

## contents

### 2 News from around the world

Forest Carbon Partnership Facility, plus news in brief



### 3 News: protected areas

Protected areas and climate change, plus news in brief

### 4-5 International initiatives

### 6 The science behind

forests-climate change links

### 7 Climate change

and forest livelihoods



**8-9 Feature:** Climate change and forestry: a complicated relationship

### 10 Forest adaptation to climate change

### 11 Forests, energy and climate change



### 12 Carbon offsets

### 13 The REDD debate

### 14 WWF focus

### 15 IUCN focus

### 16 Reviews



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## A green light for REDD? Forests and climate change

Rarely has an environmental issue achieved such massive media coverage as climate change has over the last year or so. Opinion polls are showing that climate change now ranks high in public concern and on the political agenda in many countries. Yet far fewer column inches and debates have mentioned the role that forests play in climate change. In the heated negotiations of the Kyoto Protocol, forests were dealt with in a rather ad hoc fashion and ended up being included solely as a tree-planting 'techno-fix' for offsetting fossil fuel-based greenhouse gas (GHG) emissions.

The reality is that forest loss and degradation is responsible for approximately 20 percent of global GHG emissions, so slowing the rate of deforestation could make a significant contribution to overall emissions reduction. Support for this idea of reducing emissions from deforestation and degradation (REDD) is gathering momentum and the United Nations Framework Convention on Climate Change (UNFCCC) meeting in December this year will discuss several REDD proposals.

If, as looks increasingly probable, provision for REDD is included in the second round of Kyoto commitments, will it be the silver bullet for forest conservation that many are hoping for? Hardly likely, given the powerful threats facing forests and the technical and institutional challenges associated with REDD. Nonetheless, REDD mechanisms have the potential to add hefty financial and political weight to sustainable forest management and conservation, and would advance the recognition of forests' multiple values.

At the same time, we need to quickly gear up our understanding of REDD, to better address the risks associated with it. In particular, we need to build safeguards to ensure that the rights and needs of forest-dependent people are not compromised by REDD initiatives. The possible 2012 start date for REDD is only five years away so we need to fast track our efforts, if this new opportunity for forest conservation is to fulfil its potential, not only for climate change mitigation but also for sustainable development and biodiversity conservation.

Rodney Taylor, WWF and Stewart Maginnis, IUCN

# Getting ready for REDD: the Forest Carbon Partnership Facility



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**The facility aims to tackle deforestation through a carbon finance programme**

In September, the World Bank Board formally approved the planned Forest Carbon Partnership Facility (FCPF), clearing the way for the launch of this US\$250 million initiative at the UNFCCC CoP in December. The idea behind the facility is to prepare for the expected inclusion of 'reduced emissions from deforestation and degradation' (REDD) provisions in the next commitment period of the Kyoto Protocol (from 2012). The FCPF is planned as part of a huge new Global Forest Alliance (GFA), announced at the 7th UN Forum on Forests in April this year.

The FCPF aims to build capacity for REDD by assisting about twenty developing countries to calculate the opportunity costs of possible REDD interventions and to design appropriate REDD strategies. The facility will also test a carbon finance programme in five pilot countries (Papua New Guinea, Costa Rica, Indonesia, Brazil and the Democratic Republic of Congo) through the provision of carbon credits to those countries that achieve verifiable emission reductions from their forest protection measures.

While the FCPF has generated a great deal of interest among developed and developing countries, it also has its share of critics. Some countries and groups have voiced their scepticism that carbon trading will prove an effective mechanism to tackle deforestation, while others are concerned that REDD schemes may yield little benefit for local people, and may serve to support existing unjust forest protection laws.

Kristalina Georgieva, director of strategy and operations in the World Bank's sustainable development unit, has countered these arguments. Speaking to reporters at a Sydney meeting on forests and climate in July, she said "If we do nothing, if we don't experiment, then the scepticism whether we actually can provide compensation for avoiding deforestation would be there."

For more information: visit: [www.carbonfinance.org](http://www.carbonfinance.org) or contact Werner Kornel, [wkornel@worldbank.org](mailto:wkornel@worldbank.org).

## news in brief

**Record planting:** Indonesia will plant 79 million trees in one day in November, in the run up to the UN climate change summit in Bali in December. This is part of a global campaign, launched at climate talks in Nairobi last year, to plant one billion trees. In announcing this initiative, Ahmad Fauzi Masud, spokesman for the Indonesian Ministry of Forestry, said "Everybody, residents and officials from the lowest unit of the government to the president, will take part in this movement. It will be a national record and, possibly, a world record."

Source: [www.planetark.com](http://www.planetark.com), October 5, 2007

**Missing sink found?** A group of scientists writing in *Science* claims to have found the 'missing carbon sink' – a billion tonnes of human-generated carbon that was assumed to be absorbed by northern forests, but remained unaccounted for in field studies. The researchers, led by Britton Stephens from the National Center for Atmospheric Research in Colorado, USA, say they have found the missing carbon in tropical forests that are removing much higher quantities of carbon dioxide from the atmosphere than was previously realized. Conversely, northern temperate forests were found to play a smaller role in carbon uptake than was previously assumed. Tropical deforestation, say the researchers, therefore not only increases carbon emissions, but also removes a potentially important carbon sink. Nevertheless, Stephens warned that relying on trees to mitigate climate change was not a long-term solution. "Afforestation and reforestation can provide short-term sinks to slow warming and possibly give us more time to find solutions, but ultimately we need to get the carbon into the ocean or geologic reservoirs, or not emit it in the first place," he said.

Source: [www.nature.com](http://www.nature.com), August, 2007

# Protected areas and climate change

**Lee Hannah of Conservation International looks at how protected areas can help avoid climate-related extinctions.**

## Moving out? Climate change is leading to a net exodus of species from protected areas

As climate change redraws the range maps for numerous plant and animal species, these species may move in or out of forest protected areas, such as parks. Because parks cannot move, the species they protect may change. This was recognized in a series of classic papers by Rob Peters and Tom Lovejoy in the late 1980s and early 1990s (e.g. Peters and Lovejoy, 1992). These changes will alter the outcomes of conservation strategies and therefore need to be factored into conservation planning.

Recent work has shown that climate change is leading to a net exodus of species from protected areas (Araújo et al., 2004). This is because species may not be able to keep up with climate change; their suitable climatic range may shift faster than they are able to disperse, or move through urban or agricultural areas in which the species can't survive.

## Need for new protected areas, connectivity

Climate change will therefore require more protected areas to be established. The amount of new protection needed varies by region and will be greater in those parts of the world where the protected area systems don't adequately protect all of the species in the region in their current ranges. When this is the case, substantial investment may be required to move the protected area system to a strong, systematic base. However, this doesn't need to be done before climate change is accommodated. With adequate advance planning, much climate change response can be built in at the same time, or even instead of, completing protection for current ranges alone. If new areas to complete coverage of species' existing ranges are planned to coincide with areas that will capture shifts due to climate change, the overall area (and financial investment) required can be greatly reduced.

Adapting to climate change will also entail creating new connectivity, i.e. the provision of areas of natural or semi-natural land between protected areas to give species a pathway to protection or a path between one protected area and another. However, long-range connectivity may be expensive and difficult, so curbing climate change before species range shifts become too pronounced is critical.

## Policy and conservation response

The ultimate goal of conservation in the face of climate change needs to be maintaining species in the wild, with low



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required levels of management. The first and most important step towards this goal is an early halt to climate change, thus minimizing the damage that must be compensated by conservation actions such as new protected area. For limited change, new protected areas offer a way of conserving a surprisingly large number of species. Connectivity, which is much more expensive on a per-species basis, is then a last resort to maintain species in the wild. Connectivity is important for many other reasons however, and climate change may provide important rationales for decisions at the margin.

Araújo, M.B., M. Cabeza, W. Thuiller, L. Hannah, and P.H. Williams. 2004. *Would climate change drive species out of reserves? An assessment of existing reserve-selection methods*. *Global Change Biology* 10:1618-1626.

Peters, R.L., and T.E. Lovejoy. 1992. *Global Warming and Biological Diversity* Yale University Press, London.

This article is based on the following paper: Hannah, L., G. Midgley, S. Andelman, M. Araujo, G. Hughes, E. Martinez-Meyer, R. Pearson, and P. Williams. 2007. *Protected area needs in a changing climate*. *Frontiers in Ecology and the Environment* 5:131-138.

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## news in brief

**PNG's biggest protected area:** In September, three new wildlife management areas were created in Papua New Guinea, linking up with two existing protected areas. Together this will form the largest protected area in PNG and will protect almost 2 million hectares, straddling the borders of PNG and Indonesia. The new wildlife management areas will be managed by local landowner committees, with assistance from WWF to promote protection of wildlife and habitat, and sustainable enterprises such as eco-tourism.  
**Source:** www.panda.org, 28 September, 2007

**Corridor for 'new' wild ox:** Two local authorities in Vietnam have agreed to establish new nature reserves to protect the saola, a critically endangered wild ox discovered 15 years ago and found only in the Annamite Mountains of Vietnam and Lao PDR. The reserves will link up with the Bach Ma National Park to secure a landscape corridor for the saola and other important species. When the saola was discovered in 1992, it was the first large mammal to be discovered anywhere in the world since 1936. Very little is known about the species, the global population of which is thought to number no more than 250 individuals.  
**Source:** www.panda.org, 28 September, 2007

# The UNFCCC: expectations from Bali and beyond

**Ken Creighton, WWF-International's Senior Policy Advisor on Forests and Climate, assesses the outlook for forests at the UNFCCC CoP13 in December.**



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**Bringing standing forests into a post-Kyoto agreement could benefit forest-dependent people and biodiversity**

Addressing deforestation and forest degradation is now widely acknowledged as an important element of the evolving global climate change regime, due to both the contribution to global atmospheric greenhouse gas concentrations and the negative effects on local climate stability of, for instance, water resources. According to the 2006 UK government's Stern Review on the Economics of Climate Change (see [www.hm-treasury.gov.uk/media/8AC/F7/Executive\\_Summary.pdf](http://www.hm-treasury.gov.uk/media/8AC/F7/Executive_Summary.pdf)), "curbing deforestation is a highly cost-effective way of reducing... emissions and has the potential to offer significant reductions fairly quickly". Additionally, the United Nations Framework Convention on Climate Change (UNFCCC) Subsidiary Body for Scientific and Technological Advice (SBSTA) has

acknowledged that forest degradation needs to be addressed when developing mechanisms to reduce emissions from land use change.

So called "avoided deforestation" or "reduced emissions from deforestation and degradation" (REDD) projects are not recognized under the Clean Development Mechanism (CDM) of the UNFCCC during the first commitment period (2008-2012) of its Kyoto Protocol. The exclusion of standing forests, as opposed to afforestation or reforestation projects, from the CDM in the first commitment period stemmed from a number of concerns, including the urgent need to curb industrial emissions and intricate technical issues relating to whether forests can deliver

robust carbon benefits over the long term. These issues include for example the risk of “leakage” (if reducing deforestation and degradation in one place may result in displacement to other locations) and permanence (if forest carbon stores can succumb to disease, fire or illegal logging).

Nonetheless, there is now a growing international consensus that a post-2012 UN climate agreement must include measures to reduce emissions from forests. Thus, recent policy developments have started to address the concerns around leakage and permanence issues. “Pooling” of large forest areas and offering only a percentage of them as carbon stocks eligible toward meeting a carbon reduction target helps address the question of what happens if part of a forest does burn or succumbs to pests (essentially, “risk banking” as insurance). And widespread acceptance of the need to reduce forest-based emissions in the framework of national programs goes a long way towards addressing the concerns with potential leakage of sequestration efforts carried out at just a local project level.

### From Bonn to Bali

The main lead-up to the UNFCCC COP to be held in December this year was the 26th meeting of the SBSTA, in Bonn in May. The goal of conservation organizations concerned about deforestation and its impacts on global climate change going into SBSTA 26 was to lay the groundwork for a decision in Bali that would:

- empower developing countries to begin to address deforestation, forest degradation and their underlying causes and drivers;
- send a signal that new and additional financial resources would be made available from Annex 1 countries (broadly-speaking, industrialized countries) to expeditiously initiate REDD-related capacity building and pilot initiatives in non-Annex 1 countries (mostly developing countries);
- encourage documentation of the results of REDD-related policies and measures that could contribute to future convention deliberations concerning crediting of REDD within a future convention-linked compliance mechanism; and
- be based on a national-level approach that has the potential for producing scientifically valid and verifiable reductions in gross national emissions from deforestation and degradation that could be creditable under a revised compliance system during the “second commitment period” of the Kyoto protocol or a similar instrument agreed within the framework of the UNFCCC for post 2012.

Although much of the SBSTA text remains in [brackets] and is therefore still open for further discussion at Bali, the acknowledgement that degradation is an important component of the deforestation cycle, the recognition that significant financial resources are needed to begin addressing REDD – through “early action” projects to be

initiated even before a post-Kyoto agreement is decided – and the importance of national-level approaches or “frameworks” as a durable solution to REDD were encouraging steps forward. NGO members of the Climate Action network will nonetheless advocate that strong safeguards (project standards) be agreed by the Parties to ensure the environmental and social “integrity” of both national and project-level interventions.

If the draft decision text negotiated at SBSTA 26 is agreed by the Parties in Bali, it could lead to opening the door for recognizing Certified Emissions Reduction (CER) credits for REDD in a future convention-linked compliance regime. There is tacit agreement that such actions would not earn CER (Kyoto compliance) credits before 2012 but it leaves open the possibility of a posteriori crediting for early actions. This could also send a positive signal to voluntary markets that responsible and verifiable early actions might eventually earn credits or, at the least, develop sound methodologies that could be accepted to yield compliance-linked credits post 2012.

Looking beyond Bali within the UNFCCC process, there is an expectation that a path to bringing REDD within the Convention-sanctioned framework will be found that will provide adequate and appropriate compensation for REDD to drive lasting reductions on the scale needed for forest-based greenhouse gas emissions reductions to contribute their fair share toward global climate stabilization. This could be through either fund-based or market-based mechanisms or a combination of both approaches.

### Why is CoP13 so important for forests?

By agreeing to include forest-based carbon stocks (and deforestation-based GHG emissions) in the formal negotiations leading to a post-Kyoto instrument for reducing emissions and implementing the UNFCCC, the Parties will be taking a major step toward providing the fuel to attack deforestation and forest degradation via economic incentives. Even if funding to reduce emissions from forest conversion and degradation is “capped” at the proportion these represent of overall global emissions (approximately 20 percent), this would represent an orders-of-magnitude increase in financing for forest conservation. Including a mechanism to address forest degradation could provide impetus to increase forest certification and implementation of techniques such as low impact logging, bringing the production forest industry into the convention by extending the financial benefits of compensated reduction of GHG emissions to owners and managers of production forest landscapes. If done responsibly with appropriate revenue-sharing and effectively monitored environmental and social safeguards, this could generate significant co-benefits for forest-dependent people and biodiversity as well.

## Forests and climate change: the science in a nutshell



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**Kevin Gurney of Purdue Climate Change Research Center summarizes the science behind the forests and climate change links.**

The relationship between forests and climate change has emerged as not only a complicated biophysical problem but one with an array of socioeconomic and policy facets. The biophysical relationship between forests and climate rests on three coupled exchanges with the atmosphere: carbon, water and radiation.

### Carbon

Forests exchange carbon through photosynthesis and respiration and also through forest removal/destruction. The relationship between the photosynthesis/respiration cycle and climate change has emerged in the last two decades as a crucial feedback on climate change projections. Currently, the terrestrial biosphere removes roughly one-third of the sum of fossil fuel CO<sub>2</sub> and deforestation emissions each year and intact forests are likely a dominant contributor to that annual uptake. Understanding the exact nature of this removal has stimulated considerable scientific research yet remains incomplete. A compelling motivation for improving this understanding is the growing consensus that the fortuitous carbon uptake will weaken, or reverse in sign, as the planet warms. A significant development in the last few years is research suggesting that a warming planet could lead to widescale drought-stress in the tropical forests leading to massive die-off and the release of significant amounts of CO<sub>2</sub>, further exacerbating climate change.

**Intact forests play an important part in removing carbon from the atmosphere**

### Water and radiation

The exchange of water and radiation between forests and the atmosphere is a central element in the energy budget of the lower portion of the atmosphere. Forests and all plants act much like wicks, moving water from the soil to the atmosphere and accounting for roughly 70 percent of the total water moved from the land to the atmosphere each year. Forest cover is darker than most land cover types and as such, absorbs more radiation than exposed soil. These interactions allow forests to act as key regulators of local and regional climate and can potentially influence the global atmosphere should forest cover be significantly altered in the future. Aside from direct manipulation by humans, forests are sensitive, as are all plants, to water, temperature and a host of other crucial environmental variables. Hence, changes in the hydrologic cycle and temperature, anticipated with global warming, will be a key determinant of future forest cover, health, and biodiversity.

### The science-policy nexus

The reality of this research into the biophysical interactions has intersected in the last decade with the policy arena through the central role that carbon has played as the main 'currency' in international negotiations. In addition to tracking industrial emissions of greenhouse gases, the industrial countries will include exchange of carbon with forests in a variety of ways in the first commitment period of the Kyoto Protocol (2008-2012). Forest removal within these countries must be counted but countries can offset the total emissions with uptake by vegetation, including adding forest and managing existing stands. Tropical forests are included within the uptake mechanisms but with a cap on the available carbon credit. Not included in the first set of targeting is tropical deforestation which currently accounts for roughly 25 percent of global CO<sub>2</sub> emissions. Including the developing world within targeting and the importance of deforestation within those countries is emerging as one of the most critical negotiating elements and is intimately tied to how well science can quantify deforestation and other portions of the global carbon cycle. Proposals on how to construct national baselines and targets for deforestation that both ensure developed country effort on reducing fossil fuel emissions and adequately acknowledge the multiple benefits that forests provide, remain under intense discussion. It is fair to say that the role of forests within the climate change dialogue has moved to centre stage in the last few years. The renewed scientific and policy attention may turn the tide on large-scale forest destruction.

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## Climate change and forest livelihoods

**Esteve Corbera of the Tyndall Centre for Climate Change Research considers some of the climate change-related impacts and opportunities for forest-dependent people.**

Global climate change is not good news for forest-dependent people in developing countries. In its Fourth Assessment Report, the Intergovernmental Panel on Climate Change notes several predicted impacts on forests and rural livelihoods. At lower latitudes, especially in seasonally dry and tropical regions of Asia, Latin America and Africa, even small local temperature increases may reduce agricultural and forest productivity. In Latin America, increases in temperature and associated decreases in soil water are projected to lead to a gradual replacement of tropical forest by savannah in eastern Amazonia by mid century, with arid-land vegetation gaining prominence. Ecosystemic changes in tropical regions will translate into significant biodiversity loss, reductions in income derived from agricultural and forest products, and a consequential increase of hunger risk among rural populations.

**Poor farmers in the eastern Amazon stand to lose out as the savannah edges in**

### Forests as carbon reservoirs

The United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol (KP) have emphasized the critical role forests play as carbon reservoirs. Given the fact that an increasing proportion of the world's forests is being owned and/or managed by communities, it is vitally important to support these forest-dependent people in their efforts to manage forest ecosystems so that carbon sequestration levels increase, deforestation is halted and carbon forest stocks stabilized.

### Forests as a mitigation option

However, the financing sources to support sustainable forest management through the UNFCCC and the KP remain limited. The KP's Clean Development Mechanism (CDM) has only recognized afforestation and reforestation activities as eligible sources of carbon emission reductions. It has become an excessively convoluted instrument and as a result, only one plantation-based reforestation project in China is operational to date (Boyd, *et al.*, 2007). The voluntary carbon market has performed much better and several projects which support forest livelihoods and carbon sequestration have been developed in Africa, Asia and Latin America. Carbon forestry projects provide a new source of income through carbon revenues and help strengthen local capacities in forest management. Nevertheless, these projects can also exacerbate inequalities at the local level and undermine the access of the poor to forest assets; careful attention to their design and monitoring is therefore extremely important. Current



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negotiations on establishing a global framework to address deforestation through the UNFCCC confirms that forests are high on the agenda of policymakers. Here again, a thorough policy design is critical to ensure that carbon revenues reach those who may suffer most from poverty, climate change and forest degradation.

### Forests as adaptation buffers

Potential synergies exist between forest management and adaptation to climate change. Forest management can increase people's ability to cope with and recover from climate stresses. Yet, this causal relationship needs to be further tested, as the role of forestry activities in buffering against biophysical changes induced by climate change (floods, droughts, temperature increase) and in promoting financial diversification needs to be better understood. There is an opportunity to use the Kyoto Protocol's Adaptation Fund to support forestry and land-use activities and make of such projects a laboratory to explore the linkages between mitigation, adaptation, and the well-being of forest-dependent people.

Boyd, E., Roberts, T., Corbera, E., Bumpus, A., Shaw, A., Ferreira, E., Hultman, N., Liverman, D. and Brown, K. (2007) *The CDM: Lessons Learned and Prospects for the Future*. Tyndall Centre Working Paper. Tyndall Centre for Climate Change Research, Norwich and Oxford.

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# Climate change and forestry: a complicated relationship

**Charlotte Streck of Climate Focus considers the multiple roles that forests play in combating climate change, and the increasing prominence of forests in climate change policies.**

## Introduction

Climate change is one of the most severe challenges of humanity. Global warming and growing variability in our climate affects nearly all sectors of our economies and is intricately intertwined with other major environmental threats such as population growth, desertification and land degradation, air and water pollution, freshwater management, loss of biodiversity and deforestation. Until today, most of the (albeit strikingly insufficient) international attention on combating climate change has focused on the industrial and energy sector, treating agriculture, forest and other land-uses (AFOLU in climate jargon) more as an unwelcome distraction from the reduction of fossil fuel-based greenhouse gas (GHG) emissions, rather than as a key element of the climate change challenge.

In the context of the Kyoto Protocol, widespread controversies and a lack of knowledge made negotiators agree to too little too late. Since the 1997 adoption of the Kyoto Protocol, it has become clear however that any attempt at stabilizing atmospheric GHG concentrations will have to bring land-use related emissions and removals into the equation.

## Forestry and climate change

Forests are clearly impacted by climate change. A change in the combination of temperature and rainfall patterns causes a change to a forest ecosystem as it adapts to the new conditions. The stress caused by such climatic shifts may also increase the forest ecosystem's vulnerability to pests and fires.

At the same time, forests play an important part in controlling our climate, as they are our most important terrestrial storehouses of carbon. Forests can therefore add to the problem of climate change, but they can also be a tool in formulating mitigation solutions:

**Forest ecosystems can help mitigate climate change**



- Land-use changes, predominately deforestation, currently contribute about one-fifth of global carbon emissions. Deforestation is the single most important source of emissions in countries such as Brazil or Indonesia.
- Sustainably managed forests can produce wood and other biomass that offer a benign alternative to fossil fuels and construction materials. Forests can thus help to reduce energy-related emissions.
- Forest ecosystems contain the majority (approximately 60 percent) of the carbon stored in terrestrial ecosystems and have the potential to absorb about one-tenth of global carbon emissions projected for the first half of this century into their biomass, soils and products and store them – in principle – in perpetuity.

### Forestry and the Kyoto Protocol

The defining element of the Kyoto Protocol is a system of GHG emission targets that have to be complied with by all ratifying industrialized nations. Reflecting the Protocol's focus on energy and industrial GHG emissions, the targets of individual countries are calculated without taking into account forestry and land-use related emissions. During the negotiations of the Protocol, controversy was spurred by the question of whether parties should be allowed to offset emissions occurring in other sectors with removals generated by biological sequestration or whether their efforts should concentrate on the reduction of emissions from, primarily, the use of fossil fuels.

Those arguing against the accounting for, and using of, forestry offsets were concerned that carbon offsets may become void in cases where human action or natural events, such as wildfires, reversed the carbon benefits. If a tree is felled, the stored carbon is released and the temporary climate benefit reversed, i.e., the benefit is 'non-permanent'. Until today, the issue of the permanence of carbon storage forms the basis of concern for all activities that rely on the sequestration of carbon by trees or soils.

Eventually, parties decided that "direct human-induced" changes in GHG emissions and removals by sinks since 1990 could be used to meet part of the parties' commitments. Furthermore, Art. 6 and 12, which define the project-based mechanisms Joint Implementation and the Clean Development Mechanism refer directly (JI) or at least indirectly (CDM) to carbon sinks. Any forestry projects under the CDM are however limited to afforestation and reforestation. This means that while there is an incentive to restore and conserve temperate forests in industrialized countries, the most important source of emissions from the land-use sector – i.e. tropical deforestation – is currently not covered under the Kyoto Protocol and there is no incentive for developing countries to protect their forest resources.

During the 2005 United Nations Framework Convention on Climate Change annual meetings, Papua New Guinea and Costa Rica put forward a proposal to consider whether and how incentives to reduce tropical deforestation could be included in the future climate regime. This submission

created a lot of interest and earned significant support. Since then a number of ideas and technical approaches on how to expand the carbon market to create incentives for forest conservation have been tabled and are being discussed as part of a post-Kyoto agreement. There is some hope that the upcoming round of negotiations to be held in Bali in December this year will produce progress regarding the formulation of such an incentive framework.

### Outlook

Despite a common understanding that the AFOLU sector is far too important, both as a sink and a source, to be left behind in the negotiations one more time, differences remain as to when, if and how land-use related emissions should be integrated into a post-Kyoto regime. Negotiations currently focus on the definition of an instrument to reduce GHG emissions from deforestation (RED) in developing countries, leaving still aside the broader question as to how to integrate any AFOLU emissions, sequestration, and emission reduction into a post-Kyoto regime.

When it comes to the RED debate, a number of options are being proposed including both market and non-market based approaches. The most promising market-based approaches rely on the rewarding of tradable carbon credits once a country or project activity has generated a proven climate benefit by reducing GHG emissions. Several proposals argue that baselines should be developed at the national level to avoid leakage. In order to account for the challenges that developing countries face in establishing national-scale systems, it has been proposed to combine national approaches with the authorization of a CDM-type prompt start of sub-national approaches and project activities. Those arguing in favour of including project-based activities refer to the required level of resource mobilization, which goes beyond what public funds can make available, and the need to include incentives for project-level private activities.

In the context of the RED debate the old question of whether credits generated by RED activities or programmes should be fully fungible with other carbon markets has also regained prominence. To avoid a flooding of the market with RED credits, fungibility needs to be matched by strict emission limitations in industrialized countries. Another option would be to create a separate market and separate targets for avoided deforestation.

### Conclusions

Forest and biodiversity conservation are intrinsically linked to climate change mitigation and adaptation. If we lose forests, we also lose our biggest terrestrial carbon store and an important system for regulating freshwater and rainfall patterns. Omitting sinks from a post-Kyoto regime would leave out a major exchange of carbon, which could swamp any gains made through fossil fuel reductions under the Kyoto Protocol. It is therefore necessary that a post-Kyoto regime includes a comprehensive carbon accounting mechanism that provides the necessary incentive framework for conserving not only temperate and boreal, but – most importantly – tropical rainforests.



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makers have a unique opportunity to take action to increase forests' resilience and resistance to continuing anthropogenic climate change by employing adaptive measures now.

As recently outlined by IIED, strategies for adapting to climate change need to encompass both institutional and technical measures. Institutional measures may include, for example, increasing local ownership and access to forest resources, and developing local monitoring and analysis of climate change impacts (see Macqueen and Vermeulen, 2006, *Climate Change and Forest Resilience*; available online at [www.iied.org/pubs/pdf/full/11054IIED.pdf](http://www.iied.org/pubs/pdf/full/11054IIED.pdf)).

The technical adaptation measures outlined in the box below are taken from a recent WWF publication, *Buying Time: A User's Manual for Building Resistance and Resilience to Climate Change in Natural Systems* (Hansen et al., 2003; available online at [www.panda.org/climate/pa\\_manual](http://www.panda.org/climate/pa_manual)). The main principle behind these measures is to maintain or enhance ecosystem health to allow natural adaptation processes such as migration, selection, and change in structure to take place. In general, options to strengthen forest adaptation to climate change are not dissimilar from traditional forest conservation methods, although they place greater emphasis on increasing spatial and temporal scales, increasing connectivity, protecting key forest communities, and managing for increased disturbances and flexibility.

The effects of climate change are already occurring, yet we still have time to drastically reduce greenhouse gas emissions and ensure that our forests are resistant and resilient to climate change but we must act now.

## Preparing forests for climate change

**Michael Case of WWF International's Climate Change Programme looks at some of the options for strengthening forests' resilience to climate change.**

**Buffer zones and protected areas may help buy time for forests to adapt to climate change**

The Intergovernmental Panel on Climate Change projects a global average warming of 1.1 to 6.4°C by the end of the 21st century and overall an increase in global precipitation and evapotranspiration. Warming of the Earth's surface temperature, increased levels of CO<sub>2</sub>, and changes in climatic patterns may have substantial impacts on forested ecosystems affecting the distribution, composition, and growth of forests, which in turn may influence ecosystem processes and functions, including forest productivity and carbon sequestration. Further impacts will affect the unique biodiversity that forests harbour and the communities that rely on forests for ecosystem services such as regulating water supply and providing both commodity and non-commodity resources. However, managers and policy-

### Options to strengthen forest resilience to climate change

- Complete a vulnerability assessment;
- Reduce present non-climatic threats;
- Avoid fragmentation and provide connectivity;
- Maximize the size of the management unit and employ decision-making on a large biogeographic scale;
- Provide buffer zones and flexibility of land uses;
- Represent forest types across environmental gradients;
- Protect mature forest stands for ecosystem services;
- Protect functional groups and keystone species;
- Protect climatic refugia to protect genetic diversity and accommodate shifts in species composition and species migrations;
- Maintain 'natural' disturbance regimes, including fire;
- Actively manage invasive species;
- Prevent conversion to high-intensity forestry (e.g., plantations) and encourage sustainable use;
- Maintain genetic diversity and promote ecosystem health via restoration where applicable;
- Evaluate and consider assisted migration of species to new areas; and
- Encourage and promote management-science partnerships.

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# Forests, bioenergy and climate change

**László Máthé of WWF International considers both sides of the bioenergy-climate change link.**

**Bundles of Amorpha in Hungary, ready to be transported to the power plant**

Recent moves towards using renewable energy sources and reducing greenhouse gas (GHG) emissions have led many countries worldwide to switch to using fuelwood for their heating and electricity needs. In addition, wood, if sourced from responsibly managed forests, is seen as a very good alternative to GHG-intensive materials such as steel, plastic or concrete for packaging and construction. On the other hand, the last decade has seen a growing awareness about the role of deforestation and forest degradation in contributing to global GHG emissions. It is now estimated that deforestation is responsible for nearly 20 percent of global GHG emissions. It is difficult to see how we can best use forests to tackle climate change, given these conflicting demands. Things get even more complicated if we add nature conservation objectives to the picture and factor in the potential affects of climate change on forest productivity.

Using wood as an energy source or a raw material will lead to increased demand for wood and will therefore increase our forest footprint. With this in mind, several international organizations (such as the United Nations Economic Commission for Europe, and the EU) are looking at ways to mobilize wood from underutilized forests. Maintenance of high conservation values has to be a key element of these policies as most of the “underutilized” forests are in fact valuable habitats for biodiversity.

Decision-makers devising energy policies don't have an easy job, in the face of often controversial scientific evidence, trends towards increased energy consumption, and recent problems with energy security. The situation is also hindered by the very poor quality of forest inventory data. Some believe that in some cases a trade-off will have to be accepted (for example, involving more intensive wood production and less emphasis on nature conservation) in order to avoid the worst impacts of climate change, including species extinctions.

WWF sees climate change as a major threat to biodiversity that will potentially overshadow any other human-induced threat. Large-scale use of bioenergy is part of the solution (along with the use of other renewables, a focus on energy efficiency and the reduction of wasteful consumption), but only if it is produced in a responsible way. There is mounting evidence of how some unacceptable practices (such as the conversion of carbon-rich habitats for bioenergy feedstocks, and the unsustainable use of freshwater for irrigation) significantly reduce the carbon benefits provided by the use of such feedstocks. WWF will continue to promote credible



and independent schemes to ensure that large-scale deployment of bioenergy production will not create disproportionate environmental and social costs. In addition, the organization will support the development of mechanisms under the post-2012 climate regime aimed at reducing global emissions from deforestation and degradation by providing financial incentives to forest owners.

## Bioenergy and floodplain restoration in Hungary

Contrary to the negative press about the potential environmental and social impacts of bioenergy, this new sector can provide surprising solutions for nature conservation, as illustrated by a pilot restoration project in Hungary's Tisa floodplain. Invasive species are a particular problem for these restoration efforts – the most aggressive one being false indigo (*Amorpha fruticosa*), a fast-growing shrub from North America.

Removal of this invasive has been quite costly as it requires the use of heavy machinery to harvest the false indigo several times a year for more than a year. However, its suitability for bioenergy production (once dried, it burns well) has meant that the local power plant is willing to buy the biomass as fuel and the funds generated have been used to help finance the eradication work. Ideally, once the land is cleared of the invasive, the traditional extensive land-uses, including floodplain forests with native species, can be reintroduced as sustainable, diverse sources of local livelihoods.

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## Forestry carbon offsets need more transparency

**Samuel Fankhauser and Ian Johnson of IDEACarbon look at the need for better carbon standards and monitoring.**

**Rigorous carbon standards can help ensure that offset projects bring real benefits**

In 2002 British rock band Coldplay planted 10,000 mango trees in a small village in India to offset the carbon emissions from their second album, *A Rush of Blood to the Head*. Four years later the band had to admit that 40 percent of the saplings had died – casualties of poor project design and the arid south Indian climate. This well-known episode is a high-profile reminder of the inevitable risks of afforestation projects. It is also a call for better project management, more stringent quality standards and stricter monitoring.

Independent scrutiny and better standards are needed for all carbon projects, not just those in the forestry sector. But forestry projects are particularly challenging. People have raised genuine concerns about leakage (whether afforestation in one place triggers forest loss elsewhere), permanence (whether carbon is sequestered for good), additionality (whether projects would have happened anyway) and the complex time dimension that makes forestry projects more demanding than other emission reduction methods. As a consequence the scope for forestry projects under the Kyoto Protocol has been limited. However, ways to address leakage, permanence and additionality are now being developed for the post-Kyoto period and the voluntary market.

Then there is the question of sustainable development. The Clean Development Mechanism (CDM), but also many voluntary schemes, requires its projects to contribute to the sustainable development of the host nation. There are obvious synergies between carbon sequestration and sustainable development, but it is also possible to sequester carbon in a non-sustainable way, for example through fast-growing monocultures.

The sustainable development requirement is important both in its own right and because it helps to reduce project risks in general. We know that forest projects embedded in the local community are more likely to succeed. They are less likely to cause leakage and the carbon savings are more likely to be permanent. Perhaps most importantly, sustainable projects yield much wider benefits in terms of livelihood enhancement, biodiversity protection, habitat preservation and watershed protection, which may well be larger than the carbon revenues. Many forestry projects are attractive only if the whole range of benefits is taken into account.

The development of a credible standard and monitoring regime would not start from zero. There already are a number of existing standards and monitoring regimes in the forestry sector on which carbon offset standards could build. There are now also a number of afforestation and reforestation methodologies recognized by the Executive Board of the CDM.

Perhaps the best-known standards for carbon offsets are the Voluntary Carbon Standard (VCS), supported by the International Emissions Trading Association and the World Economic Forum, and the WWF-sponsored Gold Standard. However, the latter does not include forestry projects. Guidelines specifically designed for land-use projects include Plan Vivo and the Climate, Community and Biodiversity (CCB) standards, both developed by non-profit organizations and heavily focused on community-based approaches.

New technologies are emerging that make monitoring increasingly easy and more accurate. Advanced satellite and field-based methods are now available that allow a much more precise assessment of forestry changes than was possible a few years ago.

The building blocks to create sound, transparent and effective standards for forest carbon projects are thus in place, opening an important window of opportunity. The negative image created by the Coldplay forest has to be replaced by success stories that demonstrate the benefits of genuine, sustainable projects. Carbon offsets are a great opportunity to promote sustainable forestry, just as sustainable forestry offers great scope to offset carbon. It is a chance for developing countries to both benefit from and contribute to the international effort to reduce carbon emissions.

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# Forest loss, degradation and climate change

**David Huberman and Jeffrey A. McNeely of IUCN discuss the growing support for REDD.**

With deforestation accounting for a significant share of global human-induced greenhouse gas emissions (18 percent according to the FAO), it follows that maintaining mature forests ought to be one of the more effective means of reducing such emissions. It is therefore not surprising that the early negotiation rounds of the Kyoto Protocol included arguments that measures to slow deforestation should be included under the Clean Development Mechanism. However, the proposal to include “avoided deforestation” led to an impassioned debate among conservation and social justice organizations. The majority of these groups were concerned that such a proposition would enable OECD countries, the major emitters of greenhouse gases, to avoid their commitments to reduce fossil fuel consumption simply by paying forest-rich, developing nations not to deforest. While a few conservation organizations lamented a lost opportunity to be paid for keeping forests standing, doubts over “additionality” (whether those forests would really have been felled in the first place), “permanence” (whether a demonstrable reduction in the deforestation rate could be sustained over the long term) and “leakage” (whether a reduction in forest clearing in one location would simply accelerate deforestation elsewhere) won the day.

Now six years on, options for reducing emissions from deforestation and land degradation (REDD) have reappeared on the climate agenda and there is a very real possibility that provision for REDD will be made in follow-up arrangements to the Kyoto Protocol, due to come into force after 2012. Many of those who were adamant in their opposition to “avoided deforestation” are now prepared to consider, and perhaps even advocate for, REDD. So what has changed?

First, the growth of carbon markets worldwide has provided an increasingly attractive financial motivation for participation in credible climate mitigation action. Carbon investors are becoming more discerning – they want firm guarantees that land-use emissions avoidance contributes both to slowing climate change and reinforcing the sustainable use and conservation of biodiversity. Second, most of the new REDD proposals envision a broader sectoral context within which forest-based emissions accounting could take place. This reduces the possibility

that any individual action to curb forest degradation or slow deforestation in one specific location will be undermined by accelerated land clearance in a neighbouring area which has not been fortunate enough to attract carbon financing.

Uncertainty still exists but this time there is a general feeling that it need not translate to hopelessness or inaction. While the scale of carbon trading still pales in comparison to the timber market, the former continues to grow dramatically while trade from natural tropical forests is highly volatile with more and more tropical timber being plantation grown. Consequently, the climate mitigation benefit of reducing emissions through REDD could serve to stimulate better forest management and conservation.

That said, the potential of REDD extends well beyond its capacity to scale-up financial support for the conservation and sustainable management of biologically important forests. Above all, it represents an opportunity for the many overlooked values of forests to spread across our global consciousness. If the carbon market helps attract this sort of attention, then foresters and conservationists should not hesitate to wave their flag.

As the market for emission reductions from forests develops, there are some major concerns that will need to be addressed. High up on this list is the distributional mechanism to ensure that benefits reach forest-dwelling and forest-dependant communities, as highlighted in a recent report by Tom Griffiths of the Forest People's Programme (Seeing RED?, reviewed on page 16). The concern here is that governments will effectively nationalize forest-based carbon, thereby depriving local forest communities from any real benefits from REDD payments and from their rights to use their forest land for, say, shifting cultivation or timber production.

While the current Kyoto arrangements are expected to remain in force until 2012, it is not too early to begin addressing the opportunities and constraints of REDD. Top priority should be given to ensuring that forests are used to help address climate change in a way that is socially just, economically responsible, and environmentally effective.

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## WWF and REDD

**Soh Koon Chng of WWF International describes some of WWF's current work on forests and climate change.**

**Fighting a peat swamp forest fire in Borneo. WWF is working to help prevent these fires that release large amounts of carbon**

WWF is committed to keeping global warming well below a 2°C increase on pre-industrial temperatures and dramatically reducing deforestation. Given the key role of forests in mitigating climate change and the importance of reducing emissions from deforestation and degradation (REDD), these two goals are intertwined. WWF believes that a successor agreement to the Kyoto Protocol specifying targets for reducing industrial emissions and REDD can help achieve both goals. Setting these targets requires input from technical and political realities on the ground.

WWF is therefore developing a portfolio of field-based projects on sequestration and REDD to gain knowledge and experience that can feed directly into ongoing policy debates, enhance project design and management, and influence actions taken by other organizations, governments and the corporate sector.

Guidelines are being developed to help ensure high quality standards and steer the carbon market towards investment in projects that do more than just reduce global warming. Projects should be designed and implemented so that they contribute to maintaining global biodiversity values, providing goods and services to forest-dependent peoples, preserving cultural heritage values and contributing to sustainable development objectives of rural communities.

One such project is the Terai Arc Landscape Programme, jointly implemented by WWF and the government of

Nepal. This integrated programme, with landscape-wide restoration activities, provides useful insights for forest carbon projects that also benefit biodiversity conservation and local livelihoods. The project uses an "institutional restoration" approach, shifting forest ownership and management to local communities. This has resulted in reduced incidences of forest fires, encroachment, and theft of forest products, as well as a switch from fuelwood to biogas by the communities. These changes have together kickstarted natural forest regeneration processes.

In Indonesia, WWF has built up a wealth of experience in REDD-related activities. For example, in Central Kalimantan, where peat swamp forests are estimated to store Borneo's largest amount of carbon, WWF has initiated simple but effective approaches to restore peatland, such as canal blocking that prevents peatland drainage and therefore fires. WWF is also helping the government to develop a framework for REDD, and is involved in the Indonesia Forest Climate Alliance, led by the Ministry of Forestry. The Alliance has created a multiplier effect at the local level, with several provincial governors making unprecedented commitments to address climate change through protecting millions of hectares of natural forest.

Both in Brazil and Papua New Guinea, WWF is looking at the link between protected areas and REDD. In Brazil, an upcoming study will analyze the Amazon Region Protected Areas (ARPA) Programme as a recipient of REDD financing. ARPA's public/private partnership design, its large-scale, comprehensive plan for consolidating protected areas, its long-term financial design and successful track record make it a strong model for stemming deforestation through the creation and sound management of protected areas. WWF is working with ARPA partners and the German aid agency, GTZ, to demonstrate how protected areas can serve as a tool for REDD, and then disseminate this model beyond Brazil. In PNG, awareness of REDD is growing and WWF is discussing with the government and private sector the prospects for carbon accounting and support for REDD projects. The challenge remains to ensure that Papua New Guineans, especially rural landowners, benefit from funds that might flow from new carbon trading systems for REDD.

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### WWF news in brief

**New forest director:** Rod Taylor is WWF International's new Forests Programme Director. He replaces Duncan Pollard who has been promoted to Director, Conservation Practice and Policy, overseeing WWF's global climate change, forests, freshwater, marine and species programmes, among others, following restructuring of the WWF International secretariat. Rod has over 20 years' experience in policy-related natural resource management. He joined WWF in 1998 as Coordinator of the WWF-World Bank Alliance and later as Asia-Pacific Forest Coordinator. Rod also initiated WWF's Global Forest and Trade Network (GFTN) in the Asia-Pacific region.

# A forest conservation focus on climate change

15

**Liz Schmid of IUCN's forest conservation programme outlines IUCN's main avenues of forest-related work on climate change.**

Tackling climate change is a top priority for IUCN. As we address the various manifestations of a changing climate with our members, forests emerge as both part of the problem and part of the solution. IUCN therefore strives to ensure that the positive contribution that forests can make to climate change mitigation is better understood and utilized.

## Carbon sequestration

Forests contribute approximately 20 percent of the greenhouse gas emissions and therefore can potentially contribute to avoiding these same emissions. To harness this potential, IUCN develops best practices for carbon sequestration initiatives to conserve biodiversity and support livelihoods. Drawing on our expertise in ecosystem management, we help countries to design measures to prevent deforestation and land degradation and to restore forest landscapes.

## Adaptation

IUCN, together with the International Institute for Sustainable Development (IISD) and the Stockholm Environmental Institute and Intercooperation, have developed and field-tested a project management tool called CRiSTAL (Community-based Risk Screening Tool Adaptation & Livelihoods). CRiSTAL enables project planners and managers to assess an intervention's impact on local capacity to cope with climate stress, and to consider how to adjust project activities to further enhance local coping capacity. This tool has been field-tested on planned or ongoing natural resource management projects in Mali, Bangladesh, Tanzania, Nicaragua and Sri Lanka. In addition, CRiSTAL is currently being used in Zambia, Tanzania and Mozambique, as part of the IUCN Climate Change and Development Project. This project aims to ensure that climate change-related policies and strategies lead to adaptation activities that emphasize the role of forests and water resources in supporting people's livelihoods and associated farming systems.

## Reinforcing the forest sector's engagement in the climate change debate

IUCN is currently laying the groundwork for a process that would support coordinated outreach from national forest agencies to their government colleagues dealing with climate change, using established coalitions in which IUCN participates, such as the Global Partnership for Forest Landscape Restoration and The Forest

Dialogue (TFD). Governments have already expressed their willingness to input and lend political support to a more integrated approach to addressing forests within the climate change arena at the highest level. Interest has also been voiced by the World Business Council for Sustainable Development.

## IUCN Climate Fund

The IUCN Climate Fund provides a mechanism for IUCN members and partners who would not otherwise engage in the carbon market to develop and participate in projects that reduce CO<sub>2</sub> emissions and strongly contribute to sustainable development. Positive progress is already being made in:

**Mt Elgon, Uganda**, where at least 1,000 hectares of degraded forest and at least 50 kilometres of boundary forest will be restored using indigenous trees.

**Huong river basin, Vietnam**, where the increased flooding caused by timber extraction for construction and fuelwood will be curtailed by restoration of the upper forest catchment area and by the rehabilitation of the coastal wetlands.

**Meso-America**, where at least 7000 hectares of degraded forest in the upper watershed of the Tacana Volcano area on the border of Mexico and Guatemala are being restored. The income generated from the sale of the carbon credits will provide a much-needed alternative source of income for farmers who are suffering from depressed coffee prices.

Beyond the project level, the major challenge facing IUCN and the conservation community at large when it comes to forest-related climate change work is how to develop strategies to manage the uncertainties created by climate change and to keep future management options open.

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## IUCN news in brief

Climate change flyer: IUCN has just produced a flyer to highlight its approach to the challenges of climate change. Two priorities of the organization are to reduce greenhouse gas emissions and improve the capacity of the world's ecosystems and communities to adapt to inevitable climate change impacts. The flyer is available at: [www.iucn.org/themes/climate](http://www.iucn.org/themes/climate)



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The next issue of *arborvitae* will be produced in December 2007 (copy deadline mid-November) and will focus on forest conservation tools. If you have any material to send or comments please contact:

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Back issues of *arborvitae* can be found on:  
[www.iucn.org/forest/av](http://www.iucn.org/forest/av)

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The editors and authors are responsible for their own articles. Their opinions do not necessarily represent the views of IUCN and WWF.

## Reviews in brief

### Brief encounters

**There has been a recent flurry of briefing papers on forests and climate change, put out in the run-up to the United Nations Climate Change Conference (CoP13) in December. Here is a selection:**

**Can standards for voluntary carbon offsets ensure development benefits?** ODI Forestry Briefing 13 (July 2007).

Downloadable at:  
[www.odi.org.uk/fpeg/publications/policybriefs/forestrybriefings/0707\\_forestrybriefing13\\_carbonoffsets.pdf](http://www.odi.org.uk/fpeg/publications/policybriefs/forestrybriefings/0707_forestrybriefing13_carbonoffsets.pdf)  
This is the most recent in a series of ODI briefs on climate change-related issues. In six pages, it summarizes well how the current carbon standards are assessing sustainability issues and gives a set of policy recommendations for the design of robust and relevant standards.

**Climate, Carbon, Conservation and Communities** IIED/WWF Briefing (August 2007).

Downloadable at:  
[www.iied.org/pubs/pdf/full/17011IIED.pdf](http://www.iied.org/pubs/pdf/full/17011IIED.pdf)  
The latest in a series of IIED briefs on climate change, this four-page brief looks at the strengths and weaknesses of carbon funds in addressing conservation and development objectives. It provides some examples of conservation-carbon projects that have generated both carbon and biodiversity benefits.

### Tropical Forests and Climate Change

Forestry Advisers Network of the Canadian International Development Agency (June 2007).

Downloadable at: [www.rcfa-cfan.org/english/pdf/Tropical\\_Forests\\_and\\_Climate\\_Change\\_2007.pdf](http://www.rcfa-cfan.org/english/pdf/Tropical_Forests_and_Climate_Change_2007.pdf)

This paper, while not so brief (14 pages), gives a succinct yet comprehensive picture of all the key issues, and the relevant facts and figures. Accessible to those unfamiliar with all the technicalities and acronyms in this field, it is a good first port-of-call for those interested in learning more about the interconnections between forests and climate change.

### A RED hot issue

Downloadable at:  
[www.forestpeoples.org/documents/ifi\\_igo/avoided\\_deforestation\\_red\\_jun07\\_eng.pdf](http://www.forestpeoples.org/documents/ifi_igo/avoided_deforestation_red_jun07_eng.pdf)

As the debate about including reduced emissions from deforestation (RED) in a post-Kyoto global deal on climate heats up, the recent publication *Seeing 'RED'? 'Avoided deforestation and the rights of Indigenous Peoples and local communities'* by Tom Griffiths of the Forest Peoples Programme is a timely reminder of the safeguards that need to be in place to ensure that local people in developing countries don't end up footing the bill for their forests soaking up the rich world's carbon.

Unfortunately there is a long history of local people losing control over formerly "worthless" natural resources as soon as the latter start fetching good prices in world markets. The risks highlighted by

Griffiths – including violations of poor people's rights to own and use ancestral or customary lands and undue restrictions placed on their forest-dependent livelihoods – are very real.

The publication contains detailed critiques of two field projects. FACE/Profafor in Ecuador and the Noel Mercado National Park in Bolivia. Further assessments of progress made and challenges encountered by ongoing avoided deforestation and forest restoration pilot projects would be helpful in drawing lessons learned from experience, and putting in place safeguards to protect local people's interests.

The front cover photograph suggests that FACE project staff has been involved in shootings of farmers in the Mount Elgon National Park in Uganda, although there is no critique of this project in the text. This is somewhat unfortunate as according to IUCN's sources, FACE was not linked to the shootings and actually has achieved much progress in putting in place mutually beneficial collaborative management agreements with local communities for the planting of 7,000 hectares of native trees. The communities are benefiting not only from employment opportunities but also from permission to harvest selected natural resources in the areas planted. The efforts by FACE, who are working in close collaboration with the Uganda Wildlife Authority, to provide real benefits to local communities as well as enhance biodiversity conservation were recently recognized through a Forest Stewardship Council certificate.

### Podcast proceedings!

Downloadable at: [www.eci.ox.ac.uk/news/events/070320presentations.php](http://www.eci.ox.ac.uk/news/events/070320presentations.php)

Here's a novel idea from Oxford University's Environmental Change Institute. The papers presented at a three-day conference on *Climate Change and the Fate of the Amazon* (in March this year) have been made available as podcasts. Powerpoint slides are also available for most of the presentations. The presentations, by a wide range of experts in various fields, are brought to life, so listeners can almost imagine being there. Something to put in your iPod for your next jog?

### New tree map reflects warming

Downloadable at:  
[www.arborday.org/media/zonechanges2006.cfm](http://www.arborday.org/media/zonechanges2006.cfm)

The Arbor Day Foundation recently released an updated map of US Hardiness Zones, to show which tree species are suitable for planting in different parts of the country. The new map reflects significant warming of large areas of the US since the last map was produced by the United States Department of Agriculture in 1990. Significant portions of many states have shifted at least one full hardiness zone, and some areas have even warmed two full zones. The website above also includes an interactive map, illustrating the changing zones.