

# CENTRAL AFRICAN REGIONAL PROGRAM FOR THE ENVIRONMENT

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Issue Brief #8

## #8 — If the Forest Disappeared What Would We Lose and What Might We Gain?

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### Key Concepts

- The forests of the Congo Basin are valuable in terms of both the benefits that they generate directly, tangibly, and immediately, and those that are indirect, intangible, and may be accrued in the future. Land uses to capture these values often conflict with one another. The benefits generated are often not equally distributed both among those alive today and between present and future generations. Deciding what blocks of forest to use in what way, over what time period, to whose benefit, is clearly a political process, the results of which will be determined by how power is shared or concentrated within and among nations.

- Regional-scale deforestation may result in a reduction in rainfall of 40-50%, down to a level comparable to that of many of the most productive savanna regions of Africa - regions that typically have robust agrarian and livestock economies and higher human population densities.
- Regional-scale deforestation will result in the loss of forest-dependent plant and animal species and the local or global extinction of species unique to the Congo Basin. It will jeopardize the forest's capacity to generate a regular stream of desirable goods and services in the future.
- Complete deforestation of the Congo Basin over the next 50 years, though unlikely, would result in a release of carbon equivalent to five years of present global emissions, a relatively small quantity compared to that contributed by the industrialized nations.

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## **Deforestation in Central Africa**

In the Congo Basin the overall rate of deforestation at present does not exceed 0.5% per year and is considered low relative to other tropical forested areas in Africa, Asia, and the Americas. Yet given the extent and rate of forest fragmentation by roadside farming and logging, preliminary simulations suggest that few large blocks of relatively undisturbed forest will remain in 50 years. Forest clearing will (1) reduce the long-term economic value of the landscape as a source of timber and other wood and non-wood products to household and national economies, (2) result in the loss of habitat for forest-dependent plants and animals, causing the local or global extinction of species that are both unique to the region and that may produce chemicals of vast potential value as pharmaceuticals, and (3) release carbon into the atmosphere, contributing to global warming.

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## **Impacts of Forest Clearing**

The impact of regional-scale deforestation on rainfall is highly speculative. Research in West Africa suggests that though deforestation in the sahelian region may have little impact on rainfall, large-scale clearing of dense coastal forests may disrupt movement of the intertropical convergence, causing a collapse of monsoon rains and an overall reduction of rainfall in the region. Though no such studies are available for Central Africa, massive deforestation may result in average rainfall decreasing by as much as 50%, from 2,000 mm to 1,000 mm per year, because much of the moisture that falls as rain is generated by evapo-transpiration of trees growing within the region.



Light grey areas show that most of the forest in West Africa has been disturbed and is now either regrowth forest or agricultural land. Source: TREES Project, Joint Research Centre.

### **Farming and Pasture Land Uses**

Depending on the timing of this reduced rainfall agricultural practices will need to adapt to new conditions with new crops and cropping practices. Overall farm productivity may not be adversely affected if — and this is a big “if” — farmers are able to respond successfully to changing rainfall conditions. On the positive side, at least in the short-term, forest cleared for agriculture contributes tangibly to household and national economies, as does the felling and selling of timber.

Forest converted to pasture will also increase the carrying capacity of the land for herbivores, thus potentially increasing consumers’ access to the meat of domesticated animals. Moreover, a decline in rainfall associated with deforestation may reduce human mortality and morbidity, as the prevalence of water-borne and respiratory diseases decreases. In contrast, a 50% drop in rainfall will fundamentally change the composition and production of forest tree species, jeopardizing the huge revenues generated from the logging industry and resulting in widespread loss of habitat for obligate forest species and a massive loss of forest biodiversity.

### **Consequences and Precautions**

Whether regional deforestation results in such huge changes in rainfall, and what the consequences of such changes will be, are matters of mere speculation. However, given the uncertainties associated with regional scale deforestation, it would be more than merely imprudent for anyone to advocate for policies and practices that would put into motion such an enormously risky global engineering experiment. The precautionary principle strongly suggests that forest management policies should, without evidence to the contrary, assume that regional-scale deforestation will have severe adverse impacts on local and national economies and may have global implications.

This said, determining the optimal scale and rate of forest transformation is a political question, one that must be answered by the governments and citizens of Central African nations. Given present population growth rates and per-capita Gross Domestic Product (GDP), resolving conflicts over forest land-uses will most likely be settled in favor of generating immediate, tangible, and assured benefits for today’s residents of the region, at the risk of jeopardizing potential, future, and largely intangible benefits that would accrue primarily to global citizens. Donors and the international community should seek ways to address the immediate priorities of local and national forest resource users so that short-term mining of forest resources does not jeopardize the long-term economic and intangible values of the forest.



Dark areas on this satellite image-based map suggest that most of the forest remains relatively intact within Central Africa (dark green = intact forest cover, light green = agriculture and regrowth forest). Source: TREES Project, Joint Research Centre

<b>Table 1: Indicative Data for Worldwide Tropical Forest Distribution</b>			
<b>South America</b>	<b>Forest &gt; 60%, km<sup>2</sup></b>	<b>Total Land, km<sup>2</sup></b>	<b>% Forest</b>
Brazil	3,909,940	8,372,890	0.47
Peru	713,487	1,276,300	0.56
Colombia	563,572	1,125,450	0.5
Bolivia	541,357	1,077,650	0.5
Venezuela	429,448	902,937	0.48
Guyana	180,982	208,591	0.87

Suriname	123,761	139,742	0.89
Ecuador	102,939	253,075	0.41
French Guiana	65,829	83,420	0.79
<b>Total</b>	<b>6,631,315</b>	<b>13,440,055</b>	<b>0.49</b>
<b>Southeast Asia</b>			
	<b>Forest &gt; 60%, km<sup>2</sup></b>	<b>Total Land, km<sup>2</sup></b>	<b>% Forest</b>
Indonesia	1,030,590	1,854,610	0.56
Papua New Guinea	316,356	448,817	0.7
Malaysia	219,285	323,970	0.68
<b>Total</b>	<b>1,566,231</b>	<b>2,627,397</b>	<b>0.6</b>
<b>Central Africa</b>			
	<b>Forest &gt; 60%, km<sup>2</sup></b>	<b>Total Land, km<sup>2</sup></b>	<b>% Forest</b>
DRC	1,271,860	2,268,380	0.56
Gabon	222,362	256,118	0.87
Congo	216,775	342,173	0.63
Cameroon	199,640	462,188	0.43
CAR	46,218	620,236	0.07
Equatorial Guinea	25,265	26,203	0.96
<b>Total</b>	<b>1,982,120</b>	<b>3,975,298</b>	<b>0.5</b>

Source: Defries, R.S., M.C. Hansen, J.R.G. Townshend, A.C. Janetos, and T.R. Loveland. 2000. "A new global 1-km data set of percentage tree cover derived from remote sensing." *Global Change Biology* 6:247-254

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## Forest Evolution and Use

During the last glacial period, rainfall in the Congo Basin was insufficient to support dense forest in all but a few remnant patches and river galleries, and the landscape was dominated by scrub-savanna. It was not until 6,000 BC, after the glaciers had receded and rainfall increased, that the savannas were fully re-colonized by trees and the forest reached somewhat beyond its present extent. Not only is the forest young in geological terms, the ubiquitous presence of scorched oil-

palm kernels suggests that almost all of it has been cleared by subsistence farmers at least once, and thus should best be described as old regrowth forest.

Though the forests have been used by humans as a source of food, medicines, construction materials and agricultural production since the last glacial period, it was not until the last 100 years, when roads and railroads were constructed, that forest resources began to be exploited at an industrial scale for export to global markets. Between the 1940s and 1970s export agriculture was an important component of the economies of Cameroon and the Democratic Republic of Congo (DRC), and resulted in a pulse of deforestation. Low commodity prices and insufficient maintenance of the transportation infrastructure have substantially reduced the economic viability of export agriculture, particularly in the DRC, lowering the incentives for forest conversion. Timber now constitutes the most important economic value of the forest to national treasuries, whereas commercial trade in bushmeat and non-timber forest products has risen in importance to household economies and to a few pharmaceutical companies.

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## **Lessons From Deforested West Africa**

Nigeria and Ghana have cleared over 75% of their forests, yet their economies are growing more rapidly than those of any Central African nation. This land area supports three to five times the density of families in Cameroon, the most populated nation in Central Africa. Agriculture continues to contribute significantly to the economy, and per-capita GDP and life-expectancy rates are as good if not better than in most Central African nations.

Given cessation of civil wars and political and economic instability, experience from West Africa suggests that Central African nations could use their forest resources as the fuel for economic development. In Nigeria and Ghana, however, this approach has now relegated forest plants and animals to a few remnant patches of forest that are probably too small and too isolated to continue to support viable populations indefinitely. In gross terms, then, deforestation has not been catastrophic to the agricultural productivity of either Ghana or Nigeria; it appears to have contributed positively to economic growth and social welfare, at least in the short-term; it has, however, been calamitous to biodiversity and has placed the future of most endemic forest species in severe jeopardy. Over the next 50 years whether the extent of forest clearing within Central African nations will approach that of West Africa, and whether the ecological and economic impacts will be comparable, remain unresolved questions. Whether the forests of Central Africa are used for short-term profits or long-term economic development will be determined largely by whether forest resource-use decisions continue to be made by a few government officials or through a more inclusive and transparent public debate.

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## **Deciding How Much Forest to Conserve**

If forest values are to be used efficiently and the benefits shared equitably, decisions about how the forest is used over a given time frame is a political decision that must be made collectively by the governments and citizens of Central African nations. The international community interested in promoting economic development, enhancing social welfare, and conserving biodiversity within Central Africa must help governments and citizens in the region establish the political processes needed to negotiate what land uses are desirable within which blocks of forest across the region. Moreover, if international perspectives on the value of forests and desired land uses conflict with regional priorities and would result in lost revenue-generating opportunities to local and national economies in the short-term, then international donors must be willing to pay compensation to mitigate these costs, or accept that use of the forest is unlikely to reflect international interests.

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## **What Can You Do About It?**

### **Governments**

- Commit to establishing national and regional processes for land-use decision making to ensure that forest resources are used efficiently and the benefits are shared equitably.

### **Donors**

- Commit resources to establishing and nurturing institutions necessary for Central African nations to negotiate forest land uses that benefit the majority and do not close the door on future options.
- Establish trust funds to compensate households and governments for lost revenues associated with land uses that favor global, rather than local and national, values.

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## **For More Information**

### **Technical Reports**

Brown, D., and K. Schreckenberg. 1999. *Shifting cultivators as agents of deforestation: Assessing the evidence*. London: Overseas Development Institute.

Fairhead, J., and M. Leach. 1998. *Reframing deforestation: Global analysis and local realities - studies in West Africa*. London: Routledge.

Gaston, G., S. Brown, M. Lorenzini, and K. D. Singh. 1998. "State and change in carbon pools in the forests of tropical Africa." *Global Change Biology* 4:97-114.

Kaimowitz, D., and A. Angelsen. 1998. *Economic models of tropical deforestation - a review*. Bogor, Indonesia: CIFOR.

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## **CARPE...What Is It?**

### **Central African Regional Program for the Environment (CARPE)**

Launched in 1995, the *Central African Regional Program for the Environment (CARPE)* engages African NGOs, research and educational organizations, private-sector consultants, and government agencies in evaluating threats to forest integrity in the Congo Basin and in identifying opportunities to sustainably manage the region's vast forests for the benefit of Africans and the world. CARPE's members are helping to provide African decision makers with the information they will need to make well-informed choices about forest use in the future. BSP has assumed the role of "air traffic controller" for CARPE's African partners. Participating countries include Burundi, Cameroon, Central African Republic, Democratic Republic of Congo, Equatorial Guinea, Gabon, Republic of Congo, Rwanda, and São Tomé e Príncipe.

**Web site:**

<http://carpe.umd.edu>

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