

An hourglass-shaped graphic with a globe inside. The top bulb is dark blue, and the bottom bulb is light blue. The globe is centered in the narrow neck of the hourglass. The text is overlaid on the graphic.

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*The Bali Agreements and Forests*

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**Abstract.** Climate change and its drivers are receiving increasing global attention. Negotiations in the United Nations Climate Change Conference in Bali, Indonesia, in December 2007 led to an action plan and decision on slowing the rate of deforestation to reduce atmospheric concentrations of greenhouse gases, especially carbon dioxide. The decision to reduce deforestation and forest degradation, especially in developing countries in the tropics, is seen as a significant step toward reducing carbon dioxide emissions, although many believe that much more is needed to halt or reverse greenhouse gas emissions from deforestation. This report describes the portions of the Bali Action Plan and Decision that relate to forests.

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## CRS Report for Congress

# The Bali Agreements and Forests

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### Summary

Climate change and its drivers are receiving increasing global attention. Negotiations in the United Nations Climate Change Conference in Bali, Indonesia, in December 2007 led to an action plan and decision on slowing the rate of deforestation to reduce atmospheric concentrations of greenhouse gases, especially carbon dioxide. The decision to reduce deforestation and forest degradation, especially in developing countries in the tropics, is seen as a significant step toward reducing carbon dioxide emissions, although many believe that much more is needed to halt or reverse greenhouse gas emissions from deforestation. This report describes the portions of the Bali Action Plan and Decision that relate to forests.

### Background

Tropical forests and the impacts of deforestation on tropical forest ecosystems have been of international concern for decades.<sup>1</sup> As part of the carbon cycle, tropical forests are substantial carbon *sinks* — they have absorbed and now sequester (store) large amounts of carbon.<sup>2</sup> Tropical rainforests are considered among the Earth's most biologically diverse ecosystems; indeed, some claim that tropical rainforests hold nearly

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<sup>1</sup> Tropical forests are found between the Tropics of Cancer and of Capricorn (23.5° latitude). Those that receive high amounts of rainfall and have humid climates are called tropical *rainforests*. Within the United States, tropical forests are limited to Hawaii and Puerto Rico.

<sup>2</sup> For more on the role of forests in the carbon cycle, see CRS Report RL34059, *The Carbon Cycle: Implications for Climate Change and Congress*, by Peter Folger.

50% of the Earth's biological diversity.<sup>3</sup> Many believe that preserving tropical forests — preventing deforestation and forest degradation — is important for maintaining biodiversity and regulating climate.

Deforestation is the removal of trees from an area, generally with replacement by pasture or crops. Tropical rainforests are commonly cleared to harvest timber, as well as to establish farms and pastureland for local communities in many tropical countries. The causes of deforestation vary regionally around the globe, and often combine to exacerbate the effects. For example, roads for commercial wood extraction may allow settlers into previously inaccessible areas to clear forests and plant crops. Access to forests also allows settlers to harvest wildlife and wood for consumption and trade. Such pressures for deforestation are often driven by domestic needs to accommodate expanding human populations and to offset rising trade deficits. The pressure to clear tropical rainforests has, in part, led to concerns over protecting them.

Forest degradation is similar to deforestation, although usually only some of the trees are removed, sometimes leaving the forest as an altered ecosystem, devoid of some of its original ecological characteristics.

Deforestation and forest degradation have numerous, generally undesirable impacts. The most obvious and immediate damages are to the original ecosystem and its biodiversity. Deforestation reduces wildlife habitat and tree cover, directly lowering biodiversity. These changes may also lower regeneration (i.e., growth of seedlings and saplings) and tree growth,<sup>4</sup> and reduce water quality and soil retention. Crop and livestock production in moist tropical areas can also deplete soils, which are naturally low in nutrients and depend on litter from vegetation (leaves, uneaten fruits, seeds and seedpods, etc.) and wildlife dung. Fires used to burn cover vegetation to replenish soils before and after crop cycles also lead to deforestation. Fires often go beyond the intended fields and burn untouched forests, displacing wildlife and polluting the air. Some have reported that the combination of deforestation and fire cycles will lead to permanent losses of tropical forests.<sup>5</sup> Deforestation and loss of wildlife also can lead to the displacement of native peoples who depend on the forest for subsistence.

A less obvious impact of deforestation, with potentially significant global consequences, is a decline in *transpiration* (also called *evapotranspiration*). Trees bring water from the soil to their leaves to react with sunlight and carbon dioxide to produce sugars, used for growing leaves, stems, roots, and fruits and seeds. Some of the water is lost to the atmosphere through the same pores that allow carbon dioxide to enter the leaves. In the tropics, transpiration is a significant source of atmospheric water vapor, which forms clouds and leads to precipitation. Substantial loss of tropical forest cover thus can reduce regional precipitation.

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<sup>3</sup> World Resources Institute, *1998-1999 World Resources: A Guide to the Global Environment* (Oxford, England: Oxford Univ. Press, 1998).

<sup>4</sup> Some contend that some forms of forest degradation may result in *standing dead forests*, or forests with little or no regenerative capacity. In these forests, once the adult trees are dead or harvested, the forest ecosystem ceases to exist and other ecosystem types take over.

<sup>5</sup> M.A. Cochrane, et al., "Positive Feedbacks in the Fire Dynamic of Closed Canopy Tropical Forests," *Science*, v. 284 (1999): 1832-1835.

Finally, deforestation and forest degradation have impacts on the global climate. They release the carbon and eliminate the vegetation that has served as a carbon sink. Some carbon may continue to be sequestered in wood products and cover crops, but a large share of forest carbon returns to the atmosphere through direct burning, plant decomposition, and soil disturbance.<sup>6</sup> Many scientists acknowledge that, worldwide, deforestation is responsible for the largest share of CO<sub>2</sub> released to the atmosphere from land use changes, and is approximately 20% of anthropogenic greenhouse gas emissions.<sup>7</sup> Much of the deforestation responsible for CO<sub>2</sub> releases occurs in tropical regions, which are substantially located in developing countries such as Brazil, Indonesia, and the Democratic Republic of the Congo. Scientists estimate that tropical deforestation and other land use changes were responsible for releasing approximately 1.6 GtC (gigatons or billion metric tons of carbon) per year to the atmosphere in the 1990s, and may be contributing similar amounts of carbon to the atmosphere today.<sup>8</sup>

Tropical deforestation was one of many global concerns that led to the Earth Summit in Rio de Janeiro, Brazil, in 1992. Negotiations under the auspices of the United Nations Environment Programme led to two treaties being opened for signature in Rio: the Convention on Biological Diversity and the United Nations Framework Convention on Climate Change (UNFCCC). Negotiations under the latter treaty led in 1997 to the Kyoto Protocol, establishing legally binding, mandatory emissions reductions of greenhouse gases (GHGs), including carbon dioxide, by 38 developed nations over the period from 2008 to 2012.<sup>9</sup>

The treatment of carbon sinks was a contentious issue in Kyoto, and continues to present challenges. The protocol only mandated emission reductions in developed countries (listed in Annex I of the UNFCCC), only a few of which (e.g., Canada and the United States) have substantial forest carbon sinks, and none of which have substantial tropical forests. Certain forestry and land use activities were included as eligible for offsets to protocol mandates, such as *afforestation* (planting trees on sites with no trees) and *reforestation* (planting trees on sites where trees had recently been removed), but the means for measuring the additional carbon benefits of such efforts and for incorporating such benefits into a country's obligations has remained unsettled.

## Outcomes from the Bali Negotiations

Negotiations of the 13<sup>th</sup> Conference of the Parties to the UNFCCC (COP-13) and the 3<sup>rd</sup> Meeting of the Parties to the Kyoto Protocol (MOP-3) were held in Bali, Indonesia, December 3-14, 2007. The focus was on goals and actions after 2012, with the

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<sup>6</sup> See CRS Report RL31432, *Carbon Sequestration in Forests*, by Ross W. Gorte.

<sup>7</sup> Intergovernmental Panel on Climate Change, "Working Group I Contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change," *Climate Change 2007: the Physical Science Basis* (2007), at [<http://ipcc-wg1.ucar.edu/wg1/wg1-report.html>]. (Hereafter referred to as 2007 IPCC WG-I Report.)

<sup>8</sup> 2007 IPCC WG-I Report, Table 7.1, p. 517.

<sup>9</sup> For more extended discussion of the Kyoto Protocol and the background to the negotiations in Bali, see CRS Report RL33826, *Climate Change: The Kyoto Protocol, Bali "Action Plan," and International Actions*, by Susan R. Fletcher and Larry Parker.

expectation that the Bali negotiations would most likely lead to a “roadmap” for further negotiations on post-2012 goals and actions. Controversies continue over the GHG-reduction commitments by developed and developing nations and whether the commitments would be legally binding. All Parties espouse the UNFCCC principle of “common but differentiated responsibilities,” but disagree on how to incorporate “differentiated responsibilities” into specific commitments.

The Bali negotiations led to three outcomes: a “Bali Action Plan” for future negotiations of GHG mitigation and commitments; an “Adaptation Fund” to assist the least developed nations that are most vulnerable to climate change impacts; and a “Decision” on deforestation. The Action Plan calls for mitigation (“deep cuts in global emissions”); adaptation to climate change; financial assistance to developing countries; and technology transfer. The Action Plan specifically addresses deforestation, including among actions to mitigate climate change:<sup>10</sup>

- (iii) Policy approaches and positive incentives ... [for] reducing emissions from deforestation and forest degradation in developing countries; and [identifying] the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries ...

**Bali Decision on Deforestation.** Of greater significance for forestry is the Bali “Decision” on deforestation.<sup>11</sup> The Decision acknowledges that deforestation and forest degradation contribute to GHG emissions, but that the problem is complex, with differing national circumstances and multiple causes. It notes that, while actions to reduce deforestation and forest degradation are occurring, there is an “urgent need” to further reduce GHG emissions from these sources, and that such efforts could complement “the aims and objectives of other relevant international conventions and agreements.”

The Decision includes a number of possible actions:

- It invites all Parties to voluntarily support and strengthen efforts to reduce deforestation and forest degradation.
- It encourages Parties to support capacity-building, technical assistance, and technology transfer for data collection, monitoring, and reporting, and for institutional development.
- It encourages a range of actions, options, and efforts to address the causes of deforestation and forest degradation and enhance sustainable forest management. It also encourages use of “indicative guidance” in the Annex to the Decision, for undertaking and evaluating demonstration projects.

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<sup>10</sup> UNFCCC, *Decision -/CP.13 — Bali Action Plan*, at [[http://unfccc.int/files/meetings/cop\\_13/application/pdf/cp\\_bali\\_action.pdf](http://unfccc.int/files/meetings/cop_13/application/pdf/cp_bali_action.pdf)].

<sup>11</sup> UNFCCC, *Decision -/CP.13 — Reducing Emissions From Deforestation in Developing Countries: Approaches to Stimulate Action*, at [[http://unfccc.int/files/meetings/cop\\_13/application/pdf/cp\\_redd.pdf](http://unfccc.int/files/meetings/cop_13/application/pdf/cp_redd.pdf)].

- It invites Parties, especially those in Annex I to the UNFCCC (i.e., developed countries), to “mobilize resources to support” these efforts.
- It encourages use of the most recent GHG reporting guidelines (currently UNFCCC Decision 17/CP.8) and, for non-Annex I (i.e., developing) countries, the *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (UNFCCC Decision 13/CP.9).
- It requests the Subsidiary Body for Scientific and Technological Advice to review methodological issues related to GHG emissions and forests, advance methodological development, and report on results.
- It invites relevant organizations and stakeholders to support efforts for reduced deforestation and forest degradation, for demonstration projects, and for capacity-building, assistance, and technology transfer.
- It proposes an Internet platform for information exchange, notes that policy approaches and incentives for reducing deforestation and forest degradation are to be further considered under the Action Plan, and suggests that such consideration should reflect the results of the demonstration projects and other actions to reduce deforestation and forest degradation.

In sum, the Decision encourages various efforts, including demonstration projects, to reduce GHG emissions from deforestation and forest degradation, and encourages financial and technical support for those efforts from the Parties to the Convention and from others. It also seeks to improve the measurement and reporting of GHG reductions that result from such efforts.

**Observations on the Bali Decision.** The Bali Action Plan and Decision on Forests were broadly hailed as a major step forward in addressing climate change. In contrast to the Kyoto Protocol, reducing emissions from deforestation and degradation (commonly called REDD) is now included for future efforts to negotiate obligations and commitments to ameliorate carbon emissions. In addition, developing nations can earn credits for reducing carbon emissions by halting or slowing deforestation.

Nonetheless, some observers are concerned with some of the limitations of the agreements. One group noted that the Decision did not include a financial mechanism for potentially compensating developing countries for reducing deforestation.<sup>12</sup> This might be partly addressed by a new World Bank program to pay some developing countries not to clear forests.<sup>13</sup> Some suggest that this fund will provide the financial means for REDD efforts.<sup>14</sup> Others question whether the World Bank’s “less than stellar record” on avoiding

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<sup>12</sup> Janet Redman, “Bali’s Business-As-Usual Mandate,” *Common Dreams News Center*, at [http://www.commondreams.org/archive/2007/12/24/5982/print].

<sup>13</sup> The World Bank launched a new Forest Carbon Partnership Facility, with support from several developed nations and The Nature Conservancy, in December 2007, before the Bali meetings began. See [http://carbonfinance.org/docs/FCPF\_Booklet\_English\_Revised.pdf].

<sup>14</sup> See “Climate Change: The Nature Conservancy Applauds Adoption of Bali Roadmap,” at (continued...)

deforestation in developing nations may undercut the effectiveness of the proposal.<sup>15</sup> In addition, some observers are concerned that payments to developing nations for avoided deforestation could also harm indigenous peoples by displacing them or their use of the forest: “There is danger that funding provided to national governments for halting deforestation will not benefit local people, and could lead to a loss of their land tenure rights and rights to use forest resources.”<sup>16</sup> Furthermore, some contend that payments to developing nations may not address the diverse causes of deforestation — industrial needs, infrastructure projects, agricultural subsidies, governmental corruption, and more — and thus may be ineffective or push deforestation elsewhere.<sup>17</sup>

While the Decision on Forests clearly brings deforestation issues into the UNFCCC and Kyoto negotiations, it does not impel action — it encourages, invites, requests, and proposes, but does not require any action or binding commitments from Parties. Further, the Decision focuses efforts to be undertaken in developing countries. While desirable in many respects, some contend that rewarding countries for reducing deforestation and forest degradation could divert money and attention from the necessary efforts to reduce carbon emissions in the developed world.<sup>18</sup>

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<sup>14</sup> (...continued)

[<http://www.nature.org/initiatives/climatechange/features/art23374.html>], and Pew Center on Global Climate Change, “Thirteenth Session of the Conference of the Parties to the UN Framework Convention on Climate Change and Third Session of the Meeting of the Parties to the Kyoto Protocol,” at [[http://www.pewclimate.org/docUploads/Pew%20Center\\_COP%2013%20Summary.pdf](http://www.pewclimate.org/docUploads/Pew%20Center_COP%2013%20Summary.pdf)].

<sup>15</sup> Redman, “Bali’s Business-As-Usual Mandate.”

<sup>16</sup> Oxfam International, “Oxfam Analysis of the Bali Conference Outcomes,” at [[http://www.oxfam.org.uk/resources/policy/climate\\_change/downloads/bali\\_analysis.pdf](http://www.oxfam.org.uk/resources/policy/climate_change/downloads/bali_analysis.pdf)].

<sup>17</sup> “New Report on Deforestation Reveals Problems of Forest Carbon Payment Schemes” (Dec. 7, 2007), at [[http://www.eurekalert.org/pub\\_releases/2007-12/bc-nro120607.php](http://www.eurekalert.org/pub_releases/2007-12/bc-nro120607.php)], and Center for International Forestry Research (CIFOR) “Governments Must Act on Forests and Livelihoods,” *CIFOR News*, no. 32 (May 2003), at [[http://www.cifor.cgiar.org/publications/pdf\\_files/News-32.pdf](http://www.cifor.cgiar.org/publications/pdf_files/News-32.pdf)].

<sup>18</sup> “‘Forest Conservation’ — Right Answer, Wrong Problem,” *ECO NGO Newsletter*, v. CXIII, no. 7 (Dec. 10, 2007), at [<http://www.climate-network.org/eco/bali-ecos/ECOcop13n07.pdf>].