁴⁷ Microfinance is broadly used here to discuss both micro- and meso-finance.

⁴⁸ A few funds supported by NGOs and IGOs such as Verde Ventures (Conservation International) and Proyecto CAMBIO (Central American Bank for Economic Integration, United Nations Development Program, and Global Environment Facility) have already been established along these lines.

CASE STUDY ENVIRONMENTAL MORTGAGES FOR MARINE TURTLE CONSERVATION

Marine turtles suffer from a suite of human impacts. As such, these species are highly endangered; loggerhead turtles, for example, may be extinct in 50 years. Some governments have taken steps to minimise impacts on marine turtles through command and control approaches limiting coastal development and regulating fisheries, at some cost to the public and private sectors. The efficacy of these conservation actions can be compromised, however, by other activities like the direct harvest of eggs and adults for domestic subsistence and sale in foreign markets. That threat is particularly acute in coastal communities where there are few alternative sources of income.

Where direct regulation of unsustainable activities is likely to be ineffective due to local economic pressures, the primary question is how to overcome the lack of alternative livelihoods and reduce the unsustainable resource use that results from it. One possibility would be to use an “environmental mortgage” approach. An environmental mortgage programme would establish a community conservation lending trust. Community members could qualify for low interest lines of credit provided by the trust, with the total credit available *conditionally* linked to preservation of some environmental asset. In the case of coastal communities harvesting sea turtles, the credit available would depend on the annual number of sea turtle hatchlings (i.e. a direct ex-post conditionality). Loans could be used for a range of pre-approved ventures, from improved agricultural production on existing cultivated lands, to alternative economic

activities, to infrastructure improvements in order to improve market access.

Given the success of microfinance institutions in alleviating poverty over the past two decades, environmental mortgages provide a promising approach for linking sustainable development and incentives for environmental stewardship. Today, environmental assets are often valued solely for their extractive uses, and much of that extraction is unsustainable, often due to a lack of alternatives. If challenges in design and implementation can be overcome, environmental mortgages would capitalise the value of conserving environmental assets, and provide not only the incentive, but also the means for low-impact livelihoods and development.

C. Josh Donlan, Advanced Conservation Strategies

For more information see (Mandel et al., 2009)

<http://www.advancedconservation.org>

THE STATE OF WATERSHED PAYMENTS

It's been only eighteen months since 2010's *State of Watershed Payments: An Emerging Marketplace* report – which comprehensively tracked global payments for watershed services and water quality trading mechanisms for the first time – was published⁴⁹, but much has since changed.

New research for the upcoming *State of Watershed Payments: 2012* report, released in November 2012, suggests that the market is not simply getting bigger; it's also getting richer. A number of projects in the 2010 report and Forest Trends' inventory of projects, Watershed Connect⁵⁰, have emerged as models for financing watershed conservation. Project developers have found creative ways to diversify funding sources by engaging new stakeholders and through 'stacking' and 'bundling' payments for watershed and other ecosystem services (ES).

A WATERSHED APPROACH TO ECOSYSTEM SERVICES

Forests, wetlands, and other habitats critical to hydrological functions are under tremendous pressure around the world. Land-use change and over-consumption of freshwater coupled with dropping rates of freshwater recharge and a growth in the number and severity of aquatic "dead zones" all contribute to the ongoing degradation of our natural water infrastructure⁵¹.

In a growing number of communities, incentive-based mechanisms have been developed to conserve natural water infrastructure and its functions. Interest in incentive-based mechanisms is driven by a desire for more cost-effective, politically feasible conservation tools, particularly where regulatory capacity is inadequate, or traditional command-and-control approaches are impractical or inequitable. Incentive-based mechanisms can also be tailored to support the livelihoods of rural or poor land users, and to shift the onus for water resource protection from government to users.

Watershed services are closely linked to other critical ecosystem functions. The same standing forests that filter water and trap sediments also sequester carbon and provide wildlife habitat. Although ecosystem service thinking has an anthropocentric genesis, other species rely on these functions as much as we do: the trout, for example, needs low sediment levels, canopy cover from healthy riparian habitat, and sufficient stream flows to survive.

A watershed approach lends itself well to both ecosystem-level management – requiring a grasp of the complex interactions of soil, water, vegetation, and climate – and extrapolation to larger-scale patterns and strategies. A focus on water resources is a useful proxy for other environmental values: degradation such as pollution or low flows is often more immediately apparent than other ecosystem functions.

MARKET OUTLOOK

Total watershed payments are conservatively estimated to exceed USD \$50 billion to date and more than \$9.3 billion annually. Though governments are still the largest source of funding for watershed incentives, payments from the private sector are growing. Private utilities, dam operators, beverage companies, factories, mining companies, and other firms are recognizing the value of protecting water at its source. The ability to scale-up private sector finance for watershed payments is often limited by poor regulatory frameworks. Regulatory reform, improved understanding of ecosystem service risk, and better tools for measuring and monitoring risks will be instrumental in scaling up private sector funding for ES.

Programs that rely on a mix of funding streams are proving to be an effective source of finance for conservation. Linking watershed payments and other incentive-based mechanisms, such as certifications and eco-labeling, could scale up finance. For example, the US-based Willamette Partnership is linking their ecosystem service credit standards with the Salmon-Safe certification scheme⁵². Alternatively, a water trust fund model with contributions from water users, government, NGO, and the private sector can compensate upstream communities for management interventions that protect watershed functions and associated ES.

Payments to restore environmental flows are also proving to be an important driver of biodiversity conservation. Restoring natural flow regimes is critical for aquatic and riparian habitat protection, and market mechanisms supporting in-stream flows are on the rise in Australia and the United States. Cities and municipalities are also increasingly turning to water protection strategies to secure supply of clean water as an alternative to traditional engineering approaches⁵³.

Forest Trends
<http://www.forest-trends.org/>

52. http://www.ecosystemmarketplace.com/pages/dynamic/article.page.php?page_id=8951§ion=news_articles&eod=1

53. http://www.ecosystemmarketplace.com/pages/dynamic/resources.library.page.php?page_id=22§ion=home&eod=1

49. See (Stanton et al., 2010)

50. <http://www.watershedconnect.com>

51. See (Millennium Ecosystem Assessment, 2005b)

CASE STUDY

PAYMENTS FOR WATERSHED SERVICES IN LOS NEGROS, BOLIVIA

Agriculture is a key activity in the Los Negros River region of Bolivia and heavily relies on irrigation from the river due to the semi-arid climate of the area. Since the late 1980s, the downstream agricultural zone experienced a 50% reduction in water levels, attributed by downstream farmers to increased upriver water use and deforestation at the headwaters. To support restoration of water levels, Fundación Natura Bolivia developed a payment for watershed services (PWS) programme to compensate upstream farmers to conserve forest. Not only does this provide watershed services, but also delivers biodiversity conservation as the watershed borders the Amboró National Park.

Based on the preferences of upstream farmers (who receive payments) the programme uses non-financial incentives in the form of artificial beehives (as well as technical training in many cases) instead of cash payments. Through a process of stakeholder engagement several key lessons were learnt on the design and use of non-financial incentives instead of (or to complement) cash payments. Firstly, it was considered important that the incentive provide long-run benefits either in the form of social benefits (such as schools or infrastructure) or by supporting alternative livelihoods. In both cases, but particularly in the case of alternative livelihoods, the incentive should help produce a genuinely marketable product and the livelihood should preferably depend on, or at least permit, ecosystem service co-production. Apiculture (bee keeping) was an appropriate alternative livelihood because it produces honey (a locally useful subsistence product) and incentivises forest

conservation to protect bee habitat (ecosystem co-production).

Another crucial consideration in incentive design was strengthening land tenure claims. Improving property rights is often cited as a reason for participation in PWS schemes. In the case of Los Negros, the inclusion of land as part of the scheme strengthens the idea it is being used and is owned by someone. Some participants have even suggested changing the in-kind payment from beehives to barbed wire, or some other support for delineating their land claim.

Finally, in relation to delivery of the incentive, the Los Negros experience highlights three important points. Firstly, training costs must be considered in the budgeting of the scheme and incentive design. This is important for any scheme that requires alternative land uses, but particularly important for in-kind payments that provide new equipment technologies for alternative livelihoods. Secondly, the incentive should be as flexible as possible to meet participants' needs. Finally, where the incentive is related to an alternative livelihood, access to markets and market creation for new products arising from this livelihood will allow the new livelihood to be adopted more effectively.

For more information see Asquith et al., 2008 <http://www.naturabolivia.org>

NON-FINANCIAL INCENTIVES

Non-financial incentives reward ecosystem-friendly behaviour by offering non-financial benefits (e.g. strengthening of property rights) or specific in-kind payments (i.e. a local school). They can be unconditional, but are usually to some degree conditional on biodiversity conservation or ecosystem service provision. While cash payments are theoretically preferred in situations where providers forgo income to deliver ecosystem services, in cases where they have been implemented the benefits from cash payments are often '*insignificant*' (Porras et al., 2008) or do not overcome opportunity costs (Wunder, 2005, Kosoy et al., 2007). In contrast, *non-financial benefits* are believed to be a key reason for participating in PES schemes. For example, strengthening property rights, capacity building, and improvements in social organisation and quality of life are often cited as strong motivations for participation by ecosystem service providers in payments for watershed services (Porras et al., 2008).

Where absorptive capacity is an issue *in-kind payments* are a more rational choice (Asquith et al., 2008). Without these financial options, there is higher risk that cash will be spent on non-necessary consumption (e.g. alcohol or other luxury goods). Although that occurrence is context-dependent, some ecosystem service providers themselves echo this sentiment and prefer receiving non-financial incentives. For example, in designing the Los Negros watershed programme (see page 156), future recipients of payments were concerned that cash did not provide a lasting benefit (Robertson and Wunder, 2005).

There are also psychological benefits to non-financial incentives. Payments can crowd-out already existing altruistic or cultural motivations for providing ecosystem services (Farley and Costanza, 2010); they may also be viewed as entitlements over time thus diminishing their ability to incentivise (Sommerville et al., 2009); and can cause fears of land expropriation (Robertson and Wunder, 2005). The decision between financial and non-financial incentives is highly context-specific, however, so ecosystem service buyers must investigate in advance the mode of incentives local ecosystem service providers prefer (Wunder, 2005).

LEVEL



PARTICIPATION



THEME



PERFORMANCE BASED



POSITIVE TAX INCENTIVES

LEVEL



PARTICIPATION



THEME



PERFORMANCE BASED



Governments can use positive tax incentives (specifically tax credits and tax exemptions) to promote ecosystem-friendly behaviour among businesses and land users. Positive tax incentives use domestic policy to deliver finance directly from a government's budget. Biodiversity-related tax credits and exemptions would therefore likely be most politically feasible if the revenue for tax incentives were generated by an ecosystem-focused revenue generation mechanism.

Positive tax incentives take many forms and are found in a range of jurisdictions, but are still not used to their potential (TEEB, 2009b). They are most commonly used to reward landowners that currently undertake biodiversity conservation or forgo future development in order to safeguard habitats (i.e. conservation easements). Positive tax incentives are not always limited to rewarding sustainable land use. They can also reward ecosystem-friendly behaviour by businesses and investors.

Whilst revenue generation mechanisms that negatively incentivise biodiversity impacts (e.g. subsidy reform and natural capital levies) are politically difficult to implement (OECD, 2005), positive incentives such as tax credits are more politically palatable. In general, however, it is preferable to tax negative impacts rather than subsidise preferable outcomes as there might be a tendency for companies or land users - who would have changed practices without the additional incentive - to take advantage of financial support (Stern, 2006).

Depending on the level at which incentives are set, positive tax incentives can leverage additional finance from personal values held by landowners (Boyd et al., 1999) or in the case of business directly from the private sector. More information is required, however, on the environmental impacts of such measures to better understand their effectiveness in achieving environmental outcomes.

CASE STUDY SUPPLEMENTARY BIODIVERSITY PAYMENTS FOR REDD+

An international climate finance mechanism for reducing emissions from deforestation (REDD+) is expected to provide substantial benefits for biodiversity. By financing the conservation of tropical forests for their greenhouse gas abatement value, REDD+ would be safeguarding habitat for the majority of the world's terrestrial species as well. But conservationists have an opportunity to increase the biodiversity benefits of REDD+ still further. By supplementing REDD+ finance with biodiversity payments, conservation organisations could guide market demand for REDD+ towards high-biodiversity forests. By leveraging the vast infrastructure being put in place for REDD+ - systems for forest conservation, monitoring, accounting and governance - transaction and startup costs could be far lower than under a project-by-project approach to biodiversity conservation.

Simulations using the OSIRIS model indicate that supplementing carbon finance with biodiversity payments would not only increase biodiversity benefits, but carbon benefits as well. In some forests carbon finance alone may be enough to incentivise conservation. In forests where carbon finance alone is insufficient, biodiversity payments would act as a subsidy, allowing combined carbon and biodiversity payments to conserve forests where costs would otherwise be too high.

A price premium for emissions reductions originating in high-biodiversity forests could be paid either by existing buyers of REDD+, or by a new set of buyers interested primarily in forest biodiversity. The price premium could be paid through:

- Providing additional up-front finance to develop high-biodiversity REDD+ programmes or projects;

- Purchasing high-biodiversity REDD+ credits above market price and reselling at regular market price; or
- Rewarding sellers of high-biodiversity REDD+ credits with a "biodiversity matching payment".

To implement any of these supplemental biodiversity payment methods, three additional global institutional investments would be useful:

A **registry** identifying the spatial origin of emission reductions would allow potential buyers of biodiversity to decide which forests are rich enough in biodiversity to merit a price premium. This registry may already be an important feature of international or national REDD+ programmes even in the absence of supplemental biodiversity finance.

Standardised, accepted **metrics** for quantitatively differentiating forests' relative biodiversity value would relieve individual buyers of the cost of gathering this information. Arriving at appropriate and accurate metrics for biodiversity value should result from an independent, transparent and science-based process, and need not be under the auspices of the UNFCCC.

A centralized institution could **consolidate demand** for the biodiversity benefits of avoided deforestation from many small and geographically dispersed potential buyers.

*Jonah Busch, Ph.D. Conservation International
For more information see (Busch et al., 2010)*

<http://www.conservation.org/osiris>

EQUITY

LEVEL



PARTICIPATION



THEME



PERFORMANCE BASED



Biodiversity finance can also be delivered as equity, whereby investors purchase a level of ownership within an investment or project. Equity can be delivered through the purchase of stocks and shares, or on a project basis (Persson et al., 2009). Similar to the delivery of biodiversity finance through concessional debt (page 136) or microfinance (page 138), equity investments are most appropriate for activities that generate a profitable revenue stream (e.g. sustainable agriculture) (Persson et al., 2009). Equity finance will therefore be most applicable to sustainable use activities. There is some potential to deliver finance through equity investments for conservation activities, but only if there is a strong regulatory framework to compensate for the ecosystem services provided by, for example, protected areas.

Equity will tend to be used to deliver private sector finance, but private equity investment in biodiversity and ecosystems is scarce since most commercial financial institutions are not familiar with the relevant issues, many projects are too small for direct financing, and most private capital has focused on more immediately lucrative sectors (Bishop et al., 2008). Public finance delivered in the form of complementary finance (such as grants or concessional loans), positive financial incentives, or risk mitigation (such as insurance and guarantees) can be used to leverage private sector equity investment and direct it towards activities that support key biodiversity and ecosystem protection objectives.

Equity is mostly used to delivery biodiversity finance in countries with low political risk, stronger financial institutions and the capacity to absorb finance. As such this mechanism is unlikely to be used to deliver large amounts of biodiversity finance to the Least Developed Countries.

CASE STUDY VERDE VENTURES: INVESTING IN ECOSYSTEM-FRIENDLY SMES

The small- and medium-sized enterprise (SME) sector represents a large and economically important sector in nearly every country in the world, accounting for 95% of registered firms worldwide. A thriving SME sector is normally considered as a sign of a thriving economy as a whole; the agglomeration of SME's helps to create new jobs, build supply chains and forge dynamic business clusters linked to global markets through trade and investment (Yago et al., 2007).

SMEs, particularly in developing countries, often have a major impact on biodiversity and ecosystem services and so present a unique opportunity to influence the development paradigm in favour of poverty alleviation and ecosystem health. Ecosystems are degrading and natural resources becoming scarcer, so as SMEs integrate into national and global supply chains they are increasingly pressured to adhere to higher environmental and human wellbeing standards to mitigate ecosystem impact and enhance social returns.

Lack of access to financing, however, is consistently cited by SMEs as one of the main barriers to growth (Beck, 2007) and adoption of more sustainable business practices. Often considered by commercial banks and financial institutions as risky and costly to finance, SMEs are largely underserved when it comes to basic financial services. The existence of this “missing middle”—a slice of the

economy not served by either microfinance institutions or large financial institutions—presents a significant challenge for countries trying to develop national green economies.

Conservation International's Verde Ventures Fund⁵⁴ (VVF) supports entrepreneurs in this 'missing middle', helping to build sustainable green economies by investing in SME's that are strategically placed to contribute to conserving Earth's biologically richest and most threatened areas. To date, VVF has provided technical assistance and financial capital of more than USD 15 million to a range of SME's in 13 countries in Africa and Latin America, serving markets as diverse as coffee, tourism, fisheries and clean energy. These investments have directly supported protection of 308,009 hectares of key biodiversity habitat and alleviated pressure on an additional 3 million hectares of protected areas adjacent to project sites, while supporting businesses that employ thousands.

VVF experience demonstrates that addressing the constraints and challenges of the SME sector can enhance employment, raise incomes, increase demand for locally sourced inputs, and widen the tax base; and this can all be done in a manner conducive to enhancing healthy ecosystems and poverty alleviation around the globe.

Neel Inamdar, Conservation International
<http://www.conservation.org/verdeventures>

54. VVF is supported by Agence Française de Développement (AFD), le Fonds Français pour l'Environnement Mondial (FFEM), International Finance Corporation (IFC), Overseas Private Investment Fund (OPIC), and Starbucks Coffee Company.

INSURANCE AND GUARANTEES

LEVEL



PARTICIPATION



THEME



PERFORMANCE BASED



Insurance and guarantees are a way to leverage private sector investment in natural capital projects. Insurance is used to reduce the overall risk seen by an investor and can be used in developing countries where insurers have experience of at least some of the risks involved in investment related to natural capital (O'Sullivan et al., 2010). Guarantees are used to specifically insure against underperformance by governments and are therefore a more appropriate mechanism to stimulate investment in LDCs (O'Sullivan et al., 2010).

Whilst insurance is typically provided by the private sector, public-sector finance could be used to subsidise insurance premiums for ecosystem investments (Gaines and Grayson, 2009). Guarantees, in contrast, are typically provided by host country governments, multilateral organisations such as the Multilateral Investment Guarantee Agency⁵⁵ (MIGA), and development banks. Public organisations like MIGA are in a better position than private investors to leverage relationships with governments and reduce political risk.

Based on hypothetical REDD-specific guarantees provided by multilateral institutions, biodiversity finance delivered as guarantees could have a leverage factor of around 1:5.5-1:6 (Gaines and Grayson, 2009)⁵⁶. Although insurance and guarantees are useful delivery mechanisms, they address the symptoms but not the causes of the barriers to increased private-sector investment (O'Sullivan et al., 2010). Additional finance, likely in the form of grants (see page 134), performance-based payments (see page 135) and concessional lending (see page 136), will therefore be needed to help remove those barriers.

⁵⁵. MIGA is a member of the World Bank Group

⁵⁶. Leverage factors for insurance are harder to estimate



DELIVERY CONCLUSIONS

DELIVERY CONCLUSIONS

The mechanisms discussed in the Delivery section are likely to have differing efficacies from country to country, depending on the varying priorities and national circumstances in which they are applied. It is therefore possible to present some broad potential complementarities between mechanisms and national context, in order to provide possibilities for future research and discussion.

In many Least Developed Countries (LDCs – see definitions on page 123) for example, unconditional grants remain a common delivery mechanism for biodiversity finance. However, as biodiversity finance generation is scaled-up, a parallel scalable system of delivery is likely to be needed to support this expansion, which could be provided by a system of national performance-based payments. In many LDCs, finance delivery to areas that indirectly support biodiversity, such as capacity building and technology transfer, will also remain critical, and is also likely to require grant based support. Concessional loans and microfinance focused on individuals and small enterprise may also be important within LDCs, but may also need to be complemented with grants. At the project level, non-financial incentives could become increasingly important, with more diversified methods of distribution such as debt-to-grant transfers increasing in use. Non-financial incentives could also be used to improve conditionality within community-level activities, and indeed may also be more appropriate in LDCs where there are issues of absorptive capacity for finance or to avoid elite capture.

Conversely, in developing countries, capacity building and technology transfer may be a lesser priority at the national level than at the sub-national level, where capacity gaps may be more prevalent. Sub-national institutions in some developing countries (particularly those with devolved government control to state or provincial level), such as Brazil and China, are likely to have a higher absorption capacity for biodiversity finance. In these cases, performance-based payments could be used to build capacity around biodiversity conservation and ecosystem service provision at these scales. Performance-based payments could also be complemented with conditional tax incentives in developing countries where fiscal enforcement is strong and there is an existing tax-base large enough to ensure that tax credits provide

the intended incentive. Small-scale microfinance may also be useful in delivering finance for conservation at a project level, but may need to be complemented with grants, whilst strong institutional arrangements and oversight are essential.

In both developing and developed countries concessional debt may also have high potential to finance sustainable land use, but is likely to require sufficient political support to ensure that the chosen delivery mechanisms have the mandate and the accountability to improve their distribution. Tax incentives could also complement these mechanisms by providing positive incentives for the private sector. In the most developed countries equity investment is also an option, where private investors could theoretically deliver finance to the enterprises engaging in sustainable land use activities.

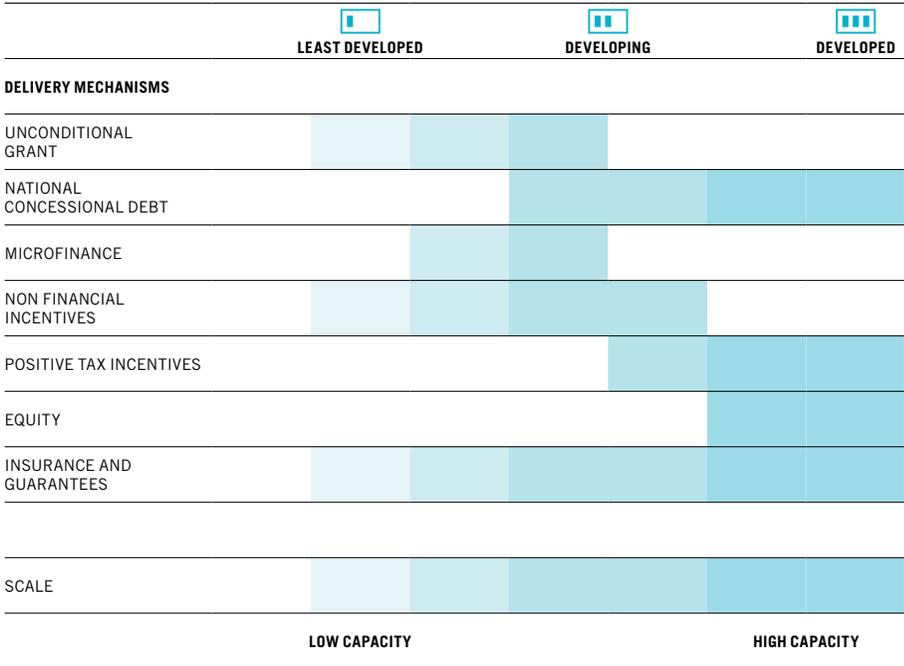
In a variety of national contexts insurance products and guarantees may also be suitable. These may be an economically efficient way to leverage public sector money, and rather than considered as a separate delivery mechanism, they could often be considered as complementary, or integral to the successful implementation of other delivery mechanisms. Indeed without complementary delivery mechanisms they often do little to address a lack of finance received on-the-ground.



BIODIVERSITY FINANCE DELIVERY MECHANISMS: WHAT COULD WORK WHERE?

This diagram proposes a broad model showing where various biodiversity finance mechanisms could be expected to be most effective, depending on national circumstances and priorities.

Figure 11.
Biodiversity finance delivery
mechanisms: What could work
where?



INSTITUTIONAL ARRANGEMENTS

UNDERSTANDING INSTITUTIONAL ARRANGEMENTS

The governance and coordination of financial flows for biodiversity is of critical importance in maximising the efficient and sustainable use of funds. This section explores the various institutional arrangements that have been proposed to manage the flows of international biodiversity finance, and which can be applied and implemented at the sub-national, national and international level across developed and developing country Parties.

THE STATE OF PLAY

A proliferation of institutions and funding channels at the international and national level has led to a fragmented, decentralised model in which developing countries must negotiate an array of uncoordinated funding sources, each with their own priorities, governance structures, and regional foci. As a result, the management of these revenue streams faces often bewildering complexity at national and project level, exacerbated by competing centres of authority and a duplication of funding efforts.

Currently, the LifeWeb Initiative (see page 176) and the GEF (see page 162) are the sole institutions that aim to mobilise and manage financial resources to achieve the CBD mandate. Outside of the CBD process, biodiversity-specific finance is provided through an array of bilateral initiatives as well as through a variety of civil society and private sector pathways. Additionally, several bilateral and multilateral funds have recently emerged related to climate finance, which offer potential co-benefits for biodiversity. But as these funds lie primarily outside of the CBD mandate, strong institutional cooperation will be required to maximise the co-benefits.

A BRIEF HISTORY

In accordance with Article 21 of the Convention, Parties are required to review the effectiveness of the mechanisms used to manage their financial resources for biodiversity, and to improve the mechanism used, if necessary through the strengthening of existing financial resources.

Parties to the CBD continually aim to substantially enhance international financial flows and domestic funding for biological diversity in order to achieve a reduction of the current funding gaps for effective implementation of the Convention's three objectives. Appropriately managing that finance will be an important factor in maximising its efficient and effective use.

INSTITUTIONAL ARRANGEMENTS FRAMEWORK

CRITERIA

The diagram opposite presents a framework that can be used to analyse and understand the different proposals that have been put forward for institutional arrangements. The framework comprises four criteria as follows:

Institutions: Will new institutions be required?

Coherence: Will there be consolidation or fragmentation of funding streams?

Devolution: Who will make spending decisions?

Approval: Who will approve funding for projects and programmes?

Using these criteria allows us to compare individual proposals and to collectively see areas of convergence or divergence.

The criteria and proposals that are discussed in this section are predominantly related to the decision-making processes within the overall financial mechanism. There will inevitably be overlap, however, between this module and the normative components of revenue generation and delivery. For clarity and understanding, decisions and criteria related to the generation and delivery of finance have been discussed in the previous two sections.

The following pages show how these criteria can be used to understand proposals for institutional arrangements.

Figure 12. A framework for understanding Institutional Arrangements

INSTITUTIONAL ARRANGEMENTS

PRINCIPLE

EFFECTIVE / EFFICIENT

EQUITABLE / TRANSPARENT

CRITERION

COHERENCE

Will there be consolidation of fragmentation of funding streams?

INSTITUTIONS

Will new institutions be required?

DEVOLUTION

Who will make spending decisions?

APPROVAL

Who will approve funding for projects and programmes ?

CASE STUDY THE GLOBAL ENVIRONMENT FACILITY

The Global Environment Facility (GEF) was established in 1991 and is the largest single funder of environmental projects having to date allocated over USD 10 billion to over 2,800 projects in 168 developing countries and economies in transition (EITs)⁵⁵.

DELIVERY OF FINANCE FOR BIODIVERSITY

Finance under the GEF is delivered through unconditional grants to cover the 'incremental costs' of actions to protect the environment. The GEF funds projects across six focal areas: biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants. The goal of the biodiversity focal area – in line with the objectives of the CBD - is the conservation and sustainable use of biodiversity and the maintenance of ecosystem goods and services. To achieve this goal, the current GEF biodiversity strategy encompasses four objectives: to improve the sustainability of protected area systems; to mainstream biodiversity conservation and sustainable use into production landscapes/seascapes and sectors; to build capacity to implement the Cartagena Protocol on Biosafety; and to build capacity on access to genetic resources and benefit sharing.

The funding that is directly used for biodiversity has increased in recent years, with an average USD 300 million a year committed to the biodiversity focal area under the GEF-5 replenishment that runs from fiscal year 2011 through fiscal year 2014.

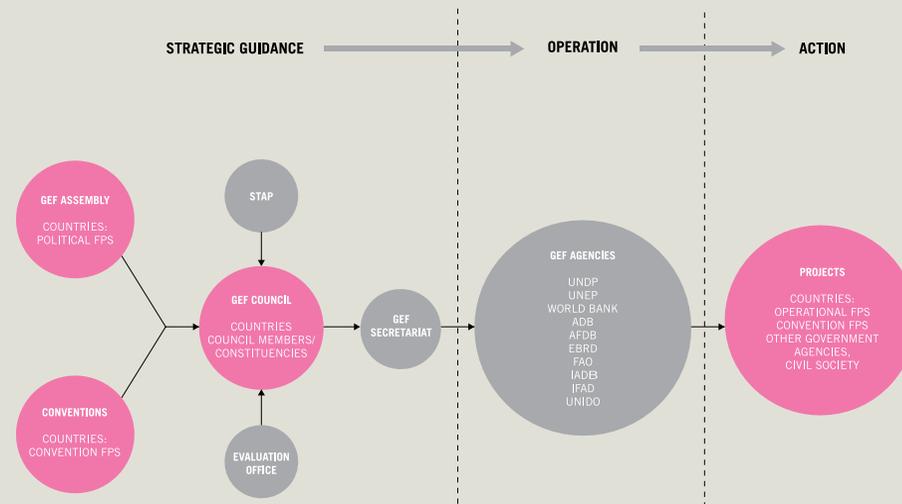
INSTITUTIONAL ARRANGEMENTS OF THE GEF

The governance structure of the GEF is composed of the Assembly, the Council, the Secretariat, 10 agencies, a Scientific and Technical Advisory Panel (STAP), and the Independent Office of Monitoring and Evaluation (see Figure 13).

The **Assembly** is made up of all 176 member countries, or Participants. It meets every four years at the ministerial level to review the general policies, operations, membership and potential amendments to the GEF. The **Council** is the main governing body of the GEF and is comprised of 14 donor Participants and 18 recipient Participants. The Council meets every six months and is responsible for developing, adopting and evaluating the operational policies and programmes for GEF-financed activities, as well as reviewing and approving the work programme (projects submitted for approval)⁵⁶. The GEF **Secretariat** coordinates the overall implementation of GEF activities. It services and reports to the Assembly and the Council.

The GEF has 10 implementing Agencies that act as the operational arm of the GEF. The **Scientific and Technical Advisory Panel (STAP)** provides independent advice to the GEF on scientific and technical aspects of programmes and policies. The members of STAP are appointed by the Executive Director of UNEP, in consultation with the GEF's CEO, the Administrator of UNDP, and the President of the World Bank.

Figure 13. Structure of the GEF adapted from http://thegef.org/gef/gef_structure



55. The information presented here has been taken from <http://www.thegef.org> and <http://www.climatefundsupdate.org/listing/gef-trust-fund> and http://unfccc.int/files/cooperation_and_support/technology/application/pdf/es_gef.pdf

56. As decisions are made by consensus, two-thirds of the Members of the Council constitute a quorum.

Figure 14. Contributions by donor countries to the GEF-5 replenishment



The Independent Office of Monitoring and Evaluation (M&E) provides a basis for decision-making on amendments and improvements of policies, strategies, programme management, procedures and projects; promotes accountability for resource use against project objectives; documents and provides feedback to subsequent activities; and promotes knowledge management on results, performance and lessons learned.

CONTRIBUTIONS TO THE GEF

The GEF is replenished every four years by donors and contributions to the fund are considered ODA by donor countries. In November 2006, under the GEF-4 replenishment, thirty-two donor countries pledged USD 3.13 billion to fund operations until June, 2010. Under the current GEF-5 replenishment USD 4.25 billion is being pledged from thirty-four donor countries for the period 1 July 2010 to 30 June 2014 (see Figure 14).

To date GEF financing has been complemented by more than USD 47 billion in co-financing. One of the central questions, however, is the extent to which both GEF funds and co-financing are truly 'additional' as required by the Rio Conventions on climate and biodiversity (Pearce, 2004) (see page 52 for a discussion of additionality). Since ODA for the environment as a proportion of total ODA has declined in recent years (Castro and Hammond, 2009), one argument is that GEF replenishments and co-financing are not new and additional finance, but are simply diverted from other financing channels.



INSTITUTIONS

The first criterion for institutional arrangements describes how existing institutions will play a role in a future financial mechanism.

Options: New, Reformed

Whilst there are a multitude of organisations and financing channels available for biodiversity and ecosystem services, they are not designed to deal with the scale of financing that is required to meet the objectives of the CBD. This status quo leaves two possible alternatives: either create **new** institutions or **reform** existing ones.

Under a reformed approach, existing institutions, such as the Global Environment Facility (GEF) (see page 162) or existing conservation trust funds, would be improved or made 'fit for purpose'. This could mean reform within institutions, but could also mean reform in a broader sense of changing the number of and/or coordination between institutions of the same type (e.g. CTFs). The alternative to reform is to create new and appropriate institutions to enable the objectives of the Convention to be fulfilled. The debate around new versus reformed institutions is largely one of control. A central argument for creating new institutions is that the existing institutions typically represent the views and interests of developed country Parties, or the constituents of developed countries (e.g. through Philanthropy or other private mechanisms). Developing countries therefore see new institutional arrangements as a way to achieve equitable representation and more direct access to finance, particularly international sources.

As with other criteria outlined here, the decision to reform existing institutions or to create new institutions is not binary. Both scenarios would require a transition period, and some degree of both is likely required. The institutional arrangements presented here, however, have a stronger element of one option over the other.

COHERENCE

The second consideration for institutions is to what extent there will be consolidation of different revenue generation streams.

Options: Consolidated, Fragmented

As outlined in the revenue generation section, there are a multitude of mechanisms available to generate revenue for biodiversity and ecosystem services. A key question for the institutional arrangements of a financial mechanism will be whether funding streams will remain fragmented or whether they will be consolidated.

The level of coherence of revenue streams is a spectrum, ranging from a fully consolidated global fund at one end to a completely fragmented financial architecture at the other. The fully consolidated funding model would require all global biodiversity finance to be channelled through a single entity. At the other end of the funding spectrum, a fragmented system would involve no aggregation of finance and recipients would face a multitude of discrete and uncoordinated funding streams.

The consolidation, or at least the coordination, of funding streams both at the national and the international level is an important requirement for funding mechanisms (Müller, 2009), as it is unlikely that distribution of these funds to different themes (see page 126) or groups (see the participation criterion on page 123) can be achieved in the absence of coordinated management of these funds.

Furthermore, the fragmentation of funding streams at the international level makes the management of funds in recipient countries complex and can lead to competing centres of authority and a duplication of funding efforts at the national level (Brown et al., 2009). Another serious problem with fragmented funding streams is that it has proven very difficult in the past to monitor, report and verify the flow of finance, even when carried out as part of a 'political commitment' (Müller and Gomez-Echeverri, 2009). These are both issues that cannot be overcome so easily with coordination, and call for some degree of consolidation.





DEVOLUTION

A further consideration for institutional arrangements is the choice of where and how decisions are made on the delivery of finance and who makes them.

Options: Devolved, Retained

In general, spending decisions can either be made by recipients of finance (devolved) or by donors (retained). As with the coherence criterion, the choice of devolution will be one of degrees; that is, some funding models will require more or less devolution than others in the delivery of finance. The current financial architecture, with a few exceptions, uses a retained model in which donors make decisions on how finance is delivered.

The subsidiarity principle encourages decisions to be made at the lowest or least centralised *competent* authority. The devolution of funding decisions is vital in ensuring both national- and community-level ownership of actions to conserve biodiversity and ensure ecosystem service provision. It also provides 'direct access' to funding and leaves the option for both off-budget and on-budget funding streams.

Devolved or national-level decision-making also relieves international bodies of an otherwise unmanageable number of operational decisions related to the approval of activities and monitoring, reporting and verification (MRV) of support (Müller and Gomez-Echeverri, 2009). As decision-making is devolved further, however, monitoring of how financing is being used will likely need to increase.

APPROVAL

This final criterion describes who will approve funding for projects, programmes and activities in developing countries.

Options: Centralised, Decentralised

There are two ways in which decisions related to the approval of funding can be made. Decision-making can either be centralised, under a national or international governing body; or decentralised, whereby individual donors or recipients make decisions on how finance is used. The current model for financing (with a few exceptions) is decentralised, in which decisions about how finance for biodiversity is generated and delivered are retained (see page 168) by a fragmented (see page 167) array of bi- and multi-lateral donor organisations. This approach is typically not favoured by the recipients of finance due to the lack of involvement in decision-making processes. An alternative proposition would be a decentralised model in which decision-making is devolved to the recipients of finance.

The alternative to a decentralised approach is a centralised approach, in which a central national or international body would take decisions relating to how finance should be generated and delivered. At the international level, the governing body could be under the authority or guidance of the Parties to the CBD (see the GEF on page 162) or it could be a multilateral fund under the World Bank. At the national level, the governing body could be under the authority of the national government or a non-governmental organisation. Due to issues of political capture (see page 54), it may be preferable at the national-level to establish funds that are legally separate entities from national governments.

As discussed above, under a devolved model, decentralised decision-making relieves international bodies of an otherwise unmanageable number of operational decisions related to the approval of funding activities (Müller and Gomez-Echeverri, 2009). An element of centralised authority is desirable, however, for certain types of capacity building and technology-transfer activities (Müller, 2009).



INSTITUTIONAL ARRANGEMENTS PROPOSALS

A GUIDE TO INSTITUTIONAL ARRANGEMENTS

INSTITUTIONS



COHERENCE



DEVOLUTION



APPROVAL



The following pages present a guide to four options for the institutional arrangement of finance for biodiversity and ecosystem services using the framework presented above. Each option is represented graphically using the icons shown overleaf. These icons represent the main options from the analytical framework, and have been grouped into their respective criteria.

The icons will be presented to the side of each proposal in an 'icon bar' shown here on the left. Not all proposals aim to define all of the criteria of the framework. To simplify matters, all icons in the icon bar will be greyed out by default and only the options that are explicitly proposed in the submissions will be highlighted in colour.

For example the 'icon bar' shown on the left indicates that this hypothetical institution would use a new, consolidated institution with devolved and decentralised decision-making.

KEY TO INSTITUTIONAL ARRANGEMENTS ICONS

INSTITUTIONS REFORMED



NEW



COHERENCE CONSOLIDATED



FRAGMENTED



DEVOLUTION DEVOLVED



RETAINED



APPROVAL CENTRALISED



DECENTRALISED



CONSERVATION TRUST FUND

INSTITUTIONS



COHERENCE



DEVOLUTION



APPROVAL



A conservation trust fund (CTF) is a pool of biodiversity finance managed by an entity that is legally independent from the institutions where financing is generated. CTFs have three primary structures: 1) an *endowment fund* where the principal capital is invested in perpetuity, and only investment income is spent on conservation; 2) a *sinking fund* where a portion of principal capital is spent each year along with the investment income; and 3) a *revolving fund* where the principal capital is maintained by earmarked revenue generated through taxes, fees, etc.

As of early 2011, 60 CTFs existed worldwide with many more in formation (Adams & Victorine, 2011). Many funds are up to 20 years old, and work at the national (e.g., FONAFIFO on page 94) or sub-national level (e.g. FONAG, page 68). Some CTFs are reforming and consolidating into CTFs that work not by political boundaries, but at the eco-region level, which is particularly useful for transboundary ecosystems such as tropical forests.

Whilst CTFs have traditionally delivered finance through grants delivered to protected area systems, funds have emerged recently that deliver performance-based payments in exchange for ecosystem services (see e.g. FONAFIFO and FONAG). There has also been a donor-driven push to finance more sustainable use activities rather than strict conservation (Spergel & Taïeb, 2008). As such, in addition to direct environmental benefits, the long-term nature of CTFs is helping to support long-term community support for conservation (Adams & Victorine, 2011).

CTFs usually support national government's sustainable development objectives, and although they can be established by governments, they are legally separate entities. This is important when receiving revenue from a domestic tax or other mechanism that is difficult to hypothecate (e.g. the petrol tax in Costa Rica, 106). Allocating national funds to CTFs has seen only moderate success in avoiding revenue capture (see page 54). Allocating international finance to CTFs has seen much more success based on experience with debt-for-nature swaps (page 96) and GEF funds (page 162), used to capitalise CTFs, and which have often worked to heavily leverage initial capitalisation.

CLEARING HOUSE

A clearinghouse is an institutional arrangement that brings together buyers and sellers of biodiversity and ecosystem service projects. By providing a forum for sharing diversified projects, a clearinghouse makes it easier for buyers to locate and finance projects that match their needs, thereby lowering overall transaction costs. Whilst an exchange market (see page 172) requires a standard metric of exchange (e.g. hectares of forest restored), a clearinghouse can sell diversified projects to buyers with differing individual needs. As such, a clearinghouse is more appropriate in situations where markets are not yet fully developed, where projects deliver unstandardised or unmeasured benefits or in markets where most trades consist of one-off, bespoke purchases from a diversified group of buyers.

An example of an international clearinghouse in action is the CBD LifeWeb Initiative (see page 176) that allows Parties and private donors who have committed to funding biodiversity protection in developing countries and countries with economies in transition to easily find projects and programmes that meet their needs. An international private sector clearinghouse could also be useful if private sector demand for voluntary biodiversity offsets increases on a global scale (see BBOP on page 72). In addition to providing informational services, a clearinghouse could also provide a channel for transferring finance from buyers to sellers, which could further lower transaction costs and help achieve economies of scale. Importantly, a clearinghouse is primarily a platform of information, so even if a finance channel were provided a clearinghouse would not consolidate finance and nor would it have authority over how the funding is raised or delivered.

As illustrated by CBD LifeWeb, a clearinghouse can work at the international level and it can also be established at a national level, assuming the demand for projects is high enough to warrant it. Such an institutional arrangement would be useful in countries with regulation that makes the private sector liable for their impact on biodiversity and ecosystems, but for political reasons choose not to use a standard metric. This may be the case in high biodiversity areas where offsetting requires a strict like-for-like equivalency (eftec, IEEP, et al., 2010).

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CASE STUDY THE LIFEWEB INITIATIVE

GOAL AND MANDATE

The CBD LifeWeb Initiative is a partnership platform that strengthens financing for protected areas to conserve biodiversity, secure livelihoods and address climate change, through implementation of the CBD Programme of Work on Protected Areas (PoWPA). LifeWeb adds value to donors and recipients by: Providing a user-friendly clearing-house of financial priorities; Facilitating funding matches; Helping leverage counterpart funding; Recognising support provided for protected area solutions.

CBD LifeWeb was invited by the 9th Conference of the Parties to the CBD, and is managed by the CBD Secretariat. The 10th Conference of the Parties (COP10) encourages developing countries to express funding needs based on their national biodiversity strategies and action plans through the LifeWeb Initiative and urged donors and countries in a position to do so to support funding needs. COP10 also encouraged donors, Parties and countries in a position to do so to hold sub-regional and national roundtable meetings to support mobilisation of funding, involving relevant funding institutions, in collaboration with the CBD LifeWeb Initiative.

HOW IT WORKS

Developing countries and countries with economies in transition are invited to submit "Expressions of Interest" of their priorities using a template provided on the CBD LifeWeb website. These submissions provide an overview of *in-situ* biodiversity funding needs and must be consistent with priorities defined in national biodiversity action plans and advance the implementation of the CBD PoWPA. Submissions must be made by the

National Focal Point or the Focal Point for the PoWPA, or by indigenous or local community groups accompanied by an endorsement letter from a Focal Point. Submissions are then profiled on LifeWeb's interactive clearing-house website.

The LifeWeb coordination office proactively shares project concepts and attempts to facilitate funding matches with a diversity of donors interested in sustaining biodiversity, addressing climate change and securing livelihoods. The roundtable process serves as a means for host country(s) to convey their protected area priorities based on national planning and to invite financial support from multiple international cooperation partners at the same time. For international cooperation partners, the roundtables provide a means to gain information and align their cooperation focus to be consistent with recipient priorities, as well as and identify opportunities for coordination and counterpart funding among Parties, consistent with the Paris Declaration on Aid Effectiveness. Suggested criteria for holding national financing round tables in collaboration with CBD LifeWeb Initiative are:

- A clear vision for national priorities, based on National Biodiversity Strategies and Action Plans, in particular, for implementing the CBD Programme of Work on Protected Areas.
- Political will and recent demonstrated commitment by host government(s) to strengthen funding from domestic sources.
- A submission made to CBD LifeWeb clearing house inviting international cooperation based on national priorities.

As of November 2010, the CBD LifeWeb Initiative has profiled more than 70 submissions totalling more than USD 1 billion.

Since 2008, financing for protected area projects associated with LifeWeb has totaled over USD 200 million. At the CBD LifeWeb dinner held at COP10 on 24 October 2010, over USD 110 million in financial support was announced for specific projects profiled on the CBD LifeWeb clearing-house and facilitated with the support of this platform.

FEATURED MATCHES

Forever Costa Rica

Covering less than one tenth of 1% of the Earth's surface, Costa Rica still hosts as much as 5% of the world's biodiversity. Although 26% of the country's land area is placed under various protection management categories, Costa Rica's current marine protected areas are inadequate to support its collapsing fisheries and its national parks suffer from insufficient and uncertain financing.

Forever Costa Rica will double the country's marine protected areas system, establish an independent trust to provide long term support to this expansion, and manage marine and terrestrial protected areas. Under the terms of the agreement with the Costa Rican government, more than USD 50 million of external private and public funding will be placed in a permanent trust, leveraging the Costa Rican government's ongoing funding of USD 19 million annually, thus sustaining long-term funding for protected areas. To help Costa Rica reach its goals, USD 50 million has been confirmed from the Government of the United States through the Tropical Forest Conservation Act, as well as the Gordon and Betty Moore Foundation, the Linden Trust, the Walton Family Foundation, and The Nature Conservancy, with further support in the final stage of agreement announced by the government of Germany.

Colombia

In June 2010 the Presidential Agency for Social Action and International Cooperation, National Parks of Colombia, and the CBD Secretariat's LifeWeb Initiative launched a national round table for financing Colombia's protected areas. This roundtable serves as a forum to examine protected area financing needs in Colombia and these priorities were shared as a basis to foster cooperation and coordination in support of the establishment and maintenance of a comprehensive, effectively-managed and ecologically-representative national system of protected areas, consistent with the CBD PoWPA. Two meetings have been held to date, and have been attended by governments of 9 international cooperation partners, the Colombian Ministries of Foreign Affairs and Environment, the Department of National Planning, as well as NGOs. A working group of Colombian government and support organisations has been formed to advance the articulation of specific priorities and gaps in support, in support of this process involving both public and private development partners.

At the CBD LifeWeb dinner on 24th October 2010, it was announced that the US Agency for International Cooperation intends to provide USD 20 million, much of which will be consistent with the aforementioned roundtable. In addition, at this same dinner, it was also announced that the government of the Netherlands will support USD 5 million for REDD+ preparation in protected areas and buffer zones in the Colombian Amazon, consistent with Colombia's Expression of Interest submitted to the CBD LifeWeb.

<http://www.cbd.int/lifeweb>

EXCHANGE MARKET

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An exchange market links buyers and sellers of biodiversity and ecosystem service offsets and credits using a standard metric of exchange (e.g. hectare of forest), making credits easily tradable (i.e. fungible). In other words, unlike a clearinghouse, which is project-based, an exchange market is credit-based.

The units of exchange in an exchange market can be relatively simplistic or more complex measures that account for combinations of area impacted, ecosystem services impacted, priority level of biodiversity impacted, etc. The fungibility⁵⁷ of credits will be crucial in determining potential market size and complexity. Simpler units of exchange (e.g. hectares of habitat or tonnes of carbon) lend themselves to a broader market reach, and would be simpler to arrange institutionally; they are therefore often used for the exchange of ecosystem-service-based credits (e.g. forest carbon markets). Markets with more complex approaches to the metric of exchange, sometimes described as registry-based markets, exhibit elements of both a true exchange market and a clearinghouse. Further, they require greater institutional capacity, and are generally only used on a sub-national, national, or regional scale; they are therefore more applicable for programmes of biodiversity protection (see Australian Biodiversity Markets on page 179).

As with a clearinghouse mechanism, exchange markets would not consolidate financing nor have authority over it. In contrast to a clearinghouse arrangement, however, since less information is provided about how credits are originated, the decision on delivery of finance is devolved to the project developers.

⁵⁷ The tradability of credits for commodities including biodiversity and ecosystem services is often referred to as fungibility.

CASE STUDY AUSTRALIAN 'MARKETS' FOR NATIVE VEGETATION

Roughly half of the world's biodiversity offsetting programmes are funded by buyers that require 'one-off' offsets that are generally negotiated between the developer and the regulator; and these trades could easily be facilitated through a clearinghouse mechanism (see page 175). There are also examples of more market-like institutions being used to protect biodiversity, in which a brokerage or registry is generally required to support the exchange of more complex credits associated with biodiversity exchange markets (see page 178). Australia provides two good examples of such markets.

The **BushBroker** programme in the state of Victoria is a government-assisted offset-brokering service that facilitates the supply of native vegetation offsets. Market demand is created by a permitting system that regulates clearing of native vegetation⁵⁸. To facilitate supply, the BushBroker programme identifies landowners willing to preserve and manage native vegetation on their property and then a government or accredited private assessor determines the potential number and type of credits available on the site using the *habitat hectares* measurement methodology. Credits are created under this methodology through conservation gains from management actions, protection, maintenance of quality, and improvements of quality specified in a permanent on-title agreement signed by the landowner. The BushBroker programme keeps a database of willing landowners that permit-holders requiring offsets can search to find an appropriate offset. BushBroker has also seen several habitat banks initiated in the programme and will be expanding banking by creating a pool of supply for its over-the-counter programme. Over 200 transactions have been completed to date.

While Victoria focuses on brokering services for one-off offsets, in the neighbouring state of New South Wales, the BioBanking program uses a registry to support the creation of credits in BioBanks. Like BushBroker, private landowners provide a supply of ecosystem and species credits to developers needing to comply with environmental regulation (essentially to offset their negative impacts on ecosystems). Negative impacts (and therefore the demand for offsets) are calculated by accredited assessors using the *BioBanking Assessment Methodology* and its associated *Credit Calculator* software. Credits are created through land protection and management (i.e., managing grazing, fire, weeds, and human disturbance) carried out by the landowner as specified in each BioBank agreement.

The New South Wales Department of Energy and Climate Change (DECC) maintains a registry of these agreements that provides information on the nature of the credits (searchable by location, ecosystem or species type), landowners interested in creating BioBanks, and credit transactions and sales. The programme also features a government-run *BioBanking Trust Fund* to ensure sufficient funding for ongoing maintenance of BioBank sites. When a credit sale occurs, a set amount is sent to the Trust Fund that distributes funds on an annual basis. The remaining portion of the sale is the profit to the landowner. Currently, only one BioBank has been established but applications for another five sites are being assessed.

Becca Madsen, Madsen Environmental

⁵⁸ The 2002 Native Vegetation Management Framework

FRAGMENTED AND DECENTRALISED

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Under a fragmented and decentralised model a very large number of actors work in a relatively uncoordinated manner to implement projects and programmes. This model is generally associated with more traditional biodiversity finance, which in the context of developing countries is dominated by ODA.

The current aid architecture provides an indication of the current status of institutional arrangements for biodiversity finance. There are over 2,500 individual donor/recipient relationships for the delivery of ODA, 60% which are used for environment aid, and the proliferation of actors for environment aid has occurred twice as fast as within ODA (Castro and Hammond, 2009).

Some level of decentralisation is desirable within the context of a consolidated fund, such as the GEF, to relieve central institutions of an otherwise unmanageable number of funding decisions (Müller and Gomez-Echeverri, 2009). Equally some level of fragmentation is required as different financial mechanisms will lend themselves more to different activities.

As biodiversity finance is scaled up, therefore, particularly from fragmented sources such as ODA, it will be important to make full use of the existing channels available. Those channels must be used rationally, however, with some level of coordination of finance and decentralisation of decision-making, particularly those related to the approval of funding. Learning from discussions under the climate change regime, an element of centralised authority can be particularly useful for some capacity building and technology-transfer activities (Müller, 2009).



INSTITUTIONAL ARRANGEMENTS CONCLUSIONS

INSTITUTIONAL ARRANGEMENTS CONCLUSIONS

Similar to the delivery mechanisms, the institutional arrangements discussed in this section will have differing efficacies from country to country, depending on the varying priorities and national circumstances in which they are utilised.

Conservation trust funds (CTFs), for example, are a widely used form of institutional arrangement that facilitate the generation and delivery of biodiversity finance. CTF's should ideally contribute to the consolidation of finance for conservation activities at a national level, making it simpler for groups engaged in biodiversity or conservation projects to locate funding, thereby reducing costs. Despite their value, however, it is likely that a proliferation of CTFs could lead to further fragmentation of funds at a national level, thereby decreasing the coordination of funding at a national scale.

As biodiversity finance generation is scaled up in response to needs, the importance of improving the coordination of the institutional landscape for biodiversity finance increases. Improved coordination requires better exchange of information between donors or buyers, and the providers and/or guardians of ecosystem services and biodiversity conservation projects. A clearing house, for example, could provide an improvement over the current biodiversity finance landscape in some countries, improving efficiency by coordinating information and possibly even facilitating financial flows.

Expanding the clearing house model, and possibly suited to countries with higher levels of institutional capacity, is that of an exchange market. Exchange markets create and trade environmental assets, permitting broader market participation. Decision-making becomes more devolved to those that generate credits, which in turn requires monitoring to ensure that biodiversity is being conserved.

However, matching buyers and sellers on an exchange market or clearing house could potentially increase fragmentation of funding channels. There is therefore a balance to be reached between the possible fragmentation of funding from a market and possible centralisation of funding when consolidating funding channels.



**WHERE DO WE
GO FROM HERE?**

GOING FORWARD: BRINGING IT ALL TOGETHER

The aims of revising the Little Biodiversity Finance Book (LBFB) were threefold: to link the book more closely with the developing work to track finance under the Convention; to update the various generation, delivery and institutional arrangement mechanisms; and to develop a more precise estimate of what is currently being spent on biodiversity.

The findings from this edition of the LBFB illuminate a clear set of recommendations:

1. The generation of finance for biodiversity must be scaled-up globally. In 2010 the global biodiversity target to “achieve a significant reduction of the current rate of biodiversity loss” set by CBD was universally missed (CBD, 2010c). In the same year, finance for biodiversity totalled USD 51.8 billion (see table 3 page 29). If this sum was not enough to reach the targets set for 2010, even more will be needed if we are to meet the more ambitious Aichi Targets.

2. All generation mechanisms outlined in this book are needed to increase the scale of biodiversity finance. It is estimated that by 2020 all the generation mechanisms discussed in this book could generate USD 70- 159 billion annually for biodiversity. Even excluding the *other-market* mechanisms – which are the most difficult to implement as – the remaining mechanisms could still raise USD 64 – 133 billion by 2020. It is clear however that no single mechanism or group of mechanisms can alone scale-up finance.

3. Proportionally more finance needs to be directed towards the regions that contain the highest biodiversity. Biodiversity finance is overwhelmingly generated by, and delivered in, the world’s largest economies. Currently, 78% of biodiversity finance is generated in what are traditionally considered developed economies, and 59% of this finance is delivered in those same countries. The difference between generation and delivery in developed economies, 19%, is transferred to lower income countries. This leaves only 41% of biodiversity finance being delivered in regions that contain the world’s most bio-diverse ecosystems.

4. Scaling-up biodiversity finance requires a greater balance between market and non-market based mechanisms. Eighty per cent of biodiversity finance is generated from non-market mechanisms. Although these mechanisms could scale-up by 2020, the market-based - direct, indirect and other-market - mechanisms have a greater potential to increase in scale. The market-based mechanisms could generate up to 50% of finance in 2020.

5. Scaling-up finance would share the financial burden more equitably between the public and private sector, and within the private sector between the beneficiaries and polluters. In 2010, 80% of biodiversity finance was generated from the public sector, 13% was from private sector beneficiaries, and only 7% came from private sector polluters. By 2020, this balance could shift towards a 50% public and 50% private split, and within the finance generated from the private sector, a greater proportion (21%) could come from private sector polluters.

6. All delivery mechanisms are needed to achieve scale but will be applied in different contexts. The range of delivery mechanisms covers traditional development finance – grants, debt and equity – and those that provide some form of incentive. Similar to generation mechanisms, no single delivery mechanism offers a panacea and they are often very context specific. The choice of delivery mechanism should be informed by environmental priorities, the political context and country capabilities.

7. Greater coordination of biodiversity finance is crucial in scaling-up. The landscape of biodiversity finance is currently fragmented and decentralised, and key sources are minimally devolved. This is likely to change as the CBD process of producing NBSAPs provides more coordination of finance.

As countries begin to develop biodiversity plans, either as part of the CBD process or independently of it, we hope that the options described in this book and, more importantly, the key messages highlighted above, will feed in to those processes.

ANNEXES

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LIST OF ACRONYMS

ABS	Asset Backed Security
BBOP	Business and Biodiversity Offset Programme
CBD	Convention on Biological Diversity
CO2	Carbon Dioxide
COP	Conference of the Parties
CSR	Corporate Social Responsibility
DAC	Development Assistance Committee
DfN	Debt for Nature
EBRD	European Bank for Reconstruction and Development
EIT	Economy in Transition
ES	Ecosystem Service
ETS	Emissions Trading Scheme
FAO	Food and Agricultural Organization
GEF	Global Environment Facility
IADB	Inter-American Development Bank
IFAD	International Fund for Agricultural Development
IFQ	Individual Fishing Quotas
IPCC	Intergovernmental Panel on Climate Change
IUCN	The World Conservation Union
IWG-IFR	Informal Working Group on Interim Financing for REDD
LDC	Least Developed Country
MDG	Millennium Development Goal
MFI	Microfinance Institutions
NGO	Non-governmental Organisation
NTFP	Non-timber Forest Product
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PA	Protected Area
PES	Payments for Ecosystem Services
PWS	Payments for Watershed Services
REDD	Reducing Emissions from Deforestation and forest Degradation
SFM	Sustainable Forest Management
tCO2	Tonne of Carbon Dioxide
TEEB	The Economics of Ecosystems and Biodiversity
TDR	Tradable Development Right
TURF	Territorial Use Right for Fisheries
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
WTO	World Tourism Organization
WQT	Water Quality Trading
WWF	World Wildlife Fund



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