

FORESTS AND THE DEMOCRATIC REPUBLIC OF CONGO OPPORTUNITY IN A TIME OF CRISIS

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A Contribution to the
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CONTENTS

Acknowledgments	4
Foreword	5
Summary	6
Opportunity in a Time of Crisis	7
Threats to the Forest's Survival	10
Recommendations	19
Conclusion	24
Notes	25

BOXES

Box 1: Priorities for Development Assistance	6
Box 2: Lessons from Uganda	20

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FOREWORD

In early 1997, the world looked on as the Democratic Republic of Congo (DRC, formerly Zaire) underwent an immense political change. It was, and continues to be, a tragic war story of ravaged communities and devastated people. The smoke in DRC is just beginning to clear, and the world continues to watch with hope for signs of stability and justice. Even as DRC struggles to recover, its neighbors in the west and north—the Republic of Congo and Central Africa Republic, respectively—were recently enmeshed in armed conflict. On DRC’s eastern flank, Rwanda and Burundi pick up the pieces from the ruinous unrest that left hundreds of thousands dead, an enormous population of refugees crossing and recrossing borders, and scattered outbreaks of violence.

Most people in and around DRC, whether they were profoundly or marginally affected by the recent devastation, continue to turn to the dense moist forests that engulf this country for shelter, food, fuelwood and other support. The government also continues to rely on forest products: revenue from commercial logging helps to fill the national coffers as it did before the war.

DRC harbors half of Africa’s, and an eighth of the world’s, remaining dense moist forest.

As vital as the forests are to the people and government of DRC, if the forest resource is poorly managed it will pose great environmental risk and imperil the country’s long-term economic security.

Commercial logging, an activity known to threaten forest biodiversity and the regrowth of certain timber species, is not currently causing excessive degradation in DRC. But, it is considered a major threat as increased numbers of transnational logging companies seek to operate in the Congo Basin. Roads built by loggers and miners are used by commercial hunters with high-powered guns and snares to supply growing markets with bushmeat. These roads are also traveled by migrants who carve agricultural plots along the borders of the forest frontiers. People’s dependence on bushmeat for protein depletes populations of seed-dispersing animals, so that the regrowth of forests is threatened. Reliance on fuelwood for energy creates halos of fragmented forest around urban areas and mandates ever longer excursions to supply a never-ending demand.

But there are opportunities to lessen the risk posed by development within DRC’s forests, and increase the likelihood for better-managed forests and better living conditions for the people.

This publication, *Forests and the Democratic Republic of Congo: Opportunity in a Time of Crisis*, highlights three promising opportunities for DRC’s development. First, DRC’s new government can take advantage of opportunities for long-term conservation and sustainable use of forests. Second, the development assistance community can play an important role in support of measures to conserve forests. Third, the government and the development assistance community can collaborate to get forest policy high on DRC’s development agenda.

This publication juxtaposes DRC’s opportunities with possible threats to its forests. It recommends nine specific measures that could be realistically undertaken by DRC’s new government.

For example, the government should assess the existing logging and mining licenses for irregularities. If found to be irregular as a result of coercion and corruption, licenses should be revoked. An environmentally sound national infrastructure plan should be developed to increase the likelihood that investment in infrastructure will promote sustained economic benefits with minimal environmental effects.

More data on DRC’s forests should be collected and disseminated. Local non-governmental organizations should also help to increase the scope of existing research, such as the forest inventories conducted in 1982 and 1989. This publication also makes pointed suggestions to the development assistance community about how support should be channeled to meet these objectives.

Forests and the Democratic Republic of Congo: Opportunity in a Time of Crisis is part of the World Resources Institute’s five-year Forest Frontiers Initiative—a multi-disciplinary effort to promote stewardship in and around the world’s last major frontier forests. By working with governments, citizens’ groups, and the private sector in Amazonia, Central Africa, Indonesia, North America, and Russia, the initiative seeks to influence investment, policy, and public opinion.

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Jonathan Lash
President
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SUMMARY

The Democratic Republic of Congo (formerly Zaire) houses a wealth of biological diversity within large tracts of “frontier” forest—relatively undisturbed, original forest cover.¹ Yet, this country still struggles to recover from five centuries of ruthless and bloody colonial exploitation followed by three decades of corrupt dictatorship under Mobutu Sese Seko, an era so extreme that it led to the coining of the term “kleptocracy.” Against this backdrop, the country faces the enormous challenge to achieve short-term economic growth and alleviate poverty while preserving natural resources for future generations. This task is especially daunting in a country that focusses development on its primary natural resources: timber, minerals, and hydropower potential.

The advent of the new government, and the potential for foreign aid and private investment, represent an opportunity to explore fresh policy options and priorities. *Forests and the Democratic Republic of Congo: Opportunity in a Time of Crisis* was written primarily for senior policy-makers in the Democratic Republic of Congo (DRC) and the development assistance community. The publication highlights the significance of the forests and the major emerging threats to them, and suggests ways to address these issues. (See Box 1.)

The report concludes that DRC has alternatives to the development path it is taking, and that forests, as a stimulant of economic growth, play a role. Various institutions also have roles. International organizations in particular must assist the government of DRC to implement these alternatives. International investment is necessary to encourage DRC’s population—its government and citizens—to adopt policies and practices that will lead to development without putting its natural resources at risk.

By demonstrating that it is serious about managing its forests and other resources responsibly, the new government will be better positioned to solicit, negotiate, and obtain international funding and investment for both resource conservation and exploitation. By involving its citizens in the design and implementation of environmental policies, DRC can also show its respect for democratic principles, which will win broad international support, including potential access to concessional funding and debt forgiveness from the World Bank and the International Monetary Fund.

OPPORTUNITY IN A TIME OF CRISIS

1

PRIORITIES FOR DEVELOPMENT ASSISTANCE

Strategic priorities for development assistance agencies include the following steps:

- Channel support to strengthen the capacities of non-governmental organizations (NGO).
- Encourage effective government agencies, such as the national mapping agency, *Service Permanent d’Inventaire et d’Aménagement*

Forestier (SPIAF), through monetary and technical support.

- Overhaul ineffective agencies.
- Promote administrative rehabilitation at both the national and local levels so that authority, rights, and responsibilities are matched.

- Place forest policy higher on the policy agenda and, where appropriate, link it with economic planning.
- Bolster research and a national consultative process for land-use planning, including the collection of remote sensing data.

On May 12, 1997, the armed forces of the Alliance of Democratic Forces for the Liberation of Congo (ADFL), led by Laurent Kabila, entered Zaire's crumbling capital, Kinshasa, and overthrew ailing President Mobutu Sese Seko, who fled the country. ADFL took over a country in ruins, renaming it the Democratic Republic of Congo (DRC).

Thirty-two years of kleptocratic misrule, fed by foreign assistance during the Cold War from the United States, Europe, and the World Bank, drove the vast majority of Zaire's population into conditions of extreme poverty. Under Mobutu, the economy shrank to 1958 levels, with a population three times larger.



“The Democratic Republic of Congo is the country in Africa where the gap between what’s being produced and what could be produced is the greatest.”

– Mining Company Executive

According to the United Nations Human Development Index, which combines life expectancy, adult literacy, and income, DRC is ranked 141 out of 174 countries. The government strains under a US\$13.1 billion debt load, including \$1.4 billion in loans from the World Bank. (See Table 1.)

ADFL promises to rebuild the country's destroyed transport infrastructure and social services. To help raise the necessary capital, the government has closed deals with several foreign companies to redevelop the lucrative mining sector. DRC holds huge deposits of cobalt, copper, gold, and diamonds. There is also vast hydropower potential. According to one mining company executive, “The Democratic Republic of Congo is the country in Africa where the gap between what’s being produced and what could be produced is the greatest.”²

A WEALTH OF FOREST RESOURCES

The majority of DRC's population depends directly or indirectly on forest resources. DRC contains half of Africa's, and one eighth of the world's remaining dense moist forest—the most biologically rich terrestrial ecosystem³—which covers half of the country's territory. (See Map.) The rate of deforestation in DRC—less than 1 percent annually—has been low for three primary reasons: the gradual disintegration of the road network; agricultural expansion outside of forest areas; and political and regulatory disincentives to invest in the country. As a result, 86 percent of Congo's original forest cover remains.⁴ (See Table 2.)

But DRC's forest resources, while substantial,

are not limitless. On a per capita basis it has much less

dense moist forest cover than either the neighboring

Republic of Congo⁶ or Gabon. Outside of the

TABLE 1

Key Economic and Social Indicators

Population (million, 1995)	45
Infant mortality (per 1,000 live births)	120
Real GDP growth (% , average annual 1990-94)	-8.9
Inflation (% , annual average 1990-95)	3,558

Source: United Nations Department of Public Information.⁵

seasonally flooded central basin (the *cuvette*), where most of DRC's intact forests are located, pressure to clear forest is growing.

Properly managed, DRC's forests can contribute to sustained economic growth over the long term. But this can be achieved only if sound forestry policies are instituted soon. ADFL has expressed its desire to generate more revenue from forest assets, which is a valid need. But forests are valuable for other reasons besides filling national coffers.

Many people depend on the forests for their basic livelihoods. Approximately 70 percent of DRC's population—31.5 million out of a total population of 45 million in 1995—live outside of urban centers; many of these people use timber and nontimber forest products for food, shelter, and artisanal products.⁷ In 1994, both urban and nonurban dwellers collected fuelwood and charcoal from the forest at a rate of 42.6 million cubic meters annually.⁸ Wildlife is a large part of the national diet.

This report focusses on the choices DRC's government must make related to its forests. ADFL must choose between selling Congo's forests for short-term economic gain, or sustainably managing them for the use of future generations. Though history clearly shows that simply mining trees and minerals does not bring wealth to a nation, ADFL seems poised to continue the pattern of resource exploitation that will only lead to further economic stagnation for the country.

Potential short-term solvency may be less attractive than it appears at first glance. Most of the country's forests are currently inaccessible and of very low commercial value, so the opportunity cost involved in conservation and in taking time to plan carefully for development, is small. The new government has the chance to invest in the forest, agriculture, transport, and other related sectors to ensure that resources are exploited sustainably and protected areas remain unencroached.

TABLE 2

Dense Moist Forest Cover and Deforestation Rates in Central Africa

REGION	DENSE MOIST FOREST		AVERAGE ANNUAL DEFORESTATION RATE	
	1993 thousand km ²	1993 ha/capita	1980-90 (% of Total)	1990-95 (% of Total)
Cameroon	180 (39%)	1.44	0.6	0.6
Republic of Congo	237 (69%)	9.88	0.2	0.2
Democratic Republic of Congo	1,108 (47%)	2.69	0.7	0.7
Equatorial Guinea	100 (60%)	5.54	0.4	0.5
Gabon	214 (81%)	17.83	0.6	0.5

Sources: Deforestation rates from World Resources Institute.⁹ Forest cover data from Tropical Ecosystem Environment Observations by Satellite Project (TREES).¹⁰

Note: The figures in parentheses give the percent of forest cover in each country.

A BRIEF HISTORY OF COMMERCIAL OPERATIONS

DRC's history of commercial operations with Europe began in the late fifteenth century when Portugal established relations with what was then the coastal Kongo Kingdom to export slaves, ivory, and copper. In the 1600s, the region was the principal source for slave markets in the Middle East and the New World.

In 1885, the Conference of Berlin granted King Leopold of Belgium the area and established the Congo Free State. Africans were forced into labor to provide ivory and rubber to the colonial monopolies. Construction of transportation networks and more intensive exploitation of mineral resources then began. The Belgian king seized all so-called "vacant lands" and declared his government to be the owner of all forest products.



ADFL must choose between selling Congo's forests for short-term economic gain, or sustainably managing them for the use of future generations.

International outcry over Leopold's brutality led Belgium in 1908 to assume direct control of the colony, henceforth called the "Belgian Congo." The colonial government shared administrative responsibility and business interests in mining and plantations with the Roman Catholic Church. Continued exploitation of natural resources was a priority and agricultural exports grew. At independence in 1960, minerals and agricultural commodities (including forest products) made up 60 percent and 40 percent of total exports respectively.

In 1965, military strongman Mobutu Sese Seko seized power. The country declined economically as corruption and mismanagement took hold. Agricultural commodities decreased to 15 percent of total exports. By the mid-1970s, mining was the pillar of the economy, accounting for 75 percent of export earnings and close to 45 percent of government revenues. The lack of trained staff forced the central government to settle for indirect management of resource exploitation through European mining and logging companies.

Today, commercial operations follow the same pattern as they did under Mobutu. In the mining sector, the U.S.-based American Mineral Fields (AMF) vies with South Africa's Anglo-American for a majority stake in a copper and cobalt retreatment project and zinc mine in the Shaba province, with an estimated value of U.S.\$8-13 billion.¹¹ Evidence suggests that AMF has financial connections to the most expensive mining disaster in U.S. history, in which cyanide was used to extract sulphide ores in southwestern Colorado.¹² Anglo-American's dealings are also questionable; foreign news reports indicate that a nephew of DRC's Minister of the Economy is on the payroll of both Anglo-American and the ministry.¹³

In the logging sector, many concessions—none considered examples of responsible forest management—are still operating as they did during the Mobutu period, including the German-owned SIFORZAL, a subsidiary of Danzer. This concession covers some of the most isolated rainforest in the world and is one of the largest in Africa, with a huge 2.7 million hectares of operations. It is interesting to note that it contains the best-maintained roads in DRC, expanded 120 km per year, for improved logging operations.¹⁴

THREATS TO THE FOREST'S SURVIVAL

THE IMPORTANCE OF THE FOREST

As indicated in Table 2, DRC contains more rainforests than all of the other five countries in Central Africa. DRC's rainforests make up about half that found in the whole of Africa and one eighth of all tropical forests on Earth—only Brazil and Indonesia have larger areas of rainforests.

As a result of its size and physical and climatic variability, DRC harbors an unusually wide range of habitats, including tropical moist forest, woodland savannas, grassland savannas, and, to a lesser extent, montane forests, seasonally inundated savannas, dry evergreen forests, and dry woodlands. In terms of species diversity, the country is ranked first among African countries for several taxonomic groups. It houses 409 species of mammals, 1,086 species of birds, 216 species of amphibians, 280 species of reptiles, 48 species of butterflies, and 10,000 species of angiosperms of which 3,000 are endemic.¹⁵



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DRC also harbors strategic mineral resources, including most of the world's cobalt (an essential ingredient of jet engines), and large deposits of uranium, zinc, and copper, as well as diamonds, gold, and silver. Most of the mines are in the eastern part of the country; gold mines, in particular, border the forest frontier. (See Map.)

DRC's 45 million people depend upon the forests for food, energy, housing materials, and income.¹⁶ The forests also house genetic material that could lead to advances in medicines and agricultural breeding, although not much screening has taken place. Moreover, the forests serve as a carbon store, helping to ward off global climate change by mitigating increasing temperatures, changes in local and global precipitation patterns, and associated environmental changes, such as rising sea levels.

Although forests have the potential to play a role in the economic development of DRC, a variety of internal and external pressures could build rapidly in the coming years. These pressures—including weak protected area systems, commercial logging, and expanding infrastructure—are reviewed in the sections below.

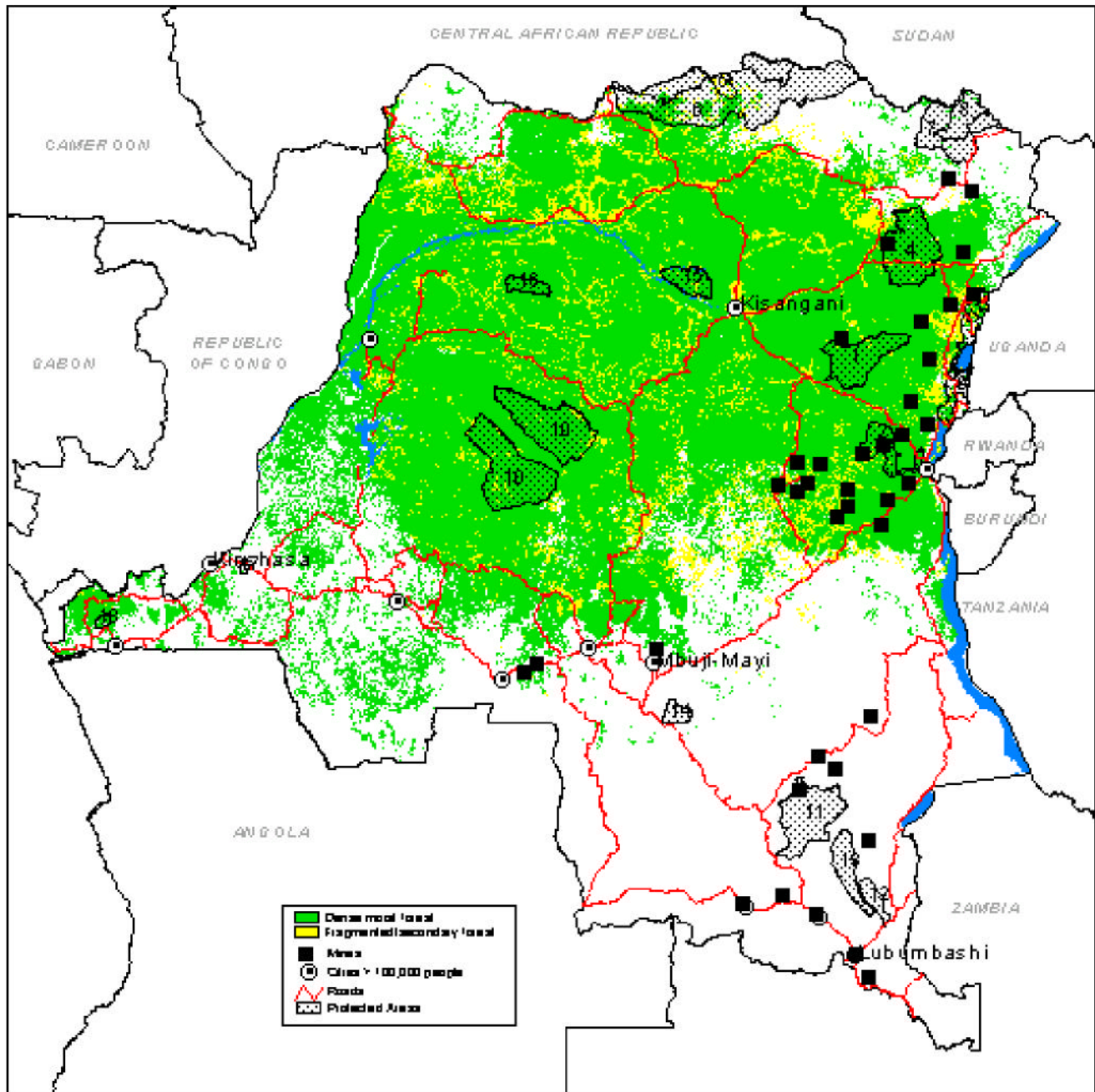
WEAK PROTECTED AREAS

In 1925, the Belgian colonial government established a system of national parks and reserves to protect the region's unique biodiversity. Protected areas now cover 180,000 km², or 7.69 percent of the country, a higher percentage than most countries have achieved.

Most of these protected areas are located in the eastern forests, which cover about 175,000 km² and stretch from the Zaire River to the volcanic chain that borders Uganda, Rwanda, and Burundi. These forests contain fauna and flora of significant conservation concern, including many large mammals restricted to the region.¹⁷ Currently, there are four major protected areas covering about 38,300 km² in the east: the Virungas, the Kahuzi-Biega, the Maiko national parks, and the unique Okapi Wildlife Reserve. (See Map.)

Most of DRC is sparsely settled. At its eastern limit, however, are some of the most fertile and densely populated areas in Central Africa. Over the last ten years, the availability of open land and gold panning opportunities have attracted migration into the eastern forests at an unprecedented rate. This trend accelerated during the past two years when ADFL's military offensive broke up Rwandan refugee camps and drove hundreds of thousands of refugees into the forest. Human populations in the forest have always been dynamic, but current population growth differs from earlier expansions in that it is politically motivated.

Protected Areas, Forest Cover, and Mines in the Democratic Republic of Congo



Protected Areas

- | | |
|------------------------------------|-------------------------------------|
| 1. Mako National Park | 10. Salonga National Park |
| 2. Kakazi-Biega National Park | 11. Upemba National Park |
| 3. Virunga National Park | 12. Kundalungi National Park |
| 4. Okapi Wildlife Reserve | 13. Kundalungi Forest National Park |
| 5. Bombo Nature Reserve | 14. Shaba Game Reserve |
| 6. Bill-Uere Hunting Reserve | 15. Yaingambi Floral Reserve |
| 7. Gaigaba-va Bodo Hunting Reserve | 16. Lomako-Yekora Game Reserve |
| 8. Garamba National Park | 17. Bombo-Lemere National Park |
| 9. Ritshiri Hunting Reserve | 18. Liki Forest Reserve |

Protected Areas data from the World Conservation Monitoring Centre, U.K. Forest Cover data from the TREES data base, Joliet Research Centre, Italy. Road data from the Digital Chart of the World and WRI.



In the face of this massive migration, the reserves have little protection. Currently, less than 150 active guards are assigned to the Okapi Reserve and the Maiko and Kahuzi-Biega national parks in eastern DRC, with an average guard density of less than 1 guard per 200 km². Official pay is low and is often not delivered. In some cases, park rangers and wardens depend on kickbacks from illegal hunting and mining to survive. In terms of providing revenue, tourism is an option, but it is likely to generate income in only three areas: Virunga (mountain gorillas), Kahuzi-Biega (elephants), and Garamba (white rhinoceros). In 1989, tourism accounted for \$820,000 in government receipts, an increase of 40 percent from 1988.¹⁸

Tourism can be successful only if wildlife populations are maintained. Elephant poaching is common in the Kahuzi-Biega National Park and has resumed in the Okapi Wildlife Reserve and Maiko National Park after having ceased following the Convention on International Trade in Endangered Species (CITES) ban on ivory in 1989. Both gorillas and chimpanzees are hunted in the Kahuzi-Biega National Park. However, an assessment of the impact of current human activity in the area showed that densities of large mammals are much higher in the protected areas than in their hinterlands, indicating that, despite illegal occupation and exploitation, the legal status of the protected areas is important.¹⁹



Urgent interventions to protect DRC's national parks and wildlife reserves are not enough. A major review of conservation legislation and forest management both within and outside protected areas is needed.

At a development assistance round table in Kinshasa in July 1997, it was proposed that the Okapi Wildlife Reserve be upgraded to a national park as a show of government commitment to biodiversity conservation. Urgent interventions to protect DRC's national parks and wildlife reserves, such as Okapi, are necessary, but not enough. A major review of conservation legislation and forest management both within and outside protected areas is needed. Without this review, the country's protected areas, as well as a large portion of its forest domain, risk being stripped and degraded before their long-term value can be secured.

A new model for conservation projects is needed. Long-term support to DRC's protected areas will still require foreign assistance. An analysis by the Wildlife Conservation Society (WCS) of four World Heritage Sites in eastern DRC (Virunga National Park, Kahuzi-Biega National Park, Garamba National Park, and the Okapi Wildlife Reserve) showed that the boldest and most creative conservation efforts were undertaken by trained national staff based on-site.

This study, conducted after the sites were seriously damaged by the looting Zairian army as it fled before the rebel advance, suggested that the morale of local staff depended to a great extent upon financial and technical assistance from international non-governmental organizations.



Although logging is currently not causing excessive degradation in DRC, it is considered a major threat as increased numbers of transnational logging companies seek to operate in the Congo Basin.

The best way to conserve the country's natural resources is to train the national staff and develop strong site-based conservation programs. WCS recommends "establishment of a fund that provides for continued professional development and support for field activities by protected areas staff."²⁰

A 1991 World Bank assessment of the Congolese Institute for Nature Conservation (ICCN), the agency that manages DRC's protected area system, showed that 75 to 85 percent of its budget is spent in Kinshasa and that decisions are highly centralized.²¹ In July 1997, the United Nations Development Programme (UNDP) submitted a two-year \$20 million proposal to the Global Environment Facility (GEF) to restructure and strengthen DRC's protected-areas management.

The objective of the proposed project is to strengthen institutional capacities for decentralized management of natural resources. Because it will be difficult for ICCN to absorb such a large sum of money in a short time, UNDP-GEF must pay close attention so that the funds are not used to reinforce the existing centralized approach to protected-areas management.

GROWTH OF LOGGING ACTIVITIES

Commercial logging is an activity that puts forests at risk. Although logging is currently not causing excessive degradation in DRC, it is considered a major threat as increased numbers of transnational logging companies seek to operate in the Congo Basin.

In 1995, DRC produced about 300,000 m³ of logs and ranked twenty-first in the world, far behind neighboring Cameroon (2.7 million m³) and Gabon (2.1 million m³), ranked sixth and eighth respectively.²² One third of DRC's logs were exported and two thirds consumed domestically.²³

The most recent assessment of DRC's logging potential was carried out in 1987. It reported an annual logged area of 100,000 hectares yielding an average of 5 m³ per hectare. Such selective logging can be relatively benign. It typically involves extraction of no more than one to two high-value trees per hectare and can damage less than 10 percent of the canopy as a result of felling sites, drag strips, log parks, and the road network.²⁴ Species with lower market value are not cut because their export price is not high enough to cover the cutting and transport costs.

Although selective logging does not destroy the forest, it is a leading cause of forest degradation, because the roads built to extract the timber open the area to commercial hunting and agricultural encroachment.

In 1988, more than 21 million hectares of the country were designated for timber production.²⁵ If logging proceeded on only the 12 million hectares that have been inventoried, this could produce 2.4 million cubic meters a year, worth about \$422 million.²⁶ It has been estimated that timber production could increase 20-fold by the year 2000 (50 million hectares producing 10 million cubic meters).²⁷ On the basis of these figures, a substantial increase in timber production in DRC over the next few years is predicted.

Because of the poor state of the transport network, log exports cannot grow rapidly; this could change. In DRC, logs are often carried from the interior of the country either by river on privately owned boats and ferries to the Kinshasa-Matadi railway line, or by road. The Kinshasa-Matadi railway is the greatest transport bottleneck restricting log exports. Together, this railway and the Republic of Congo's Brazzaville-Pointe Noire railway used to carry the majority of the region's exports to ocean ports. The collapse of the railways greatly reduced this trade. Until the civil war in the Republic of Congo erupted in June, the Brazzaville-Pointe Noire railway was in the process of being privatized. Once privatized, the World Bank believes that the service could be operating at full capacity within 2 to 3 years. A similar prognosis applies to the Kinshasa-Matadi link.²⁸



...industrial logging has provided little net government revenue and contributed only marginally to rural development. Most foreign logging companies that have operated in the Congo Basin have gone bankrupt.

DRC and its neighbors have viewed their forests as inexhaustible resources to be exploited in an effort to boost economic growth. But, almost without exception, industrial logging has provided little net government revenue and contributed only marginally to rural development. Most foreign logging companies that have operated in the Congo Basin have gone bankrupt.

European logging concerns have operated in the Congo Basin region since colonial times. Recently, logging companies from Asia have also acquired concession areas in neighboring Cameroon, Congo, and Equatorial Guinea.

Exports to Asia from Gabon of okoume and ozigo, two of the most popular timber species, grew from 2.2 percent to 52 percent and from 1.5 percent to 60 percent of total exports respectively between 1990 and 1995. It is anticipated that Asian loggers will seek logging rights in DRC as well.²⁹ Asian logging companies operating in Central Africa often cut a greater range of species than European operators. Some European firms, such as Danzer, are also starting to market to Asia and could increase their range of species cut.³⁰ This method of logging clears large tracts of land, potentially causing greater impact on forests than selective cutting.

Artisanal logging for local furniture-making and construction, which is poorly monitored, consumes three times more timber than industrial logging for export. Most artisanal loggers operate at the edge of forests and therefore do not increase access to forests. However, farmers often clear these areas once artisanal loggers have removed the largest trees. Traces of forest degradation are noticeable in lower DRC, where artisanal logging has occurred.³¹ (See Map.)

EXPANDING INFRASTRUCTURE

The second largest country in sub-Saharan Africa, DRC has a dilapidated transportation network. In 1987, the Congo River and its tributaries were supplemented by 41,000 km (2,400 km paved) of roads, but more than half of this limited network is still in disrepair or passable only in the dry season. Road systems are almost nonexistent in most areas of the country.³²

The infrastructure network must be improved, upgraded, and expanded to encourage economic development in DRC and the region. ADFL has recognized this need and has targeted road building as a priority. In July 1997, the government announced a \$2.5 billion project to rebuild 28,000 km of road. A part of the plan is to rebuild the 500-kilometer Goma-Kisangani route, which will link two major markets.³³

Road construction is both good and bad; although it often reinforces market links for development, it also puts pressure on forests as loggers, farmers, and developers move into the frontiers. In the Amazon Basin, for instance, roads have played a large role in opening up vast areas of intact forest to a wide range of economic activities and deforestation. Similarly, during the construction of the Transgabonais railway across the sparsely populated center of Gabon, it was estimated that 8 to 10 hectares were deforested for every kilometer of railway.³⁴



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Within DRC, the collapse of infrastructure and government services in rural areas at the end of colonial rule contributed to the dire conditions facing many farmers. They were pushed to clear and cultivate larger areas on marginal lands because it was difficult to migrate to more fertile areas.³⁵

By concentrating investment in agricultural areas, such as the highlands of eastern DRC and Kasai, the government will maximize the economic opportunities and incentives for small farmers to invest in more intensive and more profitable agroforestry-based farming systems, while minimizing the negative environmental effects associated with building new roads through frontier forests.

DEFORESTATION FROM AGRICULTURE

An effective forest policy in DRC must be linked to efforts to increase agricultural productivity.

The heavily forested Central Basin generally contains poor soils, which are characteristic of tropical rainforest. Nevertheless, roughly one third of DRC's land is considered suitable for agriculture. Of the country's total area of 234 million hectares, 4.5 percent is cultivated annually, with a further 13 percent lying fallow.³⁶ Most agricultural production takes place in savannah lands in the southern part of the country, but the richest soils are found in the upper DRC and Kivu provinces.

Seventy percent of the population relies on subsistence farming, clearing about 2 million hectares of land annually, much of it land that had been fallow with secondary regrowth forest. Although this is 20 times the area that is logged each year, only a small fraction of the cleared land is permanently deforested.³⁷

In areas of the country with denser populations, decreasing availability of fertile lands has resulted in shortened fallow periods and greater cutting of primary forest areas.

Industrial-scale plantations for export of cash crops (such as coffee, tea, rubber, and palm oil), and livestock ranches occupy about one third of the land used for cultivation, but only about 20 percent of this land is actually cultivated.³⁸ Few plantations are now operating, and palm oil and rubber exports—important commodities—declined significantly between 1961 and 1995. Not all commodities experienced such dramatic reductions; coffee exports peaked at 130,000 metric tons in 1986 before falling to 61,000 metric tons in 1995. (See Table 3.)

The economic collapse has driven more of the rural population into subsistence agriculture characterized by shifting cultivation and low productivity, often in areas that were forested.

In 1988, at least 40 percent of the 300 non-governmental organizations (NGOs) operating in DRC provided training and technical assistance in improved natural resource management, encompassing soil and water conservation, livestock, and agroforestry.³⁹ A lack of international assistance has likely contributed to a decrease in the number of local NGOs. Compared to the scale of the problem, NGOs are not a significant force. Given adequate support, however, they could play a much more active role in agricultural extension, providing a real alternative to the government bureaucracy.

TABLE 3

Decline of Key Exports, 1961-95

	Exports in Metric Tons 1961	Export Earnings 1961 US\$ (thousands)	Exports in Metric Tons 1995	Export Earnings 1995 US\$ (thousands)
Palm Oil	154,000	35,000	700	140
Rubber	38,000	21,000	7,000	8,000
Coffee	34,000	14,000	61,000	100,000

Source: Food and Agriculture Organization. FAOSTAT. Rome: 1997. Available from < <http://www.fao.org> >.

PRESSURE FROM HUNTING

Commercial poaching has become a thriving business throughout the Congo Basin, because wildlife provides an astonishing 80 percent of the protein consumed in DRC.⁴⁰ Although poaching does not directly lead to deforestation, it does disrupt basic forest ecology through local extinction of the larger species, such as primates, that serve as the seed-dispersal agents for most tree species. Poaching has increased because of the availability of powerful firearms and snares. Poachers move along mining and logging roads, selling smoked or fresh meat in markets and villages and to laborers working in mining and logging camps. In more sparsely populated areas, such as protected areas, poaching is the greatest threat to forest health.⁴¹

FUELWOOD COLLECTION

Almost 80 percent of energy consumption is from fuelwood. Electricity and other energy sources are expensive, scarce, and usually available only in urban areas. Fuelwood harvests amount to as much as 30 times that of industrial wood production.⁴² Despite huge potential wood supplies, many households do not have access to, or cannot afford, adequate supplies of charcoal and fuelwood. A recent report from Cameroon on periurban fuelwood collection shows that the majority of the fuelwood collected comes from fields being cleared for crop production.⁴³ It may be that a small amount of fuelwood comes from natural forests that are not being cleared for other purposes.



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In areas of higher population density, however, demand for fuelwood may outstrip supply as a result of a lack of land. In 1988, the market for charcoal in Kinshasa alone was estimated at \$70 million per year. Fuelwood demand in urban areas has surpassed the level that can be sustainably supplied from the immediate surrounding areas under current conditions. Encroachment and deforestation, driven by this demand, threaten many protected areas. Potentially, small farmers with fast-growing woodlots could earn income from selling fuelwood near urban areas.

MINING AND ENERGY DEVELOPMENT

Mining is an important source of revenue for DRC, accounting for 75 to 80 percent of export earnings.⁴⁴ Most of the significant mining areas form a crescent around the largest forest areas. However, certain mining sites in the east (portions of the Kivu and upper DRC regions) and south (part of the Shaba region) overlap with biologically rich areas so that industrial activities are affecting the forests. For example, mine wastes are contaminating rivers and lakes in the Shaba region.⁴⁵ Artisanal mining is also a concern in some areas; in the Ituri forest, gold prospecting has led to some degradation.⁴⁶

Any increase in mining activities would result in the construction of new infrastructure. It is likely that existing companies and any new endeavors will pressure the government to improve roads and railways, which could increase access to forest frontiers.

In addition to mineral and forest resources, DRC has vast hydropower potential. The Congo River and its tributaries carry a volume of water second only to the



The Congo River and its tributaries carry a volume of water second only to the Amazon River. The potential of the river is estimated at 100,000 megawatts—half the hydroelectric potential of the entire African continent—but only 1 percent of this potential has been tapped thus far.

Amazon River. The potential of the river is estimated at 100,000 megawatts—half the hydroelectric potential of the entire African continent—but only 1 percent of this

potential has been tapped thus far.⁴⁷ Before any major investments in hydropower are approved, ADFL should consider experiences in other tropical regions.

The history of dam building in those regions is replete with horror stories of massive environmental destruction through the flooding of pristine habitats, large-scale resettlement of local communities, and disappointing returns on the investments because of poor planning and management.⁴⁸

RECOMMENDATIONS

DRC's valuable frontier forests face pressures from population growth, industry, infrastructure, a lack of energy alternatives, and institutional needs. ADFL's challenge is to manage these pressures so that forests will continually contribute to economic growth. To do this, many issues that reach beyond the forests need to be addressed. NGOs can assist ADFL in identifying and implementing policies that address these issues. The foreign assistance community could make a difference by supporting policies that are based on lessons learned from the field and experiences of neighboring countries. The case of Uganda is an apt illustration. (See Box 2.)



To promote forest stewardship and sound environmental management, certain elements of democracy are key: clear provisions for civic participation; strengthening human resource capacity, particularly at the NGO and local government levels; and greater transparency in decision-making.

Placing the environment and natural resources in a priority position on its policy agenda, and linking them to broad-based development, provides the government with opportunities to promote democratization, boost government revenues, foster long-term economic security, and assume regional and global leadership. Decisions as to who controls the valuable natural resources, how they should be used, and who will benefit from their use are priorities in sustainable forest management.⁴⁹

Below, nine recommendations for the foreign assistance community and DRC policy-makers are highlighted. These recommendations do not present a prescriptive plan of action, but rather point to the scope of issues that need to be addressed and why.

1. REINFORCE THE NATIONAL SYSTEM OF PROTECTED AREAS

A fundamental first step in national development planning is to ensure that representative types of ecosystems are protected at the national level. This serves as a basic “insurance policy” for biological diversity, and the traditional approach is to forbid people to enter protected areas.

Beyond this minimal approach to protection, longer-term, more sophisticated efforts should be developed—with support from international mechanisms such as the Global Environment Facility—to design linkages between the protected areas and to integrate conservation and development outside of the core reserves. The UNDP-GEF proposal for strengthening protected areas should be carefully reviewed to reduce its tendency to promote a highly centralized approach.

2. ENCOURAGE THE DEVELOPMENT AND PARTICIPATION OF NON-GOVERNMENTAL ORGANIZATIONS TO HELP CONSERVE FORESTS

To promote forest stewardship and sound environmental management, certain elements of democracy are key: clear provisions for civic participation; strengthening human resource capacity, particularly at the NGO and local government levels; and greater transparency in decision-making.

LESSONS FROM UGANDA

Uganda has adopted major reforms to address the environmental damage resulting from 15 years of political chaos. When President Museveni came to power in 1986 following a war-torn period involving six presidents, including ruinous despots Milton Obote and Idi Amin, Uganda's economy was at a standstill. Government services, including roads, hospitals, schools, and power supplies, had fallen into utter disarray. The most basic of manufactured goods, such as salt, sugar, and soap, were luxury items, and there was a chronic shortage of gasoline. Forests had been heavily exploited. Both black and white rhinos were poached to extinction, and the elephant population was reduced by 80 to 90 percent. Government

departments were rife with corruption and ineptitude.

After Museveni took office, sustained reforms reversed the country's fortunes. Kampala and other major towns are now thriving with an emerging middle class. Government offices and ministries have been physically rebuilt and competently staffed. Game reserves, such as the Kibale Forest, have been upgraded to national parks. Ecotourism—with mountain gorillas a particular attraction—is picking up and is expected to rise to 100,000 tourists by the end of the century.

What caused this turnaround in the country's situation? Museveni acknowledged that sound management of natural resources and economic development are linked

through investment, trade, and tourism. His government has implemented national policies that encourage co-management of protected areas, with authority and responsibility given to local governments. Participation in decision-making is explicitly mandated in such documents as the 1996 Wildlife Statute. Protected areas are monitored for unauthorized activities, such as poaching and the collection of fuelwood.

What can President Kabila's government learn from Uganda? The government must acknowledge the importance of sound environmental policies integrated with economic development objectives. Environmental ministries in Uganda, once maligned for their

uselessness and corruption, are now actively supporting the conservation and sustainable use of forests. Increased participation in the political process, including discussion of contentious issues such as land tenure, has resulted in a flourishing NGO sector.

Sources: Uganda Ministry of Natural Resources, *State of the Environment Report for Uganda*. (Kampala, Uganda: 1994); Albert Mumma, "A Review of Emerging Trends in the Laws on Community Management of Natural Resources in East Africa" (World Resources Institute: 1996); Speech by President Yoweri Kaguta Museveni, 1997.

Effective environmental management requires that government understand the needs of local inhabitants and businesses. The NGOs can help in this endeavor. Ten years ago, there were more than 300 NGOs in DRC, almost half of which focussed on rural development and natural resources.⁵⁰ It is not clear how many remain today, probably very few. But, with some encouragement and small grants from development assistance programs, the number would grow quickly. In policy implementation, NGOs can increase the reach of government initiatives by promoting them in local communities. They can often provide services more directly and efficiently than public agencies.

Communities can also benefit from the linkages that NGOs provide to government agencies, international groups, and other NGOs. Funding, technical support, and training from development assistance programs can allow NGOs to improve their own resources and contribute more actively to rural development and environmental programs.

3. MOVE TOWARD MORE DECENTRALIZED CONTROL OF NATURAL RESOURCE USE AND CONSERVATION

DRC is a vast country with distinct regional identities and characteristics. The colonial government and Mobutu's administration were highly centralized and permitted little input by regional or local governments and citizens. Decentralization can aid the design and implementation of resource management. The provision of services should build on local initiatives, which are arising spontaneously in response to the almost complete breakdown of government services under Mobutu.



Effective environmental management requires that government understand the needs of local inhabitants and businesses. The NGOs can help in this endeavor.

At the same time, there should be a balance between local and central decision-making, with the national government working to ensure that national needs continue to be met, perhaps through a representative national network of protected areas.

4. COLLECT AND SHARE MORE INFORMATION ABOUT FOREST RESOURCES AND BIODIVERSITY

A key plank in strengthening civil participation is more effective information collection and sharing. Some information about forest resources and biodiversity already exists, as does some capacity to disseminate it. Two forest inventories for the whole country were carried out in the 1980s. The 1982 assessment produced a *Carte Synthèse Forestière du Zaïre* at scales of 1:400,000 and 1:250,000.⁵¹ The 1989 assessment produced a land-use database at 1:1 million, which has since been updated using data for 1993 and more sophisticated data processing techniques.⁵² The U.S. multi-agency Landsat Pathfinder project is processing satellite data for the Congo Basin acquired in the 1970s, 1980s, and 1990s to produce a forest-cover database at each point in time. The results should be available in 1998 and will be used to generate the first reliable estimates of deforestation in the Basin.

Persistent cloud cover in the Congo Basin has hampered forest inventories that use remotely sensed data acquired in optical wavelengths, but longer wavelengths in the radar portion of the electromagnetic spectrum can penetrate the cloud cover to provide large area coverage on a regular basis. The first space-borne radar system suitable for terrestrial applications was the Japanese Environmental Resources Satellite (JERS-1). By downloading data to a satellite-receiving station in Libreville, JERS-1 acquired complete coverage for the Congo Basin in the wet and dry seasons in 1996.⁵³ Radar allows for distinguishing roads, clear-cut areas, closed forest, agricultural fields, and other landscape features relevant to land-use monitoring in DRC.



A sound infrastructure plan should ensure that roads constructed by logging and mining companies are compatible with protected area boundaries and coincide with routes to markets and distant villages.

Forest and land cover data should be made available to the *Service Permanent d'Inventaire et d'Aménagement Forestier* (SPIAF) and other analysts, both in DRC and cooperating countries, as soon as possible. Analysts will be able to use these data to produce information to support policy research and development issues. SPIAF, which managed to maintain a high quality of analysis of environmental data in difficult times, should also be strengthened.

5. DEVELOP AN ENVIRONMENTALLY SOUND NATIONAL INFRASTRUCTURE PLAN

The new government has a broad mandate and wide latitude to initiate reforms to strengthen the country's physical infrastructure. Foreign assistance and private funds are likely to become available to upgrade roads, ports, hydroelectric facilities, and railways. With more complete data, economic and environmental assessments, and comprehensive land-use planning, infrastructure investment can promote sustained economic benefits with minimal environmental effects. A sound infrastructure plan should ensure that roads constructed by logging and mining companies are compatible with protected area boundaries and coincide with routes to markets and distant villages. The plan should be based on international standards, including full environmental and social impact assessments and local consultation, with special care given to avoiding biologically and socially sensitive areas.

6. STRENGTHEN LOCAL AND TRADITIONAL PROPERTY RIGHTS

Local community development is the key to national economic growth. Although rural households are dependent on forest products, there are no legally recognized gathering rights, and traditional land ownership is not recognized by the state.⁵⁴ This has resulted in expulsion and migration to neighboring forest lands, including protected areas.⁵⁵ Evidence suggests that community ownership of lands encourages conservation of wildlife.⁵⁶ Property rights that allow users to receive medium- and long-term economic benefits would encourage local groups to conserve and improve land and resources.

7. ASSESS THE STATUS OF MINING AND LOGGING CONTRACTS AND PROMOTE RESPONSIBLE INVESTMENT

Many industrial-scale natural resource extraction agreements in DRC may have been awarded on the basis of coercion and corruption. Licences should be reviewed and, if found to be irregular, revoked. They should then be auctioned in a transparent fashion, with some prequalification of eligible bidders based on a proven track record of responsibility. This system would encourage more responsible investment in those sectors. Such a review, as well as clarification of property rights, tax reform, and general modernization of the economy, may enable DRC to attract responsible investors who currently perceive the country as an unfriendly place to do business.



Until forest management improves, foreign assistance could fund conservation activities.

8. HAVE REALISTIC GOALS FOR REVENUE COLLECTION FROM FOREST-BASED ACTIVITIES

Properly managed, DRC's forests can contribute to long-term, sustained economic growth. In addition to industrial logging, greater attention is needed for community and artisanal forestry. Tourism also has potential. During the 1980s, the number of visitors to national parks in DRC rose, but further growth was slowed by poor infrastructure, limited access, encroachment and poaching, and a lack of well-trained staff.⁵⁷ Other African countries, such as Zimbabwe and South Africa, are earning substantial income from foreign visitors. In DRC, hunting reserves and sport trophy hunting may have significant tourism appeal.

In the near future, the forests of DRC are not going to be an engine of national development because of inaccessibility, low investor confidence in the country, and poorly developed markets for forest products. Recognizing this situation, however, reveals an opportunity to conserve the country's forests at a low cost until the capacity and confidence have been created to allow responsible expansion of extraction activities to occur. Until forest management improves, foreign assistance could fund conservation activities.

Investments in logging and other activities will continue to grow and, to assure that resource exploitation benefits DRC and its citizens, ADFL should reform the resource allocation process and tax structure. This reform might include simplifying the tax structure, making auction processes transparent, and elevating taxes on resource extraction industries.

9. PROMOTE REGIONAL INITIATIVES

DRC is a forest and biodiversity superpower that should play a leadership role in African forest conservation. It is a signatory to major international agreements on biological resource conservation, including CITES, the African Convention for the Conservation of Nature, and the World Heritage Convention.

By being more active in implementing existing agreements and promoting regional cooperation in these areas, DRC can demonstrate its commitment. It should build on existing national efforts, such as the abandoned National Forestry Action Plan, as well as continue to develop a National Environmental Action Plan and implement other international commitments. Consideration should be given to building upon the World Conservation Union's (IUCN) Conference on Ecosystems of Dense Humid Forests in Central Africa (CEFDHAC), a regional ministerial level initiative to address environmental opportunities and concerns within the Congo Basin. Movement toward a Congo Basin Treaty for forest and biodiversity conservation should also be considered.

CONCLUSION

The causes of forest clearance and poor natural resource management in DRC lie in uncertain land tenure, a massive influx of refugees, the government's lack of solvency, and the nation's need for economic development. These problems do not have quick and simple solutions, so policies that promote sound forest management are challenging to develop and implement.

The debate over what constitutes sound forest policy in DRC is not starting from scratch. The development of a Tropical Forest Action Plan (TFAP) was begun in 1987. It was approved in 1990 and followed by foreign pledges totaling \$160 million. However, in 1991, assistance to the TFAP was cut, creating a lull in forest policy development and implementation.



The onus is on ADFL to take steps towards moving the country to economic stability through sound environmental management.

ADFL has the opportunity to update and build on these early initiatives. The foreign development community's interest in DRC's economic growth is high, as is that of neighboring countries. ADFL should look to its neighbors, such as Uganda, for examples on how to approach priority issues. The onus is on ADFL to take steps towards moving the country to economic stability through sound environmental management.

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FOREST FRONTIERS INITIATIVE

The World Resources Institute Forest Frontiers Initiative (FFI) is a multi-disciplinary effort to promote stewardship in and around the world's last major frontier forests by influencing investment, policy, and public opinion. The FFI team is working with governments, citizens' groups, and the private sector in Amazonia, Central Africa, Indonesia, North America, and Russia. We also take part in pressing international discussions on forest policy.

We are motivated by the belief that there is a responsible way to use forests. We also see growing interest in finding alternatives to forest destruction that take advantage of the full economic potential of forests, not just immediate revenue from logging and forest clearing.

For each frontier forest region, FFI builds a network of policy-makers, activists, investors, and researchers to promote policy reform. Efforts to minimize the negative impacts of road-building and forest-clearing for agriculture, and to stop illegal logging are part of this work.

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