



Simply REDD

CIFOR's guide to forests,
climate change and REDD



When people debate climate change they often use scientific and technical language. The terms and acronyms we hear can cloud the issues if we don't know what they mean. The Center for International Forestry Research (CIFOR) has prepared this simple guide to help journalists, policy makers, NGOs and interested global citizens better understand the importance of forests in combating climate change. It also highlights issues that CIFOR's research has identified as crucial if the global climate agenda is to progress in a way that is effective, efficient and equitable.

Q: Why must we protect forests if we want to curtail climate change?

A: Scientists estimate that deforestation and forest degradation account for around 20 percent of the annual greenhouse gas emissions that fuel climate change. This is more than the emissions from the entire global transport sector.

Q: How can emissions from forests add up to more than all the emissions from cars, trucks, airplanes, and ships combined?

A: When forests are damaged or cleared the burned or decaying wood releases the carbon stored in trees as carbon dioxide, increasing levels of this heat-trapping, greenhouse gas in the atmosphere. In addition, some forests protect large quantities of carbon stored below ground. For example, when forests in peatland are burned or drained, the carbon emissions are not limited to the above-ground vegetation; the organic matter below ground also begins to release carbon. Peatland forests have more carbon below the ground than above it. This carbon leaks out of the soil and into the atmosphere after the forest is cut.

When the trees have gone, the Earth loses a valuable resource that was continuously absorbing carbon dioxide already in the atmosphere. Recent studies have suggested that just under five billion of the 32 billion tonnes of carbon dioxide emitted annually through human activity are absorbed by forests. So losing a stand of trees is a double loss: We lose an ecosystem that absorbs greenhouse gases and we lose the carbon storage the trees provide.

Q: So what should happen? Fence off all forests?

A: No. Forests are integral to the lives of the people who live in and around them and to society as a whole. According to the World Bank, over one billion people rely heavily on forests for their livelihoods. Hundreds of millions rely on medicines derived from plants harvested in forests. A large portion of the dietary protein consumed by rural communities comes from hunting and fishing on forested land. Forests are also important from a commercial perspective. In 2003, the international trade in sawn wood, pulp, paper and boards was worth almost US \$ 150 billion – over 2 percent of world trade.

We can expect the conversion of forest to agricultural land to continue. But it must be done in a measured, strategic and sustainable way. Uncontrolled logging, clearing and burning of tropical forests should be stopped. We also need to stop the large-scale disruption of carbon-rich peatland, which releases disproportionately large amounts of greenhouse gases when cleared and drained.

Q: Will anybody lose out if we try to control forest destruction?

A: Forests are usually cleared because there is money to be made from doing so. Converting forest to cash crops like oil palm, for instance, generates financial profits. So some short-term economic sacrifices will have to be made. But in the interests of equity poor, forest-dependent communities should not be the ones to suffer. Over the long term, everyone will benefit from more sustainable management of forests. If the greenhouse gases stored in forests are released, it will take generations to recapture them. So if large areas of forest continue to be lost, then we could find ourselves in a nightmare scenario.

Q: What is the nightmare scenario?

A: The most common one is called a positive feedback loop; a self-perpetuating and accelerating cycle of cause and effect. If enough forests are destroyed, more carbon in the atmosphere both from forest destruction and other human activities could lead to the destruction of what's left. More carbon emissions could lead to a warmer climate, which in turn could lead to more frequent droughts and forest fires, resulting in the release of even more carbon dioxide, which could lead to an even warmer climate. Forest exposed to repeated burning cannot recover, and can no longer store or absorb carbon. If we don't act soon, we could undermine the potential role forests can play in mitigating emissions.

Q: What should be done now?

A: There is a lot of positive work being done to address climate change through forest conservation. CIFOR's research focuses on two aspects: adaptation and mitigation.

Q: What is adaptation?

A: As the climate changes, forests and people will have to cope with gradual changes in average temperatures and precipitation rates. They will also face more frequent and intense weather events such as droughts or floods. Adaptation strategies can help people manage the effects of climate change and protect their livelihoods. CIFOR's research promotes the inclusion of effective climate change adaptation strategies into forest management plans, and seeks to ensure that forests are sufficiently incorporated into strategies for the adaptation of society as a whole.

Q: What are some examples of adaptation projects?

- A:** This is a new area of forest policy research, but to date examples include:
- Ensuring enough forests are left in watersheds to slow soil erosion, anticipating the more intense rainfall that climate change may provoke
 - Preserving corridors of forest to enable wildlife and plant species to move into suitable climates
 - Charting buffer zones to stop the spread of forest fires
 - Planting tree species that tolerate higher temperatures and extreme weather events

Many sectors have a stake in adaptation policy. For example, ministries of transportation want to conserve healthy forests because thick haze from forest fires can shut down airports, and landslides can close roads. Providers of drinking water and hydropower companies are starting to consider upstream ecosystem management, including forest management. They want to reduce their vulnerability to shifting rainfall patterns and ensure the quality and quantity of their water supply.

Q: What is mitigation?

- A:** Adaptation and mitigation are complementary. Adaptation deals with the consequences of climate change while mitigation deals with the causes. We need both because scientists expect the effects of previous emissions to continue for some time even if we were to stop emitting greenhouse gases immediately.

Q: How can the pace of climate change be slowed or mitigated?

- A:** Most mitigation efforts must come from reducing the use of fossil fuels in industrialised countries. Planting new trees to sequester carbon will also play a role. But to reduce the 20 percent of emissions related to forests, we need a new and more effective approach to conservation. One approach is called REDD, short for ‘reducing emissions from deforestation and forest degradation’. This idea differs from previous attempts to preserve forests because it directly links financial incentives for conservation with carbon stored in forests.

Q: How would REDD work?

- A:** Credits from reduced emissions, also called ‘avoided deforestation’, would be quantified. That positive quantity would then become a credit that could be sold in an international carbon market. Alternatively the credit could be handed to an international fund set up to provide financial compensation to participating countries that conserve their forest. REDD schemes allow forest conservation to compete on economic terms with the drivers of deforestation. Current economic drivers favour destructive logging practices and conversion of forest to other uses, such as pasture for livestock and arable land.

Q: For REDD schemes to take root what are the challenges?

A: Four key challenges have been identified:

- **Measuring carbon**

To place a value on the carbon-bearing potential of any forested area, we must accurately estimate how much carbon is being stored there. New technologies such as satellite imaging and computer modelling are making the measurement of carbon stocks both swift and accurate. A transparent system to measure and verify emission reductions now looks feasible.

- **Making payments**

How will countries be rewarded and what form will that reward take? Who should be paid for protecting a specific forested area: national governments, local forest communities or logging companies? Donor countries are asking that payments should benefit poor people. National governments in countries likely to benefit from REDD, however, may wish to retain control over how payments are distributed.

- **Accountability**

If a REDD payment is made, but a forest still gets destroyed, what then? What can be done to ensure that carbon payments lead to sustained forest protection?

- **Funding**

Should developed countries create a fund to reward countries that reduce emissions from deforestation? Or, should these emissions reductions be linked to a market-based carbon trading system? How would such a market system work in practice?

Researchers and policy makers are beginning to realise that REDD schemes are unlikely to be 'one size fits all' solutions. The best way to design and implement a global REDD regime may be to allow countries to proceed in parallel with several different models. That way, a range of new schemes can evolve and each country can select what works best for its particular set of circumstances.

Q: What about the voices and rights of Indigenous People who depend on the forest for their livelihoods?

A: Indigenous People and traditional communities are crucial to the process. More effort is needed to make sure their land and resource rights are recognised. Payments for carbon services could tempt government officials, private companies or local elites to take this new forest value away from local communities unless their property and tenure rights are secured. REDD architects must fully address the rights of forest communities before taking action to reduce forest-based carbon emissions. Trade-offs between reducing carbon emissions and reducing poverty may be required. The rights of local communities to exploit forests may have to be balanced against the need for concerted global action on climate change.

Q: What has put REDD on the global agenda?

A: The United Nations Framework Convention on Climate Change (UNFCCC) 13th Conference of the Parties (COP 13) in Bali in 2007 produced the Bali Action Plan; a process for negotiating a global climate strategy to succeed the Kyoto Protocol. This plan acknowledged the importance of forests in addressing climate change, and the enormous potential boon REDD represents. REDD initiatives can deliver significant climate change mitigation benefits along with co-benefits. These include protecting the environmental services that forests offer, improving the livelihoods of forest-dwelling communities and clarifying land tenure rights.

Q: What stage are global negotiations on REDD at?

A: December 2009 will mark the end of a two-year consultation period. UNFCCC negotiators at the UN Climate Change Conference in Copenhagen will decide whether a REDD mechanism will be included in the post-2012 global climate agreement. Negotiators are likely to reach a general agreement that includes REDD and defines its scope, but schedules the detailed technical and methodological discussions for later negotiations. This is what happened with many elements of the Kyoto Protocol.

Q: Some people are talking about REDD+. What is it?

A: A year after the Bali Action Plan was agreed, negotiators met again in Poznan, Poland. They reached a general consensus that REDD activities should be broadened. This approach is called REDD+ (REDD plus). Financial transfers under REDD+ will not just be used to curb deforestation and forest degradation, but also for conserving forest carbon stocks, sustainable forest management and enhancement of forest carbon stocks through tree planting and rehabilitation of degraded lands. Such a mechanism has the advantage of allowing many parties with different national circumstances to be included in a future framework. Is REDD+ feasible? That question is likely to be a key issue at negotiating rounds this year.

Q: Who benefits from REDD+?

A: When REDD was first devised at COP 13 in 2007, the idea was most attractive to countries with high rates of deforestation. These countries have the greatest potential to significantly reduce their emissions from forest loss and to reap the greatest benefit when they do. Under the broader REDD+, countries that are already effectively protecting their forests can also benefit. Sustainable practices that help poor people, such as allowing communities access to forest goods, will also be recognised and rewarded. Replanting initiatives in deforested and degraded areas will also be taken into consideration. If REDD+ is on the table, more countries are likely to support or ratify a future agreement. However,

REDD+ requires a more complex framework to accommodate all of these categories, which could lead to higher transaction and implementation costs.

Q: Who is trying to solve REDD's technical challenges, and how?

A: Two major global initiatives are underway to help developing countries implement future REDD mechanisms:

1. The **United Nations REDD Programme Fund**, UN-REDD, offers developing countries extensive support on deforestation and forest degradation issues. The programme offers capacity building, helps design national strategies and tests financing approaches and institutional arrangements to monitor and verify reductions in forest loss. UN-REDD is operating in nine countries: Bolivia, the Democratic Republic of the Congo, Indonesia, Panama, Papua New Guinea, Paraguay, Tanzania, Vietnam and Zambia. Demonstration projects have already commenced in a number of tropical forest areas and will examine the specifics of how REDD will work in practice.
2. The World Bank is coordinating the second global initiative: **the Forest Carbon Partnership Facility**. The FCPF is similar to the UN programme, but is much larger in scale. It is operating in 29 countries: Argentina, Bolivia, Cambodia, Cameroon, Central African Republic, Chile, Colombia, Costa Rica, the Democratic Republic of the Congo, El Salvador, Equatorial Guinea, Ethiopia, Gabon, Ghana, Guatemala, Guyana, Honduras, Indonesia, Kenya, Lao People's Democratic Republic, Liberia, Peru, the Republic of the Congo, Suriname, Tanzania, Thailand, Uganda, Vanuatu and Vietnam.

These two initiatives coordinate missions when operating in the same country and hold their policy meetings back-to-back to allow participants to share ideas. Both initiatives also have several REDD demonstration activities underway in different countries to better understand how REDD can be implemented and to test the workability of different approaches. The progress and outcomes of these initiatives will help UNFCCC negotiators decide whether forest-related carbon dioxide emissions can be measured and whether proposed REDD mechanisms can work.

Q: What will REDD cost?

A: According to the influential *Stern Review on the Economics of Climate Change*, the resources required to halve emissions from the forest sector up to the year 2030 could be between US \$17 billion and \$33 billion per year.

Q: And where could this money come from?

A: Money could come either directly from international financing schemes, or from national government programmes. Some funds are already available for REDD demonstration projects through the voluntary carbon market, but most money channelled through the new funds or markets that could result from UNFCCC negotiations will not be available for several years.

Glossary

Coming to terms with forests and climate

Climate change has spawned many new technical words and phrases.

This list offers some helpful definitions.

Adaptation: adjustments in natural or human systems that try to reduce the damage caused by climate change or to exploit the benefits.

Afforestation: planting new forest on land that has not previously supported forest.

Anthropogenic emissions: greenhouse gasses associated with human activity, such as deforestation or forest degradation from logging.

Biofuels: fuel from renewable biological sources in either solid or liquid form. Biofuel crops associated with deforestation include palm oil, sugar cane and soya.

Cap and trade: a two-part regulatory system in which the 'cap' is a government-imposed limit on carbon emissions, and the 'trade' is a government-created market to buy and sell greenhouse gas credits. Companies that generate less than the allowed emissions can sell credits allowing others to emit more gases than the cap allows.

Carbon dioxide (CO₂): a gas occurring naturally in the atmosphere. This gas is produced as a by-product of combustion when, for example, fossil fuels and biomass decay or burn. Carbon dioxide can also be emitted with changes in land use and during industrial processes.

Carbon markets: financing bodies and mechanisms that can exchange the carbon credits generated from verified REDD activities. This could take the form of 'voluntary markets' (that are formed under agreed bilateral mechanisms between the trading parties) or 'compliance market' (that are legally regulated to meet emission reduction target under multilateral agreements).

Carbon trading: transaction of verified or certified carbon credits generated from REDD in monetary terms.

Carbon pool: A system which has the capacity to accumulate or release carbon. Examples of carbon pools are forest biomass, wood products, soils and atmosphere.

Carbon sequestration: the uptake and storage of carbon. Trees absorb carbon dioxide and release oxygen via photosynthesis. Trees also store carbon in their biomass.

Carbon sink: any process or mechanism of absorbing carbon dioxide and retaining stocks of carbon in organic matter such as forests, oceans and soil.

Carbon tax: a surcharge levied on consumers who emit carbon dioxide into the atmosphere.

Clean Development Mechanism (CDM): a scheme that helps industrialised countries meet their Kyoto Protocol emission targets in two ways besides reducing their own emissions: they can invest in reducing greenhouse gas emissions or in enhancing greenhouse gas sinks in developing countries.

Climate change: a change in the mean meteorological parameters that define climate or their variability. These parameters include temperature, rainfall and wind speed.

Co-benefits: benefits from implementing REDD schemes in addition to reducing greenhouse gas emissions, such as poverty alleviation, biodiversity protection, and improvement in forest governance.

Conference of the Parties (COP): a decision-making body comprised of the parties that have ratified the UN Framework Convention on Climate Change.

Deforestation: the change of forested land to treeless land.

Ecosystem: a community of organisms and their physical environment.

Ecosystem services: the benefits that an ecosystem provides to humans. For example, forests provide food, water, timber and fibre. They regulate climate, floods, disease and water quality. They also provide recreational, aesthetic and spiritual benefits.

Global warming: the increase in the Earth's average temperatures year to year, which leads to changes in the climate.

Greenhouse effect: when gases such as carbon dioxide prevent the energy generated by the sun and radiated back from the earth in the form of heat to escape the Earth's atmosphere.

Greenhouse gas sink: any process or mechanism which removes a greenhouse gas, an aerosol, or a precursor of a greenhouse gas from the atmosphere.

Intergovernmental Panel on Climate Change (IPCC): a joint UN Environment Programme–World Meteorological Organisation body responsible for providing the scientific and technical foundations for the UN Framework Convention on Climate Change.

Kyoto Protocol: an international agreement covering the period 2008–2012 to slow climate change. Under the protocol industrialised countries agreed to reduce their collective greenhouse gas emissions by 5.2 percent from 1990 levels.

Leakage: what occurs when a reduction of emissions in one area leads to an increase in emissions in another area. For example, a REDD project that protects

forest in one area, but leads to increased deforestation activities elsewhere. Leakage is also known as emission displacement.

Liability: the obligation of the REDD implementing project or country to ensure that the emission reductions that have been credited are permanent.

Mitigation: actions to reduce greenhouse gas emissions and to enhance carbon sinks to curb climate change.

Nationally appropriate mitigation action (NAMA): voluntary or mandatory action by a developing country to reduce its carbon emissions in line with its economic, environmental, social and political context.

Payments for environmental services (PES): schemes where beneficiaries of ecosystem services pay those who manage them to ensure the services continue.

Peat: an accumulation of partially decayed vegetation matter. Peat forms in wetlands, including bogs, moors and peat swamp forests.

Permanence: the duration and reversibility of reduced greenhouse gas emissions.

Planted forest: wooded land where trees have been established through planting or seeding.

Primary forest: wooded land of native species largely untouched by human activities and where ecological processes are not disrupted.

REDD, or reducing emissions from deforestation and forest degradation: a mechanism to reduce global greenhouse gas emissions by compensating countries for avoiding deforestation and degradation.

REDD+: broader REDD frameworks which include forest conservation, sustainable forest management or enhancement of forest carbon stocks to encourage greater participation in REDD and to reward countries that are already protecting their forests.

Reduced impact logging (RIL): planned and carefully controlled tree felling to minimise its impact on the surrounding environment. RIL can also reduce the carbon emissions that logging activities cause.

Reforestation: establishment of forest plantations in areas regarded as former forest lands.

Stern Review: Sir Nicholas Stern's report in 2006 for the British government that examines the effect of climate change on the world economy. The Stern Review was not the first such report but it is perhaps the most influential.

UN Framework Convention on Climate Change (UNFCCC): 1992 treaty calling for the stabilisation of greenhouse gas concentrations in the atmosphere at a level that would not 'dangerously' affect the earth's climate.

Facts and Figures

Forest Cover¹

- The total forest area of the world is about 4 billion hectares, which represents nearly 30 percent of the Earth's landmass. Approximately 56 percent of these forests are located in tropical and subtropical areas.
- Forest cover is unevenly distributed. Only seven countries possess about 60 percent of it, 25 countries around 82 percent and 170 countries share the remaining 18 percent.
- Planted forests account for approximately 3.8 percent of total forest area, or 140 million hectares.

Forest Loss²

- Net global forest loss is estimated to be about 7.3 million hectares per year for the period 2000–2005.
- This represents a decrease from the period 1990–2000, for which the average deforestation rate was 8.9 million hectares per year.
- The highest amounts of deforestation occurred in South America, with 4.3 million hectares per year, followed by Africa with four million hectares per year.

Forests and Livelihoods

- More than one billion people rely heavily on forests for their livelihoods.³
- More than two billion people, a third of the world's population, use biomass fuels, mainly firewood, to cook and to heat their homes.
- Hundreds of millions of people rely on traditional medicines harvested from forests.⁴

1 Food and Agriculture Organisation of the UN (FAO) 2007 *State of the World's Forests 2007*, FAO, Rome.

2 FAO 2009 *State of the World's Forests 2009*, FAO, Rome.

3 World Bank 2004 *Sustaining Forests: A Development Strategy*, Washington.

4 UN Department of Economic and Social Affairs 2009 Indicators of Sustainable Development www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/poverty/without_electricity.pdf (1 June 2009).

- In some 60 developing countries, hunting and fishing on forested land supplies more than a fifth of protein requirements.⁵

Forests and the Economy⁶

- In 2003, the international trade in sawn wood, pulp, paper and boards amounted to almost US \$ 150 billion, or just over 2 percent of world trade. The developed world accounted for two-thirds of this production and consumption.
- In many developing countries, forest-based enterprises provide at least one-third of all rural non-farm employment and generate income through the sale of wood products.
- The value of the trade in non-timber forest products has been estimated at US \$ 11 billion. These products include pharmaceutical plants, mushrooms, nuts, syrups and cork.

Forests and Climate Change⁷

- It is estimated that 1.7 billion tonnes of carbon are released annually due to land use change. The major portion is from tropical deforestation.
- This represents about 20 percent of current global carbon emissions, which is greater than the percentage emitted by the global transport sector with its intensive use of fossil fuels.

⁵ Mery, G., Alfaro, R., Kanninen, M. and Lobovikov, M. (eds.) 2005 *Forests in the Global Balance – Changing Paradigms*, IUFRO World Series 17. International Union of Forest Research Organisations (IUFRO), Helsinki.

⁶ World Bank 2004 *Sustaining Forests: A Development Strategy*, Washington D.C.

⁷ IPCC 2007 Summary for Policymakers In: *Climate Change 2007: The Physical Sciences Basis*, <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf> (1 June 2009).

Talk to an Expert



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Center for International Forestry Research (CIFOR)

CIFOR advances human wellbeing, environmental conservation and equity by conducting research to inform policies and practices that affect forests in developing countries. CIFOR is one of 15 centres within the Consultative Group on International Agricultural Research (CGIAR).



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