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Multiple Benefits – Issues and Options for REDD

UN-REDD PROGRAMME

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TABLE OF CONTENTS

1 Introduction

This paper provides an overview of the issues surrounding and opportunities for achieving 'multiple benefits'[1] from Reducing Emissions from Deforestation and Forest Degradation in developing countries (REDD). The UN-REDD Programme understands the term 'multiple benefits' to include both the ecosystem and social benefits of REDD. This paper focuses only on the ecosystem aspects of multiple benefits as it is an output of the International Support Functions component of the UN-REDD Programme, relating specifically to the development of output 3.2: 'Tools to encourage the capture of ecosystem service co-benefits developed'.

This paper first identifies the type of benefits that are provided by forests and points out that the relationship between the individual benefits may be complex. It then considers the risks and opportunities for REDD to deliver multiple benefits. It is argued that the realisation of benefits will depend on a number of different factors, including the design of REDD and how it is implemented. The paper ends by considering firstly what countries need if they are to promote multiple benefits, and secondly the specific steps that the UN REDD Programme can take to assist countries in this regard.

UN-REDD Programme activities on multiple benefits are guided by decisions and conclusions of the United Nations Framework Convention on Climate Change (UNFCCC). The 'Bali Action Plan' states that REDD can promote co-benefits and may complement the aims and objectives of other relevant conventions and agreements (Decision 2/CP.13). A number of Parties have also requested in their submissions to the Secretariat that REDD co-benefits are taken into account. Countries will have the option to consider multiple benefits in national

[1] The terminology of 'multiple benefits' and 'co-benefits' has not yet stabilised. The table below sets out two possible interpretations of 'multiple benefits' and one of 'co-benefits'. It lists the pros and cons of each usage. In this paper we use the term in the sense of 'Multiple benefits$_1$'.

Term	Interpretation	Pros	Cons
Multiple benefits$_1$	Covers all the benefits of REDD except its contribution to climate mitigation	Gives greater weight to the non-carbon benefits than the term 'co-benefits'	Does not emphasise that the carbon benefits are primary. Meaning may be confused with 'Multiple benefits$_2$'
Multiple benefits$_2$	Covers all the benefits of REDD, including its contribution to climate mitigation	Emphasises the range of benefits from REDD	Downplays the carbon benefits of REDD. Meaning may be confused with 'Multiple benefits$_1$'
Co-benefits	Covers all the benefits of REDD except its contribution to climate mitigation	Follows UNFCCC terminology. Makes clear the primary place of carbon benefits of REDD	Implies that the non-carbon benefits of REDD are secondary

and sub-national implementation of REDD. The UN-REDD Programme aims to support actions for achieving multiple benefits from REDD.

2 The benefits provided by forests

Forests, particularly humid tropical forests, provide a number of benefits to society. They are extremely rich in biodiversity (the Amazon rainforest alone hosts about a quarter of the world's terrestrial species) and provide a range of important ecosystem services, examples of which are listed below (Table 1).

Table 1. Forest ecosystem services (based on the Millennium Ecosystem Assessment)

Ecosystem services	**Examples for forest ecosystems**
Provisioning	**The goods or products obtained from ecosystems**
Food	Non-timber forest products (NTFPs) such as fruits, berries, and bush meat
Fresh water	An estimated 4.6 billion people depend on forests for all or some of their water supplies
Wood and fibre	Timber, cotton, hemp, silk, rubber
Fuel	Fuel wood
Regulating	**The benefits obtained from an ecosystem's control of natural processes**
Climate regulation	The regulation of the global carbon cycle through carbon storage and sequestration, in addition to local and regional climate regulation (albedo effects, regional rainfall etc)
Flood regulation	The reduction and slow down of surface water run-off
Disease regulation	Intact forests reduce the occurrence of standing water, reducing the breeding area for some disease vectors and transmission of diseases such as malaria
Water regulation	Forest systems are associated with the regulation of 57% of total water runoff, and play a large role in the hydrological cycle
Cultural	**The nonmaterial benefits obtained from ecosystems**
Aesthetic	The scenery and landscapes provided by forest
Spiritual	Indigenous peoples and others attach spiritual significance to forests
Educational	Forest resources (genetic etc)
Recreational	Tourism to rainforest areas
Supporting	**The natural processes that maintain the other ecosystem services**
Nutrient cycling	Forests are extremely efficient at maintaining nutrient flows through atmosphere, plants and soils
Soil formation	Forests on slopes hold soil in place and can prevent degradation
Primary production	Forests are highly productive

All of these benefits are ones that may be delivered by actions to reduce deforestation and forest degradation. In this paper we concentrate on:

- Biodiversity
- Climate regulation
- Water regulation

- Timber
- Non-timber forest products

The relationship between the individual benefits provided by forests can be complex. Biodiversity underpins the delivery of all ecosystem services. However, maintaining and increasing biodiversity does not necessarily lead to an increase in the services provided; and some services can be supplied by ecosystems with reduced levels of biodiversity. Similarly, the fact that a forest delivers one type of ecosystem service such as water regulation may indicate little about its delivery of other services such as timber or food supply. Our knowledge of the spatial overlap of different ecosystem services and biodiversity values is not well developed.

There are also complexities in the spatial and temporal scale of the services provided. A single forest may deliver some benefits that are global in nature (e.g. climate regulation), others that are regional (e.g. water regulation) and others that are essentially local (e.g. food for forest dwellers). Similarly, services are not provided consistently throughout the year but can vary from season to season and diminish or increase over time.

Finally, questions about who receives the benefits provided by forests depend not only on whether the forest ecosystem is sustained but also on the social and institutional context. A forest may provide many provisioning services, but if local people are prevented from harvesting those resources – perhaps because their tenure rights are not recognised – then they will not receive the benefit of them. The social and institutional aspects of these benefits, which are also relevant to the distribution of REDD revenues, are not discussed further in this paper[2].

3 The multiple benefits of REDD

REDD is a mechanism to reduce deforestation and forest degradation in developing countries. Specifically, it aims to reduce the greenhouse gas (GHG) emissions from deforestation and degradation. On some variants it will also include incentives to increase the removal of greenhouse gases from the atmosphere through afforestation and reforestation.

The fact that many tropical forests are rich in biodiversity and provide the ecosystem services outlined above means that REDD in any form is likely to provide 'multiple benefits' by reducing forest loss and degradation. However, the extent to which REDD delivers multiple benefits (and the extent to which it may threaten the benefits from forests) will depend on a number of factors, including:

- The design of REDD
- The implementation of REDD

[2] It is anticipated that these aspects will be considered under UN-REDD Programme Output 3.1: 'development of a framework for making REDD work for the poor'

3.1 The design of REDD

The extent to which REDD provides ecosystem benefits, and the possible risks, will depend in part on how REDD is designed. Issues surrounding the scope of REDD, the reference levels adopted, and the financing of REDD are all relevant here. For example, the inclusion of forest conservation as a REDD activity will be broadly beneficial to biodiversity, whereas the inclusion of carbon stock enhancement in the REDD framework might in some cases lead to policies that increase carbon sequestration at the expense of biodiversity and water regulation services. Several environmental groups protested against the possible inclusion of plantations in REDD at the 14th Conference of the Parties to the UNFCCC in Poznan in December 2008, expressing concern that natural forests could be destroyed and replaced with industrial tree plantations. There is also a risk of displaced pressures, whereby protection of high-carbon forests leads to additional pressure to convert or degrade lower carbon ecosystems that may be important for biodiversity or flood regulation, such as wetlands. This is particularly relevant to non-forest ecosystems, but may also affect low-carbon forests.

3.2 The implementation of REDD

If countries wish to achieve multiple benefits from REDD, the biggest opportunity is likely to arise at the implementation phase. Countries have a number of requirements under International Conventions such as the Convention on Biological Diversity (CBD), and could meet some of these requirements by considering the multiple benefits aspects of REDD. As REDD can affect forest benefits both positively and negatively, this will require careful planning. An overview of the potential benefits and risks to the major benefits discussed here is provided below (Table 2).

Table 2. Direct and indirect effects of REDD on forest ecosystem benefits

Benefit	Direct effects of REDD	Indirect effects of REDD
Biodiversity	Positive. Some forests will be higher in biodiversity than others, and some management practices will be more beneficial than others. Some risks if forests are managed only for carbon and if access is restricted	May lead to increased conversion pressures in low carbon forests and non-forest ecosystems, with consequent loss of biodiversity
Water regulation	Positive. All forests provide water regulation. Some forests are more valuable than others in this respect (e.g. watersheds). Some risks of water depletion in the case of plantations on land not formerly forested	There may be some displacement of pressures to low carbon ecosystems that play a water regulatory role
Timber	Restriction of logging practices may reduce production levels, but could also ensure sustainability if appropriately implemented	Timber pressure could be displaced to non-REDD countries
NTFPs	Mostly positive, although actions to restrict forest degradation may interfere with access	

Countries will need to make decisions about priorities and trade-offs with regard to multiple benefits when implementing REDD. In order for them to do this they will require knowledge in two key areas:

Firstly, they will need to understand the relationship between the benefits outlined above, and how this is impacted by various management practices. As mentioned previously, the relationship between biodiversity, ecosystem services, and carbon stock changes is complex and will differ across each country. There will therefore be areas in which biodiversity and ecosystem services do not overlap. Similarly, priority areas for tackling deforestation to reduce emissions will not always reflect other forest values. Our knowledge of these relationships at the appropriate scale is limited, and areas in which REDD can benefit both biodiversity and other ecosystem services will be difficult to identify unless we are able to improve that knowledge.

Secondly, countries will need an understanding of the costs and benefits involved in promoting gains for biodiversity and ecosystem services through REDD. For example, there will be areas in which the implementation of REDD activities would achieve all of the benefits outlined above, but where the cost of reducing emissions is higher than the cost of reducing equivalent emissions in another area. Planning for multiple benefits also requires knowledge of the factors that determine land use decisions, including a consideration of the level of threats to forest, the implementation and opportunity costs of REDD activities, and the mechanisms available to bridge financial gaps.

Therefore, it is important that countries who wish to gain multiple benefits through REDD implementation are assisted through the development of tools and guidance that will facilitate informed decision making. More specifically, they will require:

- A better understanding of how actions to reduce emissions can influence biodiversity and ecosystem services, both positively and negatively, and a framework for promoting the synergies and addressing the conflicts that can arise
- An understanding of the spatial and temporal relationships between biodiversity, ecosystem services and carbon stocks. This would allow countries to make informed decisions about where to prioritise REDD activities, highlighting eligible and feasible areas that could be targeted for multiple benefits
- Decision support tools that will allow countries to weigh the benefits of promoting multiple benefits against the tradeoffs according to national priorities
- Identification of the information needs for achieving multiple benefits and the relationship with measurement, reporting and verification (MRV) frameworks developed for GHG emissions reporting. Where synergies exist, information on biodiversity and ecosystem services could potentially be obtained through these frameworks

Some developing countries may currently lack the capacity to develop the tools required to make informed decisions on multiple benefits and REDD. An ability to identify priority areas, and knowledge of the costs and benefits involved in delivering multiple benefits through REDD is likely to lead to more informed decision making and facilitate improved REDD planning.

4 How will the UN-REDD Programme support multiple benefits and REDD?

The UN-REDD Programme aims to address the multiple benefits aspects of REDD through the following key activities:

- Consultations with pilot countries to determine their priorities and information needs in relation to multiple benefits and REDD
- Development of a framework for understanding the factors that determine land use and land use change, and the consequences for biodiversity and ecosystem services
- Spatial analyses of the relationship between carbon storage in forests, biodiversity, and ecosystem services. There are some datasets available for ecosystem services such as water (Annex 1), which could be combined to provide this information at regional, national and local scales.
- The development of tools to assist decision makers in promoting synergies, addressing conflicts, and managing trade-offs
- An international consultative workshop on multiple benefits
- Regional training events on the use of the tools developed to assess multiple benefits

Consultations with pilot countries

The UN-REDD Programme aims to provide support for countries according to their national priorities. Each country will have different ambitions for REDD and different institutional capacities for promoting multiple benefits. Therefore, it will be essential to hold three regional consultations; one in Africa, one in Asia & Pacific, and another in Latin America & Caribbean, where multiple benefits issues can be discussed with each country and key information needs can be identified. Key government officials will be engaged, along with other relevant stakeholders. Initial analyses will be presented and detailed discussions held over the progress made and next steps. It is intended that all three meetings will take place before the Policy Board meeting in October 2009. Where appropriate, consultations will be linked to other planned UN-REDD events.

Development of a framework for understanding the factors that determine land use and land use change, and the consequences for biodiversity and ecosystem services.

This will facilitate the assessment of mechanisms available for promoting synergies and addressing conflicts related to multiple benefits.

Spatial analyses of the relationship between carbon storage in forests, biodiversity and ecosystem services

This work will build on the carbon and biodiversity demonstration atlas developed by UNEP-WCMC. The spatial analyses will use the best available data for carbon and biodiversity (preferably national-scale), include mapping of ecosystem services, incorporate country priorities where they exist, and where possible will incorporate pressures and threats. Livelihood issues will be taken into consideration. This work will be carried out in collaboration with national institutions in all cases, and with other international organisations where appropriate. The multiple benefit overlays will be consistent with MRV

frameworks and will identify areas in which multiple benefits can be achieved, and those in which trade-offs will need to be made.

The development of tools to assist decision makers in promoting synergies, addressing conflicts, and managing trade-offs

These tools will draw upon the two analyses outlined above, and will be guided by input from consultations at the country level.

International consultative workshop on multiple benefits

This workshop will engage the international community and provide the UN-REDD Programme with the opportunity to present draft outputs and receive feedback. It will also include presentations from representatives of pilot countries on plans for addressing multiple benefits.

Regional training events on the use of the tools developed

To provide training for pilot countries and others in the use of the tools developed, for use in REDD demonstration activities.

Annex 1- Relevant initiatives and potential data providers/partners

Organisation/Institution/Researcher	Initiative
Ecosystem services	
Conservation International (CI)	Mapping and valuing ecosystem services. Exploring linkages with REDD
Global Canopy Programme (GCP)	The GCP has proposed a mechanism – referred as "PINC" (Proactive Investment in Natural Capital) – to reward those countries that have large areas of standing forest that are not immediately threatened by deforestation. Such a mechanism is intended for maintaining of ecosystem services beyond carbon in standing forests and is suggested to be included "under the remit of the CBD". Further information at http://www.globalcanopy.org/main.php?m=117&sm=144&t=1.
Holly Gibbs (Stanford University)	Produced global biomass carbon data based on IPCC data
IIASA forest model	Calculates differences in net present value of different land uses using a spatially explicit integrated biophysical and socio-economic land use model
Katoomba Group	The Katoomba Group is an international network which works to promote, and improve capacity related to, markets and payments for ecosystem services (PES). The XIV Katoomba Meeting (Cuiaba, Brazil, 1-2 April 2009) has been convened on "Avoiding Deforestation in the Amazon through PES Markets" addressing REDD and PES including biodiversity offsets. Further information at http://www.katoombameeting2009.com.br/?pg=programacao&lang=en.
Mark Mulligan (Kings College London)	Modelling the relationship between carbon and water production, particularly in protected areas
Millennium Ecosystem Assessment	Assessed the consequences of ecosystem change for human well-being
Natural Capital Project (www.naturalcapitalproject.org)	Developing tools for modelling and mapping the delivery, distribution, and economic value of ecosystem services and biodiversity. Hydrology module under development

Robin Naidoo and others	Preliminary global scale ecosystem service mapping work
Valuing the Arc Project, Tanzania	Improving knowledge of the ecosystem services provided by the Eastern Arc Mountains of Tanzania (including preliminary spatial analyses) and advice on management of these services.
World Wildlife Fund (WWF)	WWF's Conservation Science Program is currently developing a global hydrological database, termed HydroSHEDS. Data for South America, Central America, and Asia are now available.
WaterGAP	Global hydrological model. Annual water availability and consumptive water use per sector
Biodiversity	
Convention on Biological Diversity (CBD)	Following the adoption of CBD Decision IX/16 ("Biodiversity and Climate Change"), the Second *Ad Hoc* Technical Expert Group (AHTEG) on Biodiversity and Climate Change was established and its first meeting was convened in London (UK) from 17 to 21 November 2008. At its first meeting, the AHTEG addressed, among other issues, biodiversity and climate change mitigation including REDD, also by delineating an overview of the REDD's (and other mitigation activities') potential benefits and risks for biodiversity as well as the possible actions to maximize benefits or reduce negative impacts. The Draft Findings of the meeting are available at http://www.cbd.int/doc/meetings/cc/ahteg-bdcc-01/other/ahteg-bdcc-01-findings-en.pdf, while the CBD REDD-related Decisions can be found at http://www.cbd.int/forest/redd/.
Climate Community and Biodiversity Alliance (CCBA)	Convened by CI (see above), the CCBA has developed voluntary standards, the "Climate, Community & Biodiversity Standards" (CCBShttp://www.climate-standards.org/standards/thestandards.html), allowing for evaluating climate, community and biodiversity impacts of land-based climate change mitigation projects. The project "Reducing Carbon Emissions from Deforestation in the Ulu Masen Ecosystem, Aceh, Indonesia" is an example of a REDD project which have been audited and validated under the CCBS. Further information at http://www.climate-standards.org.
Conservation International (CI)	CI works to link REDD, carbon finance and biodiversity in several locations, such as in Liberia and Ecuador. CI has also convened the Climate, Community and Biodiversity Alliance (see CCBA below) and manages the Conservation and Community Carbon

	Fund established to support the development and the implementation of forest-based carbon projects which are based in/around key biodiversity areas, address climate change, deliver biodiversity and local community benefits, and also adhere to the Climate, Community and Biodiversity Standards. Further information at http://www.conservation.org/learn/climate/Pages/overview.aspx and at http://www.conservation.org/Documents/CCCF_Overview_Nov_2008.pdf.
Center for International Forestry Research (CIFOR)	CIFOR has undertaken, in cooperation with ODI and IPAM, a research project on "Integrating REDD in the Global Climate Protection Regime: Proposals and Implications" towards coordinating and contributing to the review and analysis of REDD, and also addressing biodiversity and other co-benefits. CIFOR also co-hosted, with the Government of Poland and the Collaborative Partnership on Forests (CPF) and in parallel to UNFCCC/COP-14, "Forest Day 2" whose main programme and side events addressed REDD and its co-benefits including biodiversity. Further information at http://www.cifor.cgiar.org/carbofor/, the CIFOR Carbon forestry research webpage.
Ecosecurities	Have undertaken work on biodiversity and carbon finance, including a recent report for the CBD: Challenges for a business case for high-biodiversity REDD projects and schemes
Fauna and Flora International (FFI)	FFI conducts REDD-related conservation projects in different countries, such as Indonesia and Liberia. Further locations are identified within the partnership between FFI and the Australian bank Macquarie Group aimed at developing and implementing six REDD projects between June 2008 and June 2011. Further information at http://www.faunaflora.org/ffi_conservinghabitats.php.
Global Environment Facility (GEF)	Some GEF projects on REDD or REDD-related issues address biodiversity; among them there are the "Carbon Benefits Project (CBP): Modeling, Measurement and Monitoring" (http://gefonline.org/projectDetailsSQL.cfm?projID=3449), and the "CBSP Enhancing Institutional Capacities on REDD issues for Sustainable Forest Management in the Congo Basin" (http://gefonline.org/projectDetailsSQL.cfm?projID=3779). Further information at http://www.thegef.org/. The GEF Scientific and Technical Advisory Panel (GEF-STAP) has convened a workshop on "REDD, Forest Conservation and Sustainable Forest Management: Options for GEF-5 (LULUCF, SFM to REDD)" in Washington, DC (USA) on 31 March 2009, towards delineating GEF-STAP's contribution to the fifth replenishment strategies for

	climate change, sustainable forest management, land degradation and biodiversity. Further information at http://stapgef.unep.org/activities/technicalworkshops/SFM_REDD
IUCN - The World Conservation Union	At the international level, IUCN participates in the activities of the Pro-Poor REDD Working Group of the Poverty-Environment Partnership (PEP). During the IUCN World Conservation Congress, IUCN, in cooperation with CI and TNC, has convened a REDD-related event on "Delivering Multiple Benefits from Forest Carbon Markets to Address Climate Change, Biodiversity Conservation and Poverty Alleviation" (Barcelona, Spain, 7 October 2007), with the objectives of discussing how to optimize biodiversity and human livelihood benefits in forest carbon activities including REDD. Further information at http://cmsdata.iucn.org/downloads/redd_opportunities.pdf.
Organisation for Economic Co-operation and Development (OECD)	The OECD undertook an "Initial Review of Policies and Incentives to Reduce GHG Emissions from Deforestation" (November 2006) referring to biodiversity within the total economic value of tropical forests and to incentives for biodiversity conservation. OECD has also convened a workshop on "Capturing Carbon and Biodiversity Benefits to Reduce Deforestation" as a Joint Workshop of the Working Group on the Economic Aspects of Biodiversity and the Annex I Expert Group on the UNFCCC (Paris, France, 26 March 2008). Further information at http://www.oecd.org/department/0,3355,en_2649_33713_1_1_1_1_1,00.html
The Nature Conservancy (TNC)	TNC undertakes REDD-related forest carbon projects addressing biodiversity co-benefits in different sites, such as the Noel Kempff Mercado National Park (Bolivia) and the Rio Bravo Conservation and Management Area (Belize). Further information at http://www.nature.org/initiatives/climatechange/strategies/art20607.html.
University of Cambridge, Institute of European Environmental Policy, Alterra, UNEP-WCMC	Review on the economics of biodiversity loss: Scoping the science. Discusses the potential of mapping ecosystem services http://ec.europa.eu/environment/nature/biodiversity/economics/pdf/scoping_science.pdf
University of East Anglia (Bernado Strassburg)	Spatial analysis of species richness and carbon stocks
Wildlife Conservation Society (WCS)	WCS, in cooperation with the Malagasy Ministry of Water and Forests, Environment and Tourism with support from the Global Conservation Fund and the Critical Ecosystem Partnership Fund, has conducted work towards linking avoided deforestation, carbon-based funding for protected areas and addressing

	conservation threats in the Makira Plateau area in north-eastern Madagascar. Other WCS REDD-related initiatives, also supporting poverty alleviation and biodiversity, have been planned in the Congo Basin (e.g. DRC and Cameroon), pending availability of funds. Further information at http://www.wcs.org/globalconservation/challenges/climate?preview=&psid=&ph=class%3DAWC-4877272.
WWF-World Wide Fund For Nature	WWF undertakes REDD-related initiatives through biodiversity/livelihood projects in different countries such as Peru ("REDD Project Implementation in the Peruvian Andean Amazon") and Nepal ("Reducing poverty in Nepal, through innovative and equitable carbon financing mechanism (REDD)"). Further information at http://www.panda.org/what_we_do/footprint/forest_climate/forests_and_climate_change/. WWF-USA is working on the role of protected areas in reducing emissions from forests and in February 2009 held a workshop on "Connecting Amazon Protected Areas and Indigenous Lands to REDD Frameworks" (Stanford University, California, 11-12 February 2009). Further information at http://www.worldwildlife.org/science/stanfordgroup.html.