Africa's Forests - Vital for our Climate

greenpeace.org

GREENPEACE

Protecting the world's ancient forests

©GREENPEACE/JIRO OSE
Industrial logging did not bring development to forest communities. New finance mechanisms should provide a better future for forests and forest communities. High value Afrormosia trees ready for export March 07 Isangi DRC.

FRONT COVER IMAGE ©GREENPEACE/JIRO OSE
March 07, Djabir/Isangi, Lomami river DRC

Greenpeace is an independent global campaigning organisation that acts to change attitudes and behaviour, to protect and conserve the environment and to promote peace.

For more information contact:
enquiries@int.greenpeace.org

Printed on 100% recycled post-consumer waste.

JN 099

Greenpeace Research Laboratories Technical Note 09/2007

GRL-TN-09-2007

Published in November 2007
by Greenpeace International
Ottho Heldringstraat 5
1066 AZ Amsterdam
The Netherlands
Tel: +31 20 7182000
Fax: +31 20 5148151

greenpeace.org

AFRICA'S FORESTS - VITAL FOR OUR CLIMATE

Forests are vital in regulating the climate - locally, regionally and globally. Africa's intact rainforests act as a regulator of rainfall for the region. Moreover they act as a brake on further acceleration of climate change by serving as a vast carbon reserve. While the stakes are incalculably high in terms of biodiversity, there is also clearly an urgent need to protect Africa's tropical forests in order to maintain their carbon stocks.

Forests store half of the Earth's terrestrial carbon stock[1]. The amount of carbon stored in the world's forests is 40 times the amount emitted every year through burning of fossil fuels and the production of cement[2]. With its immense areas of intact rainforests, the Democratic Republic of Congo (DRC) alone holds 8 per cent of that part of the Earth's carbon which is stored in living forests - the fourth highest national store of forest carbon in the world[3]. The DRC's forests constitute an estimated 60 per cent of the total remaining forest in the region, more than any other country in Africa[4].

Carbon Emissions from Deforestation

Deforestation causes these stores of carbon to be emitted into the atmosphere as carbon dioxide (CO_2) where they contribute to climate change. On an annual basis, global emissions from deforestation, mostly tropical, contribute approximately 20 per cent of total human-induced greenhouse gas emissions to the atmosphere, more than that produced by the global transport sector[5]. For Central African countries, cumulative carbon emissions from deforestation from 1950-2000 were many times (over 50 times in the case of the DRC) those from burning fossil fuels[6]. When forests are completely cleared - for instance, to make way for agriculture plantations or grazing - up to half the carbon they held may be emitted into the atmosphere[7]. Even selective logging, as generally practised in Central Africa, can have a serious carbon impact.

Logging is expanding rapidly in Central Africa with more than 30 per cent of the area's forest under logging concessions[8]. Recent studies document an accelerating rate of logging road construction, with the highest densities in Cameroon and Equatorial Guinea while logging in Gabon has expanded inland in recent decades[9]. While the DRC currently has the lowest measured logging road density of all Central African countries, it is being described as the "new frontier of logging expansion"[10].

The DRC is currently twenty first on the global list of CO_2-emitting countries, almost exclusively as a result of land-use change and timber extraction. The country produces more greenhouse gas emissions than Belgium, Finland, Greece, Ireland, Spain, Switzerland or The Netherlands[11].

Predictions of future forest loss in Central Africa suggest that the DRC risks losing more than 40 per cent of its forest, with the area north of the Congo River and around infrastructure such as roads and the river transport network being entirely cleared by 2050. In Gabon, nearly half of the country's forest is under logging concessions, and this could increase to over 75 per cent of the remaining forest during the next decade unless forests are protected[12]. It is estimated that this will release in Central Africa a total of between 31.1 and 34.4 billion tonnes of CO2,[13] roughly equivalent to five years worth of global CO2 emissions from transport[14].

Intact forest landscape map for Central Africa

©GREENPEACE/KATE DAVISON

Forests are a vital buffer against climate change in Africa

The recent Intergovernmental Panel on Climate Change (IPCC) assessment[15] concluded that "climate change, interacting with human drivers such as deforestation and forest fires, are a threat to Africa's ecosystems." Climate change in Africa is expected to aggravate existing water stresses and some countries will become increasingly at risk. The frequency of extreme events, such as droughts and floods is expected to increase. The tropical forests of Central Africa play a vital role in Africa's regional climate as forest cover feeds back into climate change.

Forests are important for climate not only in terms of carbon emissions, but also in terms of rainfall. Deforestation has a strong effect on rainfall. The effect of deforestation on rainfall is particularly marked in Africa since 75-95 per cent of the rainfall in the Congo Basin derives from water recycling[16]. Logging of large concessions can thus affect rainfall in surrounding forest areas[17]. Indeed, models show that deforestation would cause a general drying trend over Africa with rainfall increasing in some areas but falling by up to 40 per cent with increased heatwaves in other areas[18]. One recent study[19] concluded that, for at least the first part of this century, the local impacts of deforestation would be more devastating to tropical Africa than direct impacts resulting from climate change. It concluded that "vegetation protection at the national scale may directly lead to a mitigation of the expected negative implications of future climate change in Africa."

On the global scale, a strong link has been found between rainfall in the Congo Basin and circulation patterns over the North Atlantic during the northern hemisphere winter and spring[20]. The Congo Basin represents the third largest region of deep convection on Earth (which drives atmospheric circulation that affect rainfall), after the Western Pacific and Amazonia. However, there is less known about climate processes in the Congo than in the other regions[21]. It is quite possible that deforestation in Central Africa could affect rainfall, not only locally, but also on the other side of the globe in ways that are not yet understood or predictable.

Carbon emissions from fragmentation and degradation

It is not only the direct effects of deforestation that cause losses of forest carbon to the atmosphere: indirect effects are also important. At present, the global figures used by the IPCC exclude emissions resulting from the fragmentation of vast areas of intact forests into smaller areas[22] - for example by logging roads. Trees on the edges of such fragments are vulnerable to edge effects[23], which can result in tree death and the release of stored carbon. In addition, many trees are inadvertently damaged, even during selective logging[24]. Similarly, only a small fraction of cut wood ends up stored in houses or other long-lasting structures which store carbon; the majority of carbon is lost to the atmosphere though the decay or burning of waste[25]. These effects combined can be highly important, and are estimated as being just as important in terms of carbon emissions as the direct impacts, if not more so[26]. The potential emissions from forest fragmentation (i.e. excluding emissions from the creation of infrastructure and transport of logs) as a result of logging infrastructure were recently calculated by Greenpeace to be nearly 2.5 times greater than, and in addition to, those created by actually extracting the commercial logs[27].

Deforestation, and the expansion of logging infrastructure into intact forest areas, exacerbates the effects of climate change and increases the vulnerability of the remaining forest to climate change impacts. Forest fragmentation caused by the expansion of logging operations into intact forest areas further increases forest vulnerability to drought, wind and fire[28]. Deforestation and climate change can lead to a decrease in rainfall, increasing the risk of drought and fire. Forest fires are currently a huge threat to tropical forests in Africa[29]. A vicious cycle is created whereby deforestation and fragmentation lead to increased droughts and fires, which in turn makes the remaining forest[30] more vulnerable to deforestation and climate change impacts. Such cycles are predicted for the Amazon forest and similar effects could be disastrous for the forest of the Congo.

Infrastructure development for logging is often the start of a process that ultimately leads to complete destruction of the forest. The introduction of logging roads increases access, leading to further encroachment and migration into previously undisturbed areas, leading to further fragmentation. This increases the likelihood of further deforestation and degradation, which will emit more carbon emissions and also leave the remaining forest vulnerable to the effects of climate change.

In summary, logging and related infrastructure development, even in the name of 'sustainable' logging, negatively impacts rainfall and climate, locally, regionally and globally and leads to further deforestation. These impacts will interact with predicted climate change, posing a serious threat to the forests of DRC and exacerbating the effects of climate change.

African Forests in Climate Change Negotiations

In their Declaration for the United Nations climate negotiations in Bali (COP/MOP December 2007), the countries of the Congo Basin ask that deforestation and forest degradation are taken into account within a future 'Reduced emissions from deforestation and degradation' mechanism. These COMIFAC countries also ask for a complementary mechanism - a stabilisation fund - to reward efforts for the sustainable management of their forests.

Greenpeace is calling on all Parties to make a commitment to end emissions from tropical deforestation a central part of the next phase of the Kyoto Protocol (post-2012) agreement on climate change. At the UNFCCC COP 13 in Bali, Indonesia, Greenpeace will unveil its proposal for an international funding mechanism to halt emissions from tropical deforestation. The proposal would provide access to funding to the broadest range of countries, including those with high historic deforestation rates, as well as countries such as the DRC with large intact forests but low deforestation rates.

The Greenpeace proposal will be adaptable to the varying capabilities of developing countries, avoid the pitfalls of market-based approaches, account for emissions at the national level, address the issues of uncertainty and permanence, assure the environmental integrity of the Kyoto Protocol, and contribute to meeting the ultimate objective of the UNFCCC. While Greenpeace supports ecologically and socially responsible logging practices, we oppose the extension of carbon financing to such operations which would increase greenhouse gas emissions and create perverse incentives to destroy otherwise intact forests. Furthermore, in order to benefit the climate, efforts to address emissions from deforestation must be additional to deeper cuts in Annex I emission reduction targets, and not provide an excuse for rich countries to do nothing at home.

Prior to 2012 initiatives are needed to improve governance, increase capacities in the African forest sector, develop alternatives to destructive forest practices, and strengthen and expand forest conservation programs. Such efforts should prioritize actions that provide win-win-win benefits for climate, biodiversity and local indigenous peoples.

©GREENPEACE/JIRO OSE

Endnotes

1) IPCC (Intergovernmental Panel on Climate Change): 2000. Land-use, Land-use Change and Forestry. Special report. Cambridge University Press, Cambridge.

2) At rates for 2000-2005 from IPCC (2007) Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

3) FAO 2005. Global forest resources assessment 2005. FAO Forestry Paper 147. Rome: FAO. Available at www.fao.org/docrep/008/a0400e/a040 0e00.htm

4) FAO 2005 op cit.

5) IPCC 2007. Climate Change 2007: Mitigation of Climate Change. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

6) WRI (World Resources Institute) in collaboration with UNDP, UNEP and World Bank 2005. World Resources 2005: The Wealth of the poor: managing ecosystems to fight povertyPeople and Ecosystems: The Fraying Web of Life. Washington DC: WRI. Table 8

7) Houghton, RA (2005) 'Tropical deforestation as a source of greenhouse gas emissions', in Moutinho, P and Schwartzman, S (eds.) Tropical deforestation and climate change. Belém, Brazil: IPAM; Washington DC: Environmental Defense. Available at www.environmentaldefense.org/documents/ 4930_TropicalDeforestation_and_Climate Change.pdf

8) Laporte, N.T., Stabach, J.A., Grosch, R., Lin, T.S. & Goetz, S.J. 2007. Expansion of Industrial Logging in Central Africa. Science 316:1451.

9) Laporte et al. 2007. op cit.

10) Laporte et al. 2007. op cit.

11) WRI (2007) Climate Analysis Indicators Tool (CAIT) Version 4.0. Washington, DC: World Resources Institute. Available athttp://cait.wri.org/

12) Laurance, W.F., Alonso, A., Lee, M., Campbell, P. 2006. Challenges for forest conservation in Gabon, Central Africa. Futures 38: 454-470.

13) Justice, C, Wilkie, D, Zhang, Q, Brunner, J &Donoghue, C 2001. Central African forests, carbon and climate change. Climate Research, 17: 229-246.

14) IPCC 2007. Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth AssessmentReport of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA

15) Boko, M., I. Niang, A. Nyong, C. Vogel, A. Githeko, M. Medany, B. Osman-Elasha, R. Tabo and P. Yanda, 2007: Africa. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge UK, 433-467.

16) Biodiversity Support Program 1992. Central Africa: Global climate change and development - synopsis. Maryland, USA: Corporate Press.

17) Baidya Roy S., Walsh, P.D. & Lichstein, J.W. 2005. Can logging in equatorial Africa affect adjacent parks? Ecology and Society 10: 6.

18) Paeth, H. & Thamm, H-P. 2007. Regional modelling of future African climate north of 15°S including greenhouse warming and land degradation. Climatic Change 83: 401-427. Boko et al. 2007 op. cit.

19) Paeth, H. & Thamm, H-P. 2007. Regional modelling of future African climate north of 15°S including greenhouse warming and land degradation. Climatic Change 83: 401-427.

20) Todd, M.C. & Washington, R. 2004. Climate variability in Central Equatorial Africa: influence from the Atlantic sector', Geophysical Research Letters 31: L23202.

21) Todd & Washington 2004 op cit.

22) For forestry, the IPCC only looks at 'harvest' (ie volume). National reporting does not address emissions from fragmentation (eg logging roads and biomass loss around logging roads), but includes only deforestation and harvesting (for logging, firewood, etc).

23) Laurance, W.F. 2005. Forest-climate interactions in fragmented tropical landscapes. In: Malhi, Y. & Phillips, O. (eds.) Tropical forests and global atmospheric change. pp31-38. Oxford University Press, Oxford.

24) Laporte et al. 2007 op.cit.

25) Houghton, RA 2005. 'Tropical deforestation as a source of greenhouse gas emissions', in Moutinho, P and Schwartzman, S (eds.) Tropical deforestation and climate change. Belém, Brazil: IPAM; Washington DC: Environmental Defense. Available at www.environmentaldefense.org/docume nts/ 4930_TropicalDeforestation_and_Climate Change.pdf

26) Gaston, G., Brown, S., Massimiliano, L. & Singh, K.D. 1998. State and change in carbon pools in the forests of tropical Africa. Global Change Biology, 4: 97-114.

27) Greenpeace 2007. Carving up the Congo. www.greenpeace.org/congoreport

28) Laurance 2005 op. cit.

29) Boko et al. 2007 op. cit.

30) Laurance, W.F. 2004. Forest-climate interactions in fragmented tropical landscapes Philosophical Transactions of the Royal Society of London Series B-Biological Sciences 359: 345-352.

GREENPEACE

Greenpeace is an independent global campaigning organisation that acts to change attitudes and behaviour, to protect and conserve the environment and to promote peace.

Published by
Greenpeace International
Ottho Heldringstraat 5
1066 AZ Amsterdam
The Netherlands
Tel: +31 20 7182000
Fax: +31 20 5148151

For more information contact:
enquiries@int.greenpeace.org