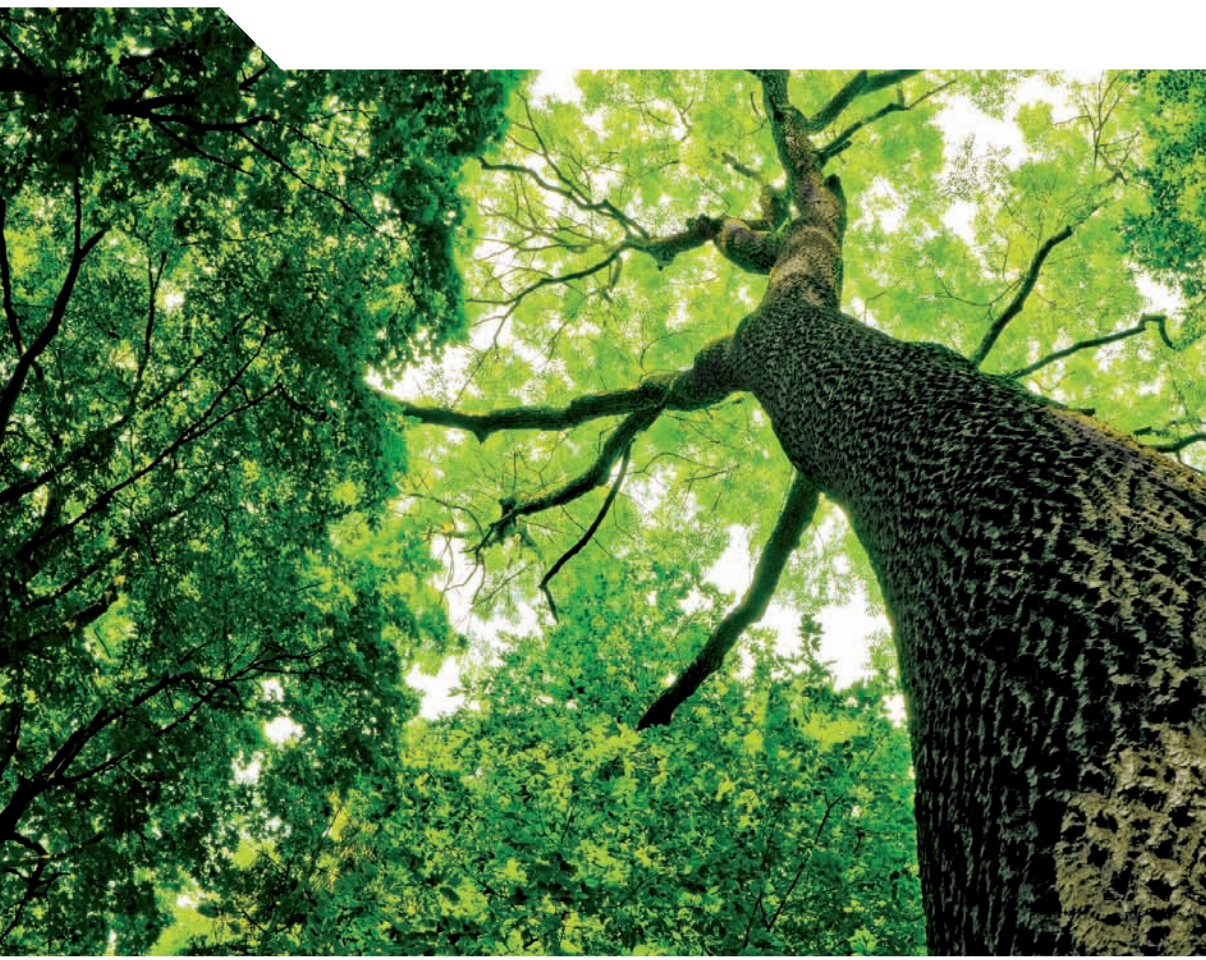
Scaling-up Finance Mechanisms for Biodiversity



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Foreword

Biodiversity loss is a major environmental challenge facing humankind. Biodiversity provides critical life-support functions and services to society, including food, clean water, genetic resources, flood protection, nutrient cycling and climate regulation. These services in turn are essential to human health, security, well-being and economic growth. However, these benefits are not fully reflected in market prices and are therefore undervalued and underprovided. Private decision makers do not always consider the social costs and benefits of natural resources and ecosystem conservation and sustainable use, but rather generally focus only their own private costs and benefits. As a result, biodiversity continues to be under-valued and lost.

The OECD provides analytical support to governments and institutions on the valuation of biodiversity and ecosystem services and on the use of economic and other policy instruments for the conservation and sustainable use of biodiversity. The issue of financing biodiversity programmes has been an increasingly important part of the national and international policy debate on biodiversity, and has been one of the more contentious policy issues in these discussions.

This book, produced under the auspices of the OECD Working Party on Biodiversity, Water and Ecosystems, considers the opportunities for scaling-up finance for biodiversity from six "innovative financial mechanisms" (as classified in Goal 4 of the Convention on Biological Diversity's Strategy for Resource Mobilization). These are: environmental fiscal reform; payments for ecosystem services; biodiversity offsets; markets for green products; biodiversity in climate change funding; and biodiversity in international development finance.

Drawing on literature and more than 40 case studies worldwide, the book addresses the following questions: What are these mechanisms and how do they work? How much finance have they mobilised and what potential is there to scale this up? And what are the key design and implementation issues – including environmental and social safeguards – that need to be addressed so that governments can help ensure these mechanisms are environmentally effective, economically efficient and distributionally equitable?

Acknowledgements

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This work has also benefitted from the presentations and discussions at the international workshop on *Financing Mechanisms for Biodiversity: Examining Opportunities and Challenges*, which took place on 12 May 2012, in Montreal, Canada. This workshop was convened by the OECD, World Bank, GEF and the European Commission, together with Sweden and India. The Co-Chairs summary of the workshop can be found at *www.oecd.org/env/biodiversity*.

The book has been prepared by Katia Karousakis and Edward Perry with contributions from SoEun Ahn, and has benefited from feedback from OECD colleagues, including Nils Axel Braathen, Christa Clapp, Anthony Cox, Dimitris Diakosavvas, Guillaume Gruere, Hubert de Milly, Marie-Christine Tremblay and Tetsuya Uetake.

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Acronyms and abbreviations

ADB	Asian Development Bank
BBOP	Business and Biodiversity Offset Programme
BOD	Biological oxygen demand
CBD	Convention on Biological Diversity
CDC	Caisse des Dépôts et Consignations
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CONAFOR	Comisión Nacional Forestal (National Forestry Commission)
CRP	Conservation Reserve Programme
DECC	New South Wales Department of Environment and Climate Change, Australia
EFR	Environmental Fiscal Reform
EIA	Environmental Impact Assessment
ENTWINED	Environment and Trade in a World of Interdependence
EUSF	Environment User Fees System (Philippines)
EVC	Ecological Vegetation Classes
FAN	Fondo Ambiental Nacional
FAST	Finance Alliance for Sustainable Trade
FDI	Foreign Direct Investment
FLO	Fairtrade Labelling Organizations International
FSC	Forest Stewardship Council
FWS	US Fish and Wildlife Service

GBO-3	Global Biodiversity Outlook 3 (Convention on Biological Diversity)
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GPP	Green Public Procurement
HADD	Harmful Alteration, Disruption, or Destruction of fish habitat
HDI	Human Development Index
HIS	Habitat Sustainability Indices
HU	Habitat Units
ICMS-E	Imposto sobre Circulaçao de Mercadorias e Servicios-Ecológico (Tax over Circulation of Products and Services-Ecological)
IFC	International Finance Corporation
IFOAM	International Federation of Organic Agriculture Movements
IIED	International Institute for Environment and Development
IISD	International Institute for Sustainable Development
ISEAL	International Social and Environmental Accreditation and Labelling Alliance
ISO	International Organization for Standardization
KfW Bank	Kreditanstalt Für Wiederaufbau (German Development Bank)
LGEEPA	Ley General de Equilibrio Ecologico y Proteccional Ambiente (Mexico)
LLDA	Laguna Lake Development Authority
MSC	Marine Stewardship Council
NGO	Non-governmental Organization
NMFS	National Marine Fisheries Service
ODA	Official Development Assistance
OECD	Organisation for Economic Cooperation and Development
PEFC	Programme for the Endorsement of Forest Certification

PES	Payments for Ecosystem Services
REDD-plus	Reduced Emissions from Deforestation and Degradation – including conservation, sustainable forest management, and enhancement of carbon stocks
RSPO	Round Table on Sustainable Palm Oil
SAI	Social Accountability International
SAN	Sustainable Agriculture Network
SEA	Strategic Environmental Assessments
SFI	Sustainable Forestry Initiative
SIA	Socio-Economic Impact Assessment
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNEP-WCMC	United Nations Environment Programme – World Conservation Monitoring Centre
UNFCCC	United Nations Framework Convention on Climate Change
WTP	Willing(ness) to Pay
WWF	World Wildlife Fund

Executive Summary

This book considers the opportunities for scaling-up finance for biodiversity across six so-called "innovative financial mechanisms" as classified by the Convention on Biological Diversity (CBD). These are: environmental fiscal reform; payments for ecosystem services; biodiversity offsets; markets for green products; biodiversity in climate change funding; and biodiversity in international development finance. Drawing on literature and more than 40 case studies worldwide, the book addresses the following questions: What are these mechanisms and how do they work? How much finance have they mobilised and what potential is there to scale this up? And what are the key design and implementation issues – including environmental and social safeguards – that need to be addressed so that governments can help ensure these mechanisms are environmentally effective, economically efficient and distributionally equitable?

What are these finance mechanisms and how do they work?

Environmental fiscal reform (EFR) refers to the process of shifting the tax burden from desirable economic activities to activities that entail negative environmental externalities. As there are relatively few examples of tax shifting in the context of biodiversity, EFR is more broadly used to refer to a range of taxation and pricing measures (e.g. on natural resource use or on pollution, and the reform of subsidies harmful to environment) that can raise fiscal revenues while furthering biodiversity objectives. Biodiversity-relevant taxes and charges include those on pesticides, fertilisers and other sources of NO_X, SO_2 and CO_2 emissions, natural resource extraction, wastewater discharges and entrance fees to natural parks. Total revenue from environmentally related taxes in OECD countries in 2010 amounted to nearly USD 700 billion. However, revenues from taxes on pollution and resources (i.e. those most relevant for biodiversity) constitute a very small fraction of this total.

Payments for Ecosystem Services (PES) are voluntary programmes that provide direct incentives to enhance the provision of ecosystem services. They compensate individuals or communities whose land use or other resource management decisions influence the provision of ecosystem services

for the additional costs of providing these services. PES programmes have proliferated rapidly over the past decade, with more than 300 programmes implemented around the world. It is estimated that five national PES programmes alone channel more than USD 6 billion per year. Another study estimates that payments for watershed services in 2008 totalled over USD 9 billion.

Biodiversity offsets are "measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken." They are intended to be carried out during the final step of the environmental impact mitigation hierarchy – avoid, minimise, and mitigate (restore and offset). Interest in these programmes has increased in recent years, with about 45 programmes in place today that require biodiversity offsets or some form of compensatory conservation for particular types of impacts. In 2011, these programmes were estimated to have mobilised between USD 2.4 and USD 4 billion.

Markets for green products have developed for goods and services that are based on sustainable use of biodiversity and ecosystems (e.g. eco-tourism and biotrade), goods that have been produced with fewer impacts on biodiversity as a result of more efficient or lower impact production methods (e.g. timber procured from reduced impact logging), and goods whose consumption will have a reduced environmental impact as a result of decreased pollution load (e.g. biodegradable detergent). As some consumers may prefer to buy and even pay a premium for green products, companies may have an incentive to adopt more sustainable production practices. Markets for certain green products have seen considerable growth (e.g. certified timber) and new markets are emerging (e.g. sustainable soy and sugar). Price premiums appear to be low but can vary considerably.

Biodiversity in climate change funding refers to the potential to leverage biodiversity co-benefits within the increasing flow of finance that is directed towards climate change mitigation and adaptation. Examples of where synergies can be harnessed include the mechanism for Reducing Emissions from Deforestation and Degradation and ecosystem-based adaptation. Climate change finance flows have been estimated at USD 70-120 billion annually in 2009-10, with lower bound estimates of biodiversity-related climate change finance from multilateral sources possibly amounting to USD 8 billion.

Biodiversity in international development finance refers to the opportunities to harness synergies and better mainstream biodiversity in broader development objectives. Biodiversity-related bilateral Official Development Assistance (ODA), as tracked by the OECD Development Assistance Committee, increased from an average of USD 3.3 billion per year in 2005-06 to USD 5.7 billion per year in 2009-10.

How do the finance mechanisms compare?

The finance mechanisms reviewed here offer three distinct yet important ways to scale up biodiversity conservation and sustainable use: first, they can raise additional revenue that can then be used to achieve biodiversity objectives. Second, they can mainstream biodiversity in the production and consumption landscape. Third, they can reduce the aggregate cost of achieving biodiversity conservation and sustainable use. In some cases the finance mechanisms examined here can work across more than one of these areas. For example, fiscal instruments can raise revenue and reduce the cost of undertaking biodiversity conservation and sustainable use measures, while also changing incentives that drive conversion rather than conservation.

Elements that vary across the six mechanisms include whether they are able to mobilise finance at the local, national and/or international level; whether the source of finance is public and/or private; whether they raise revenue directly; the extent to which the mechanisms impact on the drivers of biodiversity loss and degradation; and whether they are based on a polluter or beneficiary pays approach.

What are the key design and implementation issues – including environmental and social safeguards – that need to be considered for effective finance mechanisms?

The policy toolbox for biodiversity conservation and sustainable use can draw on these possible financial mechanisms, as well as on the broader set of instruments available (i.e. regulatory approaches such as standards and restrictions or prohibitions on use, and the wider set of voluntary instruments). The choice of the appropriate instrument mix will depend on the nature of the environmental problem and the drivers of loss; the governance and institutional capacity needed; and socioeconomic, cultural and political circumstances.

The governance and institutional capacity needed to implement a particular mechanism must be carefully considered, as without certain prerequisites in place, it is unlikely that it will effectively achieve its intended goal(s). For example, secure and clearly defined property and land tenure rights are needed for a range of these mechanisms, and where these are not present, international development finance can play an important role in helping to foster their development. Environmental taxes and charges require an established and well-functioning tax system that is capable of levying, collecting and re-distributing revenues. All the mechanisms need to be supported by robust monitoring, reporting and verification methodologies so as to enable performance assessment over time.

Other key design and implementation issues that need to be considered across a range of these mechanisms include additionality (i.e. ensuring that improvements are above business-as-usual), leakage (i.e. when the reduction of biodiversity loss in one location may lead to displacement of pressure to another location), permanence (i.e. that the biodiversity benefits are maintained over time), transaction costs, and the ability to apply appropriate enforcement of sanctions in cases of non-compliance.

In addition to evaluating the biodiversity impacts of these mechanisms, environmental as well as social safeguards need to be put in place to prevent and mitigate any undue harm (that may arise due to environmental trade-offs, or to address any potential regressive impacts to poor and vulnerable populations that may be adversely impacted by the mechanisms). Such safeguards normally include standards and performance indicators, as well as processes such as project screening, environmental and social assessments, and community consultations. Examples of safeguards include broadening the geographic scope of the monitoring framework in cases where there is risk of leakage, putting measures in place so that, for example, climate change policy does not exacerbate pressure on biodiversity (e.g. by promoting the plantation of monoculture forests); and setting up platforms for stakeholder participation in the design of instruments to identify possible concerns and impacts on local populations ex-ante.

It is important to note that the introduction of *any* new policy instrument (e.g. economic, trade-related, or for environmental objectives) can impact on other policy areas and sectors, creating both winners and losers. Successful policy is influenced by whether these potential impacts are identified in advance, with the appropriate measures put in place so as to address any possible trade-offs. This is why the careful design and implementation of different instruments is so crucial – an issue that is emphasised in this book.

Chapter 1

Global biodiversity loss: Key issues

This chapter presents the current trends in global biodiversity loss, the drivers behind this loss, and the implications of continuing on a business-as-usual pathway. It makes the case for broader and more ambitious application of policies and incentives to address biodiversity conservation and sustainable use, including those that are able to mobilise finance for biodiversity. The chapter discusses recent policy developments relevant to biodiversity finance mechanisms, and highlights the aim, scope and approach taken in this book.

Biodiversity: An invisible – yet invaluable – life support system

Biodiversity – the diversity of living organisms and the ecosystems of which they are a part – provides critical life-support functions and services to society. These include food, clean water, genetic resources, flood protection, nutrient cycling and climate regulation. These services in turn are essential to human health, security, well-being and economic growth. Yet despite the significant economic, social and cultural benefits provided by biodiversity and ecosystem services, biodiversity trends at the global level have been on a steady decline. Moreover, projections to 2050 indicate that without renewed efforts to address this challenge, a further 10% loss of global biodiversity is expected between 2010 and 2050 (OECD, 2012).

Continuing on a business-as-usual path will have adverse and costly impacts on society (OECD, 2012). The collapse of fisheries, for example, can have major ramifications on employment as well as government budgets. Indeed, over the period 1974-2008, the proportion of over-exploited and depleted stocks has been steadily increasing (FAO, 2010). It is estimated that total global soil erosion costs agriculture many hundreds of billions of US dollars every year and the annual costs incurred from invasive alien species are estimated to be more than USD 1.4 trillion (Pimental et al., 1995; CBD, 2010). Biodiversity and ecosystems also help to prevent disease through biological control, and are an important source of raw materials for pharmaceuticals (OECD, 2012). Estimates suggest that the annual value of biodiversity loss and ecosystem degradation is already between USD 2 and USD 4.5 trillion (TEEB, 2009).

Biodiversity loss and ecosystem degradation can have particularly severe implications for the rural poor – forest resources alone, for example, underpin the livelihoods of about 90% of the 1.2 billion people living in extreme poverty (World Bank, 2004). In rural areas, the poor are heavily dependent upon natural resources (e.g. forests, land, and water). Indigenous peoples are also often disproportionately adversely affected by biodiversity loss and degradation. While richer groups of people may be able to respond to loss of biodiversity and ecosystem services by purchasing alternatives, the poor may be less able to do so (OECD, 2012).

The drivers of global biodiversity loss include land use change (conversion to agriculture, and infrastructure), unsustainable use and over-exploitation of natural resources (such as forests and fish stocks, soil and water), pollution, climate change and invasive alien species. An underlying cause of loss is the fact that the benefits provided by biodiversity and ecosystems are largely invisible in day-to-day market transactions; market prices do not capture the value of public benefits provided by biodiversity and are therefore poor reflections of social opportunity costs (Perrings and Gadgil, 2003). This in turn leads to the undersupply of biodiversity and ecosystem goods and services.

Given that the costs of inaction are in many cases considerable, there is an urgent need for *i)* broader and more ambitious application of policies and incentives to address biodiversity conservation and sustainable use, including those that are able to mobilise finance for biodiversity; and *ii)* more efficient use of existing financial resources for conserving and managing biodiversity. As biodiversity and ecosystem services provide local, regional and global public good benefits, governments will need to scale-up efforts across all three levels (OECD, 2010).

The need to scale-up efforts has also been recognised by the Parties to the Convention on Biological Diversity (CBD) who, at the 10th Conference of the Parties, adopted the Strategic Plan for Biodiversity 2011-20, including the Aichi Biodiversity Targets, as well as the Strategy for Resource Mobilization (Decision X/3), in support of the achievement of the Convention's three objectives (including measurable targets and/or indicators). Building on this, at CBD COP-11, Decision XI/4 on the Review of Implementation of the Strategy for Resource Mobilization under paragraph 21 "Invites Parties and other relevant stakeholders to submit views and lessons learned on possible risks and benefits of country-specific innovative financial mechanisms, including on possible principles and safeguards for their use …".

The importance of biodiversity conservation and sustainable use for achieving other internationally agreed objectives has also been underscored in recent policy developments. Improving people's ability to derive livelihoods from a more sustainable natural resource base can help to address poverty, and as many of the biodiversity-rich areas worldwide are located in developing countries, conservation and sustainable use can contribute to the achievement of the Millennium Development Goals (MDGs) (Turner et al., 2012). This was recognised in "The Future We Want" (e.g. paragraph 4), the outcome document of the Rio+20 Conference, as well as at COP-11 in Hyderabad, where Parties agreed on Decision XI/22 "Biodiversity for poverty eradication and development". Healthy and resilient ecosystems also provide climate change mitigation and adaptation benefits and can thus contribute to achievement of the objectives under the United Nations Framework Convention on Climate Change (UNFCCC). Reflecting this, the CBD COP-11 adopted Decisions XI/9 "Biodiversity and climate change related issues" and XI/21 "Other matters related to biodiversity and climate change", and Parties to the UNFCCC agreed at COP-18 in Doha that the work programme on results-based finance in 2013 would look at, among other things, ways to incentivise non-carbon benefits (including biodiversity) (Decision 1/CP.18).

Aim, scope, and approach

The scope of this work is largely guided by the framing of discussions on finance mechanisms for biodiversity under the CBD. The book aims to contribute to these discussions by considering the opportunities and challenges for scaling-up finance for biodiversity across six so-called "innovative financial mechanisms". These mechanisms are: payments for ecosystem services, biodiversity offsets, environmental fiscal reform, markets for green products, biodiversity in climate change funding and biodiversity in international development finance (see Box 1.1 and Annex A for further detail).[1]

Drawing on literature and on lessons and insights from case studies worldwide, the book reviews the finance mobilised by each of the mechanisms

Box 1.1. **Goal 4 of the CBD Strategy for Resource Mobilization**

Goal 4 of the Convention's Strategy for Resource Mobilization seeks to: "Explore new and innovative financial mechanisms at all levels with a view to increasing funding to support the three objectives of the Convention", with six strategic objectives:

4.1. To promote, where applicable, schemes for payment for ecosystem services, consistent and in harmony with the Convention and other relevant international obligations.

4.2. To consider biodiversity offset mechanisms where relevant and appropriate while ensuring that they are not used to undermine unique components of biodiversity.

4.3. To explore opportunities presented by environmental fiscal reforms including innovative taxation models and fiscal incentives for achieving the three objectives of the Convention.

4.4. To explore opportunities presented by promising innovative financial mechanisms such as markets for green products, business-biodiversity partnerships and new forms of charity.

4.5. To integrate biological diversity and its associated ecosystem services in the development of new and innovative sources of international development finance, taking into account conservation costs.

4.6. To encourage the Parties to United Nations Framework Convention on Climate Change and its Kyoto Protocol to take into account biodiversity when developing any funding mechanisms for climate change.

Source: Convention on Biological Diversity: *www.cbd.int/financial/innovative/.*

and considers the extent to which they could be scaled up. It also examines the opportunities and challenges that have been encountered, and the types of design and implementation features – including environmental and social safeguards – that have been adopted to address these, so as to derive good practice insights.

Successful environmental policies are those that are environmentally effective and cost-effective, and that are accompanied by measures to address potential regressive distributional implications. Environmental and cost-effectiveness are important because in their absence, scarce financial and other resources are in effect being squandered. Distributional equity is important because the aim of improving and maintaining biological diversity and ecosystems is to create net benefits to society by realising all of biodiversity's values. However, just like any other environmental policy, while biodiversity policies can improve aggregate well-being, they can also create winners and losers (Bagnoli et al., 2008). Managing the distributional consequences of policy is crucial to reform success in terms of generating support and ensuring fair and positive outcomes (OECD, 2011). This is particularly important in developing countries where the poor are especially vulnerable. The report therefore also examines the types of environmental and social safeguards that are needed for biodiversity finance mechanisms to operate effectively and equitably.

The book is organised as follows: Chapter 2 delves further into the different components of biodiversity and their values, the policy instruments available to address loss and degradation, and the role of finance mechanisms in biodiversity conservation and sustainable use. Chapters 3 through 8 systematically examine each of the six finance mechanisms in turn. They review the finance that has been mobilised via the mechanisms, consider their potential to mobilise and scale-up additional resources, and examine the key features that need to be considered for the effective design and implementation of the specific mechanism. Finally, Chapter 9 provides a comparative analysis of the mechanisms, and considers the circumstances under which they are most likely to operate successfully. It also discusses cross-cutting issues, namely the environmental and social safeguards, and the governance and capacity needs that are required to effectively implement such financing mechanisms. The chapter concludes with a proposed assessment framework for policy makers to consider in the selection and introduction of new instruments for biodiversity conservation and sustainable use.

Note

1. Examination of other types of finance mechanisms for biodiversity are beyond the scope of this paper.

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Chapter 2

The role of finance mechanisms in biodiversity conservation and sustainable use

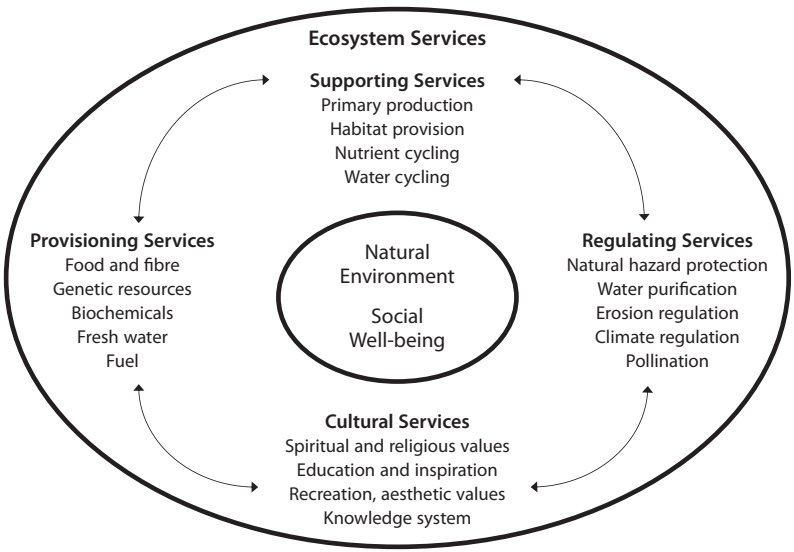
This chapter introduces the different components of biodiversity and ecosystem services and the benefits they provide to society. It presents estimates on the value of ecosystem services, the financing needs for optimal biodiversity and ecosystem service provision, and the existing financing flows. The chapter then proceeds by introducing the different policy instruments for biodiversity conservation and sustainable use that governments have at their disposal – regulatory, economic and information-based instruments – and the role of finance mechanisms.

Recognising the benefits of biodiversity and ecosystem services

Biodiversity is defined 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 a part: this includes diversity within species, between species and of ecosystems" (CBD, 1992). Ecosystem services are the beneficial outcomes, for the natural environment or people, which result from ecosystem functions. These benefits arise from the regulating, supporting, provisioning and cultural services that biodiversity and ecosystems supply (MA, 2005) (Figure 2.1).

In economic terms, these benefits are comprised in the notion of total economic value and are broadly categorised into use and non-use values. Use values refer to benefits derived directly in the form of consumables (e.g. timber, fuelwood, genetic information, tourism and recreation); indirectly through non-consumables (e.g. water purification, soil conservation, flood protection, as well as cultural and spiritual values), and option values (e.g. potential future benefits from genetic material). Non-use values comprise bequest and existence values. The former refers to the value to people today of ensuring the availability of biodiversity and ecosystem functioning to future generations;

Figure 2.1. **Four types of ecosystem services**



Source: OECD (2010), Paying for Biodiversity: Enhancing the Environmental and Cost Effectiveness of Payments for Ecosystem Services, OECD Publishing, Paris, doi: *10.1787/9789264090279-en*.

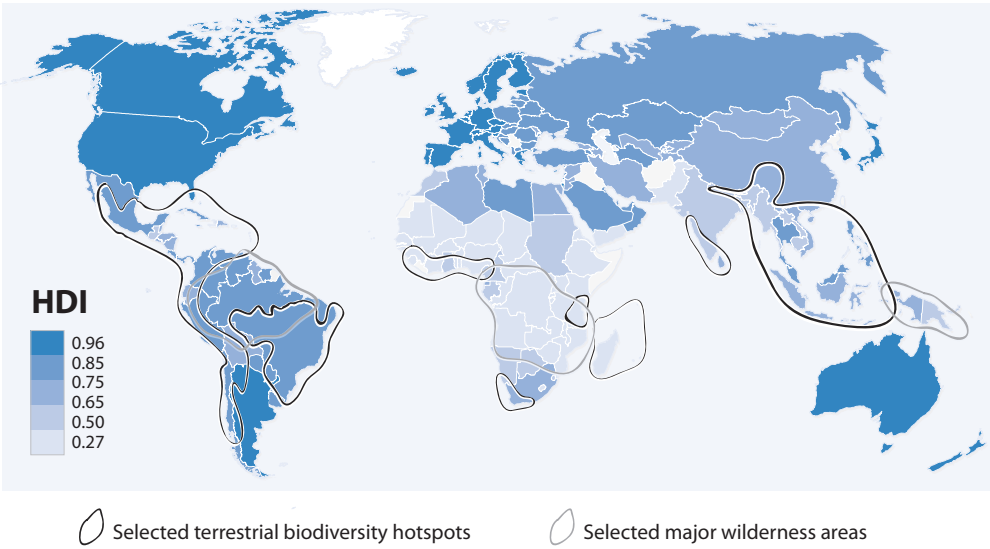
existence value refers to the benefits individuals obtain from the knowledge that biodiversity exists.

Though not all of these lend themselves easily to quantification (e.g. cultural and spiritual values), they all need to be taken into account in decision-making. While valuing the magnitude of biodiversity and ecosystem service benefits can be resource-intensive, it does enable making a case to other stakeholders, such as those in finance and agricultural ministries, of the size of trade-offs that are likely to be involved. And indeed, estimates of the size of biodiversity and ecosystem service benefits suggest that these are considerable. For example, the worldwide economic value of pollination services provided by insect pollinators was estimated at USD 192 billion per year in 2005 (Gallai et al., 2009). First sale value of global capture fisheries is almost USD 94 billion per year (FAO, 2010) and the global net value of coral reefs for fisheries, coastal protection, tourism and biodiversity is estimated at USD 30 billion per year (UNEP, 2007). Moreover, every year wildlife trade generates an estimated USD 15 billion worldwide, excluding large-scale commercial trade in fish and timber (OECD, 2008).

These benefits provide a compelling case for investing in biodiversity conservation and sustainable use. While it is difficult to estimate both the financing needs for optimal biodiversity and ecosystem service provision, and the existing financing flows, it is clear that the financing gap is large. Annual financial flows for biodiversity have been estimated at USD 36-38 billion per year, about half of which is delivered domestically in the European Union, the United States, and China (Parker and Cranford, 2010). Annual financing needs are thought to be in the order of hundreds of billions of dollars (CBD, 2012a). The GEF6 Financial Needs Assessment mandated by COP10 in decision X/26, for example, estimates that an investment of USD 74-191 billion[1] is required for the sixth replenishment period of the GEF (2014-18) to contribute to achieving the Aichi Biodiversity Targets (CBD, 2012a). A broader assessment conducted by the High-Level Panel on Global Assessment of Resources for Implementing the Strategic Plan for Biodiversity 2011-20 estimates the costs of implementing the twenty Aichi Biodiversity Targets to be between USD 150 billion and USD 440 billion per year (CBD, 2012b).[2, 3]

The large biodiversity financing gap is exacerbated by the fact that the costs of conservation and sustainable use are normally borne by locals whereas the benefits can be geographically more widely dispersed – this is particularly the case for the non-use or existence values of biodiversity. This presents a dichotomy in that most biodiversity-rich areas are located in developing countries (Figure 2.2) where pressure to convert land is high and where incomes tend to be lower, and begs the question of how to mobilise sustainable financing from relevant beneficiaries so as to compensate particularly poor or vulnerable locals for the additional costs of conservation and sustainable use.

Figure 2.2. **Overlay of biodiverse areas with human development***



Notes: To qualify as a biodiversity hotspot, a region must meet two strict criteria: it must contain at least 1 500 species of endemic vascular plants (> 0.5% of the world's total), and have lost at least 70% of its original habitat. A major wilderness area is identified as biodiverse if it has 75% of the original vegetation remaining in pristine condition and a low human population density (< 5 people/km^2). Wilderness areas are based largely on the world's terrestrial ecoregions (see Olson et al., 2001).

*Measured as the Human Development Index, which is a composite indicator used to rank countries by their level of human development. It includes life expectancy, literacy, education and standards of living for countries worldwide. The lower the index, the less developed the country.

Source: Ahlenius, H. (2004), *Global Development and Biodiversity*, UNEP/GRID-Arendal Maps and Graphics Library, based on data from UNDP 2004 and Conservation International 2004 *http://maps.grida.no/go/graphic/global-development-and-biodiversity.*

Policy instruments for biodiversity conservation and sustainable use

The policy instruments available for biodiversity conservation and sustainable use can be categorised as regulatory (e.g. command-and-control) approaches, economic instruments, and information and other voluntary instruments (Table 2.1). As biodiversity loss is often driven by several interacting market failures, effectively addressing the biodiversity challenge will involve selecting an appropriate policy mix. This is not necessarily straightforward, however; it will depend not only on the nature of the environmental problem, but also the social, cultural, political and economic context. Governance and institutional capacity (e.g. for monitoring and enforcement) will, for example, determine to some extent which instruments

are likely to be the most effective. So too will the distributional implications of environmental policies and the set of feasible corrective actions that are needed to address any regressive impacts. More broadly, selecting the appropriate instrument mix will require taking into account local and regional priorities, as well as international commitments under the CBD and other agreements. Biodiversity policy may affect broader national priorities, such as poverty alleviation, sustainable development and economic growth, and these need to be considered in a coherent way so as to maximise synergies and address any trade-offs (OECD, 2012).

Under certain circumstances, regulatory approaches are most appropriate. For example, if an over-exploited fish stock is on the verge of collapse, a (temporary) ban on fishing may be most effective, so as to allow the stock to recover. Similarly, in cases where biodiversity benefits are exceptionally high, when the adverse environmental impacts (i.e. social costs) are high (e.g. the pesticide DDT[4]) and/or when benefits are poorly understood (due to lack of scientific understanding and thus uncertainty) which may call for a precautionary approach, then prohibitions or restrictions on access, such as via the creation of natural parks, may be the best form of government intervention.

It is important to note that, to be effective, regulatory approaches also require appropriate levels of management (e.g. for protected areas) and/or monitoring and enforcement (e.g. for standards), as well as institutional and governance capacity. These instruments will also have distributional implications which need to be considered and addressed as appropriate.

Economic instruments are incentive-based mechanisms. Their purpose is to provide "correct" price signals to producers and consumers (to alter their production and consumption patterns) so as to close the gap between the marginal private costs and benefits and marginal social costs and benefits of biodiversity conservation and sustainable use. In general, such instruments are able to achieve a given environmental objective at a lower total economic cost than regulatory approaches (e.g. standards). This is because economic instruments allow the polluter/resource user to respond to the price signal of the instrument in accordance with their control (e.g. abatement) costs. This is particularly important if polluters face different marginal control costs (which economic instruments tend to equalise). Moreover, polluters are given an on-going incentive to reduce adverse environmental impacts, whereas regulatory command-and-control approaches are static: once the target is reached, there is no incentive to make further improvements. Economic instruments can offer incentives that impact on drivers of biodiversity loss, and hence are also instruments for mainstreaming. As with regulatory instruments, their effective design and implementation will also depend on the institutional and governance capacity within a country. Finally, and of particular relevance to this report, economic instruments are able to mobilise finance.

Mechanisms for mobilising finance for biodiversity

Irrespective of which policy instrument is selected, there is a need to scale-up financial resources for biodiversity conservation and sustainable use so as to help ensure levels of provision that align more closely with social (rather than private) net benefits, as well as to address the barriers to financial flows towards biodiversity (e.g. research and development). Finance mechanisms for biodiversity have important roles to play across the spectrum of spatial scales for which biodiversity provides public good benefits. At the local-national scale, for example:

> *municipalities do not usually support the existence of protected areas within their territory, apart from exceptions where intrinsic motivation or substantial potential for nature tourism comes into play. For most other local actors, protected areas reduce options for generating local income by attracting more inhabitants or promoting economic development. Even though protected areas might exist, a lack of enforcement, control, or even simply information can easily lead to the deterioration of the quality of these areas. (Ring, 2008)*

In Brazil, therefore, to help distribute the costs of conservation amongst a broader set of beneficiaries than those within a particular municipality, fiscal policy was reformed so as to include environmental indicators as a means of distributing the revenues from the ICMS, a tax on goods and services, to municipalities (see Chapter 3).

Similar issues arise at the national-international interface, as while some of the public good benefits provided by biodiversity are global in scope, the costs of conservation and sustainable use tend to be borne at the local or national level. Examples of instruments that allow for international financial transfers are Payments for Ecosystem Services (PES) (Chapter 4), Reducing Emissions from Deforestation and Degradation (REDD) (Chapter 5), and Official Development Assistance (ODA) (Chapter 8).

This points to the fact that while some of the biodiversity-specific policy instruments are able to mobilise finance directly, it is also important to consider other sources of finance (i.e. for climate change and for development) that are available to help achieve biodiversity objectives, and to examine the extent to which these too can be scaled-up.

Of the six "innovative financial mechanisms"[5] classified by the CBD – payment for ecosystem services, biodiversity offsets, environmental fiscal reform, markets for green products, biodiversity in international development finance, and biodiversity in climate change funding – the first three mechanisms fall most definitively under the category of economic instruments (Table 2.1). Markets for green products are supported by the use

of information instruments, such as ecolabels. These allow consumers to make better-informed decisions about the goods and service they purchase. Markets for green products can raise revenue indirectly via premiums for biodiversity-friendly attributes and investment in biodiversity conservation and sustainable use measures by producers. Biodiversity in climate change funding is a more recent development that seeks to identify and harness synergies between the relatively large volume of finance that has been mobilised for climate change

Table 2.1. **Policy instruments for biodiversity conservation and sustainable use**

Regulatory approaches	Economic instruments	Information and other voluntary instruments
Restrictions or prohibitions on use (e.g. trade in endangered species and CITES)*	Price-based instruments • Taxes (e.g. on groundwater extraction, pesticide and fertiliser use) • Charges/fees (e.g. for natural resource use, access to national parks, hunting or fishing license fees) • Subsidies to promote biodiversity	Ecolabelling and certification (e.g. organic agriculture labelling schemes; labels for sustainably harvested fish or timber)
Access restrictions or prohibitions (e.g. protected areas; legislated buffer zones along waterways)	Reform of environmentally harmful subsidies	Green public procurement (e.g. of sustainably harvested timber)
Permits and quotas (e.g. for logging and fishing)	Payment for ecosystem services	Voluntary approaches (e.g. negotiated agreements between businesses and government for nature protection or voluntary offset schemes)
Quality, quantity and design standards (e.g. commercial fishing net mesh-size specifications)	Biodiversity offsets/biobanking	Corporate environmental accounting
Spatial planning (e.g. ecological corridors)	Tradable permits (e.g. individual transferable quotas for fisheries)	
Planning tools and requirements (e.g. environmental impact assessments [EIAs] and strategic environmental assessments [SEA])	• Liability instruments • Non-compliance fines • Performance bonds	

Note: * Convention on International Trade in Endangered Species.

Source: Adapted from OECD (2010), *Paying for Biodiversity: Enhancing the Cost-Effectiveness of Payments for Ecosystem Services,* OECD Publishing, Paris.

(i.e. via climate policy instruments, including, for example, the auctioning of greenhouse gas emission allowances). Finally, international development finance is a more traditional channel for mobilising finance, whereby a portion of this can also contribute to biodiversity objectives.

Substantial experience exists with the use of financing mechanisms for environmental purposes, offering a range of lessons for the design of such mechanisms for biodiversity conservation and sustainable use. In general, key features that need to be considered in the establishment of any type of environmental financing mechanism are (Karousakis and Corfee-Morlot, 2007):

- identifying clear goals and objectives of the mechanism[6]
- identifying eligibility criteria and priorities (i.e. for disbursement of funds or for participation in the mechanism)
- securing sufficient and long-term sources of financing – including from the private sector
- monitoring and evaluation of performance to ensure that the objectives of the mechanism are being met, together with appropriate sanctions in the case of non-compliance.

The following chapters examine each of the six finance mechanisms identified for biodiversity conservation and sustainable use in turn. They provide a brief overview of the mechanism, including its general purpose and applicability; review the finance that has been mobilised and discusses the extent to which it could be scaled up; and then examine the key design and implementation issues that need to be considered so as to ensure that the mechanism is environmentally effective, economically efficient and distributionally equitable.

Notes

1. These estimates are before applying incremental reasoning and co-financing assumptions. The range reflects different levels of ambition. The GEF6 Needs Assessment provides a number of estimates that differ according to a) level of ambition b) whether or not incremental reasoning is applied c) level of co-financing (no co-financing; 1:2; 1:4; 1:6) (CBD, 2012a).

2. The estimates of funding needs for GEF6 are less than those proposed by the High-Level Panel for several reasons: *i)* the GEF6 needs assessment was carried out to identify funding necessary and available for the implementation of the Convention over a four year period (July 2014 to June 2018), whereas the Panel report covers the period 2013 to 2020; *ii)* the GEF6 Needs Assessment figures focus on the estimated funding needs in 155 GEF-eligible countries only (developing countries), whereas the report of the High-Level Panel estimates resource needs for both developed and developing countries; *iii)* the GEF needs assessment covers only activities which would be eligible for GEF funding whereas the work of the Panel has not restricted the types of activities used in the assessment (CBD, 2012b).

3. The High-Level Panel notes that: "these figures need to be treated with caution especially as the Panel is very clear that these resource requirements neither should nor could be met by biodiversity finance alone. Additionally … there is potential for considerable synergies among the Targets. Thus, it is expected that co-ordinated action could substantially reduce the total estimate" (CBD, 2012b).

4. DDT (Dichlorodiphenyltrichloroethane) is a synthetic pesticide that was banned for agricultural use worldwide, under the Stockholm Convention. DDT has been linked to poor human health and declines in a number of bird species including the Bald Eagle and the Brown Pelican.

5. This term was first used in the context of Agenda 21.

6. The goals and objectives of any environmental financing mechanism should be specific, measurable, agreed, realistic, and time-bound (SMART). In the case of biodiversity, where multidimensionality and ecological complexity is high, this is particularly important. Goals can be as general as increasing forest or wetland area conservation, to ensuring survival of a particular species – the latter which may entail the need for both quantity and quality based targets. As biodiversity benefits tend to be spatially heterogeneous – whereby two plots of forest area for example may yield different magnitude of benefits – clearly defined goals will help to guide the effective design of the programme, both environmentally, and in terms of costs.

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Chapter 3

Environmental fiscal reform

This chapter explores opportunities and challenges for raising biodiversity finance and promoting biodiversity conservation and sustainable use through environmental fiscal reform (EFR). It reviews a range of fiscal measures, including taxes and charges on natural resources use, pollution, and resource rents, and the reform of environmentally harmful subsidies. The key design and implementation issues for EFR are discussed, including environmental and fiscal effectiveness, social safeguards to address distributional impacts of EFR, and administrative and political feasibility.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

An introduction to environmental fiscal reform

Environmental fiscal reform (EFR) refers to the process of shifting the tax burden from desirable economic activities (such as employment, income and investment) to activities that entail negative environmental externalities (e.g. pollution, resource depletion and waste) (Bosquet, 2000). As there are few examples of where this has occurred in the context of biodiversity, a broader definition of EFR is used here to refer to a range of taxation and pricing measures which can raise fiscal revenues while furthering environmental goals (and with a view to analyse the incentives inherent in existing taxes and subsidies so as to optimise them). This includes taxes and charges on natural resource use, on pollution, and on resource rents, and the reform of subsidies harmful to the environment (OECD, 2005a; World Bank, 2005).[1]

Governments have various options for redistributing the revenue generated through fiscal measures. They can: *i)* retain the revenue and add it to other government revenue streams within the general budget to pay for additional public spending or to improve fiscal balances; *ii)* "earmark" revenue for a special (environmental) fund, separate from the rest of the budget; *iii)* use revenue to compensate for the distributive impact of the taxation or pricing measure – in the form of a financial transfer from government to individuals or businesses – or to ease the costs of transition; and/or *iv)* replace (partially or wholly) existing taxes or social security contributions (OECD, 2005a).[2]

Biodiversity-relevant taxes, charges and fees include those on pesticides, fertilisers and other sources of NO_X, SO_2 and CO_2 emissions, sealing of land, natural resource extraction (e.g. hunting; fishing; forestry; groundwater extraction), wastewater discharge, and entrance to natural parks. Subsidies that can be harmful to biodiversity are those that promote, without any environmental considerations, the intensification or geographic expansion of economic sectors such as agriculture, bio-energy, fishing, forestry and transport (OECD, 2012). Country-specific examples of biodiversity-relevant EFR measures are highlighted in Box 3.1.

Box 3.1. **EFR measures relevant to biodiversity**

Australia – New South Wales Load-Based Licensing: The Government of New South Wales (NSW) in Australia has introduced load-based licensing (LBL) to control, reduce and prevent air and water pollution in NSW, both of which have considerable impacts on biodiversity as well as people. The LBL brings many environmental levies and regulations together, pairing them within an overall licensing scheme. The annual license fee is calculated based on the potential environmental impact of that pollution, not on concentration levels.

Box 3.1. **EFR measures relevant to biodiversity** *(continued)*

The lower the potential for environmental impact, the lower the fee. To begin, all license-holders are subject to an overall administration fee, which is based on their size and which differs across industries. This provides a minimum threshold of the fees payable. In addition, some industries face load-based fees that are determined on a number of criteria that relate to environmental damage:

- quantity of pollution emitted (assessable load)
- weighting reflecting damage that particular pollutants cause
- charge of each unit of pollution
- critical zone weighting (CZ) (i.e. where the pollution is released)
- where assessable load exceeds a given threshold, the rates are doubled. Above an annual load limit fees become fines and prosecution can take place.

As this process consolidates taxes on a wide range of pollutants, it provides a comprehensive and more efficient system for addressing environmental challenges (NSW EPA 2001; OECD/EEA database on economic instruments).

Brazil – ICMS-Ecològico: The Federal Constitution of Brazil (1988) decrees that 25% of the revenues raised by ICMS, a tax on goods and services (similar to value-added tax in other countries), are to be allocated by the state to the municipalities. Constitutional law further stipulates that 75% of the total amount passed on to the municipalities is to be distributed in accordance with the share of the state ICMS that has been collected within that municipality. The state governments determine the indicators to be used for allocating the remaining 25%. Typical indicators are based on population, geographical area and primary production (Grieg-Gran, 2000). Since the 1990s, ecological indicators have been increasingly used to allocate tax revenues. This approach, known as the ICMS Ecològico (ICMS-E), was first introduced in the state of Paranà (May et al., 2002). More than 10 other states are now operating similar systems (TNC, n.d.). The ecological share of total ICMS ranges from 0.5% in Sao Paolo to 13% in the state of Tocatins.

In Paranà, the total area measured in conservation units grew by over 1 000 000 ha in the year 2000, representing an overall increase of 165% during the 9 years since the programme's inception in 1992 (May et al., 2002). The introduction of quality evaluation for conservation units has had a positive effect on the interest of municipalities in improving their management, and some municipalities and their mayors are supporting private land-users in managing conservation units, providing staff, equipment and vehicles for managing the areas (Grieg-Gran, 2000; Ring, 2008). Municipalities have also developed a strong interest in designating new public protected areas at the local level. While the ICMS-E revenues originally accrued to the municipality rather than the owner of the land, the State of Paranà recently introduced a new mechanism to transfer some of the revenues directly to private reserve landowners.

Box 3.1. **EFR measures relevant to biodiversity** *(continued)*

Cuba – Havana Bay User Tax: The Government introduced a tax on harbour users in Havana Bay including for tourism, recreation and commercial activities which have an environmental impact. The tax is calculated based on the use of the entrance channel, and the use of the shore, including harbour infrastructure. Revenue from the tax is earmarked for an environmental fund which finances clean-up activities in the Bay. It was subsequently decided to replicate the tax in other Cuban bays, as well as to increase its rate and to target a greater number of users (Garrido 2009 cited in CBD 2011).

Philippines – Environment User Fees System: Introduced in 1997, the Environment User Fees System is an industrial wastewater effluent fee designed to reduce discharge from industry in the Laguna de Bay region, to raise revenue for financing the management of the programme and for environmental activities by local government. The fee comprises a fixed fee (designed to cover the administrative cost of running the programme) and a two-tiered variable fee based on the unit load of pollution of BOD (biological oxygen demand – an indicator for biological pollution). 20% of the fee revenue is earmarked for local environmental projects such as the establishment of sewage treatment plants, while 80% are used for monitoring and enforcement of the programme by the Laguna Lake Development Authority.

Pilot tests resulted in 88% reduction of BOD from direct discharges between 1997 and 1999 of affected companies. The regulatory monitoring and enforcement components of the programme led to closure of about 50 companies between 1998 and 1999 for significant violations. The tax is being replicated with an aim to cover all water pollution sources from industrial, commercial, domestic and agricultural sources (Manila 2009, cited in CBD 2011).

Switzerland – Tax Reductions for Fuels from Renewable Feedstocks (Biofuels): Amendments to the Swiss regulatory framework for mineral oil taxation in 2008 exempt fuel produced from renewable feedstock from mineral oil tax, provided that they have a positive aggregate environmental impact and are produced under socially acceptable conditions. Three ecological minimum requirements must be met to qualify for tax exemption, including one specific to biodiversity: the cultivation of raw materials must not endanger tropical forest preservation and biological diversity. The assessment process is based on an application form completed by the manufacturers or importers, which contains questions regarding ecological and social minimum requirements. The burden of proof lies on the manufacturer or importer. In doubtful cases the FOEN may demand independent third party verification and confirmation of the accuracy of the information (FDF, 2011).

United Kingdom – Aggregates Levy Sustainable Fund: Aggregates is a specific class of mineral, which in the form of either crushed rock or sand and gravel, provide resources for house building and creating or maintaining vital infrastructure. Aggregates extraction has had and continues to have profound impacts on the natural environment. The UK Aggregates Levy came into force in April 2002, as a tax levied on the extraction of primary aggregates (mainly sand, gravel and crushed rock) and intended ultimately to bring about environmental benefits in areas affected by aggregate extraction. Part of the money raised through the Levy has been allocated by Her Majesty's Treasury to finance the Sustainability Fund.

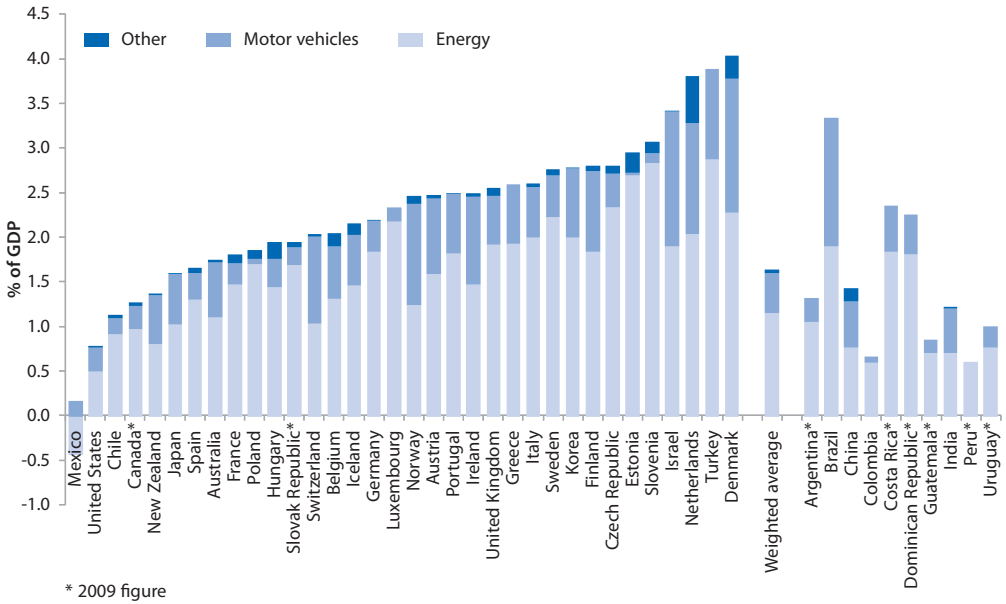
Box 3.1. **EFR measures relevant to biodiversity** *(continued)*

English Nature and The Countryside Agency were identified by Defra as major distributing bodies of the Fund and both organisations separately distributed funds in the form of grants until 2005. From 2005 to 2006 they combined their efforts under the ALSF Partnership Grant Scheme and in October 2006 this passed into part of the newly formed Natural England, which works for people, places and nature to conserve and enhance biodiversity, landscapes and wildlife in rural, urban, coastal and marine areas (Natural England, 2011a; 2011b).

Potential for mobilising and scaling-up finance from EFR

Despite the large potential environmental and fiscal benefits associated with EFR, there are not many applications in practice (at least in the narrow sense of the definition). Most of the revenue from environmentally related taxes in OECD and other countries for which data is available comes from taxes on energy (e.g. fuel) and on transport (e.g. motor vehicle purchase and annual use taxes) (see Figure 3.1). As can be observed from the figure, taxes

Figure 3.1. **Revenues from environmentally related taxes in 2010**



Source: OECD/EEA database of environmentally related taxes, www2.oecd.org/ecoinst/queries/.

on pollution and resources (i.e. "other") constitute a very small fraction of environmentally related tax revenues.

Total revenue from environmental taxes in OECD countries in 2010 was slightly below USD 700 billion.[3] According to Eurostat (2011), the total revenue from environmental taxes in the EU-27 in 2009 was equal to EUR 287 billion; this amount equated to 2.4% of GDP and to 6.3% of the total revenues derived from taxes and social contributions.[4] There is, however, considerable variation between countries.[5] In the Netherlands and Bulgaria, for example, environmentally-related taxes accounted for over 10% of total taxes and social contributions, in comparison with Spain and Belgium, where they accounted for less than 7% (Eurostat, 2011).

While it is difficult to ascribe a value to subsidies worldwide, estimates suggest these are of an order of magnitude of USD 100s of billions. Agriculture subsidies in the OECD, for example, were estimated at USD 227 billion in 2010 (OECD, 2011a), while global fishery subsidies were estimated to be between USD 15 and USD 35 billion (UNEP, 2008) and global energy subsidies to be about USD 500 billion per year (GSI, 2009). Reducing or phasing out subsidies where these no longer serve their purpose, have adverse impacts on resource allocations and the environment, or distort prices, could free up a considerable amount of revenue.

Specific examples of revenues raised from individual biodiversity-relevant taxes or subsidy removals are summarised in Box 3.2.

Box 3.2. **Revenue raised from EFR measures relevant to biodiversity**

The **Danish** pesticide tax mobilised DKK 461 million in 2010 (up from DKK 300 million in 1998). 60% of the tax revenue in 1998 was channelled back into the agricultural sector through different subsidy schemes, such as those to organic farming and extension services. The remaining 40% was used for public research and pesticide monitoring programmes (OECD/EEA, 2011).

The NSW load-based licensing scheme set up in **Australia** in 1999 raised AUD 16 million in 2001-02 and AUD 33 million by 2007-08 (OECD/EEA, 2012).

Over 14 years, the **Brazilian** ICMS-E fiscal instrument mobilised around USD 170 million in the state of Parana alone, and enabled an increase in protected areas of 158%. In the state of Minas Gerais, the ICMS-E is estimated to have mobilised about USD 17 million in its first three years of operation, benefiting protected areas in over 200 municipalities (TNC, n.d.).

Under the **United Kingdom** Aggregates Levy Sustainable Fund, 194 grants,

Box 3.2. **Revenue raised from EFR measures relevant to biodiversity** *(continued)*

worth GBP 10.97 million, were awarded and successfully completed between April 2008 to March 2011, reducing the effects of aggregate extraction by transforming degraded sites and restoring natural habitats for wildlife (Natural England, 2011a).

In **Cameroon**, fiscal forestry revenues to the State increased from USD 5 million per year to USD 50 million per year from 1994 to 2002, thanks to fiscal interventions. Fiscal forestry revenues to local governing bodies increased from close to zero to USD 9 million per year over the same period (World Bank, 2005).

Between 1981 and 1994 **Norway** reduced subsidies to fisheries by 80%, from USD 150 million to USD 30 million, relieving pressure on marine ecosystems and reducing the burden on government coffers (OECD/EEA, 2011).

Three planting seasons after the final pesticide subsidy had been removed, **Indonesia** had record levels of rice production and boasted savings of over USD 100 million (Markandya, 1998).

Key features for effective design and implementation of EFR

While the fiscal and environmental benefits of EFR can go hand-in-hand, this is not automatic. There can also be trade-offs between objectives which must be addressed explicitly. EFR requires careful policy design, taking account of issues relating to (OECD, 2005a; OECD, 2010):

- environmental effectiveness
- fiscal effectiveness
- equity
- administrative feasibility and efficiency
- political feasibility.

These issues are examined below.

Environmental effectiveness

For environmental effectiveness, taxes or charges should be targeted as closely as possible to the pollutant or polluting/resource consuming behaviour. Swedish taxes on nitrogen oxide emissions – which have deleterious effects on

biodiversity through foliar damage, eutrophication, and acidification – and the Viennese Tree Protection charge in Austria, levied when trees with a diameter of more than 40cm are cut down and not replaced, are good examples. The closer the link between the target and the damage, the better the policy will likely perform in terms of biodiversity outcomes. However, the transaction costs of administering and monitoring such taxes can be high, particularly where the source of pollution is dispersed or "non-point". An alternative is to tax observable market transactions that are related to pollution, such as the sale of fertiliser and pesticides. Administratively, such taxes may be much cheaper, but they are less directly targeted and they may prompt unintended or inefficient responses from polluters (Sandmo, 1976 cited in Mirrlees Review, 2011).

Tax rates should be set high enough to motivate environmental improvements. The optimal level is where the per-unit tax is equal to the marginal social damage. Taxes to date, however, have tended to be lower (OECD, 2011a). When establishing fiscal measures it is important to consider the full scope of environmental damages and account for variations in environmental risk. In Norway, for example, the tax rate differs between pesticides depending on their toxicology. For each pesticide, a basic tax rate common to all pesticides is multiplied by a human health and environmental risk factor (e.g. 0.5 for products with low human health risk and low environmental risk and 9 for products with high human health risk and high environmental risk). While this approach encourages more conservative use of pesticides and also provides incentives to substitute to less damaging products, it increases the administrative burden for regulators and industry. Such a programme is feasible in Norway, where less than 200 pesticides are approved for use, but it may be more difficult to implement in the United Kingdom, for example, where over 3 000 pesticides are registered for use (OECD, 2010).

The impact on biodiversity of a given level of pollution (e.g. pesticides or fertilisers) or natural resource use (e.g. logging) will also depend on the ecological sensitivity of the receiving environment. Where feasible, fiscal instruments should also account for these spatial variations. The Australian load-based licensing scheme described in Box 3.2 is an example of how this can be done.

In many countries, some policies aimed at supporting the energy and/or agricultural sectors contribute to environmental degradation by encouraging excessive use of natural resources and/or products with detrimental side-effects (e.g. fertiliser) (de Serres, 2010). In some cases even "green subsidies" have been found to distort markets or to have unintended environmental consequences (TEEB, 2009). In the fisheries sector, for example, vessel decommissioning schemes[6] aim to reduce fishing capacity in order to reduce

pressure on fish stocks, but they often have the unintended effect of creating additional rents that are re-invested in the same or another fishery (UNEP, 2004; OECD, 2009). The area of biofuels is another example. It is therefore important that environmental side-effects of policies, including sectoral policies, are carefully assessed (e.g. through regulatory impact assessments) and policies reformed where these are inefficient or ineffective.

One of the reallocation options governments have is to channel fiscal revenues to environmental projects, referred to as earmarking (see Box 3.3). Ex-ante and ex-post cost-benefit analyses and the use of indicators can help increase the effectiveness of these payments (Clinch et al., 2006; Ring, 2008). In the Brazilian ICMS-E, for example, the type of indicator chosen was found to be closely related to the effectiveness of the incentive. The examples of Parana and Minas Gerais show that not only the quantity, but also the quality, of respective areas should be taken into account (see Box 3.1) (Ring 2008). This is indeed not surprising given the spatially heterogeneous benefits associated with biodiversity.

Box 3.3. **Earmarking revenue**

While earmarking revenue from environmental taxes is undertaken in a number of countries, the theoretical debate on the relative merits of this is not conclusive. Arguments for and against earmarking are highlighted below.

Arguments for earmarking

- Promotes greater transparency on where budget is allocated and can therefore also help to garner increased public support.
- Ensures a sustainable source of finance (e.g. water taxes in Mexico used to finance national PES programme).
- Provides incentives for effective collection of taxes/fees (e.g. in Protected Areas, as the revenue is then re-injected to those same areas).

Arguments against earmarking

- Bypasses or pre-empts the annual budgets, and thus affects the fairness of the budgetary process through which departments compete on an equal footing for funds.
- Pre-assignment of claims on the budget shifts the locus of accountability and responsibility for efficient resource allocation to the managers of specific programmes or agencies.

Box 3.3. **Earmarking revenue** *(continued)*

- Creates a precedent, giving rise to claims of other government agencies to have their own earmarked funds. This leads to fragmentation of the budget and complicates fiscal policy implementation.
- Can generate issues of rent-seeking by public agencies.

Partial or "soft" earmarking refers to earmarked taxes that only partially fund their intended purpose, and is the type of earmarking most commonly applied.

Source: Carling (2007); OECD (2005a); OECD (2006a); South African National Treasury (2006).

Fiscal effectiveness

Fiscal effectiveness refers to how well EFR mobilises additional revenue (e.g. through taxes, charges or fees), minimises distortions in tax systems (e.g. income or labour taxes), and reduces drains on public finance (e.g. subsidy removal) (OECD, 2005).

The balance between the revenue-raising and environmental benefits of EFR measures will depend on how the reforms are designed. While there are opportunities to further both objectives, sometimes a trade-off will be necessary. For example, a pollution tax may be set too low to induce change in environmentally damaging production techniques but it may be successful in raising revenue. Conversely, a tax on a relatively unessential or easily substituted but highly damaging input may lead to its complete phase out, yielding considerable environmental results but minimal revenue (OECD, 2005a). This relationship between fiscal and environmental effectiveness is also dependent on the responsiveness of demand to price and tax increases (i.e. price and tax elasticities). Pearce and Koundouri (2003), for example, note that while taxes in OECD countries have played some role in reducing pesticide and fertiliser use, the price elasticity estimates are low, which suggests that taxes may only have small effect on quantity, unless they are set very high. On the other hand, revenue recycling for research and information might have been more effective.

Equity

Most EFR will entail losses for some stakeholders (e.g. poor and vulnerable groups; the private sector; the government; civil society groups; political leaders; and the media). Austria's agro-environmental scheme,

"OPUL", for example, aimed to replace agricultural subsidies based on the volume of production with direct payments for environmental services. Evaluations of the socio-economic effects of these policies between 1998 and 2002 demonstrated two important distributional impacts. First, replacing rewards based on intensive production with incentives for extensive practices led to a policy inherently biased towards crop farmers. Land-area-based payments thus led to redistribution away from livestock farms and processors. Second, larger farms were able to benefit considerably more from the new policy than smaller farms in terms of payments received (Groier, 2004 in Bagnoli et al., 2008).

Identifying winners and losers is therefore a critical part of EFR policy design, notably to build in well-targeted compensatory measures. This is one important way of putting in place social safeguards. Reforms produce different effects in the short, medium and long terms and perceived "winners and losers" will accordingly change over time. The likely winners and losers from reform can be identified by reference to the "transmission channels" of reform and their implications on different groups. These include (OECD, 2005a):

- **Prices** determine real household purchasing power through direct effects on consumption (if households pay more for water) and indirectly through effects on production (if industries pay higher prices for certain inputs, they will pass on some of these increases onto consumers). Low-income households may be particularly vulnerable to EFR as some analysis suggests they tend to spend a larger proportion of their budget than other income groups on goods and services such as water and energy (see Box 3.4). Policy makers should consider the price elasticity of the affected goods and service, as taxes may be more regressive when demand is inelastic.
- **Employment** (informal or formal) provides the main source of household income. Some policies may, for example, shift demand for labour across industries or firms within an industry. For example, energy-intensive sectors may contract in response to increased energy prices, while producers of energy-efficient equipment or materials may expand.
- **Access to goods and services** (public or private): EFR can have direct impacts on households. For example, if water tariff increases allow the expansion of the network, it brings direct benefits for those previously not connected.
- **Assets** (financial, physical, natural, human or social) can have their value changed by reforms. For example, reduced air pollution and traffic congestion may increase the value of housing and land in impacted areas.

- **Transfers and taxes** can impact households. Increased cost recovery on publicly provided services can provide room for reduction of taxes and/or free up government resources for other spending.[7]

Box 3.4. **Distributional effects of environmental fiscal reform: Some empirical analysis**

In the United Kingdom, for example, evidence suggests that the lowest income decile spends 5.6% of net household income on road fuel duty, three times more than the richest decile and more than twice as much as the average. In Norway however, environmental taxes are not found to cause any significant regressivity between high and low-income households (Barde, 2004).

In a more recent analysis, Sterner (2011) empirically examines gasoline taxation in more than two dozen countries, and concludes that while there may be some slight regressivity in some high-income countries, as a general rule, fuel taxation is a progressive policy particularly in low income countries, where the poorer parts of the population do not own a car at all.

There are sophisticated economic techniques for modelling impacts through these transmission channels but these methods require considerable data, time and human resources. Their use is therefore constrained in many low-income countries (World Bank, 2005; see also Bagnoli et al., 2008).

Some of the approaches for dealing with distributive issues include setting a tax-free threshold for essential use, or introducing a tax progressively (higher taxation on greater consumption). Compensatory measures such as lump sum payments, calculated on the basis of average tax payments per households, or tax shifting – the reduction of other taxes (e.g. VAT) – can also be used. It is usually preferable to address distributional impacts outside the environmental tax. Attempting to address both environmental issues and distributional concerns risks undermining the ability of the tax to do either and can lead to administrative complexity (OECD, 2010).

Transfers of tax revenues as payments for environmental services offer a wide range of options to take account of pressures on biodiversity, while considering distributive equity and empowering local communities with the financial resources needed to address conservation challenges. In Brazil, and more recently Portugal, protected areas have been used as an indicator to redistribute tax revenues to local levels (Ring 2008).

Table 3.1. **Potential poverty impacts of selected EFR instruments**

Type of instrument	Potential impacts	Ways to enhance the benefits to the poor
Increased prices for fertilisers and pesticides	Depends on access of poor to fertilisers and pesticides	Targeted subsidies, a small tax-free quota for each poor farmer
Rent taxes (minerals, forestry, fisheries)	Generally positive if taxes are on commercial operators and some revenues used to benefit the poor	Ensure that the poor are not negatively affected by commercial-scale harvesting; and that revenues intended for poor are not lost through corruption
Domestic water user fees	Raises prices for the poor, depending on the extent to which they are connected	Targeted subsidies for the poor ("lifeline tariffs")

Source: Adapted from OECD (2005a), *Environmental Fiscal Reform for Poverty Reduction*, DAC Guidelines and Reference Series, OECD Publishing, Paris, doi: *10.1787/9789264008700-en*.

Administrative feasibility and efficiency

EFR requires long-term commitment from governments to design, build support for, implement as well as evaluate and refine EFR. Improved incentives for environmental management require an effective legal, regulatory and administrative framework.

EFR cannot be successfully implemented without a strong, stable governance framework, particularly in relation to financial governance. It requires an established tax system that is capable of levying, collecting and redistributing revenues and of transparent, competent and accountable public financial management. Weaknesses in this field hamper investment, economic growth and sustainable development (Cottrell et al., 2008). For example, it has been estimated that the Indonesian government lost an average of nearly USD 2 billion annually between 2003 and 2006 due to illegal logging, corruption and mismanagement. This includes forest taxes and royalties never collected on illegally harvested timber; shortfalls due to large unacknowledged subsidies to the forest industry; and losses from tax evasion by exporters practicing "transfer pricing" (Human Rights Watch, 2009).

EFR also requires the ability to accurately monitor, at reasonable cost, the environmentally sensitive activities being targeted (World Bank, 2005). Government agencies responsible for administering the reforms need the appropriate technical capacity to function as a credible monitoring and enforcement agency. This will also help to enhance transparency which can in turn foster greater public support for EFR.

Instrument design will determine in part the administrative feasibility of EFR (e.g. ease of monitoring). For example, stumpage taxes can be an administrative burden and be open to abuse through evasion or corruption; collecting timber taxes at the point where they are loaded onto a boat or at the gate of the processing plant may be more cost-effective and administratively simpler (OECD, 2005a). When designing an instrument, trade-offs may have to be made between environmental effectiveness and administrative feasibility (see section on environmental effectiveness).

One challenge arising in certain developing and emerging economies is their ability to organise domestic resources. EFR can provide a relatively simple way of raising revenue while incurring low administrative costs. In the context of Brazil for example, Ring (2008) states that "one of the great advantages of the ICMS-E is that it is not an instrument that requires new institutions or a new bureaucracy. By introducing an ecological indicator into the existing fiscal transfer mechanisms, it built on existing institutions and administrative procedures, thereby entailing very low transaction costs". Furthermore, additional revenues mobilised through fiscal reform can help cover administrative costs (OECD, 2005a).

Political feasibility

EFR gives rise to redistributive effects and therefore to political opposition (Felder and Schleiniger, 1999; OECD, 2011a). Sometimes, relatively small and unrepresentative but well-organised interest groups can exert disproportionate influence over policy and can undermine reform. In 1993, for example, the United Kingdom introduced a Transport Carbon Tax (a 10% increase on transport fuel duty) with a Fuel Duty Escalator (FDE) of 3% each year in real terms. Lobbying from farmers and the transport sector (including slow driving and blockade of oil depots) pressured the government to drop the automatic increase, leading eventually to a reduction in the real rate of fuel tax not an increase (OECD, 2005b). As Deroubaix and Léveque (2006) observed with the French Ecological Tax Reform of 1999, it can be particularly difficult to reach a balance between social acceptability and political feasibility.

The political feasibility of EFR depends largely on its distributive effects, and there can be important trade-offs between equity, environmental and fiscal effectiveness and political feasibility concerns. The reallocation of fiscal revenues is therefore an important consideration. Under the 1999 French EFR, for example, environmental tax revenues were used to fund labour tax reductions. However, this was met with resistance from energy companies, as they were the ones who were supposed to pay the tax but would not be the ones benefitting because of their relatively small work force (labour tax reductions tend to concentrate on lower-skilled man-power) (Deroubaix and Léveque, 2006).

The Swedish tax on NO_X emissions, on the other hand, includes a refund mechanism to deal with distributional and competitiveness concerns. With the exception of a minor amount retained to cover administrative costs (about 0.7% of total tax revenue), all the revenues (about EU 85 million in 2010) are returned to the firms covered by the tax in proportion to the amount of useable energy they produce. There has been hardly any net cost increase for industry, and hence virtually no impact on product prices. This in turn meant that there is no negative income distribution related to the scheme[8] and is part of the reason Sweden was able to introduce such a high tax rate (OECD, 2011a).

A high level of transparency is necessary for building support for reform and challenging those who are opposed to it. This is particularly effective when there is good information on the magnitude of subsidies, as well as their negative environmental, economic and social impacts (OECD, 2011b). Scheduling and announcing future increases of charges or taxes in advance provides stakeholders with an opportunity to prepare and adapt, and provides opportunities for consultation with affected stakeholders (OECD, 2005a). Governments can also help stakeholders to adapt to new fiscal measures. Pesticide subsidy removal in Indonesia, for example, was done gradually over a period of 3 years and was accompanied by the introduction and dissemination of integrated pest management approaches (Markandya, 1998).

The political feasibility of a fiscal programme is very context-specific. Factors that should be taken into consideration include:

- characteristics of the problem to be addressed by the reform proposal (e.g. visibility and immediacy of biodiversity impacts)
- (un)certainty surrounding the cause of biodiversity loss or degradation
- socio-political factors and public perceptions of the problem
- factors linked to circumstance (e.g. fisheries subsidies in New Zealand were eliminated in the 1990s in response to fiscal pressure (OECD, 2006b); in Cameroon, lost revenues of over USD 100 million per year from illegal logging and low rent collection helped the government rally support for fiscal reform (Profor, 2003); and in Indonesia, pesticide subsidy removal was a response to the brown planthopper outbreak, which devastated rice crops (Markandya, 1998).

Box 3.5. **The EFR policy cycle**

1. **Initial Research and Agenda-Setting:** research the biodiversity impacts and costs of current policies and development activities. Assess possible instruments for achieving objectives efficiently.
2. **Policy Development:** consult stakeholders in order to further substantiate and refine the results from the initial research. Design the overall policy package and seek further consultation.
3. **Dialogue, Information Dissemination and Advocacy:** market EFR proposals through public awareness campaigns. Consult and enter dialogues with key stakeholders in the policy development process.
4. **Advance Notice and Gradual Implementation:** make public announcements at earliest possible notice to give affected parties times to prepare and adapt to proposed changes. Gradually phase-in reforms.
5. **Monitoring and Evaluation:** identify and remedy implementation problems as they emerge and verify benefits of the intervention. Identify unexpected and unintended consequences of the reforms, calling for revisions in approaches and objective.

Source: Adapted from OECD (2005a).

Notes

1. In Table 2.1 these are the price-based instruments and the reform of environmentally harmful subsidies. EFR is based on a user or polluter pays approach and can directly affect the drivers of biodiversity loss.
2. In cases when revenue is used as per option (iv), this conforms with the narrower definition of EFR described above. EFR can also contribute to poverty reduction goals by *i)* helping to address environmental problems that threaten the health and livelihoods of the poor; *ii)* generating additional finance for pro-poor programmes and investments.
3. Already in 2007, the revenues were larger than USD 700 billion, but higher international fuel prices and the economic crisis has tended to reduce the revenues in recent years.
4. These are predominantly based on energy and transport taxes. Pollution/resource taxes represented a relatively small share (4.2%) of total environmental tax revenues in the EU-27 in 2009; this pattern was repeated across most of the

EU Member States, as only Estonia, the Netherlands and Denmark (as well as Iceland) reported that in excess of 10% of their total environmental tax revenue was raised from taxes on pollution and resources; some countries did not raise any revenue from this type of tax (e.g. Greece and Luxembourg). It is important to note that part of the reason for the low share of "other" tax revenue is that the price elasticity of these tax bases is larger than for energy and motor vehicles, meaning that higher tax rates more easily can cause total revenues to decline.

5. Comparisons should be made with caution. For instance, low revenues from environmental taxes could either be due to relatively low environmental tax rates, or could result from higher tax rates that have had the effect of changing behavioural patterns among producers and consumers.

6. See OECD Recommendation of the Council on the Design and Implementation of Decommissioning Schemes in the Fishing Sector. 26 June 2008 – C(2008)78.

7. There is some overlap here with the prices category. Overall, it is relative prices that matter.

8. On the other hand, this is a disadvantage of the scheme – it will provide a smaller incentive for users that buy products causing large NO_X emissions in their production to substitute away from such products than what a tax that is not refunded would do, as it would cause less of a price increase for these products. In others words, there would only be a modest demand impact of the tax.

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Chapter 4

Payments for ecosystem services

This chapter explores the opportunities and challenges for mobilising and scaling-up biodiversity finance using Payments for Ecosystem Services (PES). It examines some of the features that need to be considered for effective PES design, including clearly defined and enforced property and land tenure rights, environmental safeguards to manage risks such as leakage and non-permanence, social safeguards to prevent or address negative distributional impacts and a robust monitoring and reporting framework.

An introduction to payments for ecosystem services[1]

Payments for Ecosystem Services (PES) are voluntary programmes that aim to address market failure by providing direct incentives to enhance the provision of ecosystem services. PES compensate individuals or communities whose land use or other resource management decisions influence the provision of ecosystem services for the additional costs of providing these services (OECD, 2010). More specifically, PES have been defined as "a voluntary, conditional agreement between at least one 'seller' and one 'buyer' over a well defined environmental service – or a land use presumed to produce that service" (Wunder, 2005). As PES are voluntary, incentive-based instruments, seeking out sites with higher value and lower costs, they can provide potentially large gains in cost-effectiveness compared to indirect payments or other regulatory approaches used for environmental objectives (Alix-Garcia et al., 2003; Engel et al., 2008).

PES are based on a system whereby the user or beneficiary pays for the ecosystem services they would like to benefit from. This is in contrast to systems whereby the polluter is required to pay for the external environmental costs of their actions. The two approaches are complementary – instruments based on the polluter pays principle penalise environmental performance that is below the socially agreed norm (accepted level of environmental damage), while instruments based on a beneficiary pays approach reward environmental performance that is superior to this norm. The choice of instrument may reflect the overall policy approach, the nature of property and land tenure rights related to the use of natural resources (such as land and water) and the societal and distributional concerns related to environmental issues (Vojtech, 2010).

PES programmes have proliferated rapidly over the past decade, with more than 300 programmes operating worldwide today, at local, regional and national scale (Blackman and Woodward, 2010). Most of these have been established to promote watershed services, biodiversity, carbon and landscape beauty (Wunder, 2006). Some examples of PES are highlighted in Box 4.1. PES are a flexible, incentive-based mechanism, which can be used as part of a policy mix in conjunction with other instruments. For example, PES can be used to incentivise enhancements in the provision of ecosystem services over and above that required by existing regulatory instruments (OECD, 2010).

In the context of biodiversity, PES have been adopted, for example, in Cambodia to help conserve the White Shouldered Ibis, one of the rarest birds in the world (Hirschfeld, 2009), and to enhance habitat quality in the United States. Other PES programmes aim to address multiple objectives, such as the Payments for Environmental Hydrological Services (PEHS) *(Pago de Services Ambientales Hydrologicas)* in Mexico which has a goal of reducing deforestation and water scarcity (OECD, 2010).

Box 4.1. Selected payments for ecosystem services programmes

Australia: The Tasmanian Forest Conservation Fund was established in 2005 to secure the protection and management of high value forests on private land. The budget available for the Fund was approximately AUD 50 million, which is aimed specifically to protect a minimum of 25 000 ha of old growth forests and up to 2 400 ha of forest to protect the karst values in the Mole Creek area. Key design features of the PES include the use of a Conservation Value Index to identify *inter alia* areas of forests with high benefits and high threat of loss, as well as to assess the proposed landholder's management actions (e.g. weed management, actions to reduce fire risks) and the impacts they are likely to have on improving the conditions of the site; and the use of inverse auction to reduce the costs of obtaining these benefits.

Source: OECD (2010).

Mexico: Under the national payments for hydrological services (PEHS) programme, which covers an area of 2.27 million ha, 5 year renewable contracts are signed with both individual and communal landowners so as to conserve forest area. Finance for the programme is mobilised via charges from federal water use, as well as other sources. Payments are fixed but are higher for cloud forest than for other forest (with lower benefits). Areas with higher risk of deforestation are also prioritised.

Source: OECD (2010).

Viet Nam: A PES pilot project in Lam Dong province seeks to deliver water source regulation and provision, soil protection, reduction of erosion, protection against sedimentation of reservoirs and ecotourism-related environmental services. The total revenue for the programme is USD 5 million (from 2 hydropower, 2 water supply and 9 ecotourism companies). Payments have been distributed to nearly 8 000 households (via 18 contracts with forest users), covering 202 000 ha of forest.

Source: Quang Tan (2011).

Potential for mobilising and scaling-up finance for PES

Available literature on PES indicates that these programmes have already successfully mobilised relatively large sums of money. While aggregate estimates are not available, one study finds that in 2008, payments for watershed services transactions totalled over USD 9 billion (Stanton et al., 2010 cited in Parker and Cranford, 2010). Data on annual PES budgets across a selection of national and regional PES programmes are summarised in Table 4.1.

Table 4.1. **Annual PES budgets in selected national and regional PES programmes**

National PES Programmes	Annual Budget in USD
China, Sloping Land Conversion Programme (SLCP)	4 billion (Bennett, 2008)
Costa Rica, Payments for Environmental Services (PES)	12.7 million (FONAFIFO, 2009)
Mexico, Payments for Environmental Hydrological Services (PEHS)	18.2 million (Muñoz Piña et al., 2008)
UK, Rural Development Programme for England	0.8 billion (Defra, 2009)
US, Conservation Reserve Program (CRP)	1.7 billion (Claassen, 2009)
Regional PES Programmes	**Annual Budget in USD**
Australia, Tasmanian Forest Conservation Fund (FCF)	14 million (DAFF, 2007)
Australia, Victoria State ecoMarkets	4 million (DSE, 2009)
Bulgaria and Romania, Danube Basin	575 000 (GEF, 2009)
Ecuador, Profafor	150 000 (Wunder and Alban, 2008)
Tanzania, Eastern Arc Mountains	400 000 (EAMCEF, 2007)

Source: OECD (2010), Paying for Biodiversity: Enhancing the Environmental and Cost Effectiveness of Payments for Ecosystem Services, OECD Publishing, Paris, doi: *10.1787/9789264090279-en*.

PES financing has been mobilised from a variety of different sources, broadly classified as direct user-financing and third-party financing (i.e. where governments or organisations act on behalf of beneficiaries). While most PES programmes have a limited geographic scope and are financed directly by users of specific environmental services – for example, payments by downstream users of hydrological services to upstream land managers in a single watershed (Blackman and Woodward, 2010), – the literature indicates that the majority of finance mobilised for PES programmes comes from government-financed programmes. Government-financed national PES programmes in China, Costa Rica, Mexico, the United Kingdom and United States alone have channelled over USD 6.5 billion annually (OECD, 2010). In the Costa Rican PES programme for example, which mobilises finance from both government taxes and individual firms, Blackman and Woodward (2010) find that user financing has supported less than 3% of the acres enrolled in the programme (mainly from hydroelectric companies).

Other sources of third-party financing are multilateral banks and international non-governmental organisations, including the World Bank, the GEF, WWF, UNEP, and the German KfW Bank. These institutions tend to provide funds to support up-front design and capacity building costs associated with PES programmes.

Finance for PES has the potential to be scaled-up at the local, national and international level, by both the public and private sector. Overall, it

may be more feasible to mobilise direct user-financing when beneficiaries are local, for example, downstream beneficiaries such as hydro-companies and breweries. In cases where ecosystem service benefits are more spatially dispersed (i.e. at regional and global scale), the higher transaction costs associated with identifying and matching buyers (beneficiaries) and sellers (providers), and the incentives to free-ride, imply that government intervention is needed to help mobilise funds from beneficiaries of ecosystem services. Better information dissemination, including training to local users and beneficiaries of ecosystem services, can assist in encouraging interest in local PES programmes.

A number of PES programmes are now operating at the national scale. These programmes have mobilised finance from a variety of different sources such as water taxes in Mexico, fuel taxes in Costa Rica, the general budget in Ecuador and China, and taxes on (mainly) state-owned entities in Viet Nam. These approaches can be replicated in other countries and new sources of finance can be tapped into. For example, environmentally harmful subsidies can be reformed to reward stewardship over production. Agri-environment payments, for instance, are used in several developed countries, such as EU countries, Norway, Switzerland and the United States (Vojtech, 2010). Additional finance for PES may be mobilised as governments consider ways to reorient existing policies so as to better promote environmental objectives (see also Chapter 3 on EFR).

In addition, as many local and national PES programmes contribute to the provision of global ecosystem services, concurrently with local and regional services, such programmes provide opportunities to tap into international co-financing of PES programmes. One example of where this has been undertaken is in a PES programme in the Los Negros valley in Bolivia. The programme involves the simultaneous purchase of two ecosystem services, watershed protection and bird habitat. While downstream irrigators through the Municipality of Pamagrande are paying for watershed services, the US Fish and Wildlife Service is paying for the protection of habitat for migratory bird species (Asquith et al., 2008).

A similar approach has been proposed in the Socio Bosque Programme in Ecuador, which aims to address deforestation. In addition to the funds allocated by the Government of Ecuador, the programme seeks complementary financial stability through a trust fund created within the National Environmental Fund (Fondo Ambiental Nacional, FAN). Through this fund, donations can be received from countries or organisations, as well as economic incentives from a possible REDD-plus mechanism (Ministry of Environment of Ecuador, 2008, cited in de Koning, 2011).

Key features for effective design and implementation of PES

Effective design and implementation of a PES programme is dependent on the specific goals, priorities and context of the programme. In practice, PES programmes differ in the type and scale of the ecosystem service targeted, the payment source, the type of activity paid for, the performance measure used, as well as the payment mode and amount (Engel et al., 2008). Key features that need to be considered in designing effective PES are summarised as follows:

- clearly defined property/land tenure rights
- clearly defined goals and objectives
- monitoring and reporting
- additionality, leakage and permanence
- performance-based payments and enforcement
- distributional issues.

Clearly defined property/land tenure rights

The individual or community whose land use decisions affect the provision of ecosystem services must have clearly defined and enforceable property or land tenure rights over the land in question. Otherwise, risks associated with, for example, illegal logging or land appropriation will undermine the ability of a landholder to provide the ecosystem service, rendering the PES ineffective. Furthermore, by increasing the value of currently marginal land, PES programmes could increase the incentive for powerful groups to take control of it. PES may then serve to exacerbate problems where tenure is insecure. In Brazil, for example, "land grabbing, insecure tenure, overlapping claims, and lacking information on private tenure constitute real medium-term impediments to PES" (Borner et al., 2010).

Clearly defined goals and objectives

Clear goals and objectives will help to guide the design of the PES programme – this requires an understanding of the current and projected magnitude of the biodiversity and ecosystems service problem that is being addressed, and the underlying socio-economic drivers of degradation and loss. The specific objective of the programme (e.g. forest conservation, hydrological services, species conservation) will also impact on the choice of the most appropriate metrics and indicators that are available so as to cost-effectively target payments and assess performance over time.

Monitoring and reporting

A robust monitoring and reporting framework is fundamental and allows for an assessment of whether the PES programme is delivering its intended objective. It therefore also enables decision-makers to adjust and improve PES programme design over time. Monitoring should be undertaken at three levels: *i)* the implementation level, to assess that landholders are undertaking the contracted land use; *ii)* the ecosystem services level, to ensure that changes in management practices are enhancing the provision of services; and *iii)* at the participants' level, to assess socio-economic impacts and ensure that welfare of participants is improved.

In the Mexican PEHS programme, for example, high resolution satellite imaging technology is used to monitor geographically dispersed forest areas. Participating lands are monitored once a year, together with some of the surrounding area in an effort to detect leakage (Muñoz Piña et al., 2008). The initial development costs of monitoring were USD 5.6 per hectare, relative to payments of USD 30 per hectare (i.e. a ratio of about 1:5). In comparison, the on the ground monitoring used in the Pimpampiro PES programme in Ecuador has a lower monitoring cost to service payment ratio (1:8), however it is limited by personal capacity and budget constraints (Wunder and Alban, 2008). In three PES programmes implemented in Cambodia for biodiversity conservation, monitoring is conducted at the local level by village institutions, by an external agency for certification, and by the Protected Area management for the enforcement of national laws (Clements et al., 2010).

Additionality, leakage, permanence

PES programmes should only reward the provision of ecosystem services when it results from actions that go above and beyond what is required by regulation. Furthermore, a PES programme should only make payments for ecosystem services that are additional to the business-as-usual baseline (i.e. in the absence of the programme), so as to enhance their provision or to avoid their loss. For example, payments for habitat protection are only additional if in their absence the habitat would be lost. Low additionality has been raised as an issue in several PES programmes, including Finland and Costa Rica, because of the low risk of imminent forest loss (Zandersen et al., 2009; Wunscher et al., 2006). Clear understanding of whether or not ecosystems are at risk of loss or degradation is therefore needed. A starting point for developing baselines is historical trend data, which needs to be combined with projections of key variables such as population and economic growth to provide forward projections of changes on biodiversity and ecosystem services in the absence of new policies. Baselines therefore also help to minimise the problem of perverse incentives from "new polluters", in other words, those who threaten to degrade ecosystems just before or after a

PES programme has been introduced so as to obtain payments. Appropriate monitoring and reporting frameworks are required for this. Examples of PES programmes that have designed their programmes so as to target payments to areas where risk of loss is high are the Mexican PEHS and the Tasmanian Forest Conservation Fund in Australia (Munoz-Pina, 2008; OECD, 2010).

Leakage occurs when the provision of ecosystem services in one location increases pressures for conversion in another. Leakage can occur at the intra-national or international level. The extent to which risk of leakage is a concern depends on the price elasticity of supply and demand for ecosystem services (Gan and McCarl, 2007). If leakage risk is expected to be high, the scope of the monitoring and accounting framework may need to be expanded to enable assessment of the potential leakage so that appropriate measures can be introduced to address it. To avoid intra-property leakage in the Mexican PEHS (which aims to mitigate deforestation and address water scarcity), in many cases the PES contracts specify that the removal of trees from the community's entire forest area (even outside of the area for which payments are being made) constitute a PES contract violation and hence subsequent non-payments.

Permanence refers to the ability to ensure the provision of ecosystem services over the long-term. Events such as forest fires, hurricanes, and the invasion of alien species, or other human-induced occurrences such as illegal logging may undermine the ability of a landholder to provide an ecosystem service as stipulated in a PES agreement. If these risks are high, this will impede the effective functioning of a PES market. Insurance mechanisms, or the creation of an emergency rehabilitation fund, can be introduced to address this. Typically, where the loss of service provision is directly or indirectly due to negligence on the part of the ecosystem service provider, payment can simply be withheld. The timing of payments should therefore be undertaken ex-post, on a regular basis such as annually.

Performance-based payments and enforcement

Ideally, payments should be ex-post, conditional on ecosystem service performance. In Sweden for example, a wastewater treatment plant makes direct payments to blue mussel farmers based on the measured nitrogen and phosphorous content on the harvested mussels' biomass. When this is not feasible (due to high costs of monitoring ecosystem services directly or the time delay between the implementation of the management practice and the ecosystem service provision), effort-based payments – such as changes in management practices – are a second best alternative, provided that changes in ecosystem management practices will bring about the desired change in service provision. Sufficient disincentives to breaching the PES agreement must also be provided and enforced, especially if payments are based on efforts rather than on actual ecosystem service delivery.

Distributional implications

PES programmes have generally been promoted as a mechanism that has positive impacts on welfare and poverty. This is because PES are voluntary schemes, whereby land users decide whether to opt-in for payments to alter their management decisions. Pagiola et al. (2005) note that though this creates a presumption that participants are at least no worse off, further factors need to be considered to assess the impact of PES on the poor. Some evidence suggests that impacts on equity are design and context-specific (Grieg-Gran, 2005; Pagiola et al., 2005) and thus emphasise the importance of safeguards. Table 4.2 summarises the potential impacts of PES.

Table 4.2. **Potential impacts of PES**

Positive	Negative
• Improved local organisation	• Exclusion from project and local development decisions
• Employment	• Eviction from lands
• Increased household income	• Unequal benefit distribution
• Change of livelihood	• Reliance on markets
• Improved health of downstream communities	• Changing food or fuel prices
• Increased interaction with business and government agencies	• Opportunity costs of other livelihoods
• Resiliency to natural disaster	• Traditional access/ use changes
• Promotion of land tenure	• Elite capture

Source: Forest Trends (2011), "Farmers Rights and Social-Environmental Best Practices", Presentation by Beto Borges, Director, Community and Markets Program, Forest Trends, 8 April 2011, *http://forest-trends.org/documents/files/doc_2727.pdf.*

Not all participants may have the same opportunities to participate. Obstacles identified for participation of the poor include: high transaction costs (e.g. complexity of application procedures and inflexible contract design); tenure insecurity (e.g. eligibility criteria associated with land titles); high investment costs (lack of access to start up capital) and opportunity costs; and education levels (Jindal and Kerr, 2007; Pagiola et al., 2005). PES programmes should seek to minimise transaction costs and to provide support to poor land users, including technical assistance or access to inputs and credit, so that they can adopt the desired management practices (Pagiola et al., 2005). They should also seek to remove inappropriate access restrictions. In a review of eight PES case studies, Grieg-Gran *et al*. (2005) find that three initiatives have eligibility criteria based on farm size that favour small landowners and communities. But other rules discourage or exclude smallholders. In particular, such rules exclude informal land tenure and mixed

livestock-forest or agroforestry systems, which are often favoured by poor people with limited land resources (see also Pfaff et al., 2007; Wunder, 2006). Muradian et al. (2010), for example, document several cases where poverty alleviation goals of conservation payments were not obtained as expected due to a distribution of benefits that favour larger wealthier landowners.

In the SocioBosque programme, the main mechanism to address fair distribution is through decreasing payments per hectare with size of the increasing conservation area. Size was used as a variable to address social equity, as it corrects for very high incentives per family when individual farms are big or when communities have many hectares available per family belonging to the community. For the first 50 ha of the conservation area, the incentive is USD 30 per hectare per year; from 51 to 100 ha, the incentive decreases to USD 20 per hectare per year; and decreases further for additional hectares (de Koning, 2011). The PEHS programme in Mexico also explicitly incorporates mechanisms to target the rural poor (see OECD, 2010).

Note

1. This section draws and builds on OECD (2010), *Paying for Biodiversity: Enhancing the Cost-Effectiveness of Payments for Ecosystem Services,* OECD Publishing, Paris, doi: *10.1787/9789264090279-en*.

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Chapter 5

Biodiversity offsets

This chapter considers the size and scalability of biodiversity offset programmes and examines the key design and implementation features needed for biodiversity offsets to operate effectively and equitably. These include, for example, metrics to ensure that biodiversity benefits at offset sites are equivalent to losses at the impact site, a robust monitoring, reporting and verification framework, and safeguards to help manage environmental and social risks.

An introduction to biodiversity offsets

Biodiversity offsets are "measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken" (BBOP, 2009a). They are used to allow some continued development within an overall objective of no net loss, or net gain of biodiversity, and are based on the premise that impacts from development can be offset if sufficient habitat can be protected, enhanced or established elsewhere (Gibbons and Lindemayer, 2007). As biodiversity offsets impose additional costs on developers whose activities have adverse impacts on biodiversity, they are in line with the polluter pays approach.

Biodiversity offsets must not become a "license to trash". They are intended to be carried out during the final step of the environmental impact mitigation hierarchy – avoid, minimise, restore and offset. This means that biodiversity offsets are a last resort, and should only be applied to the residual impacts after appropriate efforts have been made first to avoid adverse impacts to biodiversity, then to minimise the unavoidable impacts, and finally to restore biodiversity on-site.

There is a limit as to what can be offset (BBOP, 2009a). If impacts to biodiversity cannot be fully compensated for by an offset because the affected biodiversity is irreplaceable or vulnerable, or because there are no available offset sites or no known conservation approaches to achieve the offset outcomes required, the project should be redesigned so as to further avoid and/or minimise adverse impacts. If this is not possible, the project may need to be abandoned. Establishing thresholds for offsetable impacts is a fundamental environmental safeguard for both voluntary and mandatory biodiversity offsets.[1]

Biodiversity offsets were first formalised in the United States in the 1970s for wetland mitigation, and have more recently proliferated in a number of countries. Today, around 40 countries or states have laws or policies that specifically require biodiversity offsets or some form of compensatory conservation for particular sets of impacts.[2] These include Australia, Brazil, Canada, China, Colombia, India, Mexico, New Zealand, South Africa, Switzerland, the 27 Member States of the EU, and the United States (Treweek, 2009; Madsen et al., 2010; Morandeau and Vilaysack, 2012). The existing applications of biodiversity offsets generally take one of three forms (see Box 5.1).

About 45 biodiversity compensation programmes are currently in existence around the world, ranging from offset programmes where residual damage is measured and offset by an equal or greater amount of biodiversity gains, to programmes that channel a portion of development fees to biodiversity conservation activities (e.g. Brazil's Industrial Offset programme) (Madsen et al.,

2011). In addition to mandatory programmes, a number of private sector industries have implemented offsets voluntarily and several companies have committed to no net loss, or net gain policies, including Rio Tinto, BHP Billiton, BP and Shell (ten Kate et al., 2004).

Box 5.1. **Types of biodiversity offsets**

One-off approach: once (predicted) adverse impacts have been evaluated, the biodiversity offset is carried out by the developer or by a subcontractor (e.g. a conservation NGO). The developer assumes financial and legal liability. Verification is normally undertaken by a government agency or an accredited third party. One-off approaches are typically used for voluntary offsets and are common under regulatory programmes (e.g. Colombia Environmental Compensation; Vegetation Management Offsets in Queensland, Australia; Species Mitigation and Wetland Compensatory Mitigation in the United States, and Fish Habitat Compensation in Canada).

In-lieu arrangement: a government agency stipulates a fee that a developer has to pay to a third party, to compensate for residual biodiversity impacts. The third party (i.e. the offset provider) takes on the financial and legal responsibility for the offset. In-lieu fee arrangements have been employed in the US Wetland and Species Mitigation, South Australia's Native Vegetation and Scattered Tree Offsets, and forest compensation schemes in India and Mexico. Fees tend to be based upon a reasonable cost estimate of the financial resources needed to compensate for the adverse impacts (e.g. in the Mexican scheme, the compensation amount per hectare is based on the average costs of reforestation activities, not including the cost of purchasing the land). In Brazil, however, the fee represents between 0% and 0.5% of the total investment costs of the project, depending on the scale of the impacts, while in India, the fee comprises the forest's "opportunity cost", a tax to offset deforestation and the cost of the environmental losses.

Biobanking*: once (predicted) adverse impacts are evaluated, the developer can purchase offsets directly from a public or private biobank. A biobank refers to a repository of existing offset credits, where each credit represents a quantified gain in biodiversity resulting from actions to restore, establish, enhance and/or preserve biodiversity (e.g. wetlands, streams, habitat, species). As under the in-lieu arrangement, financial and legal liability is transferred from the developer to the provider. Credit prices generally reflect the expected costs of producing each credit (e.g. price of land, opportunity costs, administrative costs, and costs of implementing offset activities) and, in the case of private biobanks, a profit margin. Bankers offering the same product then compete on a price basis. Examples of biobanking include the US Conservation Banking, the New South Wales BioBanking scheme in Australia and compensation pools under the German Impact Mitigation Regulation

* Also referred to as mitigation banking, conservation banking, species banking, or habitat banking.

Source: Crowe and ten Kate (2010); DECC (2007); Madsen et al. (2010, 2011); Morandeau and Vilaysack (2012); O'Connor NRM Pty Ltd (2009); Shabman and Scodari (2004); US Federal Register (1995); Wende et al. (2005).

Offsets are applicable to a wide range of sectors and can be used to compensate for impacts on a variety of ecosystems. Sectors in which offsets have been implemented include: mining (e.g. Strongmine Coal NZ; Akyem Coal Mine Ghana); windpower (e.g. Apennine Wind Farms, Italy); pulp and paper (e.g. Pulp United Pulp Mill, South Africa); hydropower (e.g. Nam Theun 2 Hydropower Project, Laos); oil and gas (e.g. Chad-Cameroon Petroleum Development and Pipeline Project); property development (e.g. Bainbridge Island, United States); and agriculture (e.g. Queensland, Australia) (BBOP 2009b; Madsen et al., 2011). Local or national programmes have been developed to offset impacts on wetlands (e.g. in the United States and Canada), streams (e.g. United States); fish habitat (e.g. Canada and Queensland, Australia); native vegetation (e.g. Victoria, Australia); and forests (e.g. India, Mexico and Brazil), among other things (Madsen et al., 2011; Morandeau and Vilaysack, 2012). Some examples of biodiversity offset programmes are described in Box 5.2.

Box 5.2. **Selected biodiversity offset programmes**

Germany: The German Federal Nature Conservation Act of 1976 (amended in 2002) establishes the framework for the Impact Mitigation Regulation (IMR) ("Eingriffsregelung"). This requires developers to assess and mitigate impacts on the environment in accordance with the mitigation hierarchy and the precautionary principle. The aim of the law is to achieve "no net loss", by offsetting residual unavoidable impacts. It covers all natural assets under the German Federal Nature Conservation Act, including projects at both urban and sectoral planning levels. The Federal States provide supplementary provisions and organise the offset process. Developers (e.g. of new residential areas, roads or railways) may offset their residual impacts by either a one-off approach or by purchasing credits from a biobank (compensation pool). There are over 1000 biobanks operating or under development today, managed mainly by municipalities, but also some private entities. The volume of the biodiversity offset market in Germany is unknown, but data shows that offsets in the state of Bavaria conserve an average of about 2,600 hectare per year (2008/2009).

US Species Mitigation: The Endangered Species Act (ESA) of 1973 regulates impacts to US threatened, endangered, or other imperiled species. Any impact to these species must be permitted and approved by US Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS), and must follow the mitigation hierarchy after which developers may offset their residual impacts by either a one-off approach, an in-lieu fee fund, or by purchasing credits from a biobank (i.e. US Conservation Banking). Offsets are purchased by organisations developing infrastructure projects like roads and bridges, residential and commercial developers, the Department of Defense, extractive industries, and utilities. In 2009 there were a total of 77 active banks, 19 sold-out and 20 pending banks, including both public and private banks. At least 143 credit types exist (92 species and 51 habitat credit types).

Box 5.2. **Selected biodiversity offset programmes** *(continued)*

Canada Fish Habitat Compensation: Canada's Fisheries Act and the 1986 Policy for the Management of Fish Habitat requires compensation for "harmful alteration, disruption, or destruction" of fish habitat. Impacts generally arise from urban and industrial development, roads and highways, harbours and marinas, forestry, agriculture, hydropower and extractive industries. Developers must apply for a permit and show adherence to a mitigation hierarchy by "relocation, redesign, and mitigation" and then compensation of net residual loss. This programme allows only one-off offsets and biobanking; in-lieu arrangements for compensation obligations are not permitted. While there are currently more than 40 biobanks in Canada, single offset approaches remain the preferred method.

Mexico: Mexico's General Law of Ecological Equilibrium and Protection of the Environment (LEY General de Equilibrio Ecologico y Proteccional Ambiente, LGEEPA) establishes a need for Environmental Impact Assessments (EIAs). The Secretary of Environment and Natural Resources implements this law and determines if an EIA is required for any given development project. If an EIA is required, an Environmental Management plan is issued, consisting of separate mitigation, compensation and follow-up measures for development activities, and distinguishing on-site and off-site actions. Developers can either create the offset themselves or pay an in-lieu fee to the National Forestry Commission (CONAFOR). CONAFOR is responsible for setting the compensation ratio, which must be greater than 1:1. The funds are used to complete reforestation activities. The Instituto Nacional Ecologica is preparing an initiative for SEMARNAT to develop a system of banking and trading biodiversity offset credits to address some of the shortcomings of the current scheme.

New South Wales Biodiversity Banking and Offsets Scheme: The New South Wales Department of Environment and Climate Change (DECC) recently introduced a biobanking scheme based on the Environmental Planning and Assessment Act of 1979, the Threatened Species Conservation Act of 1995 (NSW), and the Threatened Species Conservation (biodiversity banking) regulation of 2008 (NSW). Developers may choose to engage in BioBanking to fulfil their requirements to minimise and offset biodiversity impacts. Impacts and required offsets are calculated with the BioBanking Assessment Methodology and the Credit Calculator software. Credits are generated through protection and management of ecological communities, threatened species, and habitat corridors. Biobanking requires a "like-for-like" trade of credits associated with 50-100 vegetation types and over 1 000 threatened species in 13 bioregions. Payments to landholders for management of offset sites are centralised through a government-managed BioBanking Trust Fund, which distributes annual payments to BioBank owners for management of the Biobank site.

Source: Darbi et al. (2009); Darbi and Tausch (2010); DECC (2007); Madsen et al. (2010); Madsen et al. (2011); Rundcrantz and Skarback (2003); Wende et al. (2005).

Potential for mobilising and scaling-up finance from biodiversity offset programmes

According to 2011 estimates, biodiversity offsets and other compensation schemes mobilise an estimated USD 2.4-4 billion each year,[3] and have resulted in the protection or restoration of more than 187 000 hectares (Madsen et al., 2011). The largest running programme, the US Wetland Mitigation programme, mobilises an estimated USD 1.1-1.8 billion per year (2008 data), and covers a total mitigation area of just under 10 000 hectares (Madsen et al., 2011). The Bushbroker programme in Victoria, Australia, facilitated AUD 34 million (USD 32 million) in credit sales cumulatively (2007-11), and an average of AUD 6.8 million (USD 6.4 million) annually over last two years. It has facilitated 3 240 hectares of credits since May 2007, or 855 hectares annually (Madsen et al., 2011).

While existing programmes continue to expand, an additional 27 compensation programmes are under various stages of development (Madsen et al., 2011). In Europe, for example, the United Kingdom embarked on a two-year biobanking pilot programme in April 2012 (DEFRA, 2012), while France has established five pilot biobanks, and adopted a national doctrine in May 2012.[4] The French pilots are conducted according to an agreement between the Ministry responsible for sustainable development and the operators. A national committee and several local committees monitor and evaluate the trial

Table 5.1. **Annual finance mobilised in selected biodiversity offset programmes**

BO Programmes	Annual Payments in USD
US Wetland Mitigation	1.1-1.8 billion (2008 data)
US Stream Mitigation	240-430 million (2008 data)
US Conservation Banking	200 million* (2009 data)
Canadian fish habitat and wetland compensation	6-145 million (n.d.)
Bushbroker, Victoria, Australia	6.4 million (average of 2010 and 2011)
South Australia's Native Vegetation and Scattered Tree Offsets	2.5 million (2008-10 data)
China's Forest Vegetation Restoration Fee	393 million (2003-05 data)

*This figure does not include species compensation through in-lieu fee funds or one-off offsets, which are also options under US Species Mitigation.

Sources: Madsen, B., N. Carroll and K. Moore Brands (2010), *State of Biodiversity Markets Report: Offset and Compensation Programs Worldwide,* Forest Trends, Washington, DC. Available at *www.ecosystemmarketplace.com/documents/acrobat/sbdmr.pdf*; Madsen, B. et al. (2011), *2011 Update: State of Biodiversity Markets, Forest Trends,* Washington, DC. Available at *www.ecosystemmarketplace.com/reports/2011_update_sbdm*.

on a continuous basis. At the European level, biodiversity offsets are being explored as a potential mechanism to achieve the "no net loss of biodiversity and ecosystem services" target of the EU 2020 Biodiversity Strategy (EC, 2011).[5] In South Africa, the Western Cape, KwaZulu-Natal and Guateng have developed provincial guidelines for biodiversity offsets, and KwaZulu-Natal has drafted provincial legislation and policy. A national biodiversity offset framework is also currently being developed. In Uganda, the Wildlife Authority is in the early stages of developing a biodiversity offset policy and is investigating voluntary offsets with oil companies with an aim to catalyze national law for compliance-based offsets in the future. There is thus considerable activity in the area of biodiversity offsets and potential to scale-up this mechanism.[6]

Biodiversity offset programmes operate at the local level (e.g. Willamette Partnership, Bay Bank, US); at the state or provincial level (e.g. Victoria and New South Wales, Australia); as well as at the national level (e.g. US Wetland Compensatory Mitigation). However, the scale at which offsets are implemented can be constrained by ecological as well as socio-political considerations. The former refers to the issue of establishing environmental equivalence between the impact and the offset sites (see discussion below). Socio-political considerations refer to the fact that stakeholders (whether at a local, state or national level) are unlikely to accept offsets when the benefits accrue to other communities, states or countries not impacted by the development. There is, however, at least one example of a cross-boundary biodiversity offset mechanism: developments which have residual negative impacts on the habitat of a vulnerable bird species in the United States, the Bicknell's Thrush, can offset residual impacts by paying money into a conservation fund, which invests in conservation activities at the Bicknell's Thrush's wintering grounds in the Dominican Republic and Haiti (VCE, 2008; Kerchner et al., 2009). Such an approach could be more acceptable from a socio-political point of view because the benefits accrue to all the countries involved.

Biodiversity offset schemes are able to mobilise finance from both the private and public sector. Offset credits under US Wetland Compensatory Mitigation, for example, are purchased by public sector transportation, water and defence agencies as well as private developers. Federal agencies are also able to offset unavoidable residual impacts, via the US National Recovery Credit System, which promotes and enhances the recovery of listed species on non-Federal lands (USFWS, 2007). Under the New South Wales biobanking scheme private and public non-developers (e.g. environment agencies or NGOs) can also purchase offset credits for conservation purposes (DEEC, 2007).

Regulatory policy is more likely to realise the potential of biodiversity offsets than voluntary approaches. There are however opportunities to scale-up voluntary approaches as well, and these can provide useful lessons and insights for the design and implementation of larger-scale biodiversity offsets.

Voluntary offsets may be motivated by a range of drivers including ethics and philanthropy, risk management, operational efficiency and cost savings, competitive and first-mover advantage, and access to investor finance (BBOP, 2010). Currently, 78 financial institutions (76 Equator Principles Financial Institutions and 2 Associates) in 32 countries have officially adopted the Equator Principles[7] covering over 70% of international Project Finance debt in emerging markets (The Equator Principles Association, 2013). Performance Standard 6 requires project developers to adhere to the mitigation hierarchy and includes specific provisions relating to biodiversity offsets.

Key features for effective design and implementation of biodiversity offset programmes

Experience with biodiversity offsets to date points to a number of design and implementation features that need to be carefully considered so as to ensure their effectiveness. Key issues that have been identified and discussed below are (BBOP, 2009c; Burgin, 2008; Gibbons and Lindenmayer, 2007; McKenney and Kiesecker, 2010; Quétier and Lavorel, 2011):

- equivalence and offset replacement ratios
- location of the offset
- additionality and leakage
- timing and permanence
- transaction costs
- monitoring, reporting and verification
- compliance and enforcement
- stakeholder participation and distributional issues.

Equivalence and offset replacement ratios

As no two areas are ecologically identical, designing offsets requires assessment of how to achieve biodiversity benefits at offset sites that are equivalent to losses at the impact site. One of the key considerations is whether the offset is to be in-kind or out-of-kind. In-kind offsets, which have tended to be more frequently adopted[8] (McKenney and Kiesecker, 2010), refer to the provision of habitats, ecosystem functions, values or other attributes similar to those affected by development. Out-of-kind offsets allow for different forms of compensation. For instance, in the case that the biodiversity components affected by development are neither national nor local priorities, it may be more appropriate to "trade-up", i.e. where the offset is out-of-kind but targets higher priority biodiversity than is affected by the development (BBOP, 2009c).

This is permitted, for example, in US Wetland Compensatory Mitigation, and encouraged by affirmative offset replacement ratios in the Victorian State Programme in Australia (McKenney and Kiesecker, 2010). Trading up may also be necessary where there is a supply shortage of like-for-like offset sites.

To attain no net loss, or net gain policy goals, offsets need to be based on the explicit calculation of biodiversity losses and gains at matched impact and offset sites. Designing an offset therefore requires a decision about which metrics to use. Ideally, these should cover type, quantity and quality of the biodiversity. While increasing the resolution of biodiversity classification and using multiple biodiversity components can provide a closer match between the losses and the gains, it can reduce flexibility, making it more difficult to locate a matching offset, and increasing costs (Crowe and ten Kate, 2010).

There are a range of different methodologies available – Germany alone has more than 40 published methodologies – which could be adopted or adapted as appropriate by countries wishing to introduce biodiversity offset schemes (Darbi and Tausch, 2010). While most frameworks provide broad guidance or provisions for selecting metrics, only a few schemes appear to endorse a particular methodology (e.g. Western Cape, South Africa; Victoria, Australia; New South Wales, Australia).

Once the metric has been established, an offset replacement ratio (multiplier) can be assigned. This indicates how many credits or units have to be generated at an offset site per unit lost at the impact site. Ratios may change depending on the proposed offset actions (e.g. preservation versus restoration); differences between expected losses and gains in ecosystem functions; distance from offset site; temporal losses; and risk and uncertainty (see discussion of permanence and timing below) (McKenney and Keisecker, 2010; BBOP, 2009c; Quétier and Lavorel, 2011). A sample of methodologies is provided in Box 5.3.

Box 5.3. **Examples of metrics and multipliers used in biodiversity offsets**

United States Habitat Evaluation Procedure: This approach is based on Habitat Units (HUs) and Habitat Suitability Indices (HSIs). HUs are derived by multiplying the HSI of a species by the area of the habitat in question. The HUs consider habitat suitability (including measures of structure and function) for the chosen species (composition). The HUs look at both the quality and quantity of suitable habitat for particular species; these HUs change as a result of negative impacts on biodiversity. The methodology relies on a good understanding of the relationship between species and their habitat, and the carrying capacity of that habitat. The HSI is effectively a measure of the benchmark optimum habitat for a particular species; an HSI of 1.0 is the benchmark habitat for that species.

Box 5.3. **Examples of metrics and multipliers used in biodiversity offsets** *(continued)*

Victoria/Australia Habitat hectares: This approach is based on "habitat hectares", units of measurement that take into account the area affected and the quality or condition of the vegetation impacted (determined by the quantities of a number of chosen attributes related to the structure of that habitat). The score for a particular area is determined by comparing biodiversity attributes (e.g. canopy cover; lack of weeds; understory strata) of the remnant native vegetation to a reference site having the same vegetation type (termed Ecological Vegetation Classes (EVC)) but in a mature and long-undisturbed state. Multiplying this score by area gives a measure termed a habitat hectare. For example, 10 hectares of mature, fully natural (100% score) wet heathland could be counted as 10 habitat hectares, whereas 10 hectares of this EVC with a "habitat score" of 50% would be scored as 5 habitat hectares. In addition to the currency based multiplier inherent in the habitat hectare calculations, the state of Victoria also requires multiples of this quantity to be applied according to the conservation significance of the habitat impacted. This ranges from at least 2x the calculated loss of habitat hectares for very high conservation significance offsets to partially address risk of some level of offset failure (regarded as "substantial net gain"), a 1.5x multiplier for high conservation significance and 1x for medium to low conservation significance.

Western Cape of South Africa Provincial Guideline: Following calculation of the residual loss in terms of hectares alone, the multiplier calculation follows two steps: a) Offsets are calculated by multiplying the area lost by the offset ratio which has been pre-assigned to the affected ecosystem according to its conservation status in the National Spatial Biodiversity Assessment. This involves multiplying the residual loss impact areas by a factor according to the endangerment of the ecosystem: a 30x "basic ratio" (i.e. for every hectare lost, 30 hectares of offset of that ecosystem would have to be secured) for "critically endangered" ecosystems (only in extraordinary circumstances; in most cases these ecosystems are irreplaceable and not offsetable); 20x for "endangered" ecosystems; 10x for "vulnerable" ecosystems; no offset for "least threatened" ecosystems. b) Revised figures are adjusted based on the habitat condition, impacts on special habitats, ecological corridors or process areas, and impacts on ecosystem services or the biodiversity underpinning these services. For example, impacts on degraded habitat mean the multiplier can be halved.

Source: BBOP (2009d).

Location of the offset

Biodiversity offsets can either be undertaken nearby the affected area (on-site) or further afield (off-site). In some cases multiple sites may be required in order to adequately compensate for residual biodiversity loss. While it is considered good practice for offset sites to generate benefits to the areas affected by the associated development project, selecting offset sites in areas adjacent or contiguous to the impact site may generate considerably less

biodiversity benefits than locating it further afield (McKenney and Kiesecker, 2010; NRC, 2001). It may also limit the availability of offset-sites, as was the case in Germany, prior to the introduction of offsite biobanking (Wende et al., 2005). To account for this, offset programmes have tended to be more flexible, basing site selection on overarching conservation goals. Under the new US Wetland Compensatory Mitigation regulations (2008), for example, developers are to locate the offset in the same watershed as the impact site only where "appropriate and practical" (US Federal Register, 2008). Conservation banks in the US are generally located within a "service area" defined by the US Fish and Wildlife Service based on physical and ecological attributes (USFWS, 2003); and in Victoria, Australia, offsets are required to be "as close as possible" when "higher significance" vegetation is affected (Victoria DNRE, 2002). In France, the national doctrine specifies that offsets should be located, "as a priority, in functional proximity to the affected site", and that "[t]he compensatory measures must be pertinent and adequate, particularly with regard to their magnitude and location" (MEDDTL, 2012).

When choosing an offset site, offset providers should also take into account the landscape context, so as to maximise the biodiversity benefits generated by the site and reduce the likelihood that the offset site will become non-viable due to land-use changes in the surrounding area (BBOP, 2009c; USFWS, 2003; Western Cape DEADP, 2007). Aggregating offsets through biobanking or by integrating offset planning into regional land-use plans or Strategic Environmental Assessments could help optimise the net biodiversity benefit delivered through biodiversity offsets, by increasing ecosystem connectivity, preventing future habitat fragmentation and creating large contiguous sites of secure high conservation value land (BBOP, 2009c).

Additionality and leakage

An offset should deliver conservation gains over and above what is already taking place or planned. A review of regulations and guidance in 8 major biodiversity offset and compensation policy programmes[9] suggests that the additionality principle is widely incorporated (McKenney and Kiesecker, 2010). New South Wales offset regulations, for example, require offsets to be "additional to actions or works carried out using public funds or to fulfill regulatory obligations" (NSW DNR, 2005), US Conservation Banking Guidance states that "land used to establish conservation banks must not be previously designated for conservation purposes (e.g. parks, green spaces, municipal watershed lands)" (USFWS, 2003), and Queensland's offset policy requires offsets to provide either additional protection to environmental values at risk or additional management actions to improve environmental values. Specific-issue offset policies (e.g. Vegetation Management Offsets;

Fish Habitat Loss and Koala Habitat) then provide guidance on which additional actions are considered appropriate (Queensland EPA, 2008).

Additionality can be assessed by comparing how biodiversity is predicted to change under a business-as-usual scenario with how it would change under the offset scenario. The offset provider should be able to demonstrate that the proposed management interventions could feasibly enhance biodiversity, given the broader economic and demographic trends, the landscape context (e.g. ecosystem connectivity), and the current level of protection of the proposed offset site. A number of tools can be used to inform this process, including biodiversity maps, spatial plans, and National Biodiversity Strategies and Action Plans (BBOP, 2009e).

In practice, additional biodiversity gains can be achieved by enhancing the biodiversity of an area (e.g. restoring it or rehabilitating certain ecological functions), creating new habitat (e.g. wetlands) or preserving or averting risk to existing habitats or ecosystems (e.g. preventing conversion of native forest to agricultural land). The proposed offset for the Akyem Gold Mining Project in Ghana, for instance, involves restoring forest vegetation with vulnerable plant species and species of ethnobotanical importance, removing invasive alien species, stopping degradation resulting from unauthorised uses (e.g. timber harvest and bushmeat hunting), and averting risks associated with future activities by working with local communities to develop conservation agreements and practices to allow sustainable, multiple uses of the offset area (Newmont Golden Ridge Limited, 2009). While conserving habitats or ecosystems may offer greater certainty of success than creating new habitats and ecosystems, or restoring degraded ones, it may be more difficult to prove additionality; developers will have to show that degradation or biodiversity loss is inevitable without the increased protection offered by the offset. It is also important that the offset management does not displace harmful activities elsewhere, resulting in leakage (see chapter 4 for a discussion of leakage in the context of PES).

Timing and permanence

Whereas project impacts cause immediate and certain losses to biodiversity, the biodiversity gains at an offset site can be uncertain and may require many years to achieve (McKenney and Kiesecker, 2010). To reduce biodiversity loss associated with time lags, several biodiversity offset programmes or policies require offsets to be operational and proven prior to permitting development projects (e.g. EU Natura 2000 offsets; US Wetland Compensatory Mitigation; US Species Mitigation) (McKenney and Kiesecker, 2010). US Conservation Banking guidance states "at the time the first credit in a bank or phase of a bank is sold, the land within the bank or its phase must be permanently protected …" (USFWS, 2003), and under the

EU Natura 2000 programme "the [compensatory] result has normally to be operational at the time when the damage is effective on the site concerned with the project …" (EC, 2000). In this regard, biobanks have an advantage over one-off approaches and in-lieu fee arrangements as they tend to be established independently and further in advance of the associated development impacts.[10]

Permanence is the principle that biodiversity offsets should exist at least as long as the negative impacts from development persist, and ideally in perpetuity. Offset regulations for native vegetation in NSW Australia, for instance, call for offset benefits to "persist for at least the duration of the negative impact of the proposed clearing" (NSW DNR, 2005), and US Conservation Banking policy requires banks to "safeguard in perpetuity the species or habitat conservation values upon which the credits are based" (USFWS, 2003).

Ensuring the long-term viability of the offset site can be undertaken by purchasing land (either to be managed by the project developers themselves or by a third-party), transferring private land to the government in order to designate it as a reserve, entering into a conservation agreement with a landowner or manager, or placing a conservation easement or covenant on a property.[11] Different approaches are required depending on the nature of the offset and the legal framework within which it is implemented (e.g. land law; protected area law; contract law). Other factors that may determine the permanence of an offset include offset location (i.e. landscape considerations), choice of management interventions, existence of long-term management plans and sustainable financing,[12] division of responsibility, performance standards and ongoing monitoring, adaptive management and compliance (McKenney and Kiesecker, 2010).

Environmental safeguards that can be put in place to address temporal loss of biodiversity and non-permanence include conservative mitigation replacement ratios (multipliers) so as to increase the required offset size to reflect risks associated with permanence and time lags; "hedge betting", where risks are spread across a portfolio of offset sites and management interventions; and financial assurances (e.g. performance bonds; cash escrows; letters of credit) (Moilanen et al., 2008; Landry et al., 2005). Financial assurance can also provide regulators with funds with which to complete the offset activities should the offset provider be unable or unwilling to do so (Institute Water Resources, 1995). Insurance products have recently been developed for mitigation bankers in the US, and may prove to be more cost effective than other assurance instruments (Kett, 2012).

Transaction costs

Transaction costs associated with establishing biodiversity offsets include costs associated with identifying and securing an offset, applying for development permission, and monitoring, reporting and enforcing biodiversity offset commitments. Administrators should aim to identify opportunities to minimise these costs to the extent possible. One way to do this is to allow biobanking. This is predominantly due to economies of scale, as biobanks tend to be designed to offset multiple development projects, which enables pooling of resources and expertise and reduces the effort required for monitoring and enforcement. It may also render offsets feasible for companies with small development sites or small residual impacts. Biobanking also reduces the time required to identify a feasible offset site and process a development permit, as the offset can be established and the credits registered in advance of a development proposal (US Federal Register, 1995; Carroll et al., 2008; Wende et al., 2005). Moreoever, transaction costs associated with biobanking can be reduced through brokerage services, such as the Bushbroker programme established by the Victorian Government in Australia, which pairs offset credit buyers with credit sellers (DSE, 2013).

Monitoring, reporting and verification

Monitoring, reporting and verification (MRV) is essential to evaluate compliance and assess progress towards intended objectives and outcomes of biodiversity offsets. It is needed for adaptive management of the offset site and, more generally, for improving the design and implementation of offset programmes based on experience (e.g. iterative adjustment of mitigation replacement ratios) (Matthews and Endress, 2008; Hayes and Morrison-Saunders, 2007).

The Business and Biodiversity Offsets Programme[13] (BBOP) suggests adopting two types of indicators or performance standards when monitoring offsets: implementation indicators, which measure the extent to which offset activities have been implemented (e.g. number of staff employed); and impact indicators to measure the influence of project activities on the status of biodiversity (e.g. change in bird species diversity) (BBOP, 2009e). The BBOP has recently introduced a global standard for biodiversity offsets to help determine whether an offset has been designed and subsequently implemented in accordance with the BBOP Principles. This global standard could provide a reference for regulatory offsets as well as voluntary ones.

In US Wetland Mitigation Banking, US Conservation Banking, and NSW Biobanking, offset providers are required to monitor their performance against standards established in the offset or banking agreement, and submit monitoring reports to regulators periodically (e.g. once a year for NSW

Biobanking). Performance is then verified by on-site inspections. In NSW these are carried out by a DECC[14]-accredited third party, in the US Wetland Mitigations Scheme by an authorising agency[15] and in the US Species Banking by the US Fish and Wildlife Service (NSW, 2012; US Federal Register, 1995; USFWS, 2003). Compliance information may also be collected through public notification. In Mexico, the DGIRA[16] also promotes the use of satellite data, and has been developing a geographic information system to supplement the on-site inspections conducted by the PROFEPA[17] (Morandeau and Vilaysack, 2012).

While MRV is fundamental to biodiversity offsets, it is often insufficient or inadequate (Esty, 2007; Harper and Quigley, 2005a; GAO, 2005; Morandeau and Vilaysack, 2012). A 2005 review of US Wetland Mitigation, for example, found that only 24% of required monitoring reports were submitted to the Corps[18] for one-off offsets; 70% for mitigation banking and 83% for in-lieu arrangements. It also found that offset site inspections had not been carried out as frequently as intended, with considerable regional variations. For instance, across seven districts, the percentage of mitigation banks that the Corps had inspected ranged from 13-78% (GAO, 2005).

Poor monitoring and reporting can be addressed by penalising those who do not submit adequate reports. In the NSW Biobanking scheme, for example, annual payments are made only after monitoring reports have been submitted. Effective verification requires sufficient capacity and commitment to conduct thorough and frequent on-site inspections. A lack of capacity threatens to undermine biodiversity offsets in both OECD (e.g. France, Mexico, United States) and non-OECD countries (e.g. South Africa) (Morandeau Pers. Comm. 1 August 2012; Morandeau and Vilaysack, 2012; Brownlie Pers. Comm. 31 July 2012).

Compliance and enforcement

Regulators must ensure that developers have adhered to the environmental mitigation hierarchy, that offset site selection and mitigation ratios conform to requirements, and that performance standards have been met. Factors that influence the likelihood of compliance include the stringency of the management prescriptions, the opportunity costs, the probability of detection (e.g. the intensity of compliance monitoring), and the level of fine for detected contract violations.

Where parties are found to be non-compliant, requests for remedial action, warning letters and inspections may be an appropriate first step in the enforcement process; but where there is a continued failure to comply, stronger enforcement actions will be required. In France, for example, authorities first issue warning letters. Where these are not met within the given timeframe,

developers must pay a fine. If developers remain non-compliant, the authority carries out the offset and requires the developer to cover the costs (Morandeau, Pers. Comm. 1 August 2012). In the US Wetland Compensatory Mitigation, the US Army Corp of Engineers may issue compliance orders and administrative penalties up to USD 27 500, suspend or revoke a permit, implement the enforcement provisions of agreements with third parties, and recommend legal actions (GAO, 2005). Despite provisions for enforcement, a lack of compliance has been identified in several biodiversity offset programmes, including in the Netherlands, in the US, and in Canada (Morandeau and Vilaysack, 2012; Matthews and Endress, 2008; Quigley and Harper, 2005).

Stakeholder Participation and Distributional Issues

Biodiversity offset design and implementation is a multi-stakeholder process. Potential stakeholders include the government (national, regional, local), the developer, lenders, landowners, NGOs and other specialists, and community groups. A successful biodiversity offset will need to engage these stakeholders in order to leverage technical expertise and local and indigenous knowledge, as well as to gain acceptance for the offset. The roles and responsibilities (e.g. offset management, operations and monitoring) of the stakeholders will need to be clearly defined and established in binding agreements. Capacity building may be necessary to ensure stakeholders are able to fulfil their responsibilities.

The monetary and non-monetary benefits, costs and risks associated with a development project and its offset must be shared amongst stakeholders in an equitable manner.[19] Development projects may have negative impacts on the livelihoods of local populations, and it is important that these be restored or compensated for. This will involve baseline studies, transparent participatory approaches and processes to ensure the right to free, prior and informed consent. The Nam Theun 2 hydropower offset project, in Lao People's Democratic Republic, for example, involves re-settlement of villages and the introduction of new livelihoods including agriculture, fisheries, commercial forestry or livestock husbandry. Losses to downstream fisheries on the affected river system were compensated, and a programme was initiated to establish sustainable management of stream fisheries in conjunction with villagers. In Kyrgyzstan, the Kumtor gold mine created a Community Business Forum comprised of community representatives, NGOs, authorities and business interests in order to share ideas for offset activities that could benefit biodiversity and local communities (BBOP, 2009b).

Notes

1. Thresholds for offsetable impacts have been included in the lending conditions of banks (e.g. International Finance Corporation Performance Standard 6 (IFC, 2010)) and in some national or sub-national policies and guidelines (e.g. Western Cape and KwaZulu-Natal (South Africa); New South Wales Native Vegetation Act (2003)) (Treweek et al., 2010; BBOP, 2011).

2. Some countries have independent laws or policies requiring compensation (e.g. US Wetland Mitigation); others address biodiversity offsets through Strategic Environmental Assessment (SEA) or Environmental Impact Assessment (EIA) (e.g. Mexico), or planning laws (e.g. Germany).

3. This is about seven times more than is mobilised through the voluntary carbon markets each year (Peters-Stanley et al., 2011).

4. Complementary national guidelines for biodiversity offsets are due to be published early in 2013.

5. The European Commission set up a "Working Group on No Net Loss of Ecosystems and their Services" to carry out further work with a view of proposing by 2015 a No Net Loss Initiative.

6. A feasibility assessment for biobanking in Latin America and the Caribbean, conducted by the UNDP, concluded that biobanking was feasible in all the countries assessed. Brazil, Costa Rica, Chile and Mexico in particular were found to have most of the elements in place for a biobanking scheme (Bovarnick et al., 2007).

7. The Equator Principles (EPs) are a credit risk management framework for determining, assessing and managing environmental and social risk in project finance transactions. Project finance is often used to fund the development and construction of major infrastructure and industrial projects. The EPs are adopted voluntarily by financial institutions and are applied where total project capital costs exceed USD 10 million. The EPs are primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. Revised Performance standards came into effect on 1 January 2012 (The Equator Principles Association, 2012).

8. Arguably because, to achieve no net loss, the losses will need to be fully replaced and this is best achieved by compensating with the same type of habitat, functions, and services.

9. US wetlands mitigation, US conservation banking, EU Natura 2000, Australian offset policies in New South Wales, Victoria, and Western Australia, and Brazilian industrial and forest offsets.

10. This is one of the arguments provided in the US Wetland Compensatory Mitigation Rule (2008) for establishing a preference hierarchy favouring mitigation banks (biobanking) over in-lieu fee programmes and permittee-responsible mitigation (one-off approaches) (US Federal Register, 2008).

11. A conservation easement is a voluntary, legally binding agreement that limits certain types of uses or prevents development from taking place on a piece of property now and in the future, while protecting the property's ecological or open-space values *www.nature.org/aboutus/privatelandsconservation/conservationeasements/index.htm*.

12. Developers could create a fund that provides sustainable finance over a specific time period to implement offset management activities, use standard annual project financing or a combination of the two. There may also be opportunities to link offset activities to other markets for ecosystem services such as ecotourism, payment for ecosystem services programmes, and small biodiversity-based enterprises, as a way of generating sustainable finance for biodiversity offset activities (BBOP 2009d).

13. BBOP is an international collaboration of more than 75 companies, financial institutions, government agencies and civil society organisations. The members are developing best practice in following the mitigation hierarchy (avoid, minimise, restore, offset) to achieve no net loss or a net gain of biodiversity *http://bbop.forest-trends.org/*.

14. Department of Environment and Climate Change.

15. Any Federal, state, tribal or local agency that has authorised a particular use of a mitigation bank as compensation for an authorised activity; the authorising agency will typically have the enforcement authority to ensure that the terms and conditions of the banking instrument are satisfied.

16. Dirección General de Impacto y Riesgo Ambiental.

17. Compensation fund, Federal Environmental Attorney.

18. The US Army Corp of Engineers (the Corp) oversees the development of wetlands in the US (ten Kate et al. 2004).

19. See the BBOP Cost-Benefit Handbook for guidance on addressing the livelihoods aspects of biodiversity offsets for local stakeholders.

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Chapter 6

Markets for green products

This chapter considers the opportunities and challenges for scaling up biodiversity conservation and sustainable use with markets for green products, focussing in particular on the role of ecolabelling schemes. It examines the current size and potential growth of markets for green products, and discusses the key design and implementation issues, including environmental and social safeguards, that need to be considered for ecolabelling schemes to operate effectively. These include, for example, harmonisation of ecolabelling schemes; monitoring, reporting and verification; compliance and enforcement; and stakeholder participation.

An introduction to markets for green products

Markets for green products have emerged in response to consumer demand for socially and environmentally responsible production. Green products include goods and services that are based on sustainable use of biodiversity and ecosystems (e.g. eco-tourism and biotrade), goods which have been produced with fewer impacts on biodiversity as a result of more efficient or lower impact production methods (e.g. timber procured from reduced impact logging), and goods whose consumption will have a reduced environmental impact as a result of decreased pollution load (e.g. biodegradable detergent) (TEEB, 2009).

Markets for green products can be facilitated by ecolabelling schemes, which certify that companies adhere to a set of criteria and communicate this information to consumers.[1] Ecolabels are based on the premise that certain consumers will prefer to buy and even pay a premium for green products. This creates incentives for companies to adopt more sustainable production practices (Blackman and Rivera, 2010; GEN, 2004).

Ecolabelling has increased considerably over the past two decades. There are now schemes in developed and developing countries, covering a range of industries and products (Earley and Anderson, 2003). The Ecolabel Index,[2] for example, has identified around 430 ecolabels in 25 industry sectors. Some of the ecolabel schemes more relevant for biodiversity include those for agriculture (e.g. Rainforest Alliance; Smithsonian Migratory Bird Center's Friendly Coffee; Aurora Certified Organic; Fair Trade); forestry (Forest Stewardship Council (FSC); Programme for the Endorsement of Forest Certification (PEFC)); fisheries (e.g. Marine Stewardship Council (MSC); Salmon Safe); and tourism (e.g. Green Globe; National Ecotourism Accreditation Program of Australia).

Ecolabelling schemes have been established by governments (e.g. EU Ecolabel), the private sector (e.g. UTZ Certified; GLOBALGAP; Sustainable Forestry Initiative (SFI)), civil society (e.g. Fairtrade, International Federation of Organic Agriculture Movements (IFOAM); Rainforest Alliance), and various combinations of these (e.g. FSC; PEFC; 4C Association). They exist at national (e.g. the Lembaga Ekolabel Indonesia for Indonesian forests; the Milieukeur sustainability label in the Netherlands), regional (e.g. EU Ecolabel; the East Africa Organic Products Standard), and global level (e.g. FSC; MSC). Some ecolabelling schemes offer certification not only to the producer, but also to manufacturing, processing or trading companies who wish to demonstrate to consumers that they are using green products. FSC, for example, offers certification for forest managers or owners producing sustainable timber or non-timber forest products, as well as companies in the supply chain that use these products.

Potential for mobilising and scaling-up finance from markets for green products

Green commodity markets have witnessed sustained growth over the past few years. The global market for organic products in 2010 was estimated at around USD 59 billion, more than double the market size in 2003 (Willer et al., 2010), and the global area under the two largest forest certification schemes (FSC and PEFC) increased from just over 324 million hectares at the end of 2008 (FSC, 2009; PEFC, 2009) to over 414 million hectares (about 35% of global forests designated for production[3]) by November 2011 (FSC, 2012a; PEFC, 2012). Rainforest Alliance certification for sustainable agriculture, first awarded in 1994, now covers over one million hectares of farmland under agricultural production or designated for conservation and the Round Table on Sustainable Palm Oil (RSPO) has certified more than one million hectares of palm oil, since the first certificate was awarded in 2008 (RA, 2012; RSPO, 2012).

Fisheries have also seen a growth in green markets. The market for MSC certified seafood products, for example, is currently worth more than USD 3.2 billion compared to USD 1.5 billion at the end of the 2009 financial year (MSC, 2012a; MSC, 2009). By the end of the 2011/2012 financial year, 147 fisheries had received MSC certification and another 128 were undergoing assessment (MSC, 2012a). Around 8% of all wild caught seafood is estimated to be certified to MSC's standard (MSC, 2012a).

Table 6.1. **Market share and recorded price premiums for green products**

Product	Market Share (2009)	Price Premiums (USD)
Coffee	8% of global exports (metric tonnes)	0.025-0.405 per pound (2009)
Tea	7.7% of global production for exports	0.17-1.59 per kilogram (2008)
Cocoa	1.2% of global sales	67-292 per metric ton (2009)
Bananas	20% of global exports	1.00-9.47 per box (2007)

Source: Potts, J., J. van der Meer and J. Daitchamn (2010), *The State of Sustainability Initiatives Review 2010: Sustainability and Transparency*, International Institute for Sustainable Development (IISD), Winnipeg, and the International Institute for Environment and Development (IIED), London.

This growth is likely to continue as green markets mature. Markets for sustainable coffee and tea, for example, are expected to grow rapidly over the next few years in response to various commitments from large buyers such as Kraft, Nestle and Sara Lee, and Tetley, Unilever, and Twinnings (Potts et al., 2010). New markets are also emerging, facilitated by ecolabelling schemes such as the Round Table on Responsible Soy Association and the Bonsucro Better Sugar Cane Initiative, both of which became operational in 2011. The Green Development Initiative,[4] currently in the piloting phase, may provide further opportunity to mobilise finance through green markets.

The motivations for companies to engage in ecolabelling schemes include risk management (e.g. protecting market share and minimising reputational risk) and harnessing business opportunities (e.g. increasing market share or price premiums, facilitating access to markets or creating new niche markets, enhancing product differentiation, increasing efficiency and improving community relations and corporate image) (Bishop et al., 2008). Companies may also adhere to ecolabel standards in pre-emption of stricter mandatory requirements, to obtain development permits from regulatory bodies, or to meet insurance criteria and business to consumer and business to business requirements (Buckley, 2001; KPMG, 2012; Watanatada and Mak, 2011).

While consumers are increasingly demanding more transparency and higher environmental performance, they are not always willing to pay (WTP) a price premium (Kraxner et al., 2011; Oliver, 2009). A survey of 10 000 households in ten OECD countries finds that overall almost 30% of respondents are not WTP any premium for organic foods and that, generally, consumers are not WTP more than 15% relative to conventional food products, whatever the food category (OECD, 2011a). Evidence suggests that price premiums vary considerably. FSC certified wood, for example, reported premiums ranging from 4 to 20 % for North American and Western European production, compared to PEFC's 0 to 1 % (Potts et al., 2010). Cha et al. (2009) find the average mean price premium for certified wood products is 5.6% in Republic of Korea and 6.3% in Europe, while Yuan and Eastin (2007) find an average price premium of 5.1% in US markets but only 1.5% in Canada. The highest recorded premiums paid in Europe for forest products are in the range of 20%-50% for FSC certified tropical sawn hardwood from Africa and Brazil (Oliver, 2009).

Where consumers are not WTP, producers will have to bear the burden of the additional costs of certification. This may exclude smaller stakeholders from entering green markets, when they are unable to cover the costs of certification (Treves and Michelle Jones, 2010). However, while greater price premiums could encourage or enable more companies to engage in green markets, they are not a prerequisite for green markets to operate. In the United Kingdom, the Netherlands and Belgium, for example, supply of PEFC or FSC labelled softwood and composite panels is the norm. The price of labelled products therefore sets the market price and there is no premium available (Oliver, 2009).[5]

While harnessing mainly private sector finance in biodiversity conservation and sustainable use, markets for green products also mobilise public sector finance. Governments have a role to play in both the provision and procurement of green products. Green Public Procurement programmes, for example, are becoming increasingly common in both developed and developing countries and can have a considerable impact on green markets by promoting innovation and increasing the competitive advantage of "green

products" (Earley and Anderson, 2003). In Europe, for example, public authorities spend around 17% of the EU GDP on procurement each year and it is thought that this figure may be closer to 25% in developing countries. The percentage of this expended on green products, however, varies considerably between countries. For example, while the Dutch government reported that 99.8% of national public procurement in 2010 was green, in other EU Member States less than a fifth of contracting authorities say over half of their contracts include green requirements (EC, 2011b).

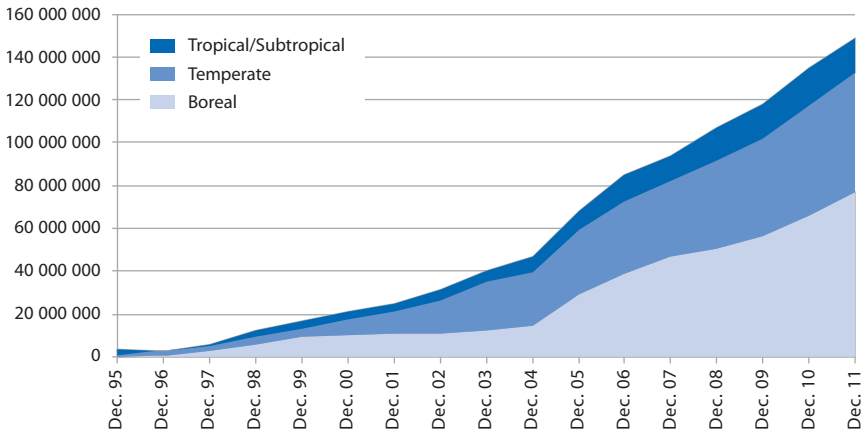
Public and private sector actors have also provided financial assistance to producers wishing to access green markets. This is particularly important in developing countries where a lack of financial capacity has prevented stakeholders from joining ecolabelling schemes. Certification of the Mayan Biosphere Reserve in Peten, Guatemala, for example, was subsidised by an NGO, reducing cost per hectare by 50% (Soza, 2003), while in Bolivia, certified concession-holders receive tax benefits of 14-28%, offsetting some of the direct certification costs (Ebeling and Yasué, 2009). Other initiatives to support the development of green markets include the Finance Alliance for Sustainable Trade (FAST),[6] which provides small and medium enterprises with opportunities to secure finance for ecolabelling, and dedicated ecological savings and green investments (OECD, 2003). Triodos Bank, for example, launched an Organic Saver Account in partnership with the Soil Association. As well as earning interest, clients are assured that their money will be used to support the setting of standards for organic production and processing.[7]

In addition to providing financial assistance, governments have scaled up green markets by adopting mixed regulatory regimes. The Government of Guatemala, for example, has made FSC certification mandatory for forestry firms operating in the Maya Biosphere Reserve (UNCTAD, 2011), and in other countries local authorities have made certification to a private standard a requirement for obtaining a license for operating a tourist enterprise in a nature reserve (Bendell and Font, 2004). On the demand side, governments have raised consumer awareness through public information and education campaigns, provided tax incentives for those that purchase retail certified products, and adopted stricter procurement policies (Bendell et al., 2011; Vermeulen et al., 2010). One of the key drivers behind the recent growth in forest certification, for instance, has been the increase in national legislation requiring forest products in national markets to be derived from legal sources (Oliver, 2009).

To fulfil the potential of green markets, a more balanced geographical distribution of supply and demand will be required. Currently, over 90% of certified forest management areas are found in boreal and temperate forests in the developed world. FSC has the greatest representation in developing countries of the international forest certification schemes, yet tropical and

sub-tropical forests account for about 10% of total FSC-certified area (FSC, 2011) (see Figure 6.1). Supply of sustainable cocoa is also skewed – while Ghana, Ivory Coast, Dominican Republic and Peru account for 53% of conventional cocoa production for export, they account for only 3% of global sustainable cocoa exports (Potts et al., 2009). Demand for green products is generally weak in developing countries. This means that where producers in developing countries do not seek to export their products, there may be little or no incentive to engage in ecolabelling schemes (Moeltner and van Kooten, 2003; Fischer et al., 2005).

Figure 6.1. **FSC certified forest area growth**



Source: Based on FSC (2011), *Global FSC Certificates: Type and Distribution*. December 2011.

Ecolabelling schemes have a growth limit. Not all producers will have the means or incentives to become certified and not all consumers will demand certified products (KPMG, 2012; Watanatada and Mak, 2011). Furthermore, as supply of green products grows, price premiums are likely to drop and at a certain point ecolabels will no longer serve to differentiate products (KPMG, 2012; OECD, 2005a). Companies may respond by putting pressure on ecolabelling schemes to ratchet up standards on their competitors or to introduce a tiered system, which recognises different levels of environmental or social performance. Alternatively, companies may look to establish new ecolabelling schemes or set their own private standards (e.g. Unilever's Sustainable Agriculture Code). Although these approaches could engage a wider group of stakeholders in green markets, they may further complicate the marketplace.

Key features for effective design and implementation of markets for green products

A number of issues have been identified for effectively designing markets for green products (Accenture and WWF, 2009; Blackman and Rivera, 2010; Buckley, 2001; GEN, 2004; Gulbrandsen, 2008; ISEAL, 2010a; Janisch, 2007; KPMG, 2012; OECD, 2000; OECD, 2005a; OECD, 2005b; Potts et al., 2010).[8] These include:

- developing standards for green products
- additionality
- streamlining and equivalency
- chain-of-custody traceability
- monitoring, reporting and verification
- compliance and enforcement
- equity and stakeholder participation
- transparency.

Developing standards for green products

Ecolabelling schemes certify companies against a set of standards. Compliance with local environmental (and other) legislation is a fundamental requirement of most ecolabel schemes. Stricter standards then serve to distinguish leaders in a specific industry or product group (GEN, 2004). Biodiversity-relevant ecolabelling schemes may explicitly address biodiversity, with rules related to genetic and species diversity of the production area, prescriptions for habitat set-asides and rules against conversion of high conservation value land; or they may address biodiversity implicitly through, for example, requirements for water and soil quality (Potts et al., 2010). Box 6.1 provides a sample of biodiversity criteria applied in ecolabelling schemes.

In general, ecolabel schemes have considerable potential to include additional criteria that explicitly address biodiversity (UNEP-WCMC, 2011; Potts et al., 2010). In "The State of Sustainability Initiatives Review 2010",[9] which examines 10 large ecolabelling schemes, three schemes (FLO, UTZ and SAI) are found to have no criteria or only non-binding criteria that explicitly address biodiversity,[10] and only one scheme (FSC) to have explicit biodiversity requirements that need to be met as a precondition for participation (Potts et al., 2010). A review by UNEP-WCMC (2011) of 36 ecolabelling schemes across eight industrial sectors finds that while all 36 address biodiversity to some extent, some issues are better covered

than others. For example, while all standards mention the protection of habitats, less than half incorporate the concept of priority conservation areas. Furthermore, while ecolabelling schemes tend to address similar biodiversity components, there is considerable variation in both the way and depth in which the issues are covered.

In most cases, it will be necessary for ecolabelling schemes to make a trade-off between the number of stakeholders engaged in a programme and the robustness of the criteria (OECD, 1997). This is because in general, the stricter the criteria, the more expensive it will be to implement. OECD (2005a) finds that ecolabel standards are typically set so that only 5-30% of products can meet the requirements, and that with a share higher than 30%, ecolabels no longer selectively identify a sub-set of products that are environmentally preferable to other products in the same category. Janisch (2007) argues that, in developing countries in particular, it may be necessary to lower standards to make ecolabelling schemes more accessible. Interim targets or milestones could then be set in order to progressively tighten the requirements.

One of the key challenges for ecolabelling schemes is to provide consistent global standards that are locally applicable. International ecolabelling schemes generally take one of two approaches to standard setting. One approach is to establish a single set of global standards to which all producers must adhere (e.g. Rainforest Alliance, 4C Association, GLOBALGAP and SAI). The other approach is to establish high-level principles and criteria at the global level and then translate these into standards at the national level (e.g. PEFC, IFOAM and FSC) (Potts et al., 2010). The former entails less transaction costs. However, a national standard-setting approach is better suited to address the social, cultural and environmental variations between countries.

On the one hand, where stakeholders applying different standards are granted the same legitimacy, there is a risk that some stakeholders will have an unfair advantage and that market distortions ensue. On the other hand, applying the same criteria to all stakeholders irrespective of the local context may render a standard meaningless, and generate little benefit for biodiversity (Earley and Anderson, 2003; Potts et al., 2010). Schemes are encouraged to take this into consideration. Different approaches may be appropriate depending on the sector and geographic coverage of the scheme.

Box 6.1. A sample of biodiversity criteria from four ecolabelling schemes

Round Table on Sustainable Palm Oil

- Aspects of plantation and mill management, including replanting, that have environmental impacts are identified, and plans to mitigate the negative impacts and promote the positive ones are made, implemented and monitored, to demonstrate continuous improvement.
- The status of rare, threatened or endangered species and high conservation value habitats, if any, that exist in the plantation or that could be affected by plantation or mill management, shall be identified and their conservation taken into account in management plans and operations.
- A comprehensive and participatory independent social and environmental impact assessment is undertaken prior to establishing new plantings or operations, or expanding existing ones, and the results incorporated into planning, management and operations.

Forest Stewardship Council

- Assessment of environmental impacts shall be completed – appropriate to the scale, intensity of forest management and the uniqueness of the affected resources – and adequately integrated into management systems. Assessments shall include landscape level considerations as well as the impacts of on-site processing facilities. Environmental impacts shall be assessed prior to commencement of site-disturbing operations.
- Safeguards shall exist which protect rare, threatened and endangered species and their habitats (e.g. nesting and feeding areas). Conservation zones and protection areas shall be established, appropriate to the scale and intensity of forest management and the uniqueness of the affected resources. Inappropriate hunting, fishing, trapping and collecting shall be controlled.
- Ecological functions and values shall be maintained intact, enhanced, or restored, including: a) Forest regeneration and succession; b) Genetic, species, and ecosystem diversity; c) Natural cycles that affect the productivity of the forest ecosystem.

Marine Stewardship Council

- Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.
- The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.
- The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimises mortality of, or injuries to endangered, threatened or protected species.

Box 6.1. **A sample of biodiversity criteria from four ecolabelling schemes** *(continued)*

Rainforest Alliance (SAN Standards)

- All existing natural ecosystems, both aquatic and terrestrial, must be identified, protected and restored through a conservation programme. The programme must include the restoration of natural ecosystems or the reforestation of areas within the farm that are unsuitable for agriculture.
- Production areas must not be located in places that could provoke negative effects on national parks, wildlife refuges, biological corridors, forestry reserves, buffer zones or other public or private biological conservation areas.
- Ecosystems that provide habitats for wildlife living on the farm, or that pass through the farm during migration, must be protected and restored. The farm takes special measures to protect threatened or endangered species.

Sources: RSPO (2007); FSC (1996); MSC (2010); SAN (2010).

Additionality and environmental effectiveness

The additional biodiversity benefits that are achieved through ecolabelling may be limited due to adverse self-selection, whereby actors already engaged in, or intending to engage in, innovative or environmentally-friendly practices disproportionately participate in the programme (Blackman and Rivera, 2010). There is a paucity of studies attempting to discern links between ecolabelling schemes and environmental and socioeconomic outcomes, and mixed findings as to whether ecolabelling schemes have generated additional socioeconomic or environmental benefits (OECD, 2005a; Blackman and Rivera, 2010). Furthermore, in a study of around 150 ecolabelling schemes, Golden et al. (2010) find that one-third have made no attempt to monitor or evaluate environmental and social benefits of their ecolabel programmes and have no intention of doing so.

To address this, ISEAL has introduced an impacts code that provides a framework to help ecolabelling schemes and other initiatives better understand their social and environmental impacts. They argue that as these schemes continue to increase in number, their actual impacts on business, social and environmental performance will likely become more heavily scrutinised. Those which can be linked to demonstrable beneficial impacts of the businesses will be the ones that continue to succeed (ISEAL, 2010b).

It is important for ecolabelling schemes to build in adaptability – including procedures to develop, review and approve standards – in order

to learn from experience and reflect changes in social and ecological knowledge as well as technological and market place developments, thereby increasing the additional biodiversity benefits generated through ecolabelling (Accenture and WWF, 2009; Eden, 2009; OECD, 2005a; GEN, 2004).

Streamlining and equivalency

The marketplace for ecolabels is becoming crowded. As ecolabels continue to proliferate at the national, regional and global level, it is increasingly important to streamline standards, and help consumers differentiate between the different labels (Earley and Anderson, 2003; OECD, 2011a). A study by ISEAL (2011) finds that 46% of corporate "thought leaders" believe that the certification landscape is too complex and that the existence of too many standards (31%), overlapping standards (21%) and confusion (16%) are all causes for concern. One of the issues identified by UNEP-WCMC (2011) is that schemes tend to use different language and do not consistently adopt internationally recognised definitions for biodiversity-related issues.

The proliferation of ecolabel schemes addressing similar issues leads to market inefficiency, increasing exporters' transaction and information costs, and in some cases requiring exporters to tailor production for different import markets or to target fewer importers (OECD, 2005). Many Asian organic farmers, for example, have had to adopt organic standards of Europe, the US and Japan entailing additional costs without any additional benefits to the environment (Willer et al., 2010).

A number of initiatives to harmonise standards and ecolabelling schemes have emerged. ISEAL, for example, is playing a key role in harmonising the ways different sustainability standards are administered, verified and assessed and the International Federation of Agriculture Movements launched a Family of Standards in January 2011 to enable multilateral equivalence (IFOAM, 2012). Other initiatives include the Global Ecolabelling Network (GEN), which is comprised of national and regional ecolabelling organisations, and ISO standardisation.

Chain-of-custody traceability

Products need to be traced along the supply chain so that consumers can accurately distinguish between green products and services and less sustainable ones. There are four main approaches. The first is identity preservation, where the product is identified individually, physically separated and tracked at each stage of the supply chain. The second approach is segregation, where compliant products are segregated at all stages and only compliant products are sold in green markets. The third approach, mass balance or controlled mixing, allows mixing of certified and non-certified

products at known percentages and ensures that the same proportions are maintained at every stage of the supply chain. The fourth option is book and claim, where sustainable certificates are granted based on the application of sustainable practices, but the certificate is completely decoupled from the product and transferable on the market. To maximise flexibility, many schemes offer more than one system. Of the ten schemes reviewed in "The State of Sustainability Initiatives Review 2010", for instance, five use preservation, eight use segregation, five use mass balance and seven of the initiatives use more than one model (Potts et al., 2010).

The different approaches for tracing green products along the supply chain vary in the degree of traceability and magnitude of transaction costs. The Roundtable on Sustainable Palm Oil's book and claim approach, for example, has lower costs than the segregation or controlled mixing approaches. The book and claim approach creates a direct link between producers and consumers, so that producers can receive financial compensation directly through a trading platform. In the other chain of custody systems producers are more dependent on the supply chain participants to whom they sell their oil palm. However, segregation and controlled mixing offer greater traceability of the product throughout the supply chain (Levin et al., 2012).

Monitoring, reporting and verification

Ecolabelling requires verification that production processes and environmental outcomes meet the required standards. As opposed to self-declaration claims, ecolabelling requires certification by a third party, independent of the producer or retailer. This increases the credibility of the schemes and may increase the integrity of green markets. Nevertheless, the degree of independence and frequency of audits do differ between schemes, reflecting different balances between cost-effectiveness and the degree of credibility or certainty established by a scheme. The 4C Association, for example, allows entry into supply chain based on self-monitoring and reporting and third-party verification, and requires only an annual self-assessment and reverification after three years. This caters for the most marginalised producer groups. Schemes such as SFI, SAI, PEFC, Rainforest Alliance (SAN) and FLO, on the other hand, require a full certification audit and report on the third year of certification with surveillance audits every year, and UTZ and GLOBALGAP require a full certification audit every year. In addition to formal auditing requirements, some schemes (e.g. IFOAM, FLO, UTZ, 4C, and GLOBALGAP) conduct random field checks (Potts et al., 2010). Certification bodies are often required to be compliant with ISO 65 (quality and independence requirements) and/or undergo accreditation by a third-party accreditation body to ensure the independence and rigour of standard-setting and evaluation. Of the ten schemes reviewed by Potts et al., (2010), eight of them are either ISO65 compliant or apply an accreditation process.

In addition to monitoring production practices, marketplaces need to be monitored to ensure products that are not certified do not carry ecolabels. In FSC's trademark protection strategy, for example, stakeholders are encouraged to report misuse of the FSC logo and the FSC website provides guidance on how to do this.

Compliance and enforcement

To avoid discrediting of ecolabelling schemes and green markets, regulatory instruments will be required to ensure that ecolabels reflect practices on the ground. Where actors consistently do not meet standards, they will need to be disqualified from using ecolabels. Several ecolabel schemes differentiate between minor non-compliances (non-conformances) and major non-compliances[11] (e.g. FSC, RSPO, SFI, and IFOAM). In the FSC scheme, for instance, actions must be taken to correct a minor non-compliance within 12 months. If it is not adequately addressed in this time frame, it is changed to a major non-compliance. Where major non-compliances are found, entities will not be issued FSC certificates and in the case of major non-compliances found in re-audits in existing FSC certificates, certificates will be suspended. The major non-compliances must be corrected within 3 months.

Non-certified and suspended companies are not permitted to put ecolabels on their products. Using ecolabels without prior consent from the ecolabelling scheme can be treated as a trademark infringement, and ecolabelling schemes may pursue legal action.

Equity and stakeholder participation

Ecolabelling schemes have been criticised for privileging developed country companies over those in developing and emerging economies, and have been accused of acting as a non-tariff barrier to trade (OECD, 2005a; OECD, 2005b). Environmental requirements are increasingly used to define commercial relationships between producers and buyers and while meeting these requirements may not always be mandatory, it is becoming an economic imperative. Developing countries are often faced with a lack of institutional and infrastructural capacity, preventing them from running or participating in such ecolabelling schemes (OECD, 2005a) (see Chapter 9 on capacity needs for effective biodiversity finance mechanisms). Furthermore, ecolabelling costs are fixed and can be very high; larger producers have tended to have an advantage because of economies of scale, and small-scale producers and community enterprises have often been excluded from green markets or have relied upon external agencies to cover the costs[12] (OECD, 2005b; Schepers, 2010; Bass and Simula, 1999; Bass et al., 2001; Klooster, 2005).

There have been several initiatives to address biases against small producers. The FSC, for example, has initiated a four year GEF-funded project to identify and protect high conservation values, especially biodiversity values in small and low intensity managed forests in the tropics; increase access and reduce barriers to certification for small and low intensity managed forests in the tropics, in order to provide a verifiable indicator of biodiversity protection in these forests; and develop innovative funding mechanisms to provide improved incentives for the conservation of biodiversity through certification in small and low intensity managed forests (FSC, 2012b). Similarly, the MSC, which has also had difficulties engaging smaller stakeholders, recently introduced Guidelines for Assessment of Small-Scale and Data-Deficient fisheries, which provide small-scale and data-deficient fisheries with guidance on the assessment process (MSC, 2012b).

Stakeholder participation in the development and implementation of ecolabelling schemes and their standards is fundamental in order to leverage the expertise of different actors, to increase accessibility to and gain acceptance of the scheme, and to promote equitable outcomes. The challenge is to find a balanced representation of stakeholders so that costs do not become exuberant, and so that no one stakeholder or stakeholder group has too much influence (GEN, 2004). Chatterji and Levine (2006), for example, emphasise the need for industry representation in defining metrics to ensure that they are widely accepted and improved upon, but warn that excessive industry participation can undermine the legitimacy and validity of the metrics.

The importance of procedural safeguards that empower and give voice to local communities has been emphasised in the context of shrimp farming certification: in 2006, a number of NGOs and representatives of community-based organisations from the tropical coastal zone of America, Asia, and Africa called for a moratorium on all shrimp aquaculture ecolabelling schemes from the viewpoint that local communities had been marginalised from standard setting and decisions on certification and that the schemes in place would not help to address the environmental and social impacts and "may in fact legitimise past and current injustices and even lead to further expansion" (Bangkok Declaration, 2006).

Transparency

Ecolabelling schemes emerged to improve the transparency of production and trade practices to empower consumers to make environmentally-friendly purchases. However, they have tended to provide limited transparency on their own operations and impacts. Given the proliferation of ecolabelling schemes and green claims it will become increasingly important that schemes provide stakeholders with access to information on certification criteria, key decisions and environmental, social and economic impacts. A survey

conducted by Global Ecolabel Monitor finds that 13% of schemes do not make their criteria public. Furthermore, while 340 ecolabelling schemes were contacted to carry out the survey, only 33% fully completed the survey. Fourteen percent began but did not finish, 42% could not be reached and 10% declined to participate (Big Room and WRI, 2010). This emphasises the need for greater accountability and transparency, and as suggested by the Global Ecolabel Monitor, most likely a lack of financial and human resources to effectively run these programmes.

Notes

1. Ecolabelling is defined by the International Standards Organization as "a voluntary, multiple-criteria based, third party programme that awards a license that authorises the use of environmental labels on products indicating overall environmental preferability of a product within a particular product category based on life cycle considerations". Ecolabelling was introduced to provide a more credible and impartial alternative to informative environmental self-declaration claims. The analysis in this chapter focuses in particular on ecolabelling. For an overview of environmental claims see OECD (2011b).
2. The Ecolabel Index is the largest global directory of ecolabels: *www.ecolabelindex.com/.*
3. Area under production forest taken from FAO 2010 Forest Resource Assessment.
4. The GDI aims to establish an international BioAreas Standard and Registry for biodiversity-responsible areas management see *http://gdi.earthmind.net/.*
5. There is a tension between market sustainability and environmental effectiveness. Ecolabels can either build a niche (< 30% of the market), become the standard or fail. The optimal result for an ecolabelling programme may be to remain a niche, because if it becomes the norm, market rents will dissipate. However, if ecolabels become the norm, there may be greater environmental benefits, assuming that the criterion is not too lenient. For further discussion on this subject see OECD (1997); OECD (2004); Earley and Anderson (2003).
6. *www.fastinternational.org/en/node/59.*
7. *www.triodos.co.uk/en/personal/savings-overview/charity-saver/organic-saver/for-who/.*
8. The International Standards Organization (ISO) has released standards (14000 series) to guide the use of environmental labels. The ISO 14024 specifically addresses ecolabelling.

9. IISD, IIED, Aidenenvironment, UNCTAD and ENTWINED.

10. Measured by the biodiversity index which monitors criteria coverage with respect to *i)* habitat set-asides *ii)* flora densities *iii)* prohibition of high conservation value land.

11. Definitions vary slightly between schemes. FSC defines a minor non-compliance as "a temporary, unusual or non-systematic non-compliance, for which the effects are limited" and a major non-compliance as "a non-compliance for which the effects prejudice the achievement of the objectives of the standard. A number of minor non-compliances may be considered to have a cumulative effect, and therefore be considered together to constitute a major non-compliance." *www.fsc.org/glossary.html*.

12. This is an issue for developed countries as well. The Canadian government, for example, has funded the MSC certification costs for several of its fisheries.

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Chapter 7

Biodiversity in climate change funding

This chapter provides an overview of climate change mitigation and adaptation funding and examines the extent to which this delivers or could deliver biodiversity co-benefits. It identifies some of the tools and techniques for targeting biodiversity co-benefits within climate change funding and discusses the key environmental and social safeguards that need to be considered. These include, for example, environmental and social impact assessments, benefit-sharing mechanisms, and transparent, participatory approaches.

An introduction to biodiversity in climate change funding

Biodiversity and ecosystems play an important role in both climate change mitigation and adaptation, and conversely, climate change is a major driver of biodiversity loss[1] (OECD, 2012). There are therefore likely to be opportunities to deliver co-benefits to biodiversity with climate change funding. One of the main opportunities to harness synergies with climate change mitigation funding is through Reducing Emissions from Deforestation and Degradation (REDD+)[2]. This is because forests not only sequester carbon but also provide other non-carbon ecosystem services, such as natural habitats and water purification. Synergies between biodiversity and climate change adaptation initiatives are probably largest in the area of ecosystem-based adaptation (EbA) i.e. "the use of biodiversity and ecosystem services to help people adapt to the adverse effects of climate change" (CBD, 2009). Restoring wetlands, for example, can protect against flood and ensure continued water flow in periods of drought, while conserving wetland plant and animal species (CBD, 2009).

Potential for mobilising and scaling-up biodiversity-related climate change funding

Total climate change finance flows (i.e. climate-specific North-South flows) are estimated at USD 70-120 billion annually (based on 2009-10 data). The percentages of private and public finance are estimated at 50-60% and 40-50% of total international flows respectively (Clapp et al., 2012). Whereas private climate finance is largely geared towards the energy sector (where opportunities for incorporating biodiversity considerations are limited), public finance is mainly channelled through bilateral and multilateral initiatives and is more amenable to incorporating biodiversity objectives. Examples of biodiversity-related climate funding initiatives are highlighted in Table 7.1.

Several approaches to promote biodiversity co-benefits in climate change mitigation funding are already underway and have the potential to be scaled-up. Most notable examples are the multilateral and bilateral initiatives to support REDD+ such as the Forest Carbon Partnership Facility (FCPF), UN-REDD Programme, Forest Investment Program (FIP), Amazon Fund, BioCarbon Fund, International Climate Initiative (ICI), International Climate and Forest Initiative (ICFI), and Global Climate Change Alliance (GCCA) (see Annex B for a short description of these). A total of USD 446 million has been approved and USD 252 million has been disbursed for REDD+ finance between 2008 and 2011, representing 13% of total climate finance (Heinrich Böll Stiftung and ODI, 2011).

Table 7.1. **Biodiversity-related climate change funding**

Multilateral Finance Mechanisms	Area of Focus/Date Operational/ Administrating Organisation	Budget in USD (millions)
Forest Carbon Partnership Facility (FCPF) • Readiness Mechanism • Carbon Fund	Mitigation-REDD/2008/ World Bank	 225.5 (Total received as of Jan. 2012) 204.3 (Total received as of Nov. 2011)
UN-REDD Programme	Mitigation-REDD/2008/ UNDP	119.6 (Total deposited as of Jan. 2012)
Forest Investment Program (FIP)	Mitigation-REDD/2009/ World Bank	348.3 (Total received as of Nov. 2011)
Amazon Fund	Mitigation-REDD/2009/ Brazilian Development Bank	57.4 (Total deposited as of Jan. 2012)
BioCarbon Fund	Mitigation-Carbon Sink/2004/ World Bank	53.8 (Tranche one in 2004) 36.6 (Tranche two in 2007)
Adaptation Fund	Adaptation/2009/ Adaptation Fund Board	258.2 (Total deposited as of Jan. 2012)*
Least Developed Countries Fund (LDCF)	Adaptation/2002/ GEF	368.4 (Total deposited as of Jan. 2012)*
Special Climate Change Fund (SCCF)	Adaptation/2002/ GEF	170.6 (Total deposited as of Jan. 2012)*
Sum (multilateral finance mechanism)		1 842.7
Bilateral Finance Mechanisms	**Area of Focus/Date Operational/ Administrating Organisation**	**Budget in USD (millions)**
International Climate Initiative (ICI)	Adaptation, Mitigation-general, Mitigation-REDD/2008/ Government of Germany	575.5 (Total approved as of Jan. 2012)
International Climate and Forest Initiative (ICFI)	Mitigation-REDD/2008/ Government of Norway	450 (Total disbursed in 2010)
Global Climate Change Alliance (GCCA)	Adaptation, Mitigation-general, Mitigation-REDD/2008/ European Commission	224.6 (Total deposited as of Jan. 2012)*
Sum (bilateral finance mechanism)		1 250.1

* This figure is total amount of fund; the budgets for biodiversity related activities are not available.

Source: Heinrich Böll Stiftung and the Overseas Development Institute (2012), Climate Funds Update, available at *www.climatefundsupdate.org*; World Bank (2012), Carbon Finance at the World Bank, The World Bank Carbon Finance Unit, available at *http://wbcarbonfinance.org*.

Initiatives to promote co-benefitis in the voluntary carbon market, such as the Climate, Community and Biodiversity Alliance (CCBA), CarbonFix and PlanVivo,[3] have also mobilised private sector finance. Buyers of verified emission reductions have demonstrated considerable interest in the co-benefits of carbon projects and in some cases are willing to pay a premium for them (Ecosecurities, 2009; Karousakis, 2009; Peters-Stanley et al., 2011). Additional private sector finance could be mobilised if REDD+ were eventually to be included in the mandatory carbon market.

The Copenhagen Accord and the Cancun Adaptation Framework adopted at UNFCCC COP15 and COP16 in 2009 and 2010, respectively, recognised the need to support developing countries in establishing long-term national adaptation strategies and action plans. According to Climate Change Update (2011), the proportion of adaptation funds in total climate change finance increased sharply from 8% (USD 587 million) to 21% (USD 957 million) between 2010 and 2011, and adaptation finance is expected to continue to increase in coming years. The main multilateral and bilateral adaptation fund initiatives include the Least Developed Countries Fund (LDCF),[4] the Special Climate Change Fund (SCCF),[5] the Adaptation Fund (AF),[6] the Pilot Program for Climate Resilience (PPCR), and the Global Climate Change Alliance (GCCA).[7]

The Green Climate Fund (GCF) is a recent development under the UNFCCC negotiations for climate finance. Established in 2010, the GCF was designed as a comprehensive multilateral financing mechanism to support climate action in developing countries. While the Parties have pledged to mobilise USD 100 billion in long-term financing per year by 2020, the extent to which the GCF will be used to channel this finance is still unclear. However, there may be opportunities to consider biodiversity objectives within climate finance that flows through the GCF. As this is likely to be a comparatively centralised approach to allocating climate finance, the transaction costs of considering biodiversity objectives in relevant climate change projects are likely to be lower.

Key design and implementation features to promote biodiversity in climate change funding

The design and implementation features that may need to be considered so as to promote biodiversity objectives in climate change funding are likely to differ depending on the specific climate change mitigation or adaptation activities undertaken. Discussion here focuses primarily on ways to integrate biodiversity considerations into REDD+ funding mechanisms, as well as in funding for ecosystem-based adaptation. Within this context, key features to

consider for promoting biodiversity benefits in climate change funding are as follows:

- identification of areas with high biodiversity benefits and with high vulnerability/risk of loss
- environmental and social safeguards
- monitoring, reporting, and verification.

Identification of areas with high biodiversity benefits and high vulnerability/risk of loss

For both REDD+ activities, as well as ecosystem-based approaches, climate funding will ideally be channelled to geographic areas where the resulting carbon mitigation and/or adaptation benefits are the highest. Using REDD+ as an example, if avoiding deforestation in two different forest areas would yield the same carbon benefits, then biodiversity co-benefits would be enhanced if the area prioritised for funding were that with higher biodiversity co-benefits. Identifying areas with both high carbon and high biodiversity benefits can therefore help target finance to locations that can deliver higher total ecosystem services.

Tools to help identify such areas are already in different stages of development. The UNEP World Conservation Monitoring Centre (WCMC) for example, produced a Carbon and Biodiversity Demonstration Atlas in 2008 and has developed other spatial tools such as Interactive Maps, an Interactive Carbon Calculator, and a Multiple Benefits Toolbox. Interactive Maps show the distribution of carbon density in relation to areas of high biodiversity and protected areas at country and global scale.[8] The Interactive Carbon Calculator provides users with initial estimates of carbon values for existing protected areas or any polygon drawn on a global map.[9] A Multiple Benefits Toolbox has been developed for REDD+ multiple benefits analyses and provides information on the spatial relationship between carbon and other ecosystem services.[10]

While the tools under UNEP-WCMC are geared towards assisting programmes in public domain, the Integrated Biodiversity Assessment Tool (IBAT) is designed to help the private sector incorporate biodiversity considerations into their project and management decisions.[11] IBAT provides information on globally recognised biodiversity-rich areas and legally protected areas through interactive mapping tools. Another example is the protected areas gap analyses that have been completed in more than 20 developing countries under the CBD.[12] The protected areas gap analyses, where ecologically representative networks of protected areas are identified, can assist REDD+ activities by providing the underlying spatial data and other relevant tools. Most of the countries that have completed the gap analyses are also pilot countries within the FCPF and UN-REDD Programmes (CBD, 2011).

Similarly, identifying those ecosystems most at risk from or vulnerable to climate change will help to prioritise areas where adaptation activities are most needed. Assessing adaptation options, including opportunities for EbA approaches, will be an important part of this.

Environmental and social safeguards

While projects and programmes to mitigate and adapt to climate change have the potential to deliver other environmental and social co-benefits, there are also potential trade-offs. A common response to integrating adaption into climate change planning in many countries has been to invest in hard infrastructure (e.g. seawalls and dams) (Munroe et al., 2011). This can have negative impacts on biodiversity, resulting in changes in species composition, abundance and diversity, and the functioning of ecosystems (Airoldi et al., 2005). Safeguards can be an effective risk management policy – they ensure that environmental and social issues are evaluated in decision making, reduce the risks, and provide a mechanism for consultation and disclosure of information (Moss et al., 2011).

The UNFCCC and CBD texts both recognise that there are potential risks associated with REDD+. UNFCCC decision 1/CP.16 and appendix 1, for example, identify important safeguards that should be promoted and supported, and CBD decision XI/19 and its accompanying annex provide advice on the application of relevant safeguards for biodiversity in the context of REDD+, recalling the guidance and safeguards adopted by Parties to the UNFCCC. Potential risks to biodiversity of REDD+ activities include: *i)* the conversion of natural forests to plantations or other uses with lower biodiversity value; *ii)* the displacement of deforestation and forest degradation to areas of lower carbon value and high biodiversity value; *iii)* increased pressure on non-forest ecosystems with high biodiversity value; and *iv)* afforestation of non-forested areas of high biodiversity value. Social risks include: *i)* the loss of traditional territories and restriction of land and resource rights resulting from displacement and relocation of Indigenous Peoples and forest dependent communities; and *ii)* the loss of ecological knowledge and rural livelihoods (CBD, 2011; Moss et al., 2011; REDD+ SES, 2010).

A number of environmental and social safeguard principles have already been developed to help manage these risks, such as the Strategic Environmental and Social Assessment (SESA) of the FCPF, the Social and Environmental Principles and Criteria (SEPC) of the UN-REDD Programme, and the REDD+ Social and Environmental Standards (SES), a voluntary multi-stakeholder initiative facilitated by the Climate, Community and Biodiversity Alliance (CCBA) and CARE International. The environmental and social safeguards for each of these are outlined in Table 7.2.

Table 7.2. **Summary of safeguards applied to three REDD+ finance mechanisms**

	Safeguard Policies or Principles		
	FCPF-SESA	**UN-REDD SEPC**	**REDD+ SES**
Environmental Safeguards	• Environmental assessment: identify, avoid, and mitigate the potential negative environmental impacts • Natural habitat: ensure conservation of biodiversity, as well as the numerous environmental services and products which natural habitats provide to human society • Forests: reduce deforestation, enhance the environmental contribution of forested areas, promote afforestation	• Protect natural forests from degradation or conversion to other land uses including plantation forest • Increase benefits delivered through ecosystem services and biodiversity conservation • Minimise indirect adverse impacts on ecosystem services and biodiversity	• Maintain and enhance biodiversity and ecosystem services
Social Safeguards	• Involuntary resettlement: avoid involuntary resettlement to the extent feasible or minimise and mitigate its adverse social and economic impacts • Indigenous peoples: ensure social and economic benefits to be received in appropriate way and avoid potentially adverse effects on the communities or minimise, mitigate, or compensate when avoidance is not feasible • Forests: reduce poverty, and encourage economic development	• Comply with standards of demographic governance • Assess potential adverse impacts on stakeholder's long-term livelihoods and mitigate effects where appropriate • Contribute to a low-carbon, climate-resilient and environmentally sound development policy, consistent with commitments under international conventions and agreement	• Recognise and respect rights to lands, territories, and resources • Share the benefits equitably among all relevant rights holders and stakeholders • Improve long-term livelihood security and well-being of indigenous peoples and local communities • Contribute to broader sustainable development and protection of human rights • Ensure all relevant rights holders and stakeholders to participate fully and effectively • Have timely access to appropriate and accurate information to enable informed decision making and good governance • Comply with applicable local and national laws and international treaties, conventions, and other instruments

Note: FCPF SESA: Forest and Carbon Partnership Facility Strategic Environmental and Social Assessment; UN-REDD SEPC: UN-REDD Programme Social and Environmental Principles and Criteria; REDD+ SES: REDD+ Social and Environmental Standards (version2).

Source: Source: World Bank (2012), *Safeguard Policies, http://go.worldbank.org/WTA1ODE7T0;* UN-REDD Programme (2012), *Social and Environmental Principles and Criteria, www.unredd.org;* REDD+ Social and Environmental Standards (2012), *REDD+ Social and Environmental Standards, Version 2*, *www.reddstandards.org.*

The UN-REDD SEPC includes a minimum standard risk assessment based on the principles and criteria of the safeguards and an evaluation of magnitudes of risks to assist in the design and implementation of the safeguards. The principles, criteria and associated tools and guidelines are still under development. The draft principles, put forward in 2011, are composed of six principles with further criteria under each to elaborate the definitions and components for a corresponding principle.[13]

The REDD+ Social and Environmental Standards (SES) have been developed to support the design and implementation of government-led REDD+ programmes with special consideration for the rights of Indigenous Peoples and local communities.[14] The REDD+ SES has a tiered structure with three levels, namely principles, criteria, and indicators, which define the issues and requirements for successful implementation of environmental and social performance of the REDD+ programme. The principles provide the key objectives that define high social and environmental performance of REDD+ programmes. The criteria define the conditions that must be met related to processes, impacts and policies in order to deliver the principles. The indicators define quantitative or qualitative information needed to show progress achieving a criterion (REDD+ SES, 2012). The standards at principle and criteria levels are to be applied across all countries while indicators are to be tailored for country and/or local-specific circumstances. The REDD+ SES has also prepared a generic "framework for indicators" to guide the development of country-specific indicators. See Annex C for a summary of REDD+ SES and SEPC of the UN REDD Programme.

Considering that both REDD+ and EbA strategies pursue multiple co-benefits such as biodiversity, social, economic, and cultural benefits for local communities, the over-arching policies and principles of REDD+ can be carried over to adaptation finance mechanisms. Experience and lessons learnt from the development process of REDD+ safeguards[15] could be used to assist the design of environmental and social safeguards for climate change adaptation finance mechanisms. The key challenge for both REDD+ and EbA is to interpret and customise the over-arching principles at national and local-specific levels, developing criteria and indicators which are specific enough to reflect local circumstances, yet still align with the core principles of safeguards. This is critical because countries have different biodiversity and development priorities, and the interactions between biodiversity and climate change vary across spatial scales.

Monitoring, reporting, and verification (MRV)

In cases where biodiversity objectives are indeed incorporated into climate change funding, additional monitoring, reporting, and verification (MRV) methodologies to assess biodiversity outcomes will be needed.

MRV of biodiversity impacts will also be needed when biodiversity-specific environmental safeguards are deemed necessary in climate change funding.

Robust reporting and verification is required to ensure accountability and transparency. It is good practice to make reports publicly available and to conduct independent third-party verification. Under the CCBA voluntary certification scheme, for example, project proponents are required to disseminate their full monitoring plan and the results of monitoring, ensuring that they are made publicly available on the internet and are communicated to the communities and other stakeholders. Project validation and verification are conducted by an accredited third-party auditor, and require site visits (CCBA, 2010).

MRV of co-benefits can impose additional costs to climate change projects. These costs will depend on the stakeholders involved in the monitoring process, the choice of indicators, the frequency of measurements and the extent to which biodiversity MRV can be coupled with carbon accounting (e.g. collecting biodiversity data from the same set of plots used to collect carbon stock data) (Gardner *et al*., 2011; Teobaldelli et al., 2010). One of the proposed approaches for biodiversity MRV is to integrate it with carbon accounting by mirroring the three-tier approach for MRV of carbon established by the IPCC. This could help reduce common barriers such as high costs and limited access to technical expertise (Gardner et al., 2011). Participatory forest monitoring (involving local stakeholders) has also been proposed as means of reducing costs and promoting equity (Danielsen et al., 2011).

Notes

1. The projected impacts of climate change on biodiversity include the shift of species toward northern regions and higher elevation from their current locations, the extinction of already vulnerable species such as species on islands or tops of mountains, and adverse effects on climate sensitive ecosystems such as coral reefs and mangroves. These climate-induced changes in biodiversity at species, ecosystem or landscape levels are expected to further affect global and regional climate through alterations in the uptake and release of greenhouse gases and evapotranspiration in lands and oceans (CBD, 2009).
2. The REDD agenda was first introduced in the UNFCCC COP-11 in 2005. This proposal, submitted by Papua New Guinea (FCCC/CP/2005/MICS.1), received wide support from Parties and there was general agreement on the importance of the issue in the context of climate change mitigation, particularly in light of

the large contribution of emissions from deforestation in developing countries to global greenhouse gas emissions. The COP-13 adopted the Bali Action Plan which includes possible financial incentives for forest-based climate change mitigation actions in developing countries and a decision (Decision 2/CP.13) that encourages Parties to explore a range of actions to address the issues of REDD. The decision broadens the concept of REDD by including conservation, sustainable forest management, and enhancement of carbon stocks, which is collectively referred to as REDD+. At the COP-18 in Doha, Parties agreed that the work programme on results-based finance in 2013 would look at, among other things, ways to incentivise non-carbon benefits (Decision 1/CP.18).

3. For more information, refer to *www.climate-standard.org; www.carbonfix.info; www.planvivo.org,* respectively.

4. The purpose of LDCF is to assist the preparation and the implementation of the National Adaptation Programmes of Actions (NAPAs), which are country-driven strategies that identify the immediate needs of LDCs in order to adapt to climate change such as agriculture, food security, and water projects.

5. The SCCF, administered by the Global Environment Facility (GEF), aims to implement long-term adaptation measures that increase the resilience of national development sectors to the impacts of climate change including water and coastal zone management and capacity building for drought.

6. The AF was established in 2009 to finance concrete adaptation projects and programmes in developing countries that are Parties to the Kyoto Protocol in an effort to reduce the adverse effects of climate change facing communities, countries and sectors.

7. The GCCA has disbursed a significant volume of finance for adaptation mainly in support of sector-level activities such as flood prevention, disaster risk management, water and agricultural projects.

8. For more information, refer to *www.unep-wcmc.org; www.carbon-biodiversity.net/Interactive*.

9. Carbon estimates are based on a global map of carbon storage (Scharlemann et al*.,* 2009), which consists of a dataset of carbon stored in above and below ground biomass (Ruesch and Gibbs, 2008) combined with a dataset on carbon stored in soil down to 1 meter depth (Scharlemann et al*.,* in prep.). For more information, refer to *www.carbon-biodiversity.net/interactive/carboncalculatornotes*.

10. This is a customised ArcGIS 9.3.1 toolbox and provides GIS users with a series of raster analysis tools to help identify, map and understand the spatial relationship between ecosystem carbon stocks, other ecosystem services, biodiversity, land-use and pressures on natural resources. The resolution of the analysis can be defined by the user. The toolbox is flexible, providing a set of tools that can be used interchangeably whilst using a consistent and efficient methodology that

will decrease the time required undertaking such analyses. For more information, refer to *www.carbon-biodiversity.net/interactive/.*

11. For more information, refer to *www.ibatforbusiness.org.*

12. For more information on the analysis process, tools, and case studies, refer to CBD (2006).

13. The complete set of safeguard principles and criteria is available at *www.un-redd.org.*

14. For more information, refer to *www.redd-standards.org.*

15. Moss et al. (2011) provide a summary of the main lessons learned from REDD+ safeguard process. These include the need for: *i)* comprehensive participation of Indigenous Peoples and local communities; *ii)* a clear protocol for the safeguard process, designed from the beginning and agreed among the stakeholders' representatives; *iii)* capacity building activities for Indigenous Peoples and local communities before starting the discussion of REDD+ safeguards; and *iv)* measures to ensure transparency and accountability shall be in place during the whole process.

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Chapter 8

Biodiversity in international development finance

This chapter discusses the opportunities and challenges of scaling up biodiversity-related development finance. It focuses in particular on Official Development Assistance (ODA) and the importance of leveraging private investment with public funds, using capital markets, co-financing, public-private partnerships and risk mitigation instruments. The chapter also underscores the need to better mainstream biodiversity into general development flows – and offers examples of how this can be done at a donor, national, sectoral and project level – as well as the importance of environmental and social safeguards.

An introduction to biodiversity in international development finance

Biodiversity-related development is traditionally financed by Official Development Assistance (ODA) outlays from donor country budgets. ODA refers to grants and concessional loans[1] for development and welfare purposes to a developing country (bilateral aid) or multilateral agency active in development (multilateral aid) (OECD, 2008). The main sources of multilateral aid are multilateral development banks, including the World Bank Group[2] (WBG), and the regional development banks (e.g. African Development Bank (AfDB)), and the agencies, funds and programmes of the United Nations. The Global Environment Facility (GEF), the official funding mechanisms of the CBD, is the largest source of multi-lateral biodiversity-related aid – i.e. ODA that finances activities that promote at least one of the three objectives of the CBD.[3] Box 8.1 highlights some examples of projects (partially) funded by biodiversity-related ODA.

Box 8.1. **Examples of ODA-funded projects for biodiversity**

France-Madagascar Debt-for-Nature Swap

In June 2008, the Government of Madagascar and the Government of France signed a debt-for-nature agreement. Under the agreement, USD 20 million in debt owed by Madagascar was allocated to the Madagascar Foundation for Protected Areas and Biodiversity, enabling it to achieve its endowment target of USD 50 million. This exchange was facilitated by the World Wildlife Fund. The Madagascar Foundation was set up in 2005 through a declaration signed by the goverment of Madagascar, Conservation International and the World Widllife Fund, as part of Madagascar's goal to triple the size of its protected areas network. Funds are directed towards activities that protect, maintain and expand the protected area network, including certain buffer zones and ecological corridors (CI, 2011; WWF, 2012).

Sustainable Financing and Management of Eastern Caribbean Marine Ecosystem

The Organisation of Eastern Caribbean States (OECS) countries have engaged in a project which aims to contribute to enhancing the long-term sustainability of protected area networks in the OECS region by establishing sustainable financing mechanisms; strengthening marine protected area networks; deploying a regional monitoring and information system for protected area networks. The project contributes to the Caribbean Challenge and to the participating governments adaptation agenda by making coastal and marine ecosystems more resilient to climate change through creating effectively managed protected areas that improve coral health and ecosystem integrity. This project is cofinanced by the GEF (USD 8.75 million); the recipient countries (USD 3.13 million); Germany's development bank (KFW) (USD 4.8 million) and other foundations (USD 4.47 million) (GEF Report No: AC5650).

Box 8.1. **Examples of ODA-funded projects for biodiversity** *(continued)*

Community Markets for Conservation (COMACO) Zambia

Since 2003, COMACO, a non-profit company stewarded by Wildlife Conservation Society (WCS) in consultation with Community Resources Boards of Luangwa Valley, Producer Group Cooperatives, District Council authorities, and key Government institutions, such as Zambia Wildlife Authority and Ministries of Tourism, Environment and Natural Resources, Agriculture, and Local Government has increased income opportunities for over 30,000 farmers by leveraging better prices for farmers who adopt conservation practices and abandon environmentally destructive practices (e.g. poaching or farming on steep slopes). This approach improves food security and household incomes, and allows people to remain more sedentary as farmers, without having to clear forests for new farm land. Seed capital for COMACO was provided by the Royal Norwegian Embassy (ODA), which has the largest donor investment in Zambia's wildlife sector, as well as by CARE International (non-ODA co-financing) (COMACO, 2011).

There are, however, also a range of other international financial flows to developing countries which have or could promote biodiversity conservation and sustainable use. These include, but are not limited to other official flows (OOF),[4] private flows at market terms (e.g. foreign direct investment (FDI) and bank loans); international migrant worker remittances (i.e. transfers of money by a foreign worker to his home town); and private grants from NGOs and foundations. The OECD Development Assistance Committee has begun to explore opportunities to extend the coverage of the Rio Markers to determine and monitor the extent to which some of these international financial flows help achieve biodiversity objectives.

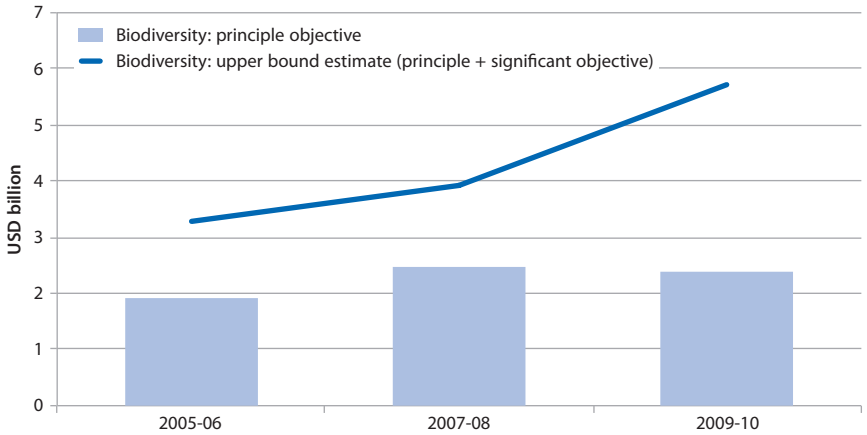
Potential to mobilise and scale-up biodiversity in international development finance

Biodiversity-related bilateral ODA increased from an average of USD 3.3 billion per year in 2005-06 to USD 5.7 billion per year in 2009-10.[5] Biodiversity-related aid where biodiversity was the principle objective increased from an average of 1.9 billion/year in 2005-06 to 2.4 billion/year in 2009-10, which is about 5% of total ODA (see Figure 8.1).

The largest volume of biodiversity-related multilateral aid flows through the GEF. Between 1991 and 2010, GEF allocated just over USD 3 billion for biodiversity-related projects. This is roughly equivalent to 16% of total biodiversity aid between 1980 and 2008 (Miller et al., 2012). GEF finance

Figure 8.1. **Biodiversity-related aid, 2005-10**

bilateral commitments, 2010 prices



Source: OECD (2011), *ODA for Biodiversity, OECD Creditor Reporting System online*, OECD, Paris, *http://stats.oecd.org/* (Development).

for biodiversity-related projects was about USD 150 million in 2010. The International Bank for Reconstruction and Development's (IBRD) investments in biodiversity projects have increased. On a five-year basis, IBRD annual investments to biodiversity averaged USD 33 million for 1998-2002 and USD 55 million from 2003-08 (CBD, 2010a). The International Development Association's (IDA) commitments to biodiversity, however, have decreased over the past two decades, despite steady increases in annual total commitments. The five-year averages show that IDA annual commitments to biodiversity decreased from USD 50 million for 1992-97 to USD 40 million for 1998-2002 and USD 38.7 million for 2003-08 (CBD, 2010a).

There is a considerable potential to mobilise new sources of finance for biodiversity-related development. The Leading Group[6] has made several proposals on "innovative" financing for development and has already mobilised an estimated USD 2.5 billion. While these have not been intended for biodiversity, there could be opportunities to adapt these mechanisms to fund biodiversity-related development.[7]

Table 8.1 summarises some of the international finance mechanisms that have or could potentially be used for biodiversity-related development. According to Girishankar (2009), these are categorised as:

- solidarity mechanisms: support sovereign-to-sovereign transfers and form the backbone of multilateral and bilateral ODA

- public-private partnerships mechanisms: leverage or mobilise private finance in support of public service delivery
- catalytic mechanisms: involve public support for creating and developing private markets (e.g. by reducing risks of private entry).

The Table further distinguishes between those mechanisms associated with raising funds for biodiversity-related development and financial solutions on the ground.

Table 8.1. **Financing mechanisms for biodiversity-related development**

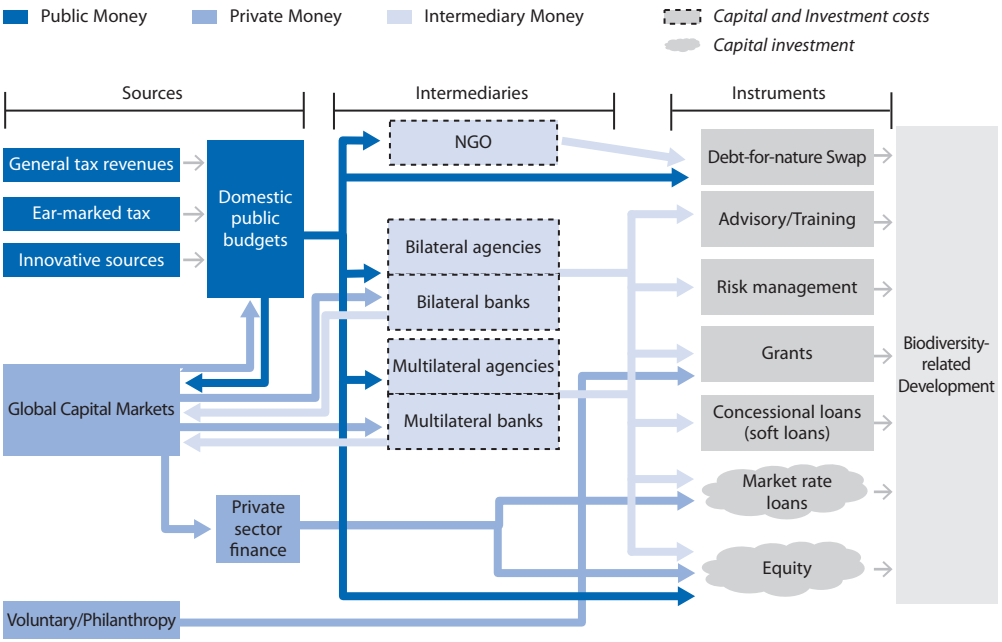
	Fund Raising	Financial solutions on the ground
Solidarity Mechanisms	• Developed country budgets fed by general tax revenues • Some private flows • National or global solidarity levies • National or global lotteries	• Transfers to public entities • Debt-for-nature swaps • Counter-cyclical lending
Public-private partnership mechanisms	• New bonds (e.g. local currency bonds; green bonds; frontloading) • Conservation Trust Funds • Bioprospecting and ABS agreements	• Privatisation of conservation (e.g. of PA management) • Risk mitigation instruments (e.g. guarantees and insurance)
Catalytic Mechanisms	• REDD+ Funds	• Leveraging private finance in biodiversity conservation and sustainable use through e.g. risk mitigation, local currency lending, microfinance, and equity instruments • Creating private insurance markets • Developing ecolabelling schemes

Source: Adapted from Girishankar, N. (2009), "Innovating Development Finance: From Financing Sources to Financial Solutions", *CFP Working Paper Series,* No. 1.

Figure 8.2 provides a simplified illustration of biodiversity-related development finance aid architecture.

There are opportunities to scale up biodiversity-related ODA through solidarity mechanisms such as national or international taxes and national or global lotteries. UNITAID,[8] for example, raises about Euro 160 million a year through an "air ticket levy".[9] In the United Kingdom, the Big Lottery Fund has contributed around GBP 213 (USD 310 million) for projects in developing countries since 1995, of which GBP 15 million was contributed in 2007 alone (Girishankar, 2009), and in 2006, a consortium of three charity lotteries in the Netherlands distributed Euro 300 million among Dutch civil society organisations including WWF (Gutman and Davidson, 2008).

Figure 8.2. **Biodiversity-related development finance flows (simplified)**



Source: Adapted from Buchner, B. et al. (2011), *The Landscape of Climate Finance,* Climate Policy Initiative, Venice.

Debt-for-nature swaps, where developing countries are relieved of their debt by creditor nations in exchange for investment in a mutually agreed biodiversity-related development project,[10] can mobilise considerable amounts of finance for biodiversity conservation. For instance, between its enactment in 1998 and June 2009, the US Tropical Forest Conservation Act supported 15 debt-for-nature swaps, which together will mobilise more than USD 218 million for tropical forest conservation (Bureau of Public Affairs, 2009). A single debt-for-nature swap may mobilise as much as USD 30 million (e.g. US-Indonesia debt-for-nature swap in 2011) (Bureau of Public Affairs, 2011). There is, however, a limit to the scalability of debt-for-nature swaps, as not all external debt is eligible for swaps – eligibility criteria must first be met before engaging in debt-for-nature swaps – and some creditors are reluctant to embark on debt-for-nature swaps (OECD, 2007).

Whenever possible, public funds should aim to leverage private investment. In this regard, donor agencies and financial institutions play an important role. The IBRD, for example, has generated more than USD 400 billion in loans

with government contributions of only USD 11 billion, by raising funds on the global capital market. Some donor countries (e.g. Germany and France) have also raised funds on domestic capital markets to fund bilateral aid programmes. The German Development Bank (KfW), for example, contributed around 20% of Germany's ODA commitments in 2007 through bonds[11] and other funds (Girishankar, 2009).

While bonds are a well-established means to raise debt from the capital markets, recent years has seen the emergence of green bonds, which are variations wherein the issuer of the bond guarantees to use the money raised for specific environmental purposes (i.e. "ring-fencing"), thereby attracting impact and socially responsible investors. The World Bank has already issued over USD 2 billion in green bonds to finance climate change mitigation and adaptation, and in some cases, forest projects have been included in the portfolio of investments (World Bank, 2011). Green bonds could be tailored so as to provide a source of frontloaded finance for biodiversity-related development. Several proposals have been put forward, and a bamboo bond has recently been issued (Cranford et al., 2011).

Conservation trust funds can also be an effective mechanism for mobilising private sector finance for biodiversity-related development. These can operate at a global (e.g. Nagoya Protocol Implementation Fund and GEF Earth Fund; see Box 8.2); regional (e.g. Mesoamerican Reef (MAR) Fund); and national level (e.g. the Mexican Nature Conservation Fund), pooling funds from international donors, national governments and the private sector. The Mexican Nature Conservation Fund, for example, has raised close to USD 100 million towards its endowment since it was established in 1994, with major donations from USAID, the Mexican government, the GEF, and philanthropic organisations such as the Lucile Packard Foundation and the Ford Foundation, amongst others (FMCN, 2005; WWF, 2012).

Private sector finance may also be mobilised in the form of project co-financing. The GEF, for example, has set a minimum benchmark target of a 1:1 ratio for co-financing, which comprises the total of cash and in-kind resources committed by the private sector, NGOs, governments, other multilateral or bilateral sources, the project beneficiaries and the concerned GEF agency. By the end of 2009, the GEF had provided USD 2.88 billion in grants for biodiversity and leveraged an additional USD 7.85 billion in total co-financing. This equates to a co-financing ratio of 1:3 (CBD, 2010a).

On the ground, public-private partnerships can provide opportunities to fill funding gaps and enable governments to improve the effectiveness of public service delivery. South African National Parks (SANParks), for example, granted exclusive rights to commercial use of lodge sites together with the surrounding parkland. The concessionaires pay SANParks an annual fee calculated as a percentage of the turnover bid during the tender

process. In 2004 lodges, shops and restaurants generated concession fees of USD 13.5 million and lodges attracted private investment of USD 42.5 million. SANParks is now independent from government transfers for more than 75% of its operating revenue (Saporiti, 2006). Other park agencies have entered long-term concession contracts with private sector providers of biodiversity management, such as African Parks. African Parks has mobilised more than USD 23 million in private and public funds for future investments in the parks it manages. While it aims to be economically self-sufficient, grants were required to fund the initial investment (e.g. in environmental restoration) (Saporiti, 2006).

Barriers to private sector investment in biodiversity and sustainable use in developing countries include financial constraints and unfavourable risk-return profiles.[12] Grants, loans, and equity investments as well as risk mitigation instruments can help remove these barriers, thereby catalysing private sector investments. Microfinance loans, for example, are increasingly being used to engage the poor, who otherwise would not have access to credit lines (see Box 8.3).

Box 8.2. **The GEF Earth Fund**

The GEF Earth Fund, originally named the Public Private Partnership Initiative, was approved by the GEF Council in June 2007 along with funding of USD 50 million. The Earth Fund was established with separate trust fund arrangements to promote projects, technologies, and business models that will contribute to protection of the global environment. Three of these explicitly address biodiversity:

IBRD/Conservation International "Conservation Agreement Private Partnership Platform"

This platform was approved by the council in August 2009 with USD 5 million from the GEF Earth Fund, USD 5M contribution by CI and USD 10 million private co-financing. The objective of the Conservation Agreement Private Partnership Platform is to catalyse private sector participation in conservation of biodiversity and provision of ecosystem services through:

- streamlining product sourcing agreements between companies and communities;
- developing conservation partnerships at community level;
- loan finance to small and medium enterprises to ensure increased participation in product and service supply chains that benefit conservation and development.

Box 8.2. **The GEF Earth Fund** *(continued)*

UNEP/Rainforest Alliance "Greening the Cocoa Industry"

This platform was approved by the council in April 2010 with USD 5 million from the GEF Earth Fund, and a USD 15 million contribution by Mars, Kraft and other participants in the cocoa value chain. The objective of the platform is to incentivise improved production and business practices in major cocoa producing countries and cocoa companies through:

- widespread adoption of the Sustainable Agriculture Standard in 750 000 hectares of cocoa farms;
- providing farmers with access to quality training, extension and relevant support services;
- implementation of a global Rainforest Alliance certification programme for cocoa that includes biodiversity standards.

IDB/The Nature Conservancy "Public-Private Funding Mechanisms for Watershed Protection"

This platform was approved by the Council in April 2010 with USD 5 million from the GEF Earth Fund, and at least USD 15 million cash co-financing. The objective of the platform is to deploy public-private funding mechanisms ("Water Funds") as sustainable long-term instruments to promote private sector participation in the conservation of freshwater ecosystems and biodiversity of global importance:

- establish at least five Water Funds across Latin America and the Caribbean;
- secure increased private and public sector funding to pay for water and biodiversity related services;
- incorporate endowment funds for long-term sustainability.

Source: GEF (2010).

Box 8.3. **Microfinance: Kamchatka, Russia**

Microfinance is a key component of the GEF-funded project in Kamchatka Peninsula, which aims to promote sound conservation management approaches in four protected areas as a model for sustainable management. A Small and Medium Enterprises Support Fund (SMESF) has been set up to invest in biodiversity-friendly income-generating projects. A share of the revenues from the interest earned on credits is channelled to the protected areas of Kamchatka through the Kamchatka Krai Protected Areas Association. This micro-crediting mechanism supplies sustainable low-risk and low-cost investment in biodiversity management, revenue generation for the Kamchatka Protected Areas, and accessible financing for local entrepreneurs. By the end of 2009 the SMESF had become fully self-financed and by late 2009, the SMESF had issued 738 micro-loans to communities totalling around USD 8.7 million.

Source: UNDP (2012).

Private equity capital for biodiversity is relatively scarce. Examples of where equity investments have been used to promote biodiversity conservation include the Kijani Initiative, Africa; The Asian Conservation Corporation; EcoEnterprises Fund, Latin America; and The Terra Capital Fund, Latin America. These provide a model for scaling up equity flows for biodiversity. The Terra Capital Fund, for example, was capitalised at USD 15 million, including USD 4 million from IFC and USD 5 million from GEF to cover the incremental operating costs associated with biodiversity-related investments of the fund. The investment portfolio includes organic farming companies, a company that harvests and processes babassu coconut in the Amazon and a FSC-certified company that harvests hearts-of-palm in the Amazon river estuary. A Biodiversity Advisory Board provides investment criteria and advice on particular projects (IUCN, 2000).

Risk mitigation instruments are "financial instruments that transfer certain defined risks from project financiers (lenders and equity investors) to credit-worthy third parties (guarantors and insurers) that have a better capacity to accept such risks" (FT, 2009). While insurance is generally provided by the private sector (perhaps with public-sector support), guarantees tend to be provided by host country governments, multilateral organisations and development banks (Gaines and Grayson, 2009). The Central American Bank for Economic Integration, for example, recently launched a USD 1.5 million Regional Program of Credit Guarantees to provide incentives for investment and lending to "biodiversity friendly" small, micro- and medium-sized enterprises in five Central American countries (Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua) (IISD, 2012).

Key features for integrating biodiversity objectives into international development finance

In addition to scaling-up biodiversity-related international development finance, biodiversity objectives and considerations need to be better integrated or mainstreamed into general development finance flows.[13] There is already considerable literature on this, and related areas such as mainstreaming biodiversity in climate change policies, from which lessons can be drawn. Overall, it is important that the approaches to mainstream biodiversity into development finance are well-aligned with the five key principles of the 2005 Paris Declaration and the 2008 Accra Agenda for Action (see Box 8.4).

Better mainstreaming of biodiversity into development finance will require renewed efforts from both donor and recipient countries. From the donor country perspective, this can include raising the attention of relevant ministries, such as Planning and Finance Ministries, on biodiversity stakes for poverty reduction and development, orientating funding towards biodiversity-dependent

sector activities, and developing focused biodiversity tools and instruments for screening project portfolios (CBD, 2009). Biodiversity issues can be better addressed in development finance through collaboration across agencies. This maximises the comparative advantages of different agencies and promotes better communication. Sweden, for example, has established a framework agreement between the Swedish International Development Co-operation Agency (SIDA) and the Swedish Environmental Protection Agency (SEPA). These two agencies co-ordinate in many developing countries where the environment has been identified as a priority (OECD, 2012).

Box 8.4. **The Paris Declaration and the Accra Agenda for Action**

The 2005 Paris Declaration lays out a practical, action-oriented roadmap to improve the quality of aid and its impact on development. It puts in place a series of specific implementation measures and establishes a monitoring system to assess progress and ensure that donors and recipients hold each other accountable for their commitments.

1. Ownership: Partner countries exercise effective leadership over their development policies, and strategies and co-ordinate development actions.
2. Alignment: Donors base their overall support on partner countries' national development strategies, institutions and procedures.
3. Harmonisation: Donors' actions are more harmonised, transparent and collectively effective.
4. Managing for Results: Managing resources and improving decision-making for results.
5. Mutual accountability: Donors and partners are accountable for development results.

The 2008 Accra Agenda for Action is designed to strengthen and deepen implementation of the Paris Declaration – it takes stock of progress and sets the agenda for accelerated advancement towards the Paris targets. It proposes the following three main areas for improvement:

Ownership: Countries have more say over their development processes through wider participation in development policy formulation, stronger leadership on aid co-ordination and more use of country systems for aid delivery.

Inclusive partnerships: All partners – including donors in the OECD Development Assistance Committee and developing countries, as well as other donors, foundations and civil society – participate fully.

Delivering results: Aid is focused on real and measurable impact on development.

From the recipient country perspective, efforts to better mainstream biodiversity into development finance need to occur at the national, sectoral, project and local levels. At the national level, it is important that biodiversity objectives, targets and indicators are included in Multi-Year Development Plans and Poverty Reduction Strategy Papers (PRSPs), and that transparent mechanisms are in place to hold national decision-makers accountable for biodiversity management. In a review of 54 PRSPs, Roe (2010) finds that "while there is clearly room for improvement, many of the PRSPs reviewed show an encouraging level of biodiversity integration including some sophisticated analysis of biodiversity – poverty linkages and clear articulation of the legislative and institutional framework required to maximise the synergies between biodiversity conservation and poverty reduction."

An effective approach for mainstreaming biodiversity into development finance at the national and sectoral planning level is to apply a biodiversity lens using a tailored Strategic Environmental Assessment (SEA) framework[14] (see Box 8.5). At the sectoral level, it is important to align regulations with conservation and sustainable use of biodiversity, and harness opportunities to incorporate biodiversity conservation and sustainable use measures into sectoral planning and implementation. At the project level, the short and long term benefits as well as threat and losses to biodiversity and related ecosystems services need to be assessed during the project identification phase. This will likely be accompanied by an Environmental Impact Assessment (EIA) during the project appraisal phase. Biodiversity-friendly measures should be prioritised and incorporated into project design, and relevant biodiversity indicators developed for monitoring and evaluating the success of the project.

It is important that stakeholders (including private sector and local communities) are engaged at all these levels – including in planning, monitoring and evaluation, and decision-making processes – and that social safeguards are in place to help ensure that development finance benefits rather than harms people (e.g. policies on involuntary resettlement, labour rights, and gender equality). While safeguard policies first emerged in development finance, starting with the World Bank in the 1970s and 80s, many are inadequate to address the realities of development finance today (Herbertson, 2012). As such, there has been recent demand to review and update them. Herbertson (2012) finds that at least seven multilateral development banks, three multilateral agencies and a bilateral development agency are currently undertaking safeguard reforms, or have undertaken them in the past five years.[15]

Box 8.5. **The Sperrgebiet land use plan, Namibia**

Background and objectives:

The Sperrgebiet is a biodiversity-rich, desert wilderness area in southwest Namibia, which also comprises a licensed diamond mining area. It has been a prohibited area since 1908. In 1994, the exclusive prospecting and mining licenses of the non-diamondiferous areas were relinquished and considerable interests arose in the area for a variety of conflicting uses. In consultation with Namdeb (the mining licence holder) and NGOs, the Government agreed that a land use plan should be formulated to ensure longterm sustainable economic and ecological potential in the fragile Sperrgebiet before it was opened up.

Approach:

An SEA-type approach was used to develop the plan, involving several steps:

- a thorough literature review with gaps filled through consultation with specialists;
- development of a series of sensitivity maps for various biophysical and archaeological Parameters;
- an extensive public consultation programme that included: public workshops, information leaflets and feedback forms, land use questionnaires, and a technical workshop with selected specialists;
- the establishment of a list of possible land use options for the area and their evaluation in terms of the environmental opportunities and constraints;
- formulation of a vision – that the entire Sperrgebiet should be declared a Protected Area;
- development of a zoning plan to provide a framework to guide immediate decisions regarding land use;
- a technical workshop including specialists to discuss and refine the draft-zoning plan;
- a preliminary economic analysis of the main land use options;
- development of an administrative framework outlining the legal processes required for land proclamation, the formation of a Management Advisory Committee and definition of its role, ecotourism models, zoning, future access control and integration into the surrounding political and economic structures. For each potential land use, guidelines were prepared outlining what needs to be included in a project-specific Environmental Impact Assessment and Environmental Management Plan.

Outcomes :

The Land Use Plan was finalised in April 2001. In April 2004, the Sperrgebiet was proclaimed a National Park. The recommendations of the Land Use Plan were accepted.

Source: Walmsley, SAIEA, South Africa in OECD 2006.

Notes

1. A loan is considered sufficiently concessional to be included in ODA if it has a grant element of at least 25%, calculated at a 10% discount rate.
2. The World Bank Group consists of five organisations: IBRD, IDA, IFC, MIGA, ICSID.
3. The three objectives of the CBD are: *i)* the conservation of biodiversity; *ii)* sustainable use of its components (ecosystems, species or genetic resources); *iii)* fair and equitable sharing of the benefits of the utilisation of genetic resources.
4. OOFs are official sector transactions which do not meet the ODA criteria, e.g. i) grants to developing countries for representational or essentially commercial purposes; ii) official bilateral transactions intended to promote development but having a grant element of less than 25 per cent; iii) official bilateral transactions, whatever their grant element, that are primarily export-facilitating in purpose.
5. Activities that are considered to be biodiversity-related aid can be scored as significant or principal. The activity will score "principal objective" only if it directly and explicitly aims to achieve one of three objectives of the CBD.
6. The Leading Group was set up in 2006 as a platform for discussion, sharing information and promoting innovative finance mechanisms. For more information see: *www.leadinggroup.org*.
7. One of the suggestions put forward to the CBD in 2010, was to mobilise the Leading Group to consider ecosystem services and underlying biodiversity (CBD 2010b). The French Ministry of Foreign Affairs has since launched a study to explore opportunities to finance biodiversity with the Leading Group.
8. UNITAID is an organisation which aims to increase the treatment coverage for HIV, Malaria and Tuberculosis *www.unitaid.eu/*.
9. The air ticket levy can range from USD 1 for economy class tickets to approximately USD 40 for business and first class travel.
10. The rationale of debt swaps is that debt can be acquired at a discount. When creditors do not expect to recover the full nominal value of debts, they may be willing to accept less. In exchange for (partial) cancellation of the debt, the debtor government is prepared to mobilise the equivalent of the reduced amount in local currency for agreed purposes on agreed terms.
11. A bond is a tradable financial security representing a promise that the organisation that sold it will pay whoever holds the security a pre-specified interest payment at defined intervals over the bond's lifetime, and also pay the full face value of the bond upon maturity (Cranford et al., 2011).

12. Risks to investment in developing countries include general political risk, currency risk, regulatory and policy risk, execution risk, technology risk and unfamiliarity risk (Brown and Jacobs, 2011).

13. Parties to the CBD agreed on decision XI/22 at COP-11 in Hyderabad. The decision entitled "biodiversity for poverty eradication and development" stresses the importance of biodiversity for poverty eradication and development and "[*i*] *nvites* Parties, all partners and stakeholders to integrate the three objectives of the Convention on Biological Diversity into sustainable development and poverty eradication programmes, plans, policies and priority actions, taking into account the outcomes of the Rio+20 Conference".

14. For guidance on good practice for SEA see OECD (2006).

15. *Multilateral development banks:* European Bank for Reconstruction and Development (2008); Asian Development Bank (2009); Forest Investment Program (2009); International Finance Corporation (2011); Forest Carbon Partnership Facility (2011); World Bank (in progress); African Development Bank (in progress). *Multilateral Agencies:* UN REDD (in progress); UN Environment Management Group (in progress); Global Environment Facility (in progress). *Bilateral donors:* German Development Agencies (2011).

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Chapter 9

Comparing across the mechanisms: Insights and lessons

This chapter provides a comparative analysis of the six biodiversity finance mechanisms – environmental fiscal reform, payments for ecosystem services, biodiversity offsets, markets for green products, biodiversity in climate change funding, and biodiversity in international development finance – and summarises the circumstances and conditions under which they are most likely to be effective. It then examines cross-cutting issues, such as environmental and social safeguards and capacity and governance needs for effectively implementing biodiversity finance mechanisms.

Drawing on the literature and on a variety of case studies, this report has examined six finance mechanisms available for biodiversity conservation and sustainable use. More specifically, it:

- provides an overview of the finance that has been mobilised across these six mechanisms and considers the potential for scaling these up
- examines the key design and implementation issues that need to be considered so as to ensure that they are environmentally effective, economically efficient and distributionally equitable.

Clearly, these six finance mechanisms fall into a much broader set of instruments available for biodiversity conservation and sustainable use (Chapter 2). To effectively address the global biodiversity challenge, governments will need to also draw on regulatory (e.g. command-and-control) approaches, as well as other economic, information and voluntary instruments, and to identify the most appropriate policy mixes. This is particularly important in the case of biodiversity, as the drivers of loss and degradation are often multiple and stem from market and government failures prevalent in biodiversity policy, as well as policies in other sectors of the economy. The appropriate choice of policy mix will depend on:

- the nature of the environmental problem and drivers of loss
- socioeconomic, cultural and political circumstances
- the governance and institutional capacity needed to effectively implement instruments.

This chapter aims to provide a comparative analysis of the six finance mechanisms and to summarise the circumstances and conditions under which they are most likely to be effective. It then looks at cross-cutting issues, namely the environmental and social safeguards and the capacity needed to effectively implement them.

Comparing across the six biodiversity finance mechanisms

How do these six biodiversity finance mechanisms compare? PES resemble incentive-based environmental taxes and subsidies. The latter aim more at changes in broader patterns of production and resource use, whereas the PES approach of purchasing conservation and/or sustainable use conditionally is even more direct (Wunder, 2007). The ecological value-added tax programme practiced in several Brazilian federal states is a borderline case between PES and fiscal environmental instruments: federal states use tax transfers to reward municipalities for the size and quality of conservation areas for watershed protection and recreational benefits (Grieg-Gran, 2000; May et al., 2002).

Biodiversity offsets impose additional costs on development that adversely impacts on biodiversity. As such, they resemble incentive-based environmental taxes.[1] One of the main differences between these two types of instruments is perhaps that whereas the application of taxes should entail an estimation of marginal biodiversity damages in monetary terms, the units used in biodiversity offsets is biodiversity itself.

Whereas EFR, PES and biodiversity offsets are economic instruments, green markets are facilitated by ecolabelling, which is an information instrument. Ecolabels provide consumers with information to enable them to preferentially purchase products that have been developed in an environmentally and socially responsible way. When consumers are willing to pay a price premium for these products, green markets in some ways overlap with PES, although the former is less direct. Where certified products are demanded by customers but do not fetch a price premium, the costs are borne by the producer; in this regard, green markets more closely resemble taxes.

Biodiversity in climate change funding is a way of harnessing and promoting synergies between the objectives for mitigating and adapting to climate change, and conserving and sustainably using biodiversity. The degree of directness provided by biodiversity in climate change funding will vary depending on the climate change instruments being used. These can be in the form of climate change-related ODA (including ecosystem-based adaptation, REDD+), and via afforestation/reforestation activities in the Clean Development Mechanism, amongst many others.

Finally, with regard to biodiversity in international development finance, biodiversity objectives can be fairly indirect and will depend on the specific projects and programmes that international development finance is intended to support. There may often be considerable overlap between biodiversity in international development finance and the other five mechanisms. For example, international development finance may be delivered in the guise of climate change finance (e.g. REDD+), biodiversity offsets (e.g. FDI projects financed by financial institutions that adhere to the Equator Principles), or PES (e.g. programmes with third-party financing from the World Bank, GEF, or UNEP). International development finance can also be used to fund the capacity building needs that are necessary for the effective development and implementation of each of the other five mechanisms.

These and other elements distinguish these six finance mechanisms. Table 9.1 summarises the extent to which they are able to mobilise finance from local, national and/or international scale; whether the source of finance is public and/or private; the extent to which they impact on the drivers of biodiversity loss and degradation; and whether they are based on the polluter or the beneficiary pays approach.

Table 9.1. **Summary characteristics of the six biodiversity finance mechanisms**

Finance Mechanism	Scope of finance	Source of finance	Direct vs. indirect revenue raising	Impact on drivers of biodiversity loss	Beneficiary vs. polluter pays
Environmental Fiscal Reform	Local, national	Private (and public)	Direct	Direct	Polluter
PES	Local, national, international	Private and public	Direct	Direct	Beneficiary
Biodiversity offsets	Local, national	Private (and public)	Direct	Direct	Polluter
Markets for Green Products	Local, national, international	Public	Indirect	Indirect	N/A
Biodiversity in climate change funding	Local, national, international	Public and private	Indirect	Depends	Polluter
Biodiversity in international development finance	International	Public (and private)	Indirect	Depends	N/A

The transaction costs associated with designing and implementing these different mechanisms will also vary. While it is difficult to say with certainty which mechanism inherently is associated with higher or lower transaction costs (as this will also depend on how they are designed and implemented), EFR for example may be expected to have lower transaction costs than, say, biodiversity offsets. As indicated in Chapter 3 however, the transaction costs of administering and monitoring EFR for dispersed or "non-point" source pollution will be higher than that for point source pollution. And, the generally high transaction costs that may be anticipated with administering biodiversity offsets can be reduced via the introduction of biobanking (Chapter 5). Similarly, the transaction costs associated with administering and monitoring a PES programme are likely to increase as the geographical scope of the benefits from ecosystem services increases and hence the beneficiaries are more widely dispersed as well. Examples of issues to consider to help ensure lower transaction costs in PES design include simple application procedures and contract design.

It is also important to note that the experience and insights amassed over time across these different mechanisms vary. For example, while there is substantial experience with PES programmes and much literature devoted to analysing this mechanism, biodiversity offsets have only more recently begun to proliferate and better monitoring, reporting and verification systems for these programmes will enable more information to be collected so as to learn how they can be improved over time. Pilot systems, such as those undertaken in the United Kingdom are a useful way to learn and adapt the design and implementation of such programmes.

Finance mobilised and scalability

It is difficult to estimate with certainty the amount of finance that has been mobilised (either directly or indirectly) by each of these finance mechanisms. Information available for some mechanisms is more comprehensive than for others. The OECD/EEA database on environmentally related taxes, for example, indicates that while total revenue from environmental taxes in OECD countries in 2010 was slightly below USD 700 billion, taxes on pollution and resources (i.e. those most likely to be relevant to biodiversity) constitute a very small fraction of this (as per Figure 3.1).

While there is no comprehensive figure available on the amount of finance mobilised globally by PES, it is estimated that national PES programmes in five countries alone have mobilised more than USD 6 billion (OECD, 2010a). Another study finds that in 2008, payments for watershed services transactions totalled over USD 9 billion (Stanton et al., 2010 cited in Parker and Cranford, 2010).

A more comprehensive study which attempts to estimate the finance mobilised across all existing biodiversity offset programmes or those where some form of compensatory conservation is required, finds that between USD 2.4 and USD 4 billion have been mobilised across 45 programmes in 2011 (Madsen et al., 2011).

While markets for green products have increased markedly in recent years, only some of these goods and services fetch price premiums. Comprehensive estimates are not available and are likely to be difficult to obtain. Although markets for green products serve to scale up biodiversity outcomes, they do not necessarily generate revenue, at least not in a direct way.

Efforts to track total climate change finance flows indicate that this could range between USD 70-120 billion annually in 2009-10 (Clapp et al., 2012). Looking across biodiversity-related climate change finance from multilateral sources (such as the Forest Carbon Partnership Facility, the BioCarbon Fund, and others) indicates that this currently amounts to approximately USD 8 billion (Table 7.1).

Finally, more comprehensive data are available for biodiversity-related official development assistance, which is tracked by the OECD DAC. This increased from an average of USD 3.3 billion per year in 2005-06 to USD 5.7 billion per year in 2009-10 (OECD, 2011a).

In terms of the potential to scale-up these mechanisms, it is likely that those mechanisms that are also able to mobilise finance directly from the private sector will have higher potential than those that do not. Overall, the climate change agenda has been arguably more successful in tapping into private sector finance than the biodiversity agenda, due to the national greenhouse gas

emissions reduction targets in the so-called Annex I countries, some of which have then passed these on to firms in the form of mandatory emissions trading programmes. It is easier however to pass on these types of comprehensive targets to the private sector in the context of climate change, as from a spatial perspective, it does not matter where emission reductions take place. Effective biodiversity policy requires more spatially specific interventions. Despite this greater complexity, a number of the mechanisms reviewed here are able to mobilise the private sector (Table 9.1), and have the potential to be scaled-up. Government will have a critical role to play in providing the necessary legislative frameworks so as to provide the appropriate incentives for the private sector to engage in biodiversity conservation and sustainable use.

While some of the mechanisms reviewed here will have greater potential for scalability than others (whether this refers to legislating new programmes, expanding the geographical scope of existing programmes, or making existing programmes for ambitious), it is important that attempts are made not only to scale-up these mechanisms, but to also design and implement existing and new ones as cost effectively as possible. Ill-designed mechanisms amount to a waste of scarce resources.

Key features and the conditions under which finance mechanisms are likely to be most effective

As noted, overall key features that need to be considered in the establishment of any type of environmental financing mechanism are (Karousakis and Corfee-Morlot, 2007):

- identifying clear goals and objectives of the mechanism
- identifying eligibility criteria and priorities (i.e. for disbursement of funds or for participation in the mechanism)
- securing sufficient and long-term sources of financing – including from the private sector
- monitoring and evaluation of performance to ensure that the objectives of the mechanism are being met, together with appropriate sanctions in the case of non-compliance.

Other design and implementation features that need to be considered are often more specific to the individual mechanism. Ensuring additionality is one feature that applies to several of the mechanisms (e.g. PES, biodiversity offsets, green markets, biodiversity in climate change funding), though it does not, for example, apply to environmental taxes, as the introduction or increase in a tax rate should impact directly on behaviour.

Each of these mechanisms is also likely to be more effective under different particular circumstances and/or conditions. Some examples of these are listed below.

Environmental fiscal reform:

- a strong, stable governance framework, particularly in relation to financial governance
- an established tax system that is capable of levying, collecting and re-distributing revenues
- transparent, competent and accountable public financial management
- biodiversity impacts are visible and the cause of loss/degradation is clearly identifiable.

Payments for ecosystem services:

- ecosystem beneficiaries and providers can be clearly identified
- property/land tenure rights are firmly with potential ecosystem service providers
- one does not want to impose additional costs on these potential providers (e.g. through environmental taxes and biodiversity offsets)
- biodiversity and ecosystem service benefits are not exceptionally high, irreplaceable or vulnerable (as PES is a voluntary instrument)
- large social benefits and insufficient private benefits
- uncertainty of benefits is low.

Biodiversity offsets:

- good metrics and indicators for biodiversity are relatively easy to identify and construct
- biodiversity and ecosystem service benefits are not exceptionally high, irreplaceable or vulnerable
- there are available offset sites and known conservation approaches to achieve the desirable offset outcomes.

Green markets:

- there is likely to be sufficient demand for certified products (i.e. if products are produced in developing countries, that products are generally exported; if governments have policies in place to encourage green procurement)
- producers have access to finance to cover transition costs.

Biodiversity in climate change funding:

- there is strong correlation between areas with high carbon and biodiversity benefits (and sufficient data is available to identify these); i.e. where carbon policies can create synergies so that biodiversity co-benefits can be harnessed.

Biodiversity in international development finance:

- enabling conditions need to be fostered, property and land tenure rights require further clarification and enforcement
- development projects and policies can yield biodiversity co-benefits and vice-versa.

In addition to these mechanism-specific considerations, there are a number of cross-cutting issues that are relevant to the finance mechanisms discussed in the report. These include addressing the need for environmental and social safeguards (due to the possible distributional implications on vulnerable sections of the population) and having in place appropriate governance frameworks and sufficient institutional and technical capacity to effectively implement the mechanisms. These issues are examined below.

9.2. Environmental and social safeguards and capacity needs

Environmental and social safeguards

The terms environmental and social safeguards are increasingly being used in the environmental domain, most notably in the fields of climate change finance, as well as in international development finance, to refer to measures that are put in place to help identify and address possible adverse impacts of environmental policy on other environment media or on specific sections of the population due to their distributional implications. A number of the design and implementation features discussed in Chapters 3 to 8 are related to environmental and social safeguards. For example, leakage – when policy introduced to reduce pressure on biodiversity in one geographical area results in increasing pressure on biodiversity in another location – is an issue that merits consideration in PES and biodiversity in climate change finance. If the risk of leakage is anticipated to be high, environmental safeguards can be introduced to address this, including broadening the geographic scope of the monitoring, reporting and verification framework to identify leakage, and, for intra-property leakage, broadening the scope of non-compliance beyond the specific area receiving payments to encompass the entire area of a private or communal property. Another example of an environmental safeguard is environmental impact assessments (EIAs). EIAs are applied in several ecolabelling schemes (e.g. the RSPO; Chapter 6), and prior to the implementation of biodiversity offsets (Chapter 5). They can help identify

the different environmental elements that need to be safeguarded in a given project.

In terms of social safeguards, it is important to note that the transmission channels identified to assess the likely winners and losers from environmental fiscal reform (discussed in Chapter 3) are, in fact, likely to apply to *any* form of new policy intervention, whether this is through regulatory, economic, or information/voluntary instruments. These transmission channels include: prices, employment, access to goods and services, assets, and transfers and taxes. Similarly, the initial allocation of tenure rights has distributional implications for each of the six finance mechanisms. Governments will need to ensure these are allocated equitably and that they are clearly defined.

During the design phase of a project, ex-ante appraisals should be conducted to help identify potential impacts on people's well-being. Some of the approaches employed to do this are social impact assessments, such as those applied in the UN-REDD SEPC, stakeholder consultation and cost-benefit analyses. The costs and benefits related to biodiversity manifest at different spatial scales, and ex-ante appraisals need to take this into account. Monitoring, reporting and evaluation of social impacts is another important safeguard, and is necessary to inform the management of existing projects as well as the design of future policy and projects. Grievance mechanisms or ombudsmen need to be in place and easily accessible to allow stakeholders, such as local or indigenous communities, to voice their concerns about the way in which a finance mechanism is implemented and managed.

Designing and implementing environmental and social safeguards will entail additional costs to the administrator of the mechanism. Many of the safeguards however, are in fact features that should be incorporated into the design and implementation of these instruments so as to ensure that they are environmentally and thus also cost-effective. A balance will need to be found between the risks and magnitude of possible undue harm and the associated measures put in place to identify them, as the risks are likely to vary across different circumstances. There are ample opportunities however to better document and derive insights from existing programmes. In many cases, it may be prudent to start with smaller programmes, including pilots, ensuring that the necessary capacity is in place to implement these effectively, rather than with larger scale, but ill-designed programmes. This leads to another cross-cutting issue, namely the capacity and appropriate levels of governance that is needed to successfully implement the finance mechanisms.

Capacity needs for effective biodiversity finance mechanisms

A prerequisite for effective implementation and scaling up of finance mechanisms for biodiversity conservation and sustainable use is the underlying technical and institutional capacity needed to support these measures. Capacity

refers to "the ability of people, organisations and society as a whole to manage their affairs successfully" (OECD, 2006). Capacity is also fundamental to "good governance", which is expressed through accountability, transparency, participation, equity, and the rule of law (UNDP, 1997; World Bank, 1994; Woods, 2000), among other things.

The OECD recognises three levels of capacity: individual capacity, organisational capacity and enabling conditions. Individual capacity refers to individual competencies, such as the knowledge, skills and the ability to set and achieve objectives. This can include both "soft" competencies such as building relationships, trust and legitimacy and "hard" competencies such as the technical expertise needed to conduct environmental valuation and cost-benefit analysis, and to develop biodiversity metrics and indicators.

Organisational capacity refers to organisational structures, functions and systems that enable the capacities of individuals to come together to effectively fulfil the mandate of the organisation and to achieve set objectives. Organisational structures will need to have adequate financial and staff capacity (e.g. for monitoring and enforcement), as well as internal systems and processes to promote participation, transparency and accountability. Institutional audits, for instance, help to ensure scarce resources are used appropriately and efficiently.

The enabling conditions refer to the policy, legal, regulatory, economic and social support systems in which individuals and organisations operate. The enabling environment is determined by international regimes, national policies, rule of law, accountability, transparency and information flows (OECD, 2006). In the context of biodiversity more generally, these may include national plans (e.g. multi-year development plans) and budgets, sectoral policies and strategies (e.g. agriculture, fisheries, forestry), poverty reduction strategy papers, spatial planning, tenure laws, indigenous rights, and contract and trust fund laws. These need to be established in a comprehensive and coherent way, through multi-stakeholder dialogue. Environment agencies, in particular, have an important role to play in promoting biodiversity conservation and sustainable use, ensuring these are appropriately addressed and receive sufficient funding. Other enabling conditions may include the availability of biodiversity and ecosystem services data, including maps showing the spatial distribution of ecosystems and threatened species, green accounting, and ecosystem valuation.

The relations between the three levels of capacity are complex and in many cases can be seen as inter-dependent. This is one of the reasons why capacity development efforts are most effective when multiple strategies, targeting all three levels, are employed together (OECD, 2012b). For example, technical and managerial competencies are a precondition for establishing organisational capacity. In turn, organisational capacity reinforces these competencies. Similarly, while the enabling conditions provide the legal framework within

which organisations operate, organisational systems designed to promote transparency and accountability reinforce the rule of law.

How do these levels of capacity relate more specifically to the six finance mechanisms? Table 9.2 highlights some of the types of capacity needs for each of these. Clearly, the level of capacity varies considerably between countries, and different approaches to capacity building will be required depending on the existing organisational systems and structures. Development finance has an important role to play in this.

Table 9.2. **Overview of capacity needs for biodiversity finance mechanisms**

Finance Mechanism	Capacity Needs		
	Individual capacity	Organisational capacity	Enabling condition
Environmental Fiscal Reform	• Trained economists to establish appropriate tax/subsidy rates • Environmental staff have the analytical, economic and communication skills to identify and make the case to finance/planning/sector ministry decision makers for environmental taxes/removal of perverse subsidies • Skilled advocates to secure political acceptance and public support for EFR through e.g. awareness campaigns	• Finance ministry has tools and mechanisms to assess economic value of environmental policies • Environment agencies participate in drafting budget proposals and finance ministry adopts its guidance • Processes for dialogue and consultation, information dissemination and advocacy with key stakeholders (including via civil society groups)	• Environmental stakeholders involved in institutional process of preparing national budget • Established tax system capable of levying, collecting and redistributing revenues • Clear rules and principles for public expenditure management, supported by a well functioning audit system
PES	• Land users and ecosystem beneficiaries are aware of the principles of PES and how to engage in programmes/agreements • Experts (external or internal) can identify metrics and carry out assessments to inform targeting of payments for public PES programmes • Land users and beneficiaries have the capacity to establish reasonable proposals (both content and price), and to monitor and measure environmental performance	• Tools and systems in place to consolidate and build on existing foundation of research concerning biological patterns and processes, local environmental services and needs for conservation and sustainable use • Systems in place to ensure that payments are delivered efficiently and to the appropriate recipient avoiding elite capture etc. • Institutions to co-ordinate small landholders who otherwise would not have access to finance	• Inclusion of ecosystem service provisions in sector strategies, Poverty Reduction Strategy Papers, etc. and coherency between policies • Legal framework in place that supports buying and selling of ecosystem services • Tenure arrangements are clear and enforceable

Table 9.2. **Overview of capacity needs for biodiversity finance mechanisms** *(continued)*

Finance Mechanism	Capacity Needs		
	Individual capacity	**Organisational capacity**	**Enabling condition**
Biodiversity offsets	• Experts to select and apply metrics and indicators to compare expected losses and gains • Well-trained officials to carry out EIAs • Relevant stakeholders trained in the implementation, monitoring and reporting of offsets	• Market support services (e.g. assurance, public registries, brokerage etc.) • EIA enforcement agencies able to ensure EIAs are followed through • Management systems to disburse funds efficiently, record and monitor expenditures	• Laws requiring developers to compensate for their environmental damages • Requirement and completion of EIAs for all key activities impacting on habitat • Overarching guidelines (including metrics) for biodiversity offsets
Markets for Green Products	• Trained consultants to assist in the implementation of ecolabelling standards • Trained experts to carry out certification and accreditation • Consumer awareness and understanding of the ecolabelling landscape (e.g. through sustainable purchasing guidelines)	• Consulting, certification and accreditation services to carry out certification pre-assessment, assessment, and periodic surveillance audits • Distribution channels to deliver certified products in competitive manner (particularly for local communities marginalised from premium markets) • Coordination and harmonisation between standards	• Green procurement policies (including public procurement policies) • Sectors characterised by strong standards and good regulatory oversight • Good practice codes for ecolabelling schemes and mechanisms to assess them
Biodiversity in climate change funding	• Experts in carbon and biodiversity measurement • Experts in applying tools for promoting environmental, social and cultural benefits • Technical expertise and knowledge related to green infrastructure and ecosystem based adaptation approaches	• Systems in place to monitor forest area change and measure biodiversity and social benefits • Procedures for assessing biodiversity benefits of climate change mitigation and adaptation measures • Systems to manage and distribute funds in an efficient and equitable manner	• National climate change mitigation and adaptation strategies explicitly recognising REDD+ and ecosystem-based adaptation options • Carbon accounting framework • Policies and guidelines promoting biodiversity co-benefits in climate change mitigation (REDD+) and adaptation

Table 9.2. **Overview of capacity needs for biodiversity finance mechanisms** *(continued)*

Finance Mechanism	Capacity Needs		
	Individual capacity	Organisational capacity	Enabling condition
Biodiversity in international development finance	• Development support staff have a thorough understanding of the local-level linkages between development, biodiversity loss and poverty • Development support staff have the analytical and economic skills to assess the costs and benefits of different interventions • Development support staff have thorough understanding of the governance and institutional context of the recipient country	• Incentives and processes for collaboration between environment and development agencies • Procedures for integrating environmental issues into country and sector programmes • Guidelines for the application of environmental and social safeguards (e.g. SEA and environmental screening tools)	• Joint Assistance Strategies to harmonise biodiversity-related development support • Development support providers have commitment to environment strategy linked to poverty reduction and the MDGs • Evidence base showing linkages between development, biodiversity and poverty

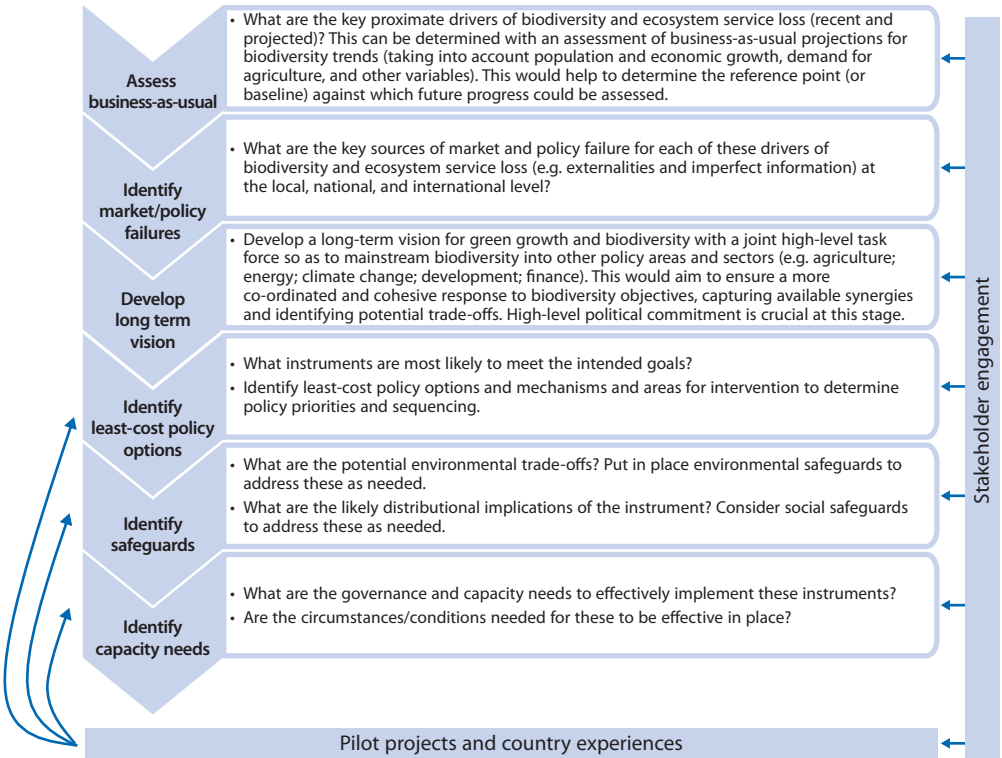
Finally, another major cross-cutting capacity issues is ensuring high-level political commitment. Political resistance, or simply a lack of political will, can obstruct the implementation of biodiversity finance mechanisms. Overcoming this resistance requires strong high-level political commitment accompanied by broad support across government departments (OECD, 2011; Cottrell et al. 2008). Couching biodiversity issues in an overall green growth strategy, addressing communication barriers between governmental structures, and putting in place systems to promote participation and transparency are therefore key. The case for introducing new measures will be more robust when there is good information on the environmental, economic and social implications of the status quo and the advantages of the proposed policy measures.

A proposed assessment framework for biodiversity instruments and mechanisms

The report covers a broad set of issues, from the review of the finance that has been mobilised through each of the six mechanisms, to some of the more technical design and implementation considerations that merit attention so as to ensure that they are as effective as possible. To conclude, Figure 9.1 provides a simplified, bird's-eye view of the types of issues that policy makers may need to consider and the possible sequencing of steps, prior to the introduction of new instruments and mechanisms for biodiversity conservation

and sustainable use. As discussed, high level political commitment and broad stakeholder participation and engagement throughout this process will be key. Incorporating flexibility to allow for adjustments over time as new information becomes available will also be important.

Figure 9.1. **Assessment framework for biodiversity instruments and mechanisms**



Note

1. Taxes allow firms with flexibility to determine how much they want to avoid, minimise (impacts on the environment), and/or pay the tax. Biodiversity offsets are similar in that, through the mitigation hierarchy, they are also required to avoid and minimise. The third stage is to offset (i.e. rather than pay a tax).

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Annex A

Innovative finance mechanisms and the Convention on Biological Diversity

Innovative financial mechanisms explore supplementary yet more sustainable financial and economic approaches to human interaction with biodiversity and ecosystem services. Based upon the modern financial and economic methods, innovative financial mechanisms seek to develop financial and economic solutions to the current biodiversity crisis and to transform the prevailing financial and economic systems that have been distortionary in sustaining life on earth, thus avoiding unsustainable commodification of the nature. Innovative financial mechanisms are considered as important instruments to mobilise new and additional financial resources for achieving the Convention's objectives, and explored in the broad context of innovation for biodiversity while recognising the close synergies between conserving biodiversity, combating desertification, and mitigating and adapting to climate change. As the only innovation process under the Convention, further work on innovative financial mechanisms will likely be organised around the following four priorities for national and international action:

- Empower Parties and relevant stakeholders to explore innovative financial mechanisms through education and training events, and foster appropriate skills and attitudes needed for innovative financing;
- Mobilise private funding through innovative financial mechanisms by fostering biodiversity entrepreneurship and enabling biodiversity entrepreneurs to experiment, invest and expand creative economic activities that contribute to addressing biodiversity challenges;
- Facilitate efficient knowledge development and flows through the development of networks and markets which enable the creation, circulation and diffusion of knowledge;
- Explore and apply innovative financial mechanisms to address global and social challenges as related to biodiversity loss, including through

the development of international mechanisms to provide finance and incentives to address global challenges through innovation in developed and developing countries.

Source: *www.cbd.int/financial/innovative/.*

Annex B

Multilateral and bilateral initiatives for REDD+

The Forest Carbon Partnership Facility (FCPF): The FCPF, launched in 2008, has dual objectives of building capacity for REDD+ (Readiness Mechanism) and funding the pilot programmes in developing countries (Carbon Fund). Since 2008, 37 projects in developing countries (14 in Africa, 15 in Latin America and the Caribbean, and 8 in Asia-Pacific) have participated in the FCPF. More information can be found at *www.forestcarbonpartnership.org*.

The UN-REDD Programme: The UN-REDD Programme was established as a joint initiative of the UNEP, UNDP, and FAO in 2008 to support national REDD+ strategies with special consideration for Indigenous Peoples in the communities. As of September 2011, USD 80 million had been approved for project implementations and USD 63 million had been disbursed for 14 UN-REDD national programmes. More information can be found at *www.un-redd.org*.

The Forest Investment Program (FIP): The FIP became operational in 2009 to support REDD efforts in developing countries by providing bridge finances for building national REDD readiness strategy while taking into account opportunities of co-benefits such as biodiversity conservation and rural livelihood enhancements. FIP is a targeted programme of the Strategic Climate Fund (SCF), which is one of two funds within the framework of the Climate Investment Funds (CIF). As of June 2011, the eight pilot countries are approved under FIP, including Brazil, Indonesia, Congo, Mexico, Ghana, Peru, Burkina Faso and Lao. More information can be found at *www.climateinvestmentfunds.org*.

The BioCarbon Fund: The BioCarbon Fund considers purchasing carbon credits from a variety of land use and forestry projects, and its portfolio includes afforestation, reforestation, and REDD activities. The fund explores innovative approaches to agricultural carbon as well. The BioCarbon Fund has completed two rounds of operations in 2004 and 2007, respectively.

A total of USD 90 million is allocated to 21 projects, and the fund is currently closed in preparing for a new round.

International Climate Initiative (ICI): The German ICI provides financial support to international projects supporting climate change mitigation, adaptation and biodiversity projects with climate relevance. In 2008, the German government auctioned 8.8% of its allowable emission permits to businesses. Approximately 30% of the revenue earned from this sale is intended to finance climate change-related projects. This is expected to amount to EUR 400 million (USD 618.30 million) per year for domestic and international use. More information can be found at *www.bmu-klimaschutzinitiative.de/en/.*

The Global Climate Change Alliance (GCCA): The GCCA is an initiative of the European Union. Its overall objective is to build a new alliance on climate change between the European Union and the developing countries that are most affected and that have the least capacity to deal with climate change. The climate activities supported include REDD projects that are building reporting systems and national capacity to monitor deforestation; strengthening institutions and developing national strategies to combat deforestation; supporting innovative performance-based mechanisms to provide positive incentives for REDD. More information can be found at *www.gcca.eu/.*

Annex C

Examples of safeguards applied in REDD+

Social and environmental principles and criteria (SEPC) of the UN REDD Programme

Principle		Criteria	
1	The programme complies with standards of democratic governance	1	Ensure the integrity of fiduciary and fund management systems
		2	Implement activities in a transparent and accountable manner
		3	Ensure broad stakeholder participation; All relevant stakeholder groups are identified and enabled to participate in a meaningful and effective manner; Special attention is given to most vulnerable groups and the free, prior and informed consent of indigenous peoples
2	The programme carefully assesses potential adverse impacts on stakeholders' long-term livelihoods and mitigates effects where appropriate	4	Promote gender equality; The activities are carried out with attention to different gender roles and women's empowerment
		5	Avoid involuntary resettlement
		6	Respect traditional knowledge; The programme is not involved and not complicit in alteration, damages, or removal of any critical cultural heritage or the erosion of traditional knowledge
		7	Develop equitable benefit distribution systems
3	The programme contributes to a low-carbon, climate-resilient and environmentally sound development policy, consistent with commitments under international conventions and agreements	8	Ensure consistency with climate policy objectives (e.g. overall national mitigation and adaptation strategies)
		9	Address the risk of reversals: plan for long-term effectiveness of REDD+; The programme includes actions to reduce potential future risks to forest carbon stocks and other benefits.
		10	Ensure consistency with development policy objectives; The programme is designed to be compatible with and contribute to environmental goals at all levels of government
		11	Ensure consistency with biodiversity conservation, other environmental and natural resource management policy objectives

Social and environmental principles and criteria (SEPC) of the UN REDD Programme
(continued)

	Principle		Criteria
4	The programme protects natural forest from degradation or conversion to other land uses, including plantation forest	12	Ensure that REDD+ activities do not cause the conversion of natural forest, and do address the other causes of conversion
		13	Minimise degradation of natural forest in order to maintain biodiversity and other key values
5	The programme maintains and increases benefits delivered through ecosystem services and biodiversity conservation	14	Set goals and plan for maintenance and enhancement of ecosystem services and biodiversity in new and existing forest
		15	Use monitoring and adaptive management to support maintenance and enhancements of biodiversity and ecosystem services
6	Minimise indirect adverse impacts on ecosystem services and biodiversity	16	Minimise indirect land-use change impacts on carbon stocks
		17	Minimise indirect land-use change in natural ecosystems and its impacts on biodiversity
		18	Minimise other indirect impacts on biodiversity; The programme assesses and mitigates other indirect impacts on biodiversity, for example as a result of intensification of agriculture or forestry

Source: www.un-redd.org; Moss et al. (2011).

Examples of principles, criteria, and framework for indicators of REDD+ SES

Principle 1: Rights to lands, territories and resources are recognised and respected by the REDD+ programme

Principle 2: The benefits of the REDD+ programme are shared equitably among all relevant rights holders and stakeholders

Principle 3: The REDD+ programme improves long-term livelihood security and well-being of Indigenous Peoples and local communities with special attention to the most vulnerable people

Principle 4: The REDD+ programme contributes to broader sustainable development, respect and protection of human rights and good governance objectives

Principle 5: The REDD+ programme maintains and enhances biodiversity and ecosystem services

Principle 6: All relevant rights holders and stakeholders participate fully and effectively in the REDD+ programme

Principle 7: The REDD+ programme complies with applicable local and national laws and international treaties, conventions and other instruments

Examples of principles, criteria, and framework for indicators of REDD+ SES
(continued)

Principle 5: The REDD+ programme maintains and enhances biodiversity and ecosystem services	
Criteria	**Frameworks for Indicators**
5.1 Biodiversity and ecosystem services potentially affected by the REDD+ programme are maintained and enhanced	5.1.1 Biodiversity and ecosystem services potentially affected by the REDD+ programme are identified, prioritised and mapped at a scale and level of detail appropriate to each element/activity within the programme 5.1.2 The objectives of the REDD+ programme include making a significant contribution to maintaining and enhancing biodiversity and ecosystem services. 5.1.3 The REDD+ programme identifies and implements measures that aim to maintain and enhance the identified biodiversity and ecosystem service priorities potentially affected by the REDD+ programme 5.1.4 The REDD+ programme does not lead to the conversion of natural forests or other areas that are important for maintaining and enhancing the identified biodiversity and ecosystem service priorities 5.1.5 The REDD+ programme generates additional resources to maintain and enhance biodiversity and ecosystem services
5.2 The positive and negative environmental impacts of the REDD+ programme on biodiversity and ecosystem service priorities and any other negative environmental impacts are assessed including both predicted and actual impacts	5.2.1 A monitoring plan and indicators are defined for measurement of the identified biodiversity and ecosystem service priorities potentially affected by the REDD+ programme drawing from traditional knowledge and scientific research as appropriate 5.2.2 There is an assessment of both predicted and actual environmental impacts of the REDD+ programme, involving Indigenous Peoples and local communities and other stakeholders as appropriate
5.3 The REDD+ programme is adapted based on predictive and ongoing impact assessment to mitigate negative, and enhance positive, environmental impacts	5.3.1 Measures to identify and effectively mitigate potential negative environmental impacts are included in the design of the REDD+ programme 5.3.2 Feedback from monitoring is used to develop and implement measures to further mitigate potential and actual negative environmental impacts, during the implementation phase of the REDD+ programme 5.3.3 Feedback from monitoring results in measures to enhance environmental impacts

Source: REDD+ SES (2012).

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