

**International financial instruments for biodiversity
conservation in developing countries – financial mechanisms
and enabling policies for forest biodiversity**

Background paper for the European Report on Development 2015¹

Max Büge², Karen Meijer³ and Heidi Wittmer⁴

² Freie Universität Berlin and ERD Consultant.

³ Deltares, German Development Institute – Deutsches Institut für Entwicklungspolitik (DIE).

⁴ Helmholtz Centre for Environmental Research – UFZ and ERD Consultant.

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1. Introduction: (Forest-)biodiversity – a precious and undervalued eco-utility

In its broadest sense, biodiversity refers to ‘the richness of life on earth’ (Parker et al., 2012). Ensuring environmental sustainability and reducing the loss of biodiversity and environmental resources are among the most urgent challenges to be addressed this century. The need to conserve biodiversity has been recognised in various international conventions and is one of the goals and targets on sustainable development proposed in the post-2015 development agenda (UN 2014: proposed Goal 15). Forests play an important role in this context. They are among the world’s most biologically diverse locations and tropical, temperate, and boreal forests are the natural habitat for the vast majority of terrestrial species. Forest ecosystems provide important services to the natural environment and also to local communities, and it is estimated that forest resources alone underpin the livelihoods of more than 1.2 billion people, including most of those living in extreme poverty (Oakes et al., 2012; OECD, 2013: 20; World Bank 2004). In addition, forests represent indispensable ‘carbon sinks’, sequestering huge amounts of CO₂, and their evaporation of water cools the Earth’s surface and reduces its exposure to sunlight (Parker, 2012). In this way, forests are important both for mitigating climate change (preventing a rise in greenhouse gas (GHG) concentration) and adapting to it (reducing the negative impacts of a changed climate).

Forest biodiversity is a comprehensive term, defined as ‘all life forms found within forested areas and the ecological roles they perform. As such, forest biological diversity encompasses not just trees, but the multitude of plants, animals and micro-organisms that inhabit forest areas and their associated genetic diversity. Forest biological diversity can be considered at different levels, including the ecosystem, landscapes, species, populations and genetics’ (CBD, 2014). The various services provided by forest ecosystems include provisioning (e.g. food, timber, biomass fuel, natural medicines), regulating (e.g. air quality, erosion, water, pollination), cultural functions (e.g. recreation, spiritual values, eco-tourism), and supporting services that maintain other ecosystem services (e.g. nutrient cycling, photosynthesis, soil formation, water cycling) (CBD, 2014; MA, 2005). Together, these services act as a giant ‘eco-utility’, providing security in relation to climate, water, food, energy, health and livelihoods, and more (Oakes et al., 2012). Although deforestation rates have slowed in recent years, however, forests are still being lost at a rate of 130,000 km²/year – to put this in context, it is more than the land area of Greece (CBD, 2010a). Approximately 12% of global GHG emissions are the result of deforestation (IPCC, 2014), of which conversion of forestland to agriculture is the prime cause. In addition, forests are lost or degraded as a result of infrastructure development, mining, forest fires, and illegal or unsustainable logging.

The tremendous loss of forest ecosystems has given rise to various initiatives for biodiversity conservation at the national or sub-national level, as well as internationally, and given the global dimension of many forest ecosystem services, there is a need to mobilise international finance for biodiversity conservation in developing countries. International biodiversity financing is already an important element of many national conservation strategies in developing countries and is increasingly important in international engagement on the part of high-income countries (HICs). Currently, however, financial resources for biodiversity remain insufficient. The total level of biodiversity finance is estimated at \$51–53 bn per year, of which only \$21 bn is spent in developing countries. The level of finance needed to sustainably stop the loss of biodiversity is between six and eight times higher than this (UN HLP, forthcoming; Parker et al., 2012).

This background paper has been commissioned as part of the *European Report on Development (ERD) 2014* to highlight international targets and agreements on biodiversity, the underlying need for international biodiversity finance, and key sources of funds as well as supporting policies for international biodiversity financing, using forest conservation as an example.⁵ It is beyond the scope of this paper to assess whether funds provided to date have been effective, although we do argue that the ability to demonstrate their effectiveness may help to mobilise future funds.

2. International targets and agreements on biodiversity

The 1992 United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, widely known as the ‘Earth Summit’, represented a historic breakthrough in the international recognition of the need for multilateral cooperation on biodiversity. Biodiversity conservation is a key objective in the three final documents – the Rio Declaration on Environment and Development, Agenda 21 and the so-called Forest Principles. Agenda 21 both provided the estimated needs of biodiversity financing and outlined international funding structures as well as capacity-building and financing mechanisms, including bilateral assistance, debt relief, private funding, direct investment, and innovative financing (CBD, 2010b).

Three legally binding agreements were made at Rio, explicitly or implicitly addressing the conservation of biodiversity: the UN Framework Convention on Climate Change (UNFCCC), the UN Convention to Combat Desertification (UNCCD), and the Convention on Biological Diversity (CBD). The CBD recognised biodiversity as a ‘common concern for humankind’, something new in international law, and its objectives as defined in Article 1 are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising from the use of genetic resources. Forest biodiversity is one of the seven thematic programmes under the Convention. The CBD has adopted two Protocols: the Cartagena Protocol addressing biotechnology and biosafety issues and the Nagoya Protocol on the access to genetic resources and a fair and equitable sharing of their benefits. In 2010, the 10th meeting of the CBD’s Convention of the Parties took place in the Japanese city of Nagoya, the capital of the Aichi Prefecture. A Strategic Plan for 2011–2020 was presented, including the so-called Aichi targets, central goals of which are to:

1. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.
2. Reduce the direct pressures on biodiversity and promote sustainable use.
3. Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.
4. Enhance the benefits to all from biodiversity and ecosystem services.
5. Enhance implementation through participatory planning, knowledge-management and capacity-building.

The Millennium Development Goals (MDGs) that were developed following the UN Millennium Summit in 2000, listing eight goals for multilateral development cooperation until 2015, address biodiversity conservation as cornerstone of environmental sustainability (MDG7). Target 7(a) is to ‘integrate the principles of sustainable development into country policies and programmes to reverse the loss of environmental resources’. Target 7(b) is to ‘reduce biodiversity loss, achieving, by 2010, a

⁵ Parts of this accompanying study are used in ERD 2014, particularly chapters 3, 4 and 7.

significant reduction in the rate of loss' (UN, 2013a). In 2012, at the Rio+20 conference, UN member states agreed to develop a set of post-2015 goals. While agreement on these goals is still under negotiation, UN member states recognised the need for action on biodiversity conservation in the conference's outcome document 'The Future We Want', which guides many of the intergovernmental post-2015 processes and the debate on the Sustainable Development Goals (SDGs). To 'protect and restore terrestrial ecosystems and to halt all biodiversity loss' features among the goals and targets proposed by the UN (Goal 15, see Box 1) on sustainable development for the post-2015 development agenda to be realised by 2030 (UN, 2014).

Box 1: Proposed goals and targets on sustainable development for the post-2015 development agenda. Goal 15: Protect and restore terrestrial ecosystems and to halt all biodiversity loss

- By 2020, halt the loss of all biodiversity, and protect and prevent the extinction of threatened species
- By 2020 ensure conservation and sustainable use of ecosystems, with particular attention to wetlands, including through restoration of at least 15 per cent of degraded ecosystems
- Maintain genetic diversity of both cultivated plants, farmed and domesticated animals and their wild relatives including through effective cooperation of national institutions
- By 2030, ensure the implementation of sustainable management of all types of forests and of mountain ecosystems
- By 2030, reverse the loss of and enhance forest cover worldwide, increase reforestation by x per cent (sic!), including by providing adequate incentives for developing countries
- By 2030, halt and prevent land degradation, reclaim land affected by desertification and drought, and improve land productivity and soil quality
- Ensure fair and equitable sharing of benefits arising from the utilization of genetic resources
- End poaching and trafficking of endangered species, and end demand and supply of illegal wildlife species
- Introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems, and by 2020 control or eliminate the priority invasive species
- Ensure free prior informed consent of indigenous peoples and local communities in decision making and natural resources management, and promote the use of their traditional knowledge
- Integrate natural resources and biodiversity values into national and local planning, development processes, and accounts

Source: UN (2014), note: This text is quoted verbatim.

3. *The need for international biodiversity finance*

The conservation and sustainable use of forest biodiversity and its financing will pose challenges. This is not least due to the different characteristics of forest ecosystem services and their management, which can have the features of (global) public goods; common goods (also called common pool resources); private goods; and, to a lesser extent, club goods.⁶ For instance, the mitigation effects of large tropical forest areas on climate change are a prime example of a (global) public good: there is no rivalry in consumption and no one can be excluded (and it takes place on a global scale). At the same time, many forests in developing countries have common good characteristics: there is rivalry in the consumption of their ecosystem services (e.g. timber or bush meat) and consumption is not paid for. This is different where forests are effectively managed and where consumers pay for the use of timber or other ecosystem services: there is rivalry and excludability in consumption, as there is for any other private good. Biodiversity in sustainably managed national parks serve as an example of club goods: consumption (e.g. visitors who enjoy the abundance of species) is generally not rivalrous and the consumer pays to visit the park. Accordingly, appropriate financing solutions may be very different for different aspects of biodiversity protection and forest ecosystem conservation. Aicher et al. (forthcoming) therefore distinguish between three different situations for investing in biodiversity conservation:

1. 'Win-win situations between nature conservation and conventional economic measures, as in many cases of watershed protection where immediate cost reductions of water provisioning can often finance buying of the land or enforcing strict protection.
2. Situations where considering the multiplicity of ecosystem services can tilt the balance towards investing in nature, e.g. flood plain restoration that outcompetes technical measures of protection against flooding when additional benefits like value as habitat and for nutrient retention are considered as well.
3. Situations – where under current settings – economic arguments for nature conservation or restoration only gain force when future generations are sufficiently considered and risks and uncertainties are addressed with precaution'. This is the case where short-term gains exceed the long-term benefits obtained from a standing forest, e.g. if time horizons of only 20 or 30 years are considered or high discount rates are applied.

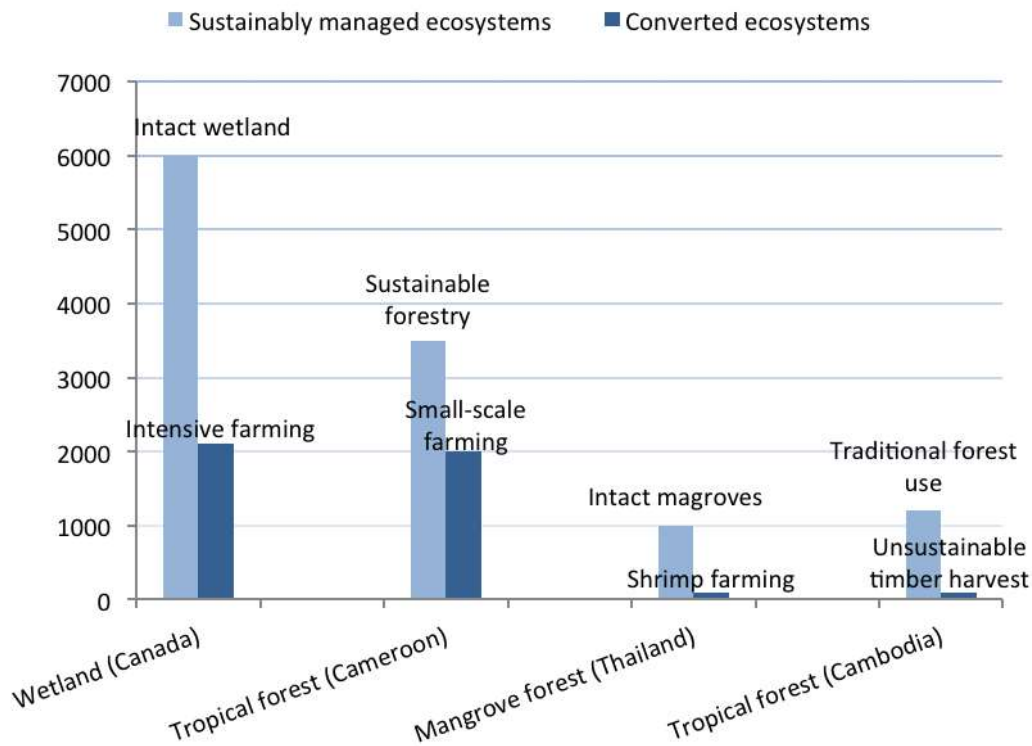
Most of the ecosystem services provided by biodiverse forests, particularly in developing countries, are likely to have public or common good characteristics in the sense that they can be consumed and depleted without an adequate payment for and financing of these services and the regeneration of their underlying natural resources, unless adequately protected by public policy. In many countries, however, public policies – e.g. direct or indirect subsidies for factors of production (fossil fuels) or production processes (agriculture) – provide economic incentives for intensifying the conversion of forests and the depletion of stocks in flora and/or fauna to the detriment of biodiversity. Furthermore, not all of the benefits of biodiversity lend themselves to quantification. While the

⁶ A definition of these good characteristics reads as follows: Public goods are characterised by non-rivalry and non-excludability in consumption. Private goods are characterised by rivalry and excludability in consumption. Common goods are characterised by rivalry and non-excludability in consumption, exclusion is possible in a common property regime, but is costly. Club goods are characterised by non-rivalry in consumption and excludability. Rivalry in consumption refers to a condition where a resource, good or a service cannot be consumed twice (e.g. fossil fuels as opposed to solar energy). Excludability in consumption refers to a condition, where a consumer has to pay in order to consume (e.g. managed as opposed to unmanaged forests).

valuation and pricing of benefits in form of consumables such as timber, bush meat, tourism, or genetic information is (at least technically although not always practically) feasible, this holds to a lesser extent or not at all for other benefits of forest biodiversity. These include non-consumables such as water purification, erosion regulation, flood protection and other forms of disaster risk reduction (DRR), and particularly spiritual and cultural values; option values such as the future benefits of genetic information; bequest values (the value of biodiversity and functioning ecosystems being available to future generations); or existence values (the value derived from the knowledge that forest ecosystems exist) (OECD, 2013: 26). These benefits are invisible to market transactions and, given the complex and sometimes fragile interplay of ecosystem factors, an unsustainable use of forest resources can result in negative effects (e.g. overuse, deterioration of other ecosystem services, loss of public goods) that the market cannot be adequately address.

Consequently, market prices are a poor and often distorted mechanism for financing and promoting the sustainable use of ecosystems. They fail to reflect the true value of public benefits stemming from biodiversity or the social opportunity costs of degradation and biodiversity loss (OECD, 2013), resulting in highly unsustainable incentive structures and the continuing loss of biodiversity. This is of particular relevance in, though by no means limited to, developing countries, where the trade-off between short-term economic gains and the costs of biodiversity loss is often tilted to the former. For instance, Figure 1 shows an estimate of the per hectare value of sustainably managed ecosystems – wetland in Canada, tropical forests in Cameroon and Cambodia, and mangrove forests in Thailand – compared to their market value when converted to agricultural use or timber harvest. But since those who hold or manage the land cannot capture these values, biodiversity goods and services are undersupplied and their financing remains insufficient. While the total costs of biodiversity loss are difficult to estimate for the above-mentioned reasons, approximations range between \$2 and \$4.5 tr annually (OECD, 2013; TEEB, 2009).

**Figure 1: Value of sustainably managed ecosystems compared to converted ecosystems
(net present value in \$ per hectare)**



Source: MA 2005, p. 13 (approximate values)

Since markets do not lead to sustainable use of natural resources and the protection of biodiversity, there is a need for policies at the national level, and where necessary international support for financing them.

The world's most biologically diverse forests and 'biodiversity hotspots'⁷ are located in developing countries where population pressure is often high, incomes are low, and governance capacity and regulatory frameworks tend to be weak. Moreover, it is local populations that have to bear much of the costs of biodiversity conservation. These costs can be direct (investment in nature conservation, such as reforestation) or indirect (opportunity costs of not converting biodiversity rich systems into biodiversity poor systems with higher market returns, such as agriculture). At the same time, many of the benefits of intact ecosystems are of a global nature, with climate regulation being only one example.

Thus, biodiversity conservation has to be seen in its broader context. Its role as enabler for, among other things, climate change mitigation and adaptation, sustainable development and poverty reduction. The provision of global and local ecosystem services has to be addressed by the international community, as highlighted in the second report of the UN High Level Panel on Global Assessment of Resources for Implementing the Strategic Plan for Biodiversity 2011–2020 (2014, key findings are summarised in Box 2). This stresses the importance of international biodiversity financing mechanisms and of enabling local actors to provide global ecosystem benefits. Several

⁷ Areas with a particularly high degree of biodiversity that are under threat because of human activity are called 'biodiversity hotspot'. They are defined according to two criteria. First, they must contain at least 0.5% of the world's total vascular plants (1,500 species or more) and have lost at least 70% of primary vegetation. The 34 biodiversity hotspots identified are spread all over the globe but most of them are tropical forests.

instruments have been agreed upon or are being negotiated to address this need for international financing. These mechanisms will be outlined in Section 4.

Box 2. Resourcing the Aichi Targets – key findings of the UN High Level Panel on Global Assessment of Resources for Implementing the Strategic Plan for Biodiversity

1. **Meeting the Aichi Targets will deliver substantial benefits to people and to economies across the world.** *Assessments of the global, regional, national and local levels all highlight the substantial values of the essential provisioning, regulating, cultural and supporting services that ecosystems provide, and the benefits of actions for the conservation and sustainable use of biodiversity, and for restoration of degraded ecosystems. ...*
2. **Biodiversity is essential to sustainable development.** *Biodiversity and functioning ecosystems are powerful engines for delivering on the future sustainable development objectives at varying scales, particularly goals linked to food security, water security, livelihoods, climate change and disaster risk reduction, among other development goals. ...*
3. **Biodiversity contributes to climate change mitigation, adaptation and resilience.** *Investing in biodiversity can effectively reduce national and community vulnerability, increase resilience and adaptation to climate-related impacts on all scales, and contribute significantly to climate change mitigation, including helping to meet mitigation targets. Ecosystem-based adaptation can be cost-effective and generate multiple benefits for society. ...*
4. **Investments in biodiversity can strengthen the provision of ecosystem services on which vulnerable communities depend.** *As biodiversity loss disproportionately affects vulnerable populations, investments in biodiversity will secure the long-term provisioning of key services, and access to critical biodiversity resources that are essential for food security, economic opportunities and human well-being/quality of life. ...*
5. **Biodiversity provides insurance and option values.** *Investments in biodiversity can provide insurance against future change and uncertainty and maintain and enhance future development options. Investments made now will reduce future costs and preserve opportunities for current and future generations. ...*
6. **Enhancing synergies, addressing trade-offs and promoting alignments across sectoral policies are prerequisites for effective implementation of the Aichi Targets and of major importance for resource mobilization ...**
7. **All countries need to invest in institutions and policy frameworks, direct conservation and sustainable use actions, incentives and economic instruments. ...**
8. **Design and implementation of appropriate economic and policy instruments is essential to halt the loss of biodiversity. ...**
9. **The monetary and non-monetary benefits of biodiversity conservation and sustainable use frequently outweigh the costs ...**

10. **There is a need to increase investments substantially to bridge financing gaps.** *Estimates at global, regional and national levels all point to a substantial gap between the instruments needed to deliver biodiversity targets and the resources currently allocated...*

Source: UN High Level Panel (2014), Note: This text is quoted verbatim.

4. Biodiversity conservation: international financing and relevant supporting policies

This section introduces a ‘financing cycle’ for preserving and enhancing biodiversity (Section 4.1). Specific financial flows are described in Section 4.2. Enabling policies to ensure the effective generation, channelling and use of biodiversity finance are set out in Section 4.3.

4.1 The financing cycle for preserving and enhancing biodiversity

Various types of measure can be taken to maintain or enhance the stock of natural capital in general and of biodiversity in particular. Based on Gupta et al. (2013), we distinguish three approaches:

1. *Formal regulation/restriction of the use of species and ecosystems.* The establishment and governance of protected areas (PAs), where certain types of activity (e.g. logging, hunting) are prohibited, is an example of a regulatory measure. The International Union for the Conservation of Nature (IUCN) defines a PA as ‘an area of land and/or sea especially dedicated to the protection and maintenance of biodiversity, and of natural and associated cultural resources, and managed through legal or other effective means’ (Emerton, 2006). Finance is required partly to acquire the land, to monitor its use, and to build capacity for monitoring and maintaining the PA. Regulation does not necessarily need to be focused biodiversity protection as such in order to achieve positive impacts. For instance, appropriate regulatory schemes to reduce air or water pollution can strongly benefit the diversity of biotic components by reducing adverse impacts from outside the PA.
2. *Financial incentives and disincentives.* Policies to either subsidise or pay for desired behaviour or to tax or sanction undesired behaviour may be used to foster the sustainable use of ecosystems. Examples include Payment for Ecosystem Services (PES) schemes (e.g. REDD+), debt-for-nature swaps, or certification.
3. *Information and best practices.* Rather than relying on formal rules and financial incentives, it is also possible to achieve success by informing ecosystem users of the consequences of their behaviour and by developing sound practices. Finance is required for awareness-raising and training programmes. This is particularly useful in win-win situations, but information and best practices can also make biodiversity-friendly measures attractive when relevant parties learn about the value and multiplicity of ecosystem services and take them into account in their behaviour and economic activity (see above).

Of course there are significant inter-linkages between the three types of measure described above. They can be complementary and can influence the incentives of relevant local actors to protect biodiversity both *directly* (e.g. primes for reforestation) and *indirectly* via creating disincentives for biodiversity-adverse activities and thus reducing the opportunity costs of biodiversity conservation (e.g. rules limiting fertiliser application or the expansion of agricultural land). Similarly, a consistent regulatory framework to conserve natural capital reduces the need for financial incentives, whereas subsidies for biodiversity-adverse activities increase the need for biodiversity financing both by exerting greater pressure on it and by increasing the funds needed to encourage biodiversity-friendly behaviour.

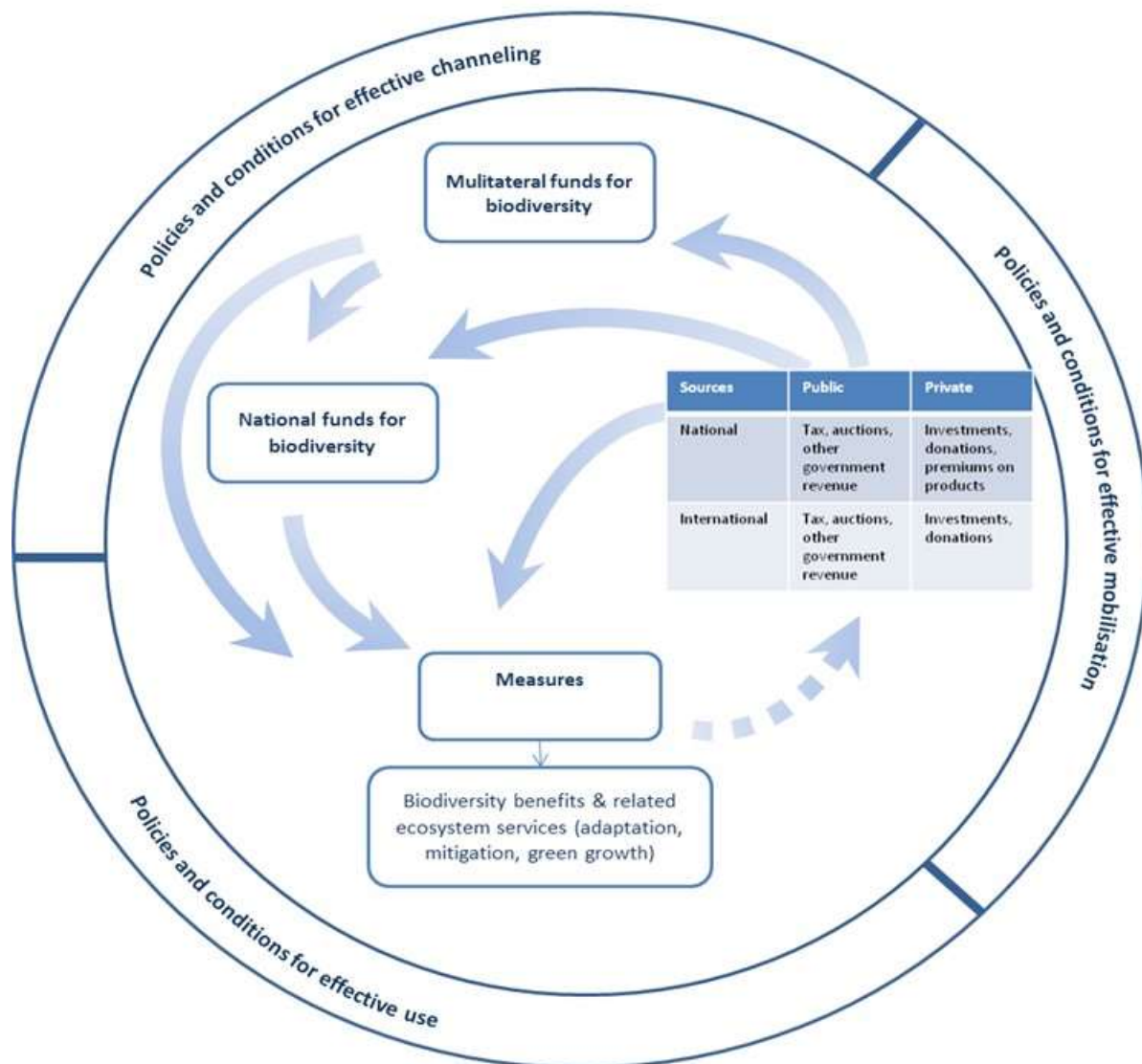
Although there is substantial variation in the estimated costs of preventing biodiversity loss, it is clear that considerable volumes of finance are required to implement measures as described above on a

meaningful scale. For instance, Emerton (2006) estimates that the expansion and management of PAs (forests but also marine, wetland and other types of ecosystems) in the range of \$12–45 bn per year. The Eliasch Review (2008) provides a conservative estimate of financial requirements for halving global deforestation by 2030 as being in the order of \$17–33 bn per year. For overall global biodiversity protection, not confined to forest ecosystems, the IUCN estimates the need for \$300 bn per year (IUCN, 2010).

The financing cycle is presented in Figure 2, which shows the flow from potential sources of finance to actual use of funds for biodiversity protection (inner circle) and the accompanying policies to mobilise, channel and effectively use these funds (outer circle). Such funds, which can come from private or public sources, can flow directly to biodiversity protection activities at the local level, be transferred to developing country governments, or be channelled through multilateral mechanisms (continuous arrows). Financing is also required for technical assistance to develop and monitor biodiversity protection plans and measures and to create the policy conditions for the effective mobilisation, channelling and use of funds. In turn, biodiversity benefits, for instance in form of green growth, can indirectly contribute to mobilising international resources (dashed arrow). There may be an overlap between funds, for example Official Development Assistance (ODA) feeds into multilateral funds, which are subsequently used to leverage private-sector funds. In addition, policy instruments that are intended to mobilise funds often also deal with their channelling and effective use.

Biodiversity conservation has strong inter-linkages with other development goals such as poverty reduction, community development, climate change adaptation or desertification reduction and other environmental, economic or social objectives. At the same time, biodiversity protection measures can also have adverse social or economic impacts on local communities. For example, it is crucial that biodiversity projects do not lead to the forced displacement of local communities or destroy their livelihoods by preventing them from using forest resources. Thus, in addition to organising, financing and managing separate biodiversity protection projects, biodiversity can be strengthened or biodiversity loss can be reduced by complementary or compensatory policies. Conversely, biodiversity protection can (and should) be expanded to include additional development objectives. The financing of these other policies and measures often follows a similar cycle, but with different primary targets. Addressing and making use of synergies between different policy areas will significantly reduce the overall financing required. Similarly, if policies reduce pressures on biodiversity or at least do not exacerbate them, the need for financing is much lower. In this sense aligning policies, i.e. the 'outer circle' in Figure 2, has a strong influence on the amount of funds required.

Figure 2: International cooperation for biodiversity conservation – the financing cycle



Source: The authors

4.2. International funds and sources for biodiversity financing

The Global Environment Facility

The Global Environment Facility (GEF), set up by the World Bank, the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP) to support the Rio Conventions, is the main financial mechanism to cover the incremental costs for developing countries to protect biodiversity. The GEF later became an independent organisation, although the World Bank acts as trustee and provides administration services. It manages around \$1 bn a year. In May 2014, the sixth replenishment round yielded \$4.43 bn for the next four years. In addition to the Rio Conventions, the GEF also serves the Stockholm Convention on Persistent Organic Pollutants (2004) and the Minamata Convention on Mercury (adopted in 2013). Today, biodiversity projects are the largest of the GEF portfolios, representing 36% of the total (GEF, 2014). Overall, the GEF has invested \$3.46 bn in supporting biodiversity projects and has leveraged \$10.04 bn in co-financing from institutions including the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA) of the World Bank Group.

More than 1,200 projects in over 155 countries have been funded and the GEF represents the largest funding mechanism for PAs: 3,277 areas covering a total of 856 million hectares have been protected, drawing on \$2.3 bn in GEF funds and an additional \$6 bn leveraged in co-financing with project partners. The GEF's biodiversity projects are conducted in cooperation with ten agencies, mainly UN specialised agencies and programmes and multilateral and regional development banks.⁸ In its Small Grant Programme (SGP), the GEF provides grants of up to \$50,000 to local communities, indigenous peoples, NGOs and community-based organisations to finance biodiversity and other projects (SGP, 2014b). More than \$240 mn for biodiversity has been financed via this channel, plus an additional \$190 mn for the protection, rehabilitation and sustainable use of forest ecosystems (SGP, 2014a).

Mainstreaming: The Small Grant Fund as a role model

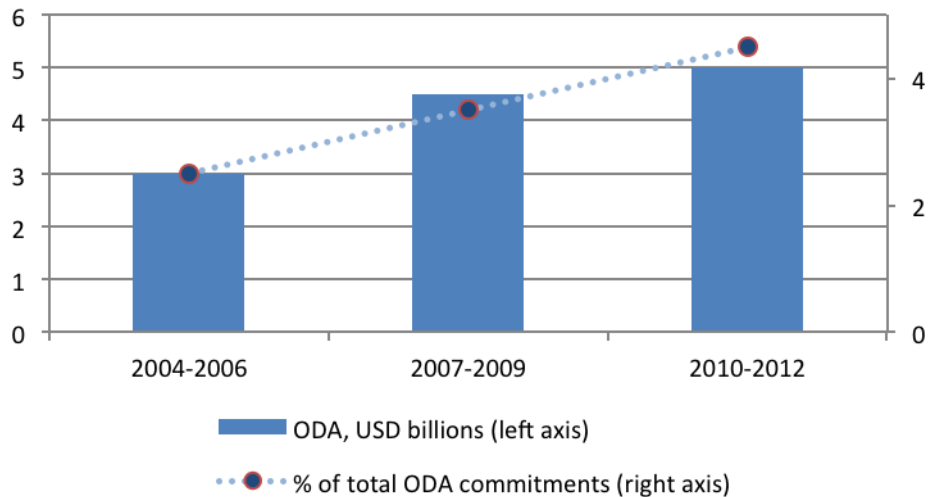
The SGF-supported programme 'Community Action to Conserve Biodiversity' is an example of biodiversity being mainstreamed in development cooperation. In the projects coming under this umbrella programme, which are conducted with local community-based biodiversity enterprises, the SGF has several objectives besides ecosystem conservation: (i) to foster additional livelihood benefits (health; gender equity and empowerment; education; poverty alleviation); (ii) to sustain project intervention beyond the project's principal objective (enhancing awareness; improvement of policy and legislation; institutional and technical capacity development; securing financing mechanisms and private-sector involvement); (iii) to improve environmental management (innovative technology applications; linkages with other environmental goals); and, (iv) to extend the approach to biodiversity conservation (mainstreaming biodiversity in production, landscapes, and sectors; catalysing the sustainability of PAs) (GEF, 2012). This SGF programme has successfully financed, for example, community-based projects for eco-labelling and environmental certification in Mexico and Costa Rica and for organic produce in Bolivia. Overall, it is estimated that the programme has generated more than 500,000 jobs through 'training for the production, implementation, and commercialization of renewable energy and energy efficient technologies and systems (...); management, recycling, composting, and safe disposal of solid waste in rural and urban areas; testing and application of innovative methods of managing sustainable fisheries and other natural resources; and participation in the co-management of protected areas' (GEF, 2012: 112). While biodiversity conservation may at times conflict with other short-term economic and social benefits, for instance the conversion of forests to farmland, the SGF programmes show that it is possible to address the various policy dimensions coherently and that mechanisms to protect biodiversity can embrace issues such as job creation, fostering sustainable livelihoods, provision of microcredit schemes, access to markets via certification of products and producers, as well as securing land and resource tenure (GEF, 2012: 112).

⁸ Asian Development Bank (ADB), African Development Bank (AfDB), European Bank for Reconstruction and Development (EBRD), UN Food and Agriculture Organization (FAO), Inter-American Development Bank (IADB), International Fund for Agricultural Development (IFAD), the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), the United Nations Industrial Development Organization (UNIDO), and the World Bank.

Official Development Assistance

Financial flows from ODA⁹ to help developing countries to engage with biodiversity loss and related issues have steadily increased during the last decade (OECD DAC, 2014). Today, diversity-related ODA amounts to approximately \$6.1 bn annually, which represents 5% of total ODA from the members of OECD’s Development Assistance Committee (DAC). This compares to a little over \$3 bn in the 2004–2006 period (Figure 3).

Figure 3: Trends in biodiversity-related aid, three-year averages
2004–2012, bilateral commitments in \$ bn (constant 2011 prices)



Source: OECD 2014 (approximate values)

ODA includes funds channelled via multilateral organisations (earmarked contributions), but not the core contributions to the GEF and other multilateral agencies such as the World Bank or Regional Development Banks (RDBs). Key donors are Japan, Germany and the EU, which provide together almost half of biodiversity-related ODA, but there are large differences in biodiversity commitments as a share of total ODA by country: less than 3% in the Netherlands, Austria, New Zealand, Korea, Luxembourg and Greece,¹⁰ but more than 10% in Norway, Australia, Finland and Iceland.¹¹ In terms of destination, Africa, Asia and Latin America receive relatively equal amounts of biodiversity funding, and the main recipients are Brazil, China, India, Indonesia and Vietnam. The three broad sectors that attract the highest share – a combined 80% – of biodiversity-related ODA are General Environmental Protection; Agriculture, Forestry, Fishing and Rural Development (of which Forestry receives almost half of biodiversity-related aid); and Water Supply and Sanitation. In 2013, two-thirds of all ODA dedicated to the forestry sector was to strengthen biodiversity and the sustainable use of forest

⁹ Traditionally, bilateral or multilateral ODA refers to grants and concessional loans, i.e. loans with a grant element of at least 25% (at a 10% discount rate).

¹⁰ ODA that is focused on meeting the objectives of the Rio Conventions is monitored in the OECD DAC’s Creditor Reporting System. This system uses the so-called ‘Rio markers’ to differentiate between aid for biodiversity, desertification, climate change mitigation, and/or climate change adaptation. The markers distinguish between principal objectives, significant objectives, and objectives that are non-targeted. ‘Activities marked as having a “principal” biodiversity objective would not have been funded but for that objective; activities marked as “significant” have other prime objectives but have been formulated or adjusted to help meet biodiversity concerns’ (OECD DAC, 2014). Countries carry out their own marking and there are no universal criteria to distinguish between principal, significant and non-targeted ODA.

¹¹ No information is available for the USA.

ecosystem resources (OECD DAC, 2013). As an overall trend, the OECD notes that donors are ‘...increasingly exploiting the synergies between biodiversity and climate change adaptation, mitigation, and desertification and integrating biodiversity into development co-operation portfolios – and this nexus may be driving the upward trend in total biodiversity-related aid’ (OECD DAC, 2014).

A noteworthy ODA financing mechanism is debt-for-nature-swaps. These allow developing countries to convert their foreign debts into funds for biodiversity conservation or other environmental and ecological projects. Two types of debt-for-nature swaps predominate (AGF, 2012: 72). First, commercial debt-for-nature swaps (also known as three-party debt-for-nature swaps), where public or private donors – often NGOs – purchase debt titles on the financial markets. They transfer these titles to the debtor country, which in turn adopts legislation on biodiversity protection or endows government bonds to finance biodiversity projects. Second, bilateral or multilateral swaps where one or more creditor governments agree to cancel or discount a portion of debt on condition that the debtor government commits to use this to finance biodiversity conservation. For example, a recent bilateral agreement between the USA and Indonesia will generate approximately \$28.5 mn a year, to be used to finance activities for the conservation of Indonesia’s forests (AGF, 2012). Debt-for-nature swaps have been important financing mechanisms for the conservation of pristine ecosystems in Bolivia, Brazil, Costa Rica and Madagascar, where an agreement with France resulted in tripling the size of the country’s PAs (AGF, 2012). By 2013, more than \$320 mn had been generated via debt-for-nature deals via the US Tropical Forest Conservation Act (USAID, 2014). Fewer debt-for-nature swaps are currently taking place mainly because international debt cancellation and debt-restructuring programmes have considerably reduced the debt volume of developing countries (AGF, 2012).

Green Climate Fund

As part of the activities under the UNFCCC, the Green Climate Fund (GCF) is now the major fund for financing climate mitigation and adaptation activities. The GCF is meant to leverage additional private-sector finance, but nevertheless requires a substantial share of public funding. Pledges from several donor countries amounted to some \$35 mn by 2014, which very little compared to the UNFCCC’s objective of an annual \$100 bn by 2020 (Climate Fund Update, n.d.). The GCF aims to contribute to the transition to low carbon emissions and increased resilience to adverse climate impacts. While the GCF does not have a biodiversity focus, it will potentially lead to large financial flows for low-carbon development (e.g. hydropower plants), protection of carbon stocks (forest) and climate adaptation (e.g. coastal protection). There are potentially both positive (forest protection) and negative impacts (river fragmentation and flow regulation by dams) on biodiversity, depending on the projects that are funded and the criteria used to avoid negative impacts and realise the potential for synergies (e.g. planting mangroves to provide flood protection). It is therefore crucial to mainstream biodiversity in GCF-supported activities.

International private investment

National and international (public-) private investment is a further source of biodiversity financing. Private investors require a sound return. For biodiversity such returns can come from, for example, sustainable forestry, organic and certified farming, eco-tourism, commercial hunting, bio-prospecting (e.g. for the use of forest products for developing pharmaceutical products), or carbon sequestration. Biodiversity-related investments can be financed through means including direct investment, green bonds, commercial loans, private equity, risk-mitigation instruments, or conservation trust funds and there is a variety of financing streams and models for public–private cooperation. For example, Peru,

a very biodiverse country that hosts almost 10% of the world's floral species, enables private co-financing of PAs via administration contracts and service concessions for eco-tourism and private conservation areas. Agreements between Peru's National Service for Protected Areas and private contractors have generated an additional \$20 mn for ten PAs, compared to the government's contribution of \$5 mn (World Bank, 2012). Foreign direct investment (FDI) is also increasingly focused on certified products and it is estimated that by 2020 these 'could generate new and additional biodiversity finance of around USD 10.4–30 billion annually to compensate farmers for implementing more sustainable agricultural practices' (Parker et al., 2012). At the same time, private investment in commercial biodiversity projects can result in low profits and financial returns, but high economic returns, e.g. in form of employment creation or provision of natural infrastructure. Such projects then illustrate how public–private partnerships (PPPs) or public subsidies can encourage private investment. In addition, not all private investors have commercial objectives: according to Parker et al. (2012), biodiversity-related funds from charities amount to some \$1 bn annually.

4.3 Initiatives and policies for mobilising, channelling and making effective use of finance for biodiversity

Mobilising, channelling and making effective use of (international) finance for (forest) biodiversity can encounter various bottlenecks at the international, national, and local level. As the UN High Level Panel (2014) stresses, closing the finance gap can be achieved only by aligning existing expenditure (particularly that which currently leads to biodiversity loss) with biodiversity objectives, and by improving sectoral integration. Supporting policies and instruments can serve as catalysts to overcome some of the bottlenecks and to make biodiversity financing more effective. These include changes in policies that may be counterproductive because they increase the demand for deforestation, such as subsidies for activities that harm biodiversity. This section highlights two multilateral initiatives, BIOFIN and REDD+, and four supporting policies, namely mainstreaming biodiversity in infrastructure development, financial-sector reforms, targeted trade policies, and broader regulatory reforms.

BIOFIN – Biodiversity Financing Initiative

UNDP's Biodiversity Financing Initiative (BIOFIN) aims to strengthen and improve policy frameworks relevant for biodiversity finance.¹² It was launched in 2012, in partnership with the EU and the governments of Germany and Switzerland, to unlock resources for meeting the Aichi Targets. The threefold objective of BIOFIN is '(i) to develop a methodology for quantifying the biodiversity finance gap at national level, (ii) to improve cost-effectiveness through mainstreaming of biodiversity into national development and sectoral planning, and (iii) to develop comprehensive national resource mobilising strategies, through a transformative process led by national stakeholders' (UNDP, 2014). Currently the initiative has a budget of \$8.5 mn in addition to \$3.1 mn from GEF-funded UNDP projects. Twelve partner countries¹³ are contributing to developing and piloting this new framework for biodiversity financing and mainstreaming.

¹² UNDP also manages a large biodiversity portfolio, the largest in the UN system consisting of more than 500 projects, financed by the GEF (\$1.5 bn) and other sources (\$3.5 bn).

¹³ Botswana, Chile, Costa Rica, Ecuador, Indonesia, Kazakhstan, Malaysia, Peru, Philippines, Seychelles, South Africa and Uganda.

REDD+

With around 12% global GHG emissions coming from deforestation, REDD+¹⁴ was set up under the umbrella of the UNFCCC as a mechanism to mobilise funds for preventing deforestation and forest degradation in developing countries in order to reduce GHG emissions (UNFCCC, 2008). First proposed by a group of tropical countries headed by Papua New Guinea at the UNFCCC's 11th Conference of the Parties in 2005, the idea is to increase the market value of intact forest ecosystems and to compensate for the economic opportunity costs of deforestation. Although REDD+'s primary objective is emission prevention, it also provides opportunities for forest protection.

REDD+ pilot projects explore potential financial and administrative structures for making payments to forest users and owners. First applications revealed the potential negative impacts on biodiversity as well as on communities that use forests but do not have formal ownership rights (UN ESC, 2013). For example, environmental NGOs pointed out that a focus on carbon storage might result in monoculture to the detriment of biodiversity, and local communities feared that they could be denied access to forest resources (Parrotta et al., 2012). REDD+ aims to prevent adverse social and/or environmental effects by applying safeguard criteria. In addition, functioning land-tenure systems and independent, qualified auditors are essential to ensure that funds generated under REDD+ are used in an effectively manner.

REDD+ comprises three stages: readiness and capacity-building; development and implementation of policies and measures; and results-based payments to developing countries. It remains unclear exactly how to value non-carbon benefits, however, and there are concerns about the diversion of funds away from emission-reducing activities (FCCC/CP/2013/5). Current finance for REDD+ is around \$1.19 bn, primarily for the first stages (Climate Funds Update, 2012). Norway is by far the largest contributor, both in absolute terms and as a percentage of Gross National Income (GNI) (2012), followed by the UK and Australia. Initially, REDD+ focused on private-sector financing for the third stage (results-based payments) (Streck and Parker, 2012), but as yet there have been no agreements regarding the trading of REDD+ credits in international compliance markets. The main obstacles to trading REDD+ credits are the difficulties associated with measuring, reporting and verification (MRV); the risk of leakage (i.e. deforestation being displaced elsewhere); the lack of permanence, which refers to the risk that carbon may be emitted later as a result of forest fire or changed policies – but, above all, the absence of binding emission-reduction targets and hence the lack of international emission markets (Streck and Parker, 2012). As a result, REDD+ is currently not fully operational.

Policies to mainstream biodiversity in infrastructure development

Infrastructure and economic development are key drivers of biodiversity loss, although when they are carefully managed and mainstreamed with biodiversity conservation objectives, such adverse impacts can be reduced. Approaches for mainstreaming biodiversity conservation in infrastructure or other development projects include impact assessment and mitigation plans or the enhancement of ecosystem services, which can significantly reduce adverse effects of private and public investment. Many public donors and also private investors apply sustainability criteria to their investment decisions. For instance, Strategic Environmental Assessments (SEAs) and Environmental Impact Assessments (EIAs) can be used to inform decision-makers – public (e.g. development banks) or private (e.g. investment funds) – about potential negative impacts and externalities of their planned

¹⁴ 'Reducing Emissions from Deforestation and Forest Degradation, and the role of conservation, sustainable management of forest and enhancement of forest carbon stocks in developing countries'.

investment on the environment, for example commercial or development-oriented infrastructure projects. Many countries could improve their coverage of biodiversity concerns and ecosystem services. Following project implementation, any adverse impacts may be reduced or compensated via environmental management plans and biodiversity offsets. Here it is essential to follow the mitigation hierarchy, which consists of avoiding, minimising, mitigating, and only then compensating for negative impacts on biodiversity. This means first and foremost the need to **avoid** negative impacts on areas that are crucial for biodiversity (e.g. maintaining old growth forests, intact peat lands and pristine ecosystems). This can be done, for instance, by adapting the design of project or infrastructure plans, such as redirecting a planned road through less vulnerable areas. If it is not feasible fully to avoid the biodiversity-adverse impact on the area in question, the impact should be **minimised**, e.g. by applying appropriate construction technologies. Then, biodiversity loss should be **mitigated** by rehabilitating affected areas as much as possible following construction, for instance in form of re-naturation in order to accelerate the recovery of biodiverse fauna and flora. **Offsetting**, that is **compensating** for ecosystem losses by creating or protecting nature elsewhere, is at the bottom of the hierarchy: it should be an instrument of last resort and used only when the other approaches cannot be applied.

Many countries are beginning to include ecosystems and their services in their infrastructure development (e.g. green infrastructure in the USA and EU, ecosystem-based adaptation to climate change). These approaches focus on the services offered by ecosystems, and aim to **enhance** them in preference to replacing them with technical infrastructure. For example, mangrove forests not only represent biodiversity reservoirs and carbon sinks, but they also provide flood protection and prevent coastal erosion in many tropical and subtropical countries. Enlarging mangrove forest can therefore be a cost-effective and biodiversity-friendly alternative to constructing concrete flood defence walls. This type of 'green adaptation' and 'green infrastructure' meets development/infrastructure and climate adaptation objectives, while providing at the same time benefiting the ecosystem and biodiversity.

Financial-sector reform

Domestic and international public bodies have a wide array of tools to correct market failures and to stimulate development of the financial sector. Private investment in commercial but ecologically sustainable forestry, farming or tourism can be strengthened by public **co-investment**. Co-finance by (national or international) public-sector finance institutions in form of concessional loans or equity can improve the return–risk ratio of environmentally friendly projects. It can thereby enhance the returns to private investors or absorb possible losses, upgrading the project's attractiveness in capital markets. In addition, co-financing can be accompanied by special political or technical expertise on the part of the public institution. **Credit guarantees** are another way to reduce the commercial risks associated with investing in forest-friendly projects, improving access to capital markets, in particular for small and medium-sized enterprises (SMEs). The guarantor agrees to repay a creditor all or part of the debts in the event of a default. For example, the USAID's Development Credit Authority has issued credit guarantees for SMEs in the forestry sector (Oakes et al., 2012; USAID, 2012). **Forward contracts** are agreements on a future exchange between a seller, e.g. of certified timber, and a buyer. Volumes, prices and transaction dates are agreed in advance, thus reducing the risks for investors. For example, the World Bank's BioCarbon Fund specialises in concluding forward contracts in the acquisition of forest carbon credits (Oakes et al., 2012: 125). Forward contracts can also appeal to private-sector buyers, for instance timber funds, since they reduce the risk of under-supply.

Trade policies

As Oakes et al. (2012) further underline, (direct or indirect) trade laws and voluntary partnership agreements can play an important role in the fight against the illegal exploitation of forest products, increasing the price of legally and sustainably produced commodities and thus facilitating biodiversity-friendly investment. For example, the EU Timber Regulation (Regulation 995/2010) regulates the imports of timber. From 3 March 2013, any operator who places timber or timber products on the EU market must prove that they have been legally produced. The Timber Regulation includes three key obligations. First, it prohibits the placing of illegally harvested timber and products derived from such timber on the EU market, whether they are of domestic or imported origin. Second, only timber accompanied by a Forest Law Enforcement, Governance and Trade or Convention on International Trade in Endangered Species licence is legally acceptable. In all other cases, operators must exercise 'due diligence' when they sell imported and domestic timber or timber products. Third, traders (who come below the operators in the supply chain) must keep records of their suppliers and customers. In this way the operators can always be traced. Thus, the EU's trade rules provide a strong supporting policy for its biodiversity financing, both within and beyond its borders.

Regulatory reforms

The effectiveness of financing for developing countries to protect biodiversity is dependent on an effective institutional setting, a sound national policy framework and institutional capacity. **Forest policy** directly affects forest biodiversity and so can be supportive or destructive. Since the 1992 Rio Declaration a number of UN initiatives have promoted sustainable forest management that also address biodiversity concerns. Many countries have adjusted their policies and laws to better protect forests and control deforestation. In 2007, the UN signed a non-legally binding instrument on all types of forests. The International Model Forest Network (IMFN) is a worldwide initiative that promotes sustainable forest management via networking and support of practical initiatives (IMFN webpage). In addition to the policies aimed at forest management a number of broader regulatory reforms can contribute to enhancing the effectiveness of – and might even contribute to increasing – biodiversity financing. These include the establishment of **clear and secure property rights**.¹⁵ Property rights are a prerequisite for mid- and long-term investment in ecosystem services; they are a means to protect indigenous peoples from being displaced, for instance by illegal slash-and-burn practices or the expansion of agro-industry; they can secure capital from international funds (e.g. REDD+); and they can encourage the commitment of traditional forest owners and resource users not to resort to unsustainable use and over-exploitation of forest biosystems (Oakes et al., 2012). The establishment of **forest-friendly procurement rules** is another policy tool for governments (and private organisations) to contribute to biodiversity conservation and to reward and thus facilitate investment in the sustainable use of forest ecosystems. **National planning and coordination** can be a strong policy device to mainstream technology implementation, biodiversity conservation and other development objectives, to identify financing gaps and the need for technical assistance, and to reduce the transaction costs of multiple-project governance. By bringing together government agencies, private-sector actors, non-profit organisations and other external stakeholders, transparency can be improved, planning horizons for green technology or biodiversity projects can be reduced and, potentially, synergies with other government policies can be exploited, thereby

¹⁵ Property rights can be private or collective. As many aspects of biodiversity are common property or public goods, as outlined in Section 2, collective rights may often be more helpful than private ones.

reducing financing needs. Finally, **subsidy reform** is another means to reduce biodiversity-adverse incentives: ‘Subsidies to key sectors (i.e. agriculture, fisheries, mining and energy) are currently running at around one trillion dollars per year. Collectively, subsidies represent 1% of global GDP yet many of these contribute directly to biodiversity and ecosystem damage’ (TEEB, 2011: 32). If subsidy reform results in redirecting funds towards the enhancement of biodiversity, its positive effect is twofold. First, it directly increases biodiversity finance, and second, by reducing harm the need for additional financing is indirectly reduced.

5. Conclusions

Biodiversity is a precious good and a prerequisite for the provision of a large variety of, often global, ecosystem services. It facilitates the achievement of sustainable development objectives such as poverty reduction, food security, water security, or disaster risk reduction. In addition, biodiversity represents a key element for climate change mitigation, adaptation and resilience. Slowing its loss, protecting current stocks and, wherever possible, increasing biodiversity is thus a policy imperative in many developed and developing countries alike. Since the latter, which host most of the world’s biodiversity hotspots, cannot bear the full costs of protecting biodiversity alone – in particular in the light of other development objectives and in view of the fact that many of the benefits provided by biodiverse areas are global – international finance is required.

As outlined in this paper, which concentrates on forest biodiversity, a number of international programmes and instruments provide financial support for biodiversity conservation, often in combination with other environmental, economic or social objectives. When carefully aligned with broader development policies, synergies between biodiversity conservation and economic development can be achieved and trade-offs can be minimised.

We have sketched out the international financing cycle for forest biodiversity, showing the flows from international (public and private) sources of finance to the actual use of funds for biodiversity protection, as well as accompanying policies to mobilise, channel and effectively use biodiversity finance. Mobilised funds can flow directly to biodiversity protection activities at the local level, they can be transferred to developing country governments, or be channelled through multilateral funds. An efficient financing cycle relies on a sound and coherent policy framework. Financing is also required for creating and implementing appropriate supporting policies. But the main contribution of this paper is to emphasise that the problem of biodiversity financing is not just one of finding more and deeper sources, and efficiently deploying them. While this is important, and should be done, it is equally important to improve incentive structures in order to reduce the need for further biodiversity funding.

Currently, total biodiversity-related funds are estimated to amount to about \$50 bn per year, of which less than half is spent in developing countries. But the finance needed to halt biodiversity loss is estimated to be six to eight times higher than this (UN HLP, forthcoming; Parker et al., 2012). There is therefore a need to mobilise more finance. As indicated in the ‘financing cycle’, the effective use of biodiversity funds depends on a sound and coherent policy framework. A well-balanced policy mix can help both to mobilise funds and to reduce the financing needs by changing current incentive structures. In order to achieve this, there is a need for appropriate policy mechanisms at the

international, national and local level. This paper has outlined options in the areas of mainstreaming biodiversity in infrastructure development, financial-sector reform, trade policies, and broader regulatory reform.

While it remains a challenge to close the current gap in biodiversity financing, a better understanding of the cycle of financing for biodiversity conservation can help to identify and address country- or region-specific bottlenecks as well as to design adequate supporting policies for the effective mobilisation, channelling and use of financing.

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