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PERVERSE HABITS: THE G8 AND SUBSIDIES THAT HARM FORESTS AND ECONOMIES

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INTRODUCTION

In 1998, the leaders of the Group of Eight (G8) committed to actions that would help to protect the world's forests. *(See Box 1.)* It is not, however, what these governments (Canada, France, Germany, Italy, Japan, Russia, the United Kingdom, and the United States) say, but how they spend their money that indicates their true commitment to policy positions. Unfortunately, some G8 members undermine forest protection with subsidy programs that accelerate forest loss. The structure of these payments is so complex, however, that the public does not often appreciate their scale or call for their removal.

This forest note surveys some of these harmful G8 subsidies explaining why such payments are not justified and suggesting actions that the G8 should take if forests are to be conserved and managed for future generations. Although availability of information and analysis on this issue varies greatly, it is clear that *the problem is serious and should be a priority for concerted G8 action.*

Subsidies come in many forms. A *perverse subsidy* in the context of forests is one that causes forest loss or degradation and has no lasting positive impact on economic development. Such subsidies undermine commitments to sustainable development. *(See Box 2.)*

The harm to forests caused by perverse subsidy programs and other policy failures is a serious problem. Most of the world's terrestrial biological diversity depends on forests.[1] Our food, drugs, and new materials, to some degree, also rely upon this diversity. Deforestation has

Box 1 The G8 Action Program on Forests

In 1998, the G8 governments committed to important and wide-ranging actions at their Birmingham summit meeting. Actions include the following:

- Improving the monitoring and assessment of the state of their own forests.
- Working with partner countries to improve forest monitoring elsewhere.
- Improving access to remote sensing data.
- Focusing technical and financial assistance on partner countries that give priority to sustainable forest management.
- Identifying key forest types that are not well protected.
- Working with partner countries to maintain and establish protected forest areas.
- Improving global understanding and recognition of the role of boreal and temperate forests as important carbon sinks, biodiversity reservoirs, and sources of other goods and services.
- Encouraging the private sector to develop and apply voluntary codes of conduct that support sustainable forest management, domestically and internationally.
- Encouraging the sharing of information and assessments on the nature and extent of international trade in illegally harvested timber.
- Taking measures to implement their obligations under international agreements aimed at combating bribery and corruption in international business transactions as they pertain to trade in timber.

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Box 2 **Definitions and Examples of Subsidies**

Subsidies are defined by economists as any measure that does one or more of the following:[1]

- Keeps prices for consumers below the market level.
- Keeps prices that producers earn above the market level.
- Reduces the costs for consumers and producers by giving direct or indirect support.

Examples of perverse subsidies that have contributed to forest loss and degradation include the following:[2]

- Failure to collect appropriate levels of resource rent in exchange for extraction activities.
- Tax write-offs for logging companies.
- Construction of roads by governments at no cost to the logging companies that will use them to transport their produce.
- Costs of public administration of forest lands that are logged by private companies.
- Direct grants to companies engaged in logging, for example, to cover planning costs.
- Low-interest loans or loans with generous grace periods at less than commercial rates.

Perverse subsidies can be less direct or even hidden and difficult to detect without sophisticated analysis. Some examples of indirect perverse subsidies include the following:

- Lower rates of taxation than would be appropriate for a normal-profit scenario.
- Public funding of the clean up or repair, replanting, and reforestation costs to mitigate the impacts of the forest products and wood processing industries.
- Provision of energy and water at prices lower than commercial costs.
- Insurance by government agencies for companies operating overseas.
- Duty allowances on imports of machinery and spare parts.
- Use of overseas development assistance for activities that lower costs for logging companies operating in ways that are unsustainable.

Notes:

1. Earth Council, *Subsidizing Unsustainable Development: Undermining the Earth with Public Funds* (Costa Rica: Earth Council, 1996).
2. N. Myers and J. Kent, *Perverse Subsidies: Tax $s Undercutting Our Economies and Environments Alike* (Winnipeg, Canada: International Institute for Sustainable Development, 1998); R. Repetto and M. Gillis, eds., *Public Policies and the Misuse of Forest Resources* (Cambridge: Cambridge University Press, 1988).

been responsible for about half of human-induced carbon dioxide emissions, leading to climate change.[2] Remaining intact forests store more carbon than most secondary or plantation forests. Boreal forests, in particular, are carbon rich, including their soils.[3] Water cycles, critical for local weather patterns, and nutrient cycles are related to forests in ways that we barely understand. Economic analyses have valued these "ecological services" in the trillions of dollars.[4] Forests and trees are also a critical resource for many of the world's poorest people. In such African countries as Tanzania, Uganda, and Rwanda, fuel wood supplies 80 percent of energy needs.[5]

Forests have other values beyond the economic and utilitarian. Much of existing human cultural diversity resides in and close to forests. Papua New Guinea, the Congo Basin, and Amazonia are home to indigenous peoples who speak more than half of all extant human languages. These cultures, languages, viewpoints, and knowledge are being lost almost as fast as the forests that they inhabit.[6] Throughout the world, people hold forests as special, even sacred, places.[7]

Yet, four fifths of the forest area that was present 8,000 years ago has been cleared or significantly altered by humans. Development could affect as much as half of the remaining 20 percent of intact forest in the next decade.[8] There is an emerging threat that climate change will also affect forests.[9]

Demand for wood and associated logging are major causes of forest degradation. There is no sign of this threat diminishing.[10] Since 1961, total global consumption of wood has risen by 50 percent. Future increases will be partly supplied through timber extraction from intact forests and recovering second-growth forests, leading to further forest degradation.[11]

Perverse subsidies have resulted in forest loss, degradation, and inefficiency. Often local communities and wider society bear the costs of these subsidies and their effects, while privately owned companies reap the benefits. One of the most pervasive forms that these subsidies take is through low charges to logging companies that are cutting old-growth wood on public lands.[12] The blue-ribbon World Commission on Forests and Sustainable Development

noted that undercharging logging companies for timber has many serious consequences, including the following:[13]

- Creating windfall profits for companies at public expense.
- Encouraging companies to log rapidly because of greater than normal profits.
- Pressuring traditional and local forest owners to have others log their forests.
- Enabling inefficient logging companies to operate profitably.
- Reducing government revenues, thereby reducing funds available to invest in activities that could promote sustainability.
- Reducing the price of forest products, which stimulates wasteful consumption.
- Stimulating illegal and corrupt activities because of the supranormal profit potential.

Why do perverse subsidies continue? Subsidies are easier to establish than to eliminate once in place. Policymakers present various reasons to justify the establishment of subsidies, including to reduce poverty, maintain jobs in rural communities, protect a "way of life," and stimulate economic growth. On closer inspection such benefits are often hard to document. Obstacles to removing subsidies tend to be highly political. Opposition of vested interests, local businesses, and segments of the workforce can be very powerful.[14] Once payments are in place then a type of addiction follows, and there may be uncertainty and fear over the consequences of subsidy removal.[15]

Harmful Subsidies, Forests, and the G8

There is little published information about subsidies to the logging and forest products industries. This note is, therefore, aimed at stimulating further research and debate. The indirect subsidies that many governments provide across the economy in the form of support for water, energy, and general transport and infrastructure are largely beyond the scope of this report. These payments are huge, and should be included in future analyses.[16]

Canada

About 90 percent of Canada's wood production comes from old-growth forests being cut for the first time. In 1997, production amounted to 182.7 million cubic meters of logs. Half of the area slated for logging faces serious productivity limitations because of climate, topography, and other factors. In British Columbia, for example, 90 percent of the timber supply areas are explicitly cut at rates greater than sustainability levels established by the government.[17]

In 1998, exports of forest products were valued at $39.7 billion (all values in the section on Canada are in Canadian dollars; one U.S. dollar is equivalent to about 1.5 Canadian dollars). The United States accounts for 79 percent of Canada's export market; the European Union, 8 percent; and Japan, 6 percent. Three provinces account for about 81 percent of the value of forest product exports: British Columbia, $13.2 billion; Quebec, $10.8 billion; and Ontario, $8.1 billion. In 1994, forestry companies directly employed 384,000 people with a further 493,000 in indirect jobs.[18]

In British Columbia, the most important province in terms of timber production, total provincial revenues from stumpage and other charges amounted to approximately $2.55 billion in 1997, of which $1.77 billion or 69 percent accrued to the British Columbia treasury. For 1997, we estimate annual federal government support payments of $421 million and provincial support of $2.51 billion, gave a total of $2.93 billion.[19] A list of expenditures from British Columbia is *indicative* of the range of public investments and subsidy payments that support the national industry in Canada. *(See Tables 1 and 2.)*

The question arises as to whether these public expenditures are 'perverse' in the sense that they produce outcomes that are likely to be negative from an environmental and sustainability perspective. A move toward sustainable ecosystem-based forestry would still require public expenditures, but the amount would be significantly less because the criteria for investment and support would discriminate against rapid depletion of the forests and take into consideration other forest values. A mid-range scenario for the degree of 'perversity' of the expenditures from the list in Table 1 is 50 percent of the total. *(See Table 1 notes.)*

The study summarized above was built around a number of other important studies conducted in the province in the 1990s. It was designed as a parallel and independent analysis and critique of the government commissioned annual report on the state of the forestry industry.[20] No similar studies have been found for other provinces. Therefore, as a crude first approximation, the level of subsidies in Canada has been extrapolated from the British Columbia data.

Table 1 **Foregone and Incurred Expenditures by the British Columbia Provincial Government in the Forest Products Industry in 1997** *(Figures in millions of Canadian dollars)*

Revenues Foregone Due to Stumpage Rates and Raw Log Export Ban	$1,729.00
Forest Renewal British Columbia (FRBC) Value-Added Programs	$3.75
FRBC Communities Programs	$17.25
FRBC Watershed Restoration Program	$35.25
Other FRBC Spending	$195.00
Government Investment	$52.50
Ministry of Employment and Investment, Natural Resources Community Fund	$1.50
Public Order Costs	$4.50
First Nation's Compensation Costs	$40.00
Public Administration Costs, Ministry of Forests	$393.00
Public Administration Costs, Ministry of Environment, Lands and Parks	$40.00
TOTAL	$2.51 billion

Notes:

There is no reliable estimate of what constitutes a perverse subsidy. The analysis presented here is based on a scenario in which it is estimated that 50 percent of the expenditure listed in this table can be considered perverse. The basis for this is the following:

- *Foregone Stumpage Revenues.* The most important perverse subsidy by far is stumpage. Since setting the correct fee for stumpage is a controversial issue, the figure reported here is based on four methods for calculating the value of the economic rent foregone as a consequence of the comparative value pricing system for stumpage used in British Columbia. A different author developed each method. We thus applied each method to the 1997 figure for revenues of $1,773 million received from stumpage as reported by Price Waterhouse to estimate the value of the economic rent foregone for that year. In doing so, we provide three scenarios for the foregone rent in 1997, deflated to account for the more than doubling of stumpage rates in May 1994. When these methods are averaged out for 1997, the low estimate of stumpage forgone averaged across all methodologies is $842 million, the intermediate scenario is $1,729 million and the high scenario is $2,615 million.
- *FRBC Value-Added Program*: Partly perverse as it supports a thin definition of 'value added.' On the other hand, expenditures on genuine value-added activities should probably be increased so that British Columbia and Canada generate more jobs and revenue per cubic meter of timber harvested.
- *FRBC Communities Program*: Partly perverse as it supports a conservative, industrial form of community forestry. On the other hand, a portion clearly supports more sustainable types of forestry in rural communities in British Columbia, and expenditures under this type of heading should probably be increased to promote sustainable forestry more generally in Canada.
- *Other FRBC Spending*: Largely perverse because the money is spent on programs, such as the Resource Inventory Program, that support industrial forestry. This program funds companies to carry out assessments that are required under the Forest Practices Code.
- *Government Investment*: Consists largely of direct expenditures to ailing industries (such as rescuing failing companies). The degree of perversity here is difficult to estimate as it depends on whether the rescue proves later to be economically sound. In many cases, such rescues do end up costing the taxpayer, but this is not an inevitable outcome of a market that is cyclical and depends also on the government's capacity to manage its investment so that it sells the company at the going rate at the right time.
- *Natural Resources Community Fund*: This involves a small amount of money and is unlikely to be a perverse subsidy.
- *Public Order Costs*: Such costs are substantial and could also be significant in any major restructuring of the forest sector (e.g., settling First Nations treaty claims, dealing with disaffected workers). The current costs of policing are perverse in the sense that they support the status quo and are likely larger than necessary because of the breakdown in the social consensus over forest practices in Canada. Over the long term, therefore, one could anticipate a decline in expenditures under this heading as community and sustainable forestry became the norm practiced in the country.
- *First Nations Compensation Costs*: Not perverse and are required as compensation for loss of revenue and damages inflicted on aboriginal populations.
- *Public Administration Costs, Ministry of Forests*: A large percentage of these costs are perverse as they support a bureaucracy that is dedicated to unsustainable forest management. Such expenditures will not entirely disappear in a shift to sustainable forestry. While certain departments in the Ministry might be closed down, others would be expanded or created anew (such as an enlarged community forestry program). There would, thus, be a significant shift out of bureaucratic forms of governance that would reduce costs. The precise amount is hard to quantify without specifying the character of the alternative system for managing Canada's forests.
- *Public Administration Costs, Environmental Ministries*: Somewhat perverse as environmental expenditures often arise in an effort to police the poor forest practices being legitimized by other ministries. On the other hand, Canadian ministries with environmental responsibilities are underfunded both federally and provincially, so there would likely be an increase in such expenditures as part of any sustainable solution to Canada's forest industry.

Source: R. Gale, F. Gale and T. Green, *Accounting for the Forests: A Methodological Critique of Price Waterhouse's Report: The Forest Industry in British Columbia 1997* (Vancouver, Canada: The Sierra Club, 1999).

For this note, we estimated subsidies and public investment in other Canadian provinces based on the value of shipments in the industry. Using the calculated mid-range figure of $2.51 billion for the support payments in British Columbia, the level of support based on the value of shipments can be calculated. The level of support for Canada as a whole is estimated at $7.2 billion. *(See Table 3: Option 1.)* If the British Columbia situation is unique, and the level of support is half as much in other provinces, total support amounts to $4.8 billion. *(See Table 3: Option 2.)*

In 1997, federal payments amounted to $421 million for British Columbia. Using this figure, we estimated the overall level of public investment in other provinces based on the value of shipments. *(See Table 4.)* The assumption that the British Columbia situation applies to all provinces produces a level of support of $1.2 billion. *(See Table 4: Option 1.)* If the British Columbia situation is unique and the level of support is half as much in other provinces, total federal support amounts to $829 million. *(See Table 4: Option 2.)*

In conclusion, our estimate of the annual value of provincial subsidies and public payments ranges from $5-7 billion. If we add to this the value of annual federal support payments estimated in the range of $829 million - $1.2 billion, the total subsidy to the forest products industry in Canada is in the range of roughly $6-8 billion. *We conservatively estimate that 50 percent, or $3-4 billion (US$2-2.7 billion) should be considered perverse.* A much more detailed analysis of program expenditures on a province-by-province basis would be required to produce a more accurate figure.

Table 2 **Foregone and Incurred Expenditures by the Canadian Federal Government in the Forest Products Industry in 1997**
(Figures in millions of Canadian dollars)

Federal Income Tax Abatement Program	$83
Manufacturing and Processing Profits Program	$44
Reduced Property Taxes Program	$83
Federal Capital Cost Allowance Program (Deferred Taxes)	$129
Tax Credits	$58
Federal Public Administration Costs, Industrial Forestry	$24
TOTAL	$421

Note: All line items can be considered perverse subsidies, insofar as they flow directly or indirectly to industry and encourage the practice of unsustainable industrial forestry in Canada. Federal government involvement in forestry, which is a provincial jurisdiction, could be substantially expanded, however, to support community forestry and sustainable forest initiatives across the country. This means that actual levels of expenditure could be maintained without the expenditure itself proving perverse.

The assumption that underlies our estimate is that foregone revenues and public expenditures are highest in British Columbia, where the dominance of the forest sector over the past century created a provincial political economy in which forest companies, workers, and rural communities were successful in extracting concessions from the local government. If this assumption is incorrect, then subsidies in other provinces could be higher than suggested here.

Japan

By the 1980s, as Japan industrialized and urbanized, the number of people employed in forestry had halved to 110,000.[21] The Ministry of Agriculture, Forests, and Fisheries gradually changed its policy from encouraging domestic industry to supply and process more timber, toward protecting the industry and the jobs dependent upon it. Small companies that have difficulty competing with cheaper imports dominated and continue to dominate domestic production.[22] Meanwhile, the pulp and paper industry began to expand overseas with support from the Ministry of International Trade and Industry (MITI) and the Japanese Export-Import Bank (JEXIM), investing in joint ventures to secure low priced wood chips for the Japanese market. By 1997, only about 19.6 percent of Japan's domestic timber needs were met from domestic production.[23]

The government provides substantial subsidies to the domestic industry. Forest planting, maintenance and protection funds include subsidies for road construction that are sometimes used to harvest forests that conservation groups would like to see protected.

Most Japanese forests are in mountainous areas, where road construction is a major cost. Large-scale road construction for forest development started in 1969.[24] Cumulative subsidies are projected to amount to 955 billion yen (US$8.7 billion) for 2,295 km of road contracted to the (former) Forest Development Public Corporation, which in 1999 was transformed into the Green

Table 3 **Estimate of Provincial Subsidies and Public Investments by Value of Shipments**
(Figures in millions of Canadian dollars)

	Annual Forestry Shipments	Calculated Mid-Range Subsidies	Subsidy as Percentage of Total Value of Shipments	Subsidies x 10.5 Percent of Total Value of Shipments	Subsidies x 5.25 Percent of Total Value of Shipments (B.C. @ 10.5 Percent)
				Option 1	Option 2
Northwest Territories	$0			$0.00	$0.00
Yukon	$0			$0.00	$0.00
British Columbia	$23,800	$2,510	10.5	$2,510.00	$2,510.00
Alberta	$4,200			$441.00	$220.50
Saskatchewan	$867			$91.04	$45.52
Manitoba	$873			$91.67	$45.84
Ontario	$15,000			$1,575.00	$787.50
Quebec	$18,000			$1,890.00	$945.00
New Brunswick	$3,600			$378.00	$189.00
Nova Scotia	$1,200			$126.00	$63.00
Prince Edward Island	$28			$2.94	$1.47
Newfoundland	$744			$78.12	$39.06
TOTAL	$68,312			$7,183.77	$4,846.89

Note: Data for the Northwest Territories and Yukon are not available.

Sources:

Alberta Treasury Department. *Government Releases 1996–1997 Public Accounts*. Government of Alberta News Release, September 24, 1997. (Edmonton, Alberta: Government of Alberta, 1997).

British Columbia, Ministry of Finance. *Annual Report for 1997/98*. (Victoria, BC: Government of British Columbia, 1998).

R. Gale, F. Gale and T. Green. *Accounting for the Forests: A Methodological Critique of Price Waterhouse's Report: The Forest Industry in British Columbia 1997*. (British Columbia: the Sierra Club, 1999). URL: http://www.sierra club.ca/bc/Publications/Publications.html.

Manitoba Department of Finance. *Operating Fund Statement of Revenue and Expenditure for the Year Ended March 31,1998*. (Winnipeg, Manitoba: Government of Manitoba, 1998).

New Brunswick Ministry of Finance. *Budget 2000–2001: Historical Fiscal Framework*. (Fredericton, New Brunswick: Government of New Brunswick, 2000)

Newfoundland Department of Finance. *Public Accounts 1998–1999: Volume I – Consolidated Summary Financial Statements*. (St. John's, Newfoundland: Government of Newfoundland, 1999).

Northwest Territories Ministry of Finance. *1999–2000 Main Estimates*. (Yellowknife, Northwest Territories: Government of the Northwest Territories, 1999).

Nova Scotia Ministry of Finance. *Public Accounts of the Province of Nova Scotia for the Fiscal Year Ended March 31, 1998*. (Halifax, Nova Scotia: Government of Nova Scotia, 1998).

Ontario Ministry of Finance. *1998–1999 Province of Ontario Annual Report* (Toronto, Ontario: Government of Ontario, 1999).

Prince Edward Island Ministry of Finance. *Public Accounts of the Province of Prince Edward Island: Volume I–Financial Statements for the Year Ended March 31, 1999*. (Charlottetown, Prince Edward Island: Government of Prince Edward Island Web Site, 1999).

Quebec Ministère des Finances. *Public Accounts 1997/98 Summary*. (Quebec City, Quebec: Government of Quebec, 1998).

Saskatchewan Ministry of Finance. *Condensed Statement of Assets, Liabilities and Accumulated Deficit as at March 31, 1998*. (Regina, Saskatchewan: Government of Saskatchewan, 1998)

Yukon Department of Finance. *Public Accounts for the Government of Yukon Territory for the year ended March 31, 1998*. (Whitehorse, Yukon: Government of the Yukon Territory, 1998).

Resource Public Corporation owned by the Ministry of Agriculture, Forests, and Fisheries. By 1995, 345 billion yen ($3.1 billion) had been spent with the remaining 600 billion yen ($5.5 billion) to be used in the next 20-30 years. Many of the roads have little to do with the forest industry. The central government covers 70-85 percent of the cost, local governments bear 10-25 percent, and road users only 5 percent.[25] The budget amount in 1996 for such payments was 121 billion yen.[26]

Routes often go through, or close to, old-growth forests such as the Shirakami Sanchi on northern Honshu island, famous for its beech forests (declared a UNESCO World Heritage site in 1993). The Forestry Agency has consequently promoted deforestation by subsidizing the public construction industry. In 1998, after a decade of campaigning by environmental groups, the government fi-

Table 4 **Estimate of Federal Subsidy and Public Support Payments by Value of Shipment for 1997** *(Figures in millions of Canadian dollars)*

	Annual Forestry Shipments 1998	Calculated Mid-Range Support Payment	Subsidy as Percentage of Total Value of Shipments	Subsidies x 1.8 Percent of Total Value of Shipments	Subsidies x 0.9 Percent of of Total Value of Shipments (B.C. @ 1.8 Percent)
				Option 1	Option 2
Northwest Territories	$0			$0.00	$0.00
Yukon	$0			$0.00	$0.00
British Columbia	$23,800	$421	1.8	$428.40	$428.40
Alberta	$4,200			$75.60	$37.80
Saskatchewan	$867			$15.61	$7.80
Manitoba	$873			$15.71	$7.86
Ontario	$15,000			$270.00	$135.00
Quebec	$18,000			$324.00	$162.00
New Brunswick	$3,600			$64.80	$32.40
Nova Scotia	$1,200			$21.60	$10.80
Prince Edward Island	$28			$0.50	$0.25
Newfoundland	$744			$13.39	$6.70
TOTAL	$68,312			$1,229.62	$829.01

nally introduced a law requiring environmental impact assessments to evaluate projects under these construction programs.[27]

In the Yanbaru area of subtropical rain forest on the north of the island of Okinawa, unique natural forests have been cleared with subsidies from the government. Funds that are designed to support reforestation and subsidies for road construction have fueled the deforestation. *(See Box 3.)*

Subsidies also support sawmills. These payments were historically restricted to mills processing domestic timber. As log imports have grown, the mills have been permitted to also handle these logs to maintain jobs. Much of Japan's log imports originate in environmentally sensitive areas, including Russia (24 percent or 3.7 million cubic meters of log imports in 1997) and North America (62 percent), as well as Indonesia and other parts of Southeast Asia. Recent reports from Indonesia and Russia highlight the growth of illegal logging. It is estimated that as much as three quarters of the logs and timber exported from Indonesia is of illegal origin.[28] As much as one fifth of government financing for sawmills, or US$200 million is being used to process imported logs, some of which probably originate from illegal operations overseas.[29]

The government encouraged timber and wood chip imports from 1960 to 1980 by providing export credit insurance via MITI for harvesting and transportation equipment through Japanese trading companies active mainly in Southeast Asia. Since 1990, aside from the pulp and paper industry, the Japanese government has not encouraged wood product imports because of worldwide oversupply and the depressed state of the domestic logging industry.

In the past, JEXIM[30] supported overseas investments by Japanese companies that have resulted in loss of old-growth forests. In 1981, for example, the JEXIM Russian Far East Forest Resource Development Collaboration (a 200 billion yen bank loan, the third in a series of such loans) promoted the export of harvesting and transportation equipment from Japan, and the import of logs, timber and other wood products from Russia. The fourth transaction under this framework is under negotiation but has been delayed due to economic instability in Russia. If negotiations are concluded, the deal will include construc-

Box 3 Japanese Subsidies Harm the Forests of Okinawa

The Yanbaru area of Okinawa is home to a unique sub-tropical forest with nearly 200 species of endemic animals and plants. Subsidy programs supported by the Japanese government are one of the major threats to the integrity of this forest. The forestry industry on Okinawa receives substantial assistance from the central government in the form of special development grants. So-called reforestation programs that are entirely government financed (30 percent of the funds are from the Water Resource Fund and 70 percent from the Treasury) have led to clearance of intact natural forest.

The Japanese government is also responsible for financing 75-80 percent of "land improvement projects" that cost tens of billions of yen annually. The farmland that has been created does not appear to be productive and has led to soil erosion in turn polluting the neighboring marine habitat.

One project, the Okuni Forest Road, is 36 kilometers long and cuts through the Yanbaru forest. Construction began in 1977 and took 18 years at a cost of 4.6 billion yen, 80 percent paid for by the central government, the rest funded by the local government. The habitat of rare species was harmed and more than 100 watersheds degraded. In 1998, this project was highlighted as one of "the 100 unnecessary public enterprises" in a report compiled by Japan's independent Nijuisseiki Kankyou Iinkai (21st Century Environment Committee).[1] The road was built largely to provide work for construction companies. In 1995, after road construction ended, restoration projects were implemented at an additional total cost of 2.8 hundred million yen.[2] The health of the forest is now threatened by further plans for construction of U.S. army helipads, dams, and continued expansion of forest roads.

Notes:

1. Yomiuri Shinbun, 27th May1998.
2. Asahi Shinbun, 8th October, 1997.

Source: The Subtropical Forests Yanbaru published by The Association for Preserving the Yanbaru Mountains, 1995, financed partly by WWF Japan. Additional information from Greenpeace Japan.

tion of a log and timber export terminal in Khabarovsk district. Much of the Russian timber involved originates in old growth forests.

In 1998, JEXIM financing for the forest products industry jumped to 15.5 billion yen from 4.0 billion yen in 1997. This includes support for Japanese paper manufacturers involved in eucalyptus plantations in Australia. Old growth forests are being harvested and their woodchips exported to Japan from East Gippsland, Victoria state, with involvement of the Harris Daishouwa company. In Tasmania, Mitsubishi Paper is involved in similar activities, as are Shinetsu Chemical and Nippon Paper in Wellington, Western Australia.

Problems associated with such plantations include clearing old-growth forests and injudicious use of fire and chemicals, which can adversely affect native species and ecosystems.

Some of Japan's overseas development assistance programs have had serious environmental impacts through their subsidies to forest products companies. In 1990, the Overseas Economic Cooperation Fund (OEFC) provided the Indonesia PT Tanjung Enim Lestari Pulp and Paper investment finance (US$45 million) for pulp production (450,000 metric tonnes per year) and plantation operations. Japanese trading companies and paper manufacturers were involved in these operations. In 1997, the Japan International Cooperation Agency (JICA) granted equipment for plantation development in northwest Vietnam, together with technical assistance (130 million yen). For the last five years, there have been 20 to 25 similar projects each year under JICA in developing countries.[31] There are concerns about the lack of sustainable forest management in these projects.

To conclude, domestic deforestation in Japan has resulted from subsidies to public corporations and the construction industry for large-scale road construction. Domestic sawmill subsidies are being partly used to process logs imported from environmentally sensitive forests overseas. Overseas deforestation has resulted from use of public funds by the former OECF (in Brazil, Indonesia, and other countries) and by the former JEXIM (Australia, Russia, and beyond). The government of Japan states that such projects will not be funded in the future, but it is unclear what measures have been adopted to ensure that this is so.

The United States

Analysis for this note about perverse U.S. logging subsidies largerly focuses on the operations of the U.S. Forest Service in the country's national forests, which cover about 76 million hectares (190 million acres).[32] About 20 million hectares (50 million acres) are classified as "suitable for timber production" and known as "timberlands."

In the late 1980s, timber removal from its timberlands amounted to about 12 percent of U.S. timber supplies. By the late 1990s, production had dropped to the equivalent of about three percent of total annual U.S. wood consumption.[33] Much of the national forest land is

considered to be of high conservation value, although only a fraction of it is old growth (and less than half is actually forested).[34]

In the Rocky Mountain States, a substantial, but unmapped, area of subalpine forest has never been cut. Most lower elevation forests have been cut and virtually all national forests in the eastern United States outside of tiny scattered pockets have been cut several times during the past 200 years. Nonetheless, they are disproportionately important conservation lands in many areas because they have been less fragmented and exploited than adjacent private lands.

Estimates of the degree to which American taxpayers are subsidizing logging and related activities in the national forests vary. All studies (including those of the Forest Service) agree, however, that subsidization is *extensive and pervasive*, amounting to at least several hundred million dollars each year. The most authoritative and conservative calculations come from the government itself. The U.S. General Accounting Office, the government's official auditor, prepared two major studies of the Forest Service's timber sales program. The most recent covers the period up to and including fiscal year 1997 (up to September 30, 1997). The Forest Service has not made available more recent accounts even though at the time of writing over 20 months have elapsed since the end of fiscal year 1998. There is, however, no reason to suspect that losses have diminished between 1997 and 2000.

The Forest Service defines "commercial forest land" as forest that can produce at least 20 cubic feet (0.67 cubic meters) per acre of industrial wood annually. This criterion should reduce the number of administrative forests that are in the program from 109 to only 91, and reduce the total area affected by about 2 million hectares to about 18 million hectares, although most of these are seldom profitable for the agency. The agency does not, however, apply this criterion and continues to heavily subsidize logging in these areas.

According to the U.S. General Accounting Office, the Forest Service's timber sales program cost American taxpayers over $2 billion net during the period 1992-97.[35] During the period 1993-97, the timber program lost a total of $1,538 million, an average of $308 million per year. This translates into an average loss from timber sales of $1,405 per hectare ($562 per acre), or $4,343 per job created, and about $30 per cubic meter ($71.26 per thousand board feet) produced.[36] *(See Table 5.)* The General Accounting Office estimates are very

Table 5 **Five Years of Federal Subsidies for Logging in U.S. National Forests, Fiscal Years 1993-97**

Forest Areas	Net Profit or (Loss) Average per Year[1]	Per MBF Cut[2]	Per Acre Cut[3]	Per Job Claimed[4]
18 "Owl" Forests[5]	(98,604,716)	(115.07)	(1,438)	(8,265)
91 Forests (All – 18 "Owl" Forests)	(208,914,462)	(60.41)	(437)	(3,549)
6 Positive Cash Flow Forests[6]	16,032,605	37.69	394	2,654
103 Negative Cash Flow Forests	(323,551,783)	(83.17)	(639)	(4,996)
All 109 National Forests	(307,519,178)	(71.26)	(562)	(4,343)

Notes:

1. Amounts in U.S. dollars.
2. For conversion to cubic meters: 1 thousand board feet (MBF) is equivalent to 2.36 cubic meters.
3. One acre is equivalent to 0.4 hectares.
4. These figures refer to the numbers of jobs that the U.S. Forest Service claims are created by the program.
5. Forests where spotted owl protection is a required part of the management program.
6. These are the Inyo, Umpqua, Mississipi, Texas, Allegheny, and Monongahela National Forests.

Source: Robert Wolf, Fellow of the Society of American Foresters, prepared this analysis based on data from U.S. General Accounting Office review of U.S. Forest Service Distribution of Timber Sales Receipts, Fiscal Years 1992-94 (GAO/RCED-95-237FS, September 8, 1995) and of U.S. Forest Service Distribution of Timber Sales Receipts, Fiscal Years 1995-1997 (GAO/RCED-99-24, November 12, 1998).

conservative. They are based on data provided by the U.S. Forest Service, which has a strong incentive to prepare accounts that minimize the resulting estimated loss to avoid political criticism. Other independent analyses have suggested that the loss could be much greater. The Earth Island Institute's John Muir Project estimates that for fiscal year 1997, the timber sales program operated at a net loss of over $1.2 billion.[37]

Fiscal year 1998, 1999, and 2000 appropriations for the Forest Service's timber sale activities indicate that there has been no decline in spending on these programs. It seems safe to assume that losses continue to be high and that the U.S. government subsidizes timber sales on public lands at the rate of at least $300 million per year. In the process, unique natural heritage is being lost with no clearly documented social benefit. *(See Box 4.)*

The timber sale program in the U.S. national forests is not financially sound, has poorly documented claims of environmental benefits (there is a growing call among U.S. environmental groups to end most commercial logging in these areas), and contributes little toward meeting national wood needs. A large proportion of the program can, therefore, be viewed as a highly perverse subsidy that harms forests of global significance and the U.S. economy.

Like Japan, the United States provides support, which could be viewed as an indirect perverse subsidy, to American corporations that harm old growth forests overseas. Two agencies are primarily responsible for this support, the Overseas Private Investment Corporation (OPIC) and the U.S. Export-Import Bank (EXIM).

In 1995, OPIC approved support for The Pioneer Group, Inc. to invest in timber harvesting operations in the Russian Far East. The agency provided $9.3 million in financing and $52 million in political risk insurance. In 1995-96, OPIC approved support for the Global Forestry Management Group's logging, also in the Russian Far East, with $17 million in political risk insurance. These companies engaged in exporting unprocessed logs from the Russian Far East to Japan. A site visit found regeneration problems, erosion, and clearcutting of old growth forest. The U.S. government's extended full faith and credit, as well as diplomatic support if things should go wrong, greatly enhanced the financial viability of these harmful investments. OPIC has made improvements to its policy that help ensure that projects that harm forests are less likely to occur in the future. These reforms have not, however, applied to OPIC's 27 investment funds. These continue to operate secretively. One of them – the Russia Partners Fund – is involved in logging in the Arkangalsk region Russia about which further details are not available.

In 1995, EXIM made a final commitment for a loan guarantee of $17.5 mil-

Box 4 Subsidies to Log Alaska's Tongass National Forest

The Tongass National Forest in Alaska is the largest and most intact area of old growth forest in the United States. Scientists recognize its global conservation value.[1] As far back as 1912, the U.S. Forest Service tried to promote huge timber sales to create a Tongass paper industry. Efforts increased in the 1920s but all of the 11 sales offered and bid upon were returned to the agency uncut. In recent decades, the U.S. Congress and the Forest Service have sought to increase production with large tax breaks and other subsidies for companies operating there. The claimed benefits that have resulted from this investment are not substantiated.

For 1992-94, the GAO showed that the Forest Service in Tongass lost $102 million from cutting 971 million board feet (2.3 million cubic meters) of timber from 31,201 acres. This translates to a loss of $3,273 per acre cut. For the next period, 1995-97, the loss expanded to $5,010 per acre cut. The loss per Tongass timber job rose from $11,369 in 1993 to $28,673 in 1997.[2] In 1997, the Forest Service proposed building 1,100 miles of new roads for logging on an additional 85,000 acres of temperate rain forest over the next 10 years. The agency noted that it lost $33 million on Tongass timber sales that same year, by far the largest losses of any national forest in the country. In 1997, the loss peaked at $11,242 per acre cut or $28,673 per job claimed.

There have also been other less direct payments. More than $250 million was spent in 1996-99 to help southeast Alaska shift away from a timber-dependent economy. In 1997, the Louisiana-Pacific Corporation received $140 million from the government to settle a contract dispute with the Forest Service. In exchange for these losses, some jobs have been temporarily maintained, while unique habitat for bears, salmon, wolves, and bald eagles has been lost. The payments amount to massive perverse subsidies. The financial loss pales when compared with the national and global environmental harm that is inflicted on this unique temperate rainforest.

Notes:

1. D. Bryant et al., *The Last Frontier Forests: Ecosystems and Economies on the Edge* (Washington, DC: World Resources Institute, 1997).
2. U.S. General Accounting Office, GAO/RCED-95-237FS and GAO/RCED-99-24.

lion to the Beloit Corporation for the export of a pulp and paper mill digester cooking system to Bratsky Lespromyshlenny pulp and paper mill complex in Bratsk, Siberia. In 1996, EXIM signed an accord with the Russian state timber monopoly, Roslesprom, to facilitate EXIM support for exports by U.S. manufacturers to forestry, pulp and paper projects in Russia. According the EXIM press release, "Under this Memorandum, EXIM is prepared to provide financing to Russian existing forest enterprises for their purchases of U.S. equipment and services to assist them in increasing the efficiency and productivity of the Russian forest products industry." Given the poor state of forest management in Russia and the high rate of illegal logging, such support is highly questionable. Current EXIM policies do not prohibit support for projects that may involve logging of primary forests.

France, Germany, Italy, and the United Kingdom

Among the European members of the G8, France stands out as the only government with documented direct and ongoing involvement and interest in logging operations in environmentally highly sensitive areas. The French government subsidizes the logging and forest products industry in parts of Central Africa, and is even a shareholder in some French logging companies operating there. Information about these activities is difficult to collect and verify. The picture presented below is incomplete and demonstrates the need for further research.

French government agencies involved in activities that help to subsidize logging and related activities in Central Africa include the French Development Agency (AFD), the French Technical Center for Tropical Forestry (CIRAD), the Ministry of Cooperation, and the French Fund for Assistance and Cooperation (FAC). The AFD is accountable to France's parliament but the information provided to the parliamentarians is confidential, severely restricting public oversight. These agencies are involved in financing roads, management programs, and research, some of which, especially the road programs, may have serious negative impacts on tropical forests in Cameroon, Gabon, Central African Republic, and the Ivory Coast. Some of these programs are also directly designed to promote forest conservation and sustainable management and are beneficial to forest protection.

The tropical forests of Central Africa are considered of global conservation value. They are the second largest tract of tropical forest in the world, after Amazonia's. Logging and the associated investment in roads and other infrastructure pose the greatest threat to these forests. Recent studies have highlighted the rapid loss and degradation of forests in the region.[38] Throughout Central Africa, hunters use logging roads to travel into previously inaccessible areas to hunt mammals and birds, which are then transported back, often on logging trucks, to cities for sale as traditional delicacies. Logging activities, even at quite low intensity, have been found to result in almost complete local eradication of key species, including chimpanzee, gorilla, elephants, and large birds.[39]

Infrastructure in Central Africa is a key limiting factor in determining where logging is viable. Roads that are built as part of development programs to help improve access to rural areas sometimes primarily benefit logging companies that are seeking to expand operations in the area. This also applies to improvements to existing roads. Development financing for road construction or improvement can effectively subsidize the logging industry. Given that in Central Africa there is also scant oversight and control of logging operations, and even widespread illegal, unlicensed cutting, this is a serious issue.[40]

A partial list of French-funded projects that may have served to support the logging industry in Central Africa has been compiled. (*See Table 6.*) It is impossible to know how much France is spending each year in Central Africa on infrastructure and related projects that may contribute to tropical forest degradation. The total for the period 1989-99 is estimated at about 3.5 billion French Francs ($500 million). Annual spending is at least tens of millions of U.S. dollars.

Other European members of the G8 no longer have such direct involvement in infrastructure and potentially damaging forestry operations in highly sensitive tropical forest regions. This is due to clear prohibitions and directives in their development assistance policies. Indeed, the United Kingdom and Germany have both been active in supporting wide-ranging forest conservation and sustainable management projects in Asia, Africa, and Latin America. Much of this assistance has been through bilateral cooperation programs that have been systematically reviewed and improved in recent years.

There is, however, significant cause for concern over how various multilateral international institutions are using some

of these countries' funds. By far the largest and most important of these, in the European context, is the European Commission. Others include the World Bank family, the regional development banks (the Inter-American Development Bank, the African Development Bank, and the Asian Development Bank), and the International Tropical Timber Organization.

The European Commission, with financial contributions from the European Union member countries, is one of the largest donor agencies in the world. It has billions of dollars worth of projects in Asia, Africa, and Latin America. A number of their projects fail to address concerns of traditional communities and have resulted in forest loss and degradation in ecologically sensitive areas.[41] Studies of projects related to tropical forests have indicated that project preparation has often been poor.[42] Of special concern, as with the French bilateral assistance discussed above, is the substantial program involving road construction and rehabilitation. This is particularly significant in Central Africa where hundreds of millions of dollars have been used for this purpose.[43] *(See Box 5.)*

The Russian Federation

Prior to the collapse of the Soviet Union and the subsequent restructuring of Russia's economy, huge subsidies were provided to the forest products industry, partly in the form of low-cost transport of logs on state-owned railways. Today, many distortions remain in the sector, but the costs and risks associated with doing business in Russia's forest sector suggest that there is little, if any, net public subsidy, perverse or otherwise to help defray the costs of the operations. The issue of growing concern in Russia is illegal logging, now estimated to account for at least a half of all of Russia's log output, including much that enters international trade. Lack of law enforcement, non-collection of taxes and fees, and logging in places not licensed for such activity, are now rampant. The recent dissolution of the Federal Forest Service has only made these problems worse. Some companies that take advantage of such dynamics do so for expected large short-term gains and effective huge subsidies in the form of facilitated tax avoidance.[44]

Major Findings and Recommendations

Findings

The G8 governments continue to provide large and perverse subsidies to forest products industries. These payments promote inefficiency, harming forests that should be conserved and that loggers would otherwise not touch. These funds could be better spent on more productive activities including helping poor

Table 6 **Examples of French-Funded Programs in Central Africa that Could Promote Forest Degradation**

Agency and Project Type	Location	Amount (Million French Francs)	Date Project Approved
AFD loan for road	Cameroon: Ambam to Equatorial Guinea border	88.55	April, 1999
AFD loan for road	Cameroon: Yaounde to Ambam	227	December, 1997
AFD road development	Woleu-Ntem province	300	1993
AFD road improvement	Gabon	143 (also supported by Spain)	Not known
Ministry of Coop and AFD support to French logging companies Rougier, SFID, SEBC	Cameroon, Dimako	35	1992
AFD roads	Central African Republic	Not known	1989
AFD roads	Gabon	Not known	1998?
FAC railroad	Gabon	42	1980
AFD roads	Gabon: Oyem-Eboro, Mitzic-Oyem, Meoumane-Lalara	210 270 210	1993?
AFD roads	Gabon	47	1999

Source: Information gathered by Catarina Cardoso

Box 5 **The European Union and Roads in Cameroon**

In 1991, the European Union provided a grant to Cameroon of about US$65 million to help cover the loss of coffee and cocoa export earnings after a fall in prices. One component was road improvement to help transport coffee and cocoa from the farms to market. The area affected by the road was also rich in rainforests and was being opened by the government to logging companies. It is also close to the Dja Biosphere Reserve, home to many Baka pygmies. The African Development Bank (ADB) had refused funding for the rehabilitation of this same road after an environmental impact assessment showed that the project could cause environmental and social harm. Only then did the Cameroon Government request finance from Europe. The donor approved funding, apparently ignoring their own guidelines and the ADB assessment.

There was almost no consultation over the project in the planning phase. Researchers from the Rainforest Foundation conducted a local survey to assess the environmental and social impacts of the project. They found the following:

- Local people gained from reduced costs in transporting agricultural produce. Prices of goods imported into the area increased, however, and because there was an influx of people looking for work, unemployment grew.
- There was an increase in prostitution, health problems, banditry, and theft.
- Logging expanded with the sale of nine licenses including four to European logging companies.
- Some large French logging companies increased their activities in the region taking advantage of the better access.
- In early 1998, a new sawmill was established near Lomié. Preparation of the site involved the destruction of a Baka village inhabited by 200 people.
- There was an increase in poaching and in the number of hunting camps in the Dja Reserve. About 27 camps up to 50 kilometers inside the Reserve were observed.

UNESCO questioned the Dja Reserve's status as a World Heritage Site, and a monitoring report suggested that unless action was taken to control logging, "World Heritage in Danger" status should be considered. Although another, existing European Union project attempted to relieve hunting pressure, the effect of the road rehabilitation program was to increase hunting pressure.

Source: *Out of Commission: The Environmental and Social Impacts of European Union Development Funding in Tropical Forest Areas*. (London: The Rainforest Foundation, 1998).

countries to conserve forests and manage them in ways that help to reduce poverty and improve environmental quality. The G8 countries that continue perverse subsidy programs and policies, directly contradict the G8 Action Program on Forests adopted at the Birmingham Summit in 1998. *(See Box 1.)*

Perverse G8 subsidies to the forest products industry add up to billions of dollars per year and directly contribute to the loss and degradation of threatened old growth forests in tropical, temperate, and boreal regions. Because of the poor availability of analysis and data, it is not possible to directly compare the G8 countries with one another. But we note with concern the following findings:

- In **Canada**, perverse subsidies amount to an estimated US$2-2.7 billion per year. In the Province of British Columbia alone, for which analysis is most detailed, subsidies to the industry in 1997 totaled about US$2 billion, of which half is estimated to be perverse, harming both forests and the economy. These payments are contributing to destruction of old growth forests, which are of global significance for conservation.
- The **Japanese** government is engaged in subsidy programs that are harmful to old growth forests both domestically and abroad. These programs provide payments to sawmills in Japan that process logs imported from old growth logging in Siberia, Canada, and elsewhere. Efforts to create jobs and stimulate economic activity have included massive public spending on roads ostensibly to help with forestry, but with serious impacts on old-growth forests. Japan's export credit and overseas investment insurance agencies are supporting plantation and wood chipping programs that directly destroy old growth forests and negatively affect traditional communities in Australia, Indonesia, and elsewhere.
- In the **United States**, timber programs in the National Forests have lost over $2 billion in the period 1992-97, according to conservative government analyses. Others believe the figure is much greater. These losses represent only a part of the entire timber sale budget, much of which can be considered a perverse subsidy to the U.S. logging industry. Of special concern is the continued subsidy for commercial logging operations in the Tongass National Forest in Alaska, an area of outstanding global significance for conservation.
- **France** is involved in road building and related investments in Central Africa that directly serve the economic interests of French (and other) logging companies. Use of development assistance for road building and road improvement has been shown by numerous scientific studies to result in serious harm to the primary tropical forests of the region.

- Other European G8 countries, **Germany**, the **United Kingdom**, and **Italy**, as well as **France**, all contribute to development assistance programs managed by the European Commission. Some of these programs involve substantial subsidized loans and grants for road building in Central Africa and elsewhere. The environmental and social impacts of these projects may be considerable.
- In Russia, forests are beset by massive illegal logging. Non-collection of taxes and fees from such operations serves as a subsidy, admittedly somewhat offset by the high risks of doing business in that country.

The full scale and structure of the subsidies and the extent of their harm is unclear. Such information would be of great value in preparing a far more rigorous assessment and identifying options for achieving a transition to more cost-effective and efficient management systems. It would be helpful if agencies in some governments were more forthcoming in sharing information that would permit such analysis to be performed.

Recommendations

The G8 declaration at the Birmingham Summit in 1998 signaled important and laudable commitments by powerful governments to help conserve and manage forests. Those governments did not at that time choose to recognize and address the perverse subsidies that some of them are providing and that contribute to forest loss and degradation. This omission should be acknowledged and corrected as soon as possible.

We recommend that the G8 should explore and analyze the issue of their payment of perverse subsidies that are harmful to forests and economies, and develop an action plan for removing all such payments. Removal of perverse subsidies should occur no later than 2005. We specifically recommend the following:

- The G8 should jointly establish and fund an independent external commission to conduct a rigorous, in-depth investigation of G8-funded perverse subsidies that promote forest degradation. The commission should include prominent experts in natural resource and ecological economics, policy, law, forestry, forest ecology, and social sciences. Members should be drawn from a mix of academic, government, and nongovernmental organizations. The commission should be given the financial and technical resources, as well as access to information, necessary to work to prepare a report detailing the extent and structure of G8 subsidies that contribute to forest loss and degradation. The report should include a country-by-country analysis and examine the multilateral agencies to which members of the G8 contribute funds. The findings of the commission should be made available to the public.
- G8 governments that are actively engaged in subsidizing their domestic or overseas forest products industry in ways that are demonstrably harmful to the environment and the economy (including Canada, United States, Japan, and France) should commit to eliminate such subsidies within three years of publication of the proposed report. Progress toward that goal should be publicly monitored between now and that time, with review at each annual G8 summit meeting and discussion to share experiences and lessons learned.
- Through their overseas assistance programs, the G8 members and the multilateral institutions that they govern should establish priority programs to assist other countries in the identification and elimination of perverse forestry subsidies. Funds for such assistance would become available by eliminating the perverse subsidies that the G8 governments currently pay.

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NOTES

1. W. Reid, *Keeping Options Alive* (Washington, DC: World Resources Institute, 1990).
2. D. Austin, J. Goldemberg and G. Parker, *Contributions to Climate Change: Are Conventional Metrics Misleading the Debate?* (Washington, DC: World Resources Institute, 1998).
3. P. Brown, *Climate, Biodiversity, and Forests* (Washington, DC: World Resources Institute and World Conservation Union, 1998).
4. R. Costanza, et al. "The Value of the World's Ecosystem Services and Natural Capital," *Nature* 387, 257; *Protecting our Planet Securing our Future* (Washington, DC: United Nations Environment Program, U.S. National Aeronautics and Space Administration, and The World Bank, 1998).
5. *State of the World's Forests Report, 1999* (Rome: United Nations Food and Agriculture Program, 2000).
6. O. Lynch, *Securing Community-Based Tenurial Rights in the Tropical Forests of Asia: An Overview of Current and Prospective Strategies* (Washington, DC: World Resources Institute, 1992).
7. T. Chappell (editor), *The Philosophy of the Environment* (Edinburgh: Edinburgh University Press, 1997).
8. D. Bryant et al., *The Last Frontier Forests: Ecosystems and Economies on the Edge* (Washington, DC: World Resources Institute, 1997).
9. *U.S. National Assessment: The Potential Consequences of Climate Variability and Change*, http://www.nacc.usgcrp. gov
10. D. Bryant et al., *The Last Frontier Forests: Ecosystems and Economies on the Edge* (Washington, DC: World Resources Institute, 1997).
11. *State of the World's Forests Report, 1999* (Rome: United Nations Food and Agriculture Program, 2000).
12. R. Repetto and M. Gillis, eds., *Public Policies and the Misuse of Forest Resources* (Cambridge: Cambridge University Press, 1988).
13. World Commission on Forests and Sustainable Development, *Our Forests Our Future* (Cambridge: Cambridge University Press, 1999).
14. N. Johnson and C. Barber, *Breaking the Logjam: Obstacles to Forest Policy Reform in Indonesia and the United States* (Washington, DC: World Resources Institute, 1994); N. Johnson and B. Cabarle, *Surviving the Cut: Natural Forest Management in the Humid Tropics* (Washington, DC: World Resources Institute, 1993).
15. Earth Council, *Subsidizing Unsustainable Development: Undermining the Earth with Public Funds* (Costa Rica: Earth Council, 1996).
16. Ibid.
17. Global Forest Watch, *Canada's Forests at a Crossroads* (Washington, DC: World Resources Institute, 2000).
18. Canadian Forest Service, *The State of Canada's Forest, Profiles Across the Nation* (Ottawa: Natural Resources Canada, 1999).
19. R. Gale, F. Gale and T. Green, *Accounting for the Forests: A Methodological Critique of Price Waterhouse's Report: The Forest Industry in British Columbia 1997* (Vancouver, Canada: The Sierra Club of British Columbia, 1999). Online at http://www.sierraclub.ca/BritishColumbia/Publications/Publications.html.
20. PriceWaterhouseCoopers, *The Forest Industry in British Columbia 1997* (Vancouver: PriceWaterhouseCoopers, 1999).
21. Japan Forestry Research Association, *Forestry Data Book* (Tokyo, 1998, page 61).
22. Forestry Agency of Japan, *Forestry White Paper* (Tokyo: Forestry Agency, 1998).
23. Forestry Agency of Japan, *Timber Demand and Supply Table 1999* (Tokyo: Forestry Agency, 1999); Japan Forestry Research Association, *World Timber Trade Structure*, (Tokyo, 2000 pages 273-286); Export-Import Bank of Japan, *Annual Report* (Tokyo, 1998); Pulp & Paper No. 603, 1999 special issue by Japanese Paper Manufacturers Association.
24. Mountain and Forest of District Tohoku (Tokyo: Ryokukuu Syuppan, 1996).
25. Ibid.
26. Forestry Agency of Japan, *Timber Demand and Supply Table 1999* (Tokyo: Forestry Agency, 1999).
27. Forestry Agency of Japan, *Forestry White Paper* (Tokyo: Forestry Agency, 1998).
28. Mubariq Ahmad, personal communication, June, 2000.
29. Forestry Agency of Japan, *Timber Demand and Supply Table 1999* (Tokyo: Forestry Agency, 1999, page 356-358).
30. The Japan Export-Import Bank merged with Overseas Economic Cooperation Fund to became the Japan Bank for International Cooperation in October 1999.
31. Forestry Agency of Japan, *Forestry White Paper* (Tokyo: Forestry Agency, 1998).
32. The 155 "proclaimed" national forests are managed by the U.S. Forest Service as 109 "Administrative Forests" for convenience.
33. U.S. Forest Service, *Timber Sale Program Annual Report, Fiscal Year 1997* (Washington, DC: U.S. Department of Agriculture, 1998).
34. D. Bryant et al., *The Last Frontier Forests: Ecosystems and Economies on the Edge* (Washington DC: World Resources Institute, 1997).
35. United States Forest Service Distribution of Timber Sales Receipts, Fiscal Years 1992-1994 (GAO/RCED-95 237FS, September 8, 1995); United States Forest Service Distribution of Timber Sales Receipts, Fiscal Years 1995-1997 (GAO/RCED-99-24, November 12, 1998).
36. Unpublished analyses prepared by Robert Wolf.
37. C. Hanson, *Ending Logging on National Forests: The Facts* (Washington, DC: Earth Island Institute, 1999).
38. Global Forest Watch, *A First Look at Logging in Gabon* (Washington, DC: World Resources Institute, 2000); Global Forest Watch, *An Overview of Logging in Cameroon* (Washington, DC: World Resources Institute, 2000). Both reports available online at http://www.globalforestwatch.org

39. J.G. Robinson et al., "Wildlife Harvest in Logged Tropical Forests," *Science*, Vol. 284, 23 April 1999, pp. 595-596.

40. Global Forest Watch, *A First Look at Logging in Gabon* (Washington, DC: World Resources Institute, 2000); Global Forest Watch, *An Overview of Logging in Cameroon* (Washington, DC: World Resources Institute, 2000). Online at http://www.globalforestwatch.org.

41. The Rainforest Foundation, *Out of Commission: The Environmental and Social Impacts of European Union Development Funding in Tropical Forest Areas* (London, 1998).

42. The Rainforest Foundation, *Out of Commission: The Environmental and Social Impacts of European Union Development Funding in Tropical Forest Areas* (London, 1998).

43. N. Sizer and D. Plouvier, *Increased Investment and Trade by Transnational Logging Companies in Africa, the Caribbean and the Pacific: Implications for the Sustainable Management and Conservation of Tropical Forests* (Brussels: The European Commission, World Wide Fund for Nature, and World Resources Institute, 2000).

44. Personal communication, Sergei Tsyplenkov. June, 2000.

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