DISCUSSION PAPER

July 2011 ■ RFF DP 11-28

A Whole-of-Government Approach to Reducing Tropical Deforestation

Michael Wolosin, Anne Riddle, and Daniel Morris

1616 P St. NW
Washington, DC 20036
202-328-5000 www.rff.org

RESOURCES
FOR THE FUTURE

Climate Advisers

A Whole-of-Government Approach to Reducing Tropical Deforestation

Michael Wolosin, Anne Riddle, and Daniel Morris

Executive Summary

Tropical forests provide critical global and local ecosystem services and habitat for many of the world's plants and animals. Their loss threatens the sustainable economic growth and social stability of developing countries, and illegal deforestation abroad places U.S. producers at an unfair disadvantage. For these and other reasons, the United States has long been engaged in programs to reduce forest loss. This engagement has recently increased, with the new Presidential Global Climate Change Initiative including a pillar dedicated to slowing forest loss. While promising, this new funding and coordination is insufficient, with a narrow focus on climate-based development assistance. Engaging the full suite of forest policy levers in the federal government, or taking a "whole-of-government" approach, would provide greater immediate impact in preventing forest loss while building the foundations of a working landscape ethic.

In this discussion paper, we explore the opportunities to expand U.S. contributions to reducing tropical deforestation through this approach. A whole-of-government approach to international deforestation consists of coordinating and focusing the programs across the federal government that could reduce the rate of tropical forest loss. It is an integrated strategy that employs existing activities and authorities of the U.S. government and directs them under an overarching goal of reducing deforestation in tropical forest countries, while continuing to support other developing-country goals, such as economic development, health, food security, and biodiversity. We identify three major areas where policy adjustments and actions by relevant authorities can have immediate and tangible impact on reducing deforestation.

- **Activities within the United States: Agriculture and trade.** The United States contributes substantially to global demand for agriculture and timber commodities, which is the major driver of tropical deforestation worldwide. The United States thus could help reduce forest loss by making deforestation prevention abroad an active focus of a wide range of trade and domestic agriculture policies.

- **Activities abroad: Foreign aid funding.** Foreign aid has been the traditional tool for reducing tropical deforestation, and existing funding for conservation and forestry spans a number of federal agencies and multilateral institutions. In addition to these programs, foreign aid initiatives that address related areas such as agriculture, food security, governance, and land tenure reform clearly impact land use decisions, deforestation, and the capacity of local governments to address the issue.

- **Intangible capital: Capacity, expertise, and institutions.** Forest protection in the developing world is constrained by a paucity of human capital and a lack of access to information and data. The U.S. government has deep expertise in a wide range of relevant areas that, if successfully transferred into global public goods, could have real impacts on developing-country efforts to reduce deforestation.

The whole-of-government approach proposed in this paper is an initial attempt to open the discussion of scoping and coordination options for U.S. government policies and actions that impact tropical deforestation. Because this approach consists of focusing and coordinating, our recommendations include actions limited to discrete authorities and those that require coordination among several authorities:

- **Target deforestation in U.S. trade policy.** First and foremost, the United States should strengthen, enforce, and fully support the implementation of the Lacey Act Amendments of 2008. When negotiating trade agreements that include tropical forest countries, the United States should seek to ensure that parties identify trade-related drivers of forest loss and take appropriate actions to mitigate them, fully implement existing laws and regulations for the forest sector, and develop the tools that enable sustainable trade of commodities that are historical drivers of deforestation. The United States should consider linking tariffs for agriculture and forest products more clearly to the success of source nations in demonstrably preventing forest loss.

- **Provide incentives for bilateral aid integration.** With foreign aid budgets likely to be constrained in the near term by concerns about deficits and federal debt, bilateral aid initiatives increasingly will need to achieve multiple outcomes through integrated goals and program criteria. The U.S. Agency for International Development should undertake enhanced efforts to investigate and pilot new ways to provide positive incentives and remove disincentives for staff in the field to achieve multiple objectives in an integrated program.

- **Increase knowledge sharing.** The United States should continue and increase efforts to ensure that at-risk forested nations can access and use relevant information and datasets by building clear input, sharing, and output points where agencies can freely exchange their forest knowledge and data.

- **Research agricultural policy levers.** A whole-of-government approach to deforestation must acknowledge links between deforestation and other critical land use issues like agriculture, conservation, food security, and a changing climate. The U.S. government should undertake a broad, coordinated effort to identify specific programs that exercise leverage on tropical deforestation dynamics, understand how these programs could be adjusted to alter their impact while still meeting their primary goals, and propose mechanisms for incentivizing these adjustments and coordinating across the government.

Key Words: tropical deforestation, forest conservation, U.S. policy, REDD, reducing emissions from deforestation, whole-of-government, environment and trade, forest policy

Contents

A Whole-of-Government Approach to Reducing Tropical Deforestation

Michael Wolosin, Anne Riddle, and Daniel Morris*

Introduction

The United States has long been engaged in programs to help developing tropical forest countries[1] better manage their forest resources, including efforts to reduce forest loss. This assistance has resulted in some successes protecting high-value forests and developing better forest management practices. But forest loss has continued despite these efforts.

At the same time, awareness and scientific understanding of the value of forests has increased. We now know that tropical forests provide habitat for enormous proportions of the world's wildlife and plants. Tropical forests also provide valuable global and local ecosystem services, including producing oxygen and increasing freshwater recycling. Intact and healthy forests reduce poverty for local communities through sustainable economic growth, unlike short-lived economic gains from resource extraction. Illegal deforestation in tropical regions also has a negative impact on the U.S. economy because domestic producers of global timber and agricultural commodities face competition without a level playing field.

Recently, tropical forests also have received attention for their role storing carbon and the amount they contribute to carbon emissions when they are lost. In many ways, placing forests in a climate context has been a boon, increasing attention and action from the private sector, civil society, and governments. For example, the Obama administration has responded by including forests as one of three pillars of a Presidential Global Climate Change Initiative (GCCI); prioritizing a $1 billion pledge for international forest assistance over fiscal years 2010–2012 in budget requests to Congress; and coalescing on a clearly stated strategy to guide this "fast-start"

* Michael Wolosin is director of research and policy at Climate Advisers and is a visiting scholar at Resources for the Future. Anne Riddle is a research assistant at Resourcesfor the Future. Daniel Morris is a center fellow at Resources for the Future. The authors would like to thank Nigel Purvis, Ray Kopp, Douglas Boucher, Donna Lee, Bruce Cabarle, Kerry Cesareo, Vanessa Dick, Eric Haxthausen, Anne Middleton, Manuel Oliva, Mark Roberts, and Gustavo Silva-Chávez for their helpful inputs. This work was supported by the Packard Foundation, the Doris Duke Foundation, and the Climate and Land Use Alliance. For further information please contact wolosin@climateadvisers.com.

[1] This discussion paper primarily addresses deforestation from developing countries in tropical latitudes, where most deforestation occurs, but may also have applications for temperate forests and developed countries.

foreign assistance package, created through an interagency process.[2] This additional coordination and funding provides an important near-term opportunity for forest protection as deforestation pressures grow worldwide.

While moving in the right direction, this new funding and coordination are incomplete and insufficient, with an excessively narrow focus on climate-based development assistance. Leveraging the full suite of forest policy levers in the federal government could provide even greater immediate and sustained impact in preventing forest loss. A "whole-of-government" approach to slowing and reversing forest loss, as an enhancement to existing government-wide initiatives, will help catalyze forward progress while starting to build the foundations of a broad working landscape ethic.

In this discussion paper, we first clarify the concept of a whole-of-government approach in the context of tropical forests. We identify major areas where U.S. policy exerts (or could exert) pressure to reduce deforestation and review existing programs and coordination. We then identify specific opportunities and recommendations, first presenting two case studies in depth and then identifying four specific opportunities for additional action and coordination: trade policy, bilateral aid integration, information sharing, and domestic agriculture. These initial recommendations are designed to spark thinking and discussion, and a few are intentionally provocative.

What Is a Whole-of-Government Approach, and Why Is It Needed?

Tangible, short-term actions through existing authorities and decision levers are the core of a whole-of-government approach to reducing international deforestation. In a development and conflict context, the Organisation for Economic Co-operation and Development has defined the whole-of-government approach as

> "one where a government actively uses formal and/or informal networks across the different agencies within that government to coordinate the design and implementation of the range of interventions that the government's agencies will be making in order to increase the effectiveness of those interventions in achieving the desired objectives" (OECD 2006).

Using the key concepts from the above definition as a base, a whole-of-government approach to international deforestation consists of a coordination and a focusing of the myriad

[2] See USAID 2010b for the strategy document.

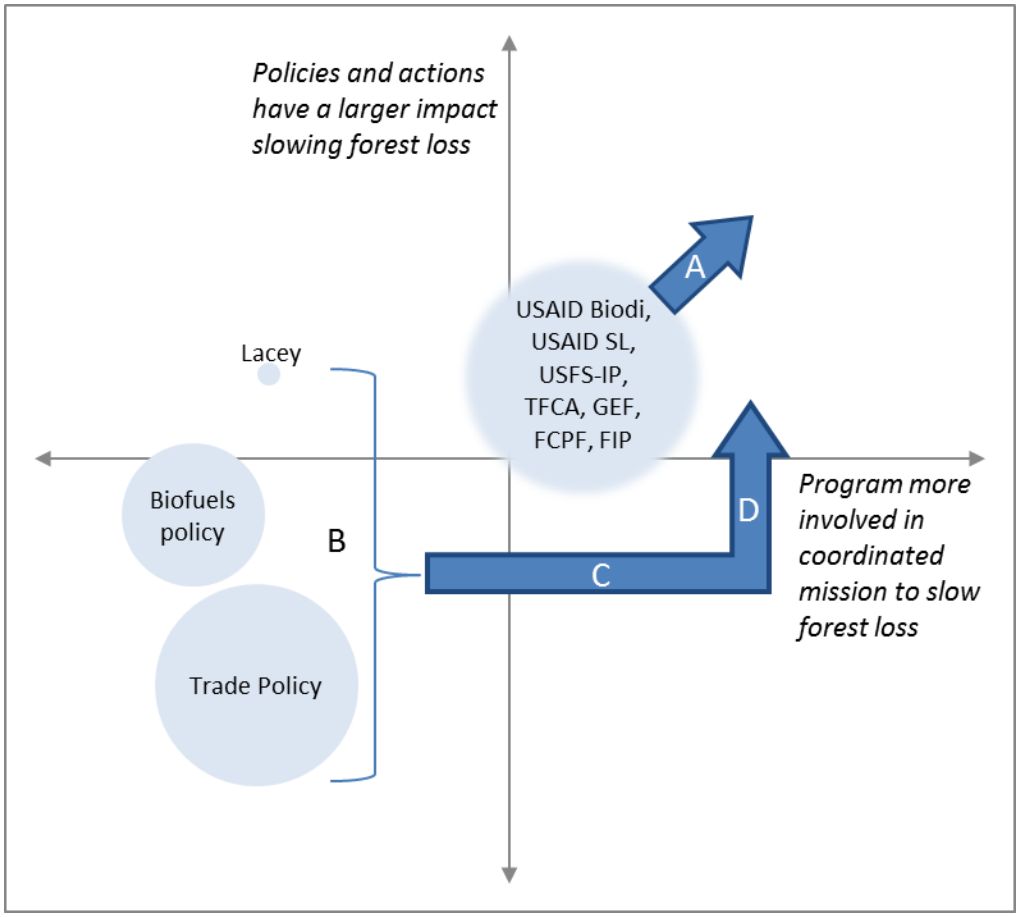
programs across the federal government whose missions, policies, and actions have or could potentially have impacts on the rate of tropical forest loss. It is an integrated strategy that harnesses current activities and existing authorities of the U.S. government and directs them under an overarching goal of reducing deforestation in developing countries—while recognizing and supporting other important U.S. government goals in developing countries such as health, food security, and biodiversity. This will require identifying various efforts already under way across agencies that either address deforestation directly or have important real or potential impacts on tropical deforestation. It also will require clarifying existing statutes and authorities as well as exploring options to authorize agencies to engage in further activity where gaps exist. Once federal officials delineate current action levers and relevant actors, they can develop a coordinated and consistent approach that all parties can use as guidance in policy formation and implementation.

This approach is needed for two primary reasons. First, the policy objective of slowing and reversing tropical forest loss is not such a clear and high priority of the U.S. government that it has an organizational unit dedicated to achieving it. Lacking a lead agency tasked to achieve this mission, progress can be enhanced through concerted efforts to bring together relevant actions wherever they occur organizationally. Second, and more importantly, the range of direct and indirect levers on tropical deforestation is so broad that these levers fall naturally within the scope and mission of a diverse set of agencies across the government.

Figure 1 illustrates the ideal, four-step process to implementing a whole-of-government approach:

- increase coordination among the existing suite of efforts to increase their impact on forest loss (A);
- identify expanded programs, policy realms, and organizational units that could exert further leverage on deforestation (B);
- move them toward more coordination with the existing suite of efforts (C);
- and increase their impact on slowing deforestation by integrating deforestation reduction as a secondary mission (D).

Figure 1. A Whole-of-Government Approach to Forest Conservation



Note: The existing suite of forest conservation efforts includes U.S. Agency for International Development Biodiversity (USAID Biodi), USAID Sustainable Landscapes (SL), U.S. Forest Service Office of International Programs (USFS-IP), the Tropical Forest Conservation Act (TFCA), and multilateral funding to the Global Environment Facility (GEF) and the World Bank's Forest Carbon Partnership Facility (FCPF) and Forest Investment Program (FIP).

U.S. Policy Levers on Global Deforestation

Within the federal government, policy adjustments in three major areas can have immediate and tangible impact on reducing deforestation. First, the U.S. government can look toward existing policies that impact the amounts and types of globally traded agricultural and forest products that the United States consumes and imports. Second, the U.S. government can use the extensive knowledge and resources of various agencies to directly assist at-risk countries develop systems that will reduce and reverse forest loss. Third, the U.S. government can increase and coordinate research and outreach functions to contribute to intellectual capital, freely available data, strong multilateral institutions, and other global public goods. A true whole-of-

government approach requires comprehensive efforts to coordinate all three categories—internal policy choices, external actions, and knowledge contributions—so that efforts are not needlessly duplicated and gaps in current activities can be corrected

Activities within the United States: Agriculture and Trade

Land use issues beyond forests will continue to influence deforestation in important ways on the international stage and domestically. Increasing incomes in the developing world lead to diets heavier in meat and dairy, stressing land resources beyond current demands. Furthermore, emissions from agricultural production account for almost 30 percent of global greenhouse gas emissions. About half is the result of deforestation, and the other half comes directly from agricultural production practices; both are likely to rise as agricultural pressures grow. Commercial agriculture, industrial timber harvesting, and small-scale agriculture are the major drivers of tropical deforestation worldwide, with commercial agriculture and timber harvesting being the largest. Both are driven by international commodity demand, to which the United States is a significant contributor. Brazil and Indonesia, two major deforesting countries, are the fifth- and sixth-largest exporters of agricultural commodities to the United States, with the value of U.S. agricultural imports from these countries exceeding $2.8 billion each in calendar year 2010.[3] Policies that impact the amount of these commodities entering the United States—including but not limited to trade policy—can and do shift deforestation pressure in the tropics.

The federal government can help reduce deforestation pressure directly through careful procurement choices. For example, it consumes approximately $6.6 billion of pulp and paper products a year, the largest amount of any G8 government (Toyne et al. 2002). While much of this is domestically produced, about half U.S. imports of paper products can be traced back to Indonesian forests, mostly via China and other processing countries (Kram 2005). By ensuring that U.S. government procurement is sourced through supply chains rooted in sustainable and legal harvests, the government can reduce forest loss directly while sending important market signals that help keep well-managed, certified tropical forests standing. Similarly, programs that reduce wasteful consumption of forest products can further reduce such pressure. Careful procurement, reduced consumption, and/or more efficient use of other commodities, such as biofuels, food, and feed, could accomplish similar goals.

---

[3] USDA Foreign Agricultural Trade of the United States Database. Top 15 U.S. Agricultural Import Sources, by Fiscal Year, U.S. Value. http://www.ers.usda.gov/Data/FATUS/ accessed May 23, 2011.

Trade policies affect the quantity of imported products originating in tropical regions, and there may be opportunities to shift these policies to reduce deforestation. Creating rules for species or types of plant and animal products that can legally be imported can reduce pressure on tropical species and shift sources to non-threatened resources. Existing federal laws such as the Lacey Act and Endangered Species Act could be adapted or expanded to include this programmatic focus. Expansions or enhancements of international agreements such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) could become diplomatic priorities, as could provisions in bilateral or multilateral trade agreements that encourage or require trading partners to track and improve their forest-product supply chains. Because these supply chains have multiple links— for example, China imports wood from Burma and exports finished products to the West—the United States should push for strengthened governance and enforcement of existing forest laws in source countries as well as the adoption of Lacey-type regulations in processing countries. Similarly, the federal government itself could promote certification and labeling of forest and agricultural products. Labeling and certification have succeeded in finding niche markets and raising awareness for commodity-related issues. The federal government has experience regulating labeling of commodities, particularly within the U.S. Department of Agriculture (USDA). Labeling of commodities that avoid deforestation, such as forest-safe soy or palm, may succeed at raising public awareness of deforestation issues and providing commercial incentives to keep forests in forests.

Careful review of domestic agriculture and energy programs may reveal that some promote tropical deforestation in the process of serving domestic policy goals. Any policy that shifts the supply, demand, or use of domestic agricultural lands may increase the pressures to convert lands elsewhere to agriculture, some of which may come from tropical forest regions. For example, the Conservation Reserve program and other well-intentioned programs that remove U.S. agricultural lands from production may be driving this type of "indirect land-use change"—trading temporary domestic conservation for permanent forest loss, when a different approach to domestic conservation may minimize this leakage. Much larger and wider-ranging economic and energy programs, such as agriculture and fuel subsidies and tariffs, can multiply this effect, dramatically shifting domestic supply in total or for certain products. Harmonizing the effects of subsidies and tariffs may reduce the pressure for additional tropical deforestation by increasing domestic supply of key products. Such initiatives also require careful consideration of economic and political impacts in the United States and abroad. However, of all possible effects the United States can have on the overall level of imports of deforestation products, coordinated efforts in this area may have one of the largest influences on the drivers of tropical deforestation.

Activities Abroad: Foreign Aid Funding

Efforts to slow forest loss in the developing world are chronically constrained by a lack of funding. U.S. foreign assistance channeled through a number of institutions and initiatives can—and does—address these constraints and contribute to slowing forest loss. Programs directly related to conservation and forestry span a number of federal agencies and a variety of issues, including wildlife conservation through the Fish and Wildlife Service, sustainable landscapes through the U.S. Agency for International Development (USAID), international protected areas through the National Park Service, debt relief through the Department of the Treasury's (henceforth, Treasury) implementation of the Tropical Forest Conservation Act, and U.S. contributions to forest- and conservation-focused multilateral institutions both old (e.g., the Global Environment Facility) and new (the World Bank's Forest Carbon Partnership Facility). These programs will be an important part of a whole-government approach and may even help anchor or coordinate it. As such, these programs and the extent of coordination among them are reviewed in a later section and the appendices.

In addition to these flows already directed toward forests, a number of foreign aid initiatives that touch on governance and corruption, agriculture and food security, land tenure reform, and even health could integrate forest conservation outcomes as secondary design and performance criteria. It is important to note that the goal of a whole-of-government approach to reducing deforestation is not to capture funding streams directed at other critical missions, but to ensure that those missions are planned and executed to align as much as possible with reduced deforestation goals. The United States has long used foreign aid programs to promote democracy, civil society participation, law enforcement capacity, land tenure reform, and honest and transparent governance. The success of these measures is critical to reducing illegal logging and deforestation, and they would be an important part of a whole-of-government approach to forest loss.

Agriculture is the most important driver of deforestation in many regions, and given the wide range of ecosystem services that healthy forests provide to agricultural productivity, the opportunities for synergy between food security and forest conservation are also clear. For example, USAID is leading the new Feed the Future Presidential Initiative, a three-year, $3.5 billion program to invest in agriculture and rural development as a lever for combating food insecurity and promoting economic growth and stability. USAID is cognizant that the goals and solutions of Feed the Future are entwined with other U.S. priorities, and the Food Security Bureau is actively researching ways to integrate climate change and natural resource management issues into this program.

Beyond foreign aid programs with direct and indirect impact on forests, creative uses of existing funding streams also have the potential to contribute to tropical forest protection. As more tropical countries become middle-income, up-front financing of deforestation reduction programs or programs that reduce pressure on forests through loan facilities may provide an increasingly important alternate to direct aid. Agricultural intensification programs run through the Overseas Private Investment Corporation or the Export-Import Bank are an example. Loan conditionality through current loan mechanisms could ensure that development projects work within the confines of low-deforestation principles. Targeted debt forgiveness to developing countries also has the potential to relieve their debt burden, reducing the pressure to clear tropical forests. Wider expansion of the Tropical Forest Conservation Act, which couples debt forgiveness with forest protection, would satisfy the interests of developing nations and the United States within the confines of an existing initiative. In all these approaches, public–private partnerships have the potential to further leverage U.S. investments.

Intangible Capital: Capacity, Expertise, and Institutions

Forest protection in the developing world also is constrained by lack of access to data and a paucity of human capital. Furthermore, development of international architectures and initiatives to slow forest loss has been delayed by design uncertainties. Thus, increasing knowledge about deforestation and building the institutions and financial mechanisms to facilitate flows of knowledge and capital will advance tropical forest conservation and international deforestation reduction efforts.

To be successful, developing countries will need to be the primary implementers of forest programs; thus, capacity building in the form of technology and knowledge transfer will help them implement deforestation initiatives more quickly. Mobilizing and coordinating the deep expertise available in U.S. government personnel presents an excellent opportunity for capacity building in this regard. The extant outreach and education programs contained within many branches of the federal government already contribute to activities of this kind and could be expanded to accelerate forest conservation readiness in developing nations. Provisions of data and capacity building for specific technical problems also fall within current expertise of the federal government. Examples include the remote sensing and monitoring, reporting, and verification (MRV) capabilities of the National Aeronautics and Space Administration (NASA) and the U.S. Geological Survey (USGS). Enhancing, expanding, and coordinating these programs will allow forest conservation architecture to be implemented with increased speed. Broader capacity that might positively impact forestland preservation, such as poverty alleviation, governance, and land tenure, could also be incorporated into programs focused on

forest conservation. These types of contributions to design and implementation of specific programs on the ground in developing countries help build functioning forest preservation architectures.

Research and funding for forestry, forest emissions, MRV, and land use economics and policy also help develop the support structure for these programs, creating global public goods in applied science capability and benefiting worldwide forest conservation efforts as a whole. Federal research branches currently have expertise in a broad suite of disciplines that could contribute to efforts to reduce pressures on forests, from basic economics to sustainable agriculture. Government agencies that provide scientific funding can provide more directed opportunities for deforestation-related research as well as enhance work on topics not directly covered by it. For example, additional research in agricultural intensification, agroforestry, payments for ecosystems services, economic decisionmaking by farmers and ranchers, and sustainable landscapes may help inform the policies and methods of countries attempting to reduce deforestation.

Contributions of funding and expertise to multilateral processes, including the United Nations Framework Convention on Climate Change, may also facilitate global capacity building and potentially speed the creation of international efforts to curb deforestation. Additionally, supporting other international efforts, such as conservation and endangered species initiatives, can benefit forest conservation.

The Critical Importance of Coordination

The U.S. federal government already provides large amounts of funding for general international forest conservation (see the next section and Appendix 1) and recently committed to providing an additional $1 billion over fiscal years 2010–2012 for forest conservation in the context of climate change assistance to developing countries. The constituent programs providing these funds are administered by a range of agencies, some encompassing only small amounts of funding. The programs achieve forest conservation through various mechanisms and for various purposes. Although it has not been a major focus to date, coordination is essential to ensure that funding achieves forest conservation co-benefits without overlaps or gaps.

The Global Conservation Act, a bill introduced in the U.S. House of Representatives and Senate during the 111th Congress, recognizes this problem for international conservation more broadly and tries to address it. It calls for much greater coordination among all U.S. agencies conducting international conservation work, along with overarching goals and benchmarks for success. Because this act is focused on conservation of ecosystems including but not limited to

forests, it makes no specific mention of the wider drivers of deforestation and how government actions could affect them. Substantive inclusion of other influences on deforestation beyond conservation, such as land and energy use, food security, trade, and international development, will provide more weight to preventive efforts and allow greater use of the agencies and their existing programs.

Similarly, the U.S. government has many outreach, education, and research programs, but they are administered individually by various agencies; existing coordination efforts are ad-hoc and narrowly focused. Lack of coordination may leave knowledge gaps in areas important to forest conservation or may allow for outreach that competes or overlaps with other domestic or international efforts. Coordination will ensure that existing or nascent programs are publicized to interested agencies to prevent duplication or allow for cooperation. Early attempts at interagency and international coordination originating within the federal government could be expanded or used as models for other programs. For example, SERVIR, which aggregates and provides remote sensing data to developing nations worldwide, and Silvacarbon, which coordinates interagency expertise in forest carbon methodologies, could easily be used as models for coordinating outreach in specific subject areas. Others, such as the Department of the Interior's Climate Change Strategy, could also serve as a model or stage for more overarching domestic coordination. Domestic research coordination also may improve or direct focus to inquiry on U.S. agricultural policies and their effects on deforestation abroad.

Existing U.S. Tropical Forest Programs and Coordination

A number of U.S. government programs are active in tropical forests through a range of departments, initiatives, and accounts. They focus on three overlapping missions: forests and forestry, conservation and biodiversity, and climate and emissions.

Forestry and forest management have a history stretching as far back as 1939, when the USDA Forest Service (USFS) first gained budget authority for foreign forestry. USFS international activities increased throughout the middle of the century, leading eventually to the deputy-level Office of International Forestry in the early nineties (West 1992), then declining in size and organizational importance after the mid-nineties following a reorganization and Congressional funding cuts. The Office of International Programs has continued to pursue its mission of bringing U.S. forestry expertise to developing countries with a small budget of $7–10 million per year for the past few years but may face further contraction as the fiscal year 2012 budget request further downgraded the program (see Appendix 1).

In 1986, Section 118 of the Foreign Assistance Act made forest management and conservation an important part of USAID's mission (USAID 2010a), and since then USAID's direct foreign assistance for forests has never dropped below $50 million. In addition to these bilateral funds, multilateral assistance for forestry has flowed through the Global Environment Facility and the International Tropical Timber Organization.

Much of this support in the early years was directed toward forestry and forest management, but throughout the nineties and into the new millennium, budgets and new programs shifted to include multiple goals. In the past decade, many of the same programs and dollars for tropical forestry have addressed biodiversity conservation, sustainable management and production, and economic development. For example, in fiscal year 2009, the most recent year with available ex-post budget analyses, almost 90 percent of USAID spending identified as "forestry" also had explicit biodiversity objectives, was geographically identified on the basis of threats to biodiversity, and monitored biodiversity indicators.

The U.S. government has created additional international biodiversity programs outside of USAID over this period, with several programs currently housed in the Department of the Interior's Fish and Wildlife Service and a small international office in the National Park Service. The Tropical Forest Conservation Act of 1998 created an innovative debt-forgiveness approach (or "debt-for-nature swap") that has provided a stable budget of about $20 million per year for tropical forests through the Treasury.

On the multilateral front, the United States has been an important participant in international conservation efforts such as CITES, the International Union for the Conservation of Nature, the Ramsar Convention on Wetlands, and the UN Environmental Programme, with the U.S. Department of State (henceforth, "State") generally taking the lead role.[4] It is important to note that most of these biodiversity and conservation funding sources are targeted toward a range of biomes, not solely tropical forests; as such, a whole-of-government approach to tropical forest conservation would engage these programs to different extents.

On a separate track from U.S. forestry and biodiversity foreign assistance, efforts to reduce deforestation have advanced over the past few years in the context of global climate negotiations and mitigation efforts. State coordinates several agencies in an ad-hoc working

[4] The International Conservation Budgets for 2009–2011 produced collaboratively by Conservation International, the Pew Charitable Trusts, The Nature Conservancy, Wildlife Conservation Society, and World Wildlife Fund (together, the Alliance for Global Conservation) have provided some guidance for this section.

group involved in negotiating U.S. REDD+ policy, which seeks to go a step beyond REDD—reducing emissions from deforestation and degradation—to include the role of conservation, sustainable management, and enhanced carbon sequestration by forests. The Environmental Protection Agency, the USFS, USAID, and Treasury have been members of the core negotiation team as subject experts and partners. A second ad-hoc working group, overlapping extensively with the first, has been engaged in strategy, planning, and coordination for the provision of REDD+ foreign assistance. USAID and State have taken the lead in this effort, and Treasury rounds out the inner circle. This group was originally convened when domestic climate legislation was before Congress, and it benefitted from additional coordination and policy inputs from the Executive Office of the President, the National Security Council, and the Council on Environmental Quality. NASA, USGS, and the Department of the Interior have provided additional expertise and active partnership to both groups on a few specific REDD+ issues and foreign aid programs. Neither ad-hoc working group is a standing body with funding or budgetary support.

The foreign aid ad-hoc working group has been coordinating efforts to deliver on the United States' pledge of $1 billion in fast-start financing for REDD+ through both bilateral programs and contributions to multilateral funding mechanisms. In October of 2010, this group released a plan focused on three primary objectives:

- "REDD+ Architecture: Creating and supporting an efficient, effective, and coordinated international system to help countries deliver REDD+ outcomes" (USAID 2010b, 1)
- "REDD+ Readiness: Helping countries become ready to participate in pay-for-performance programs and take complementary domestic actions" (USAID 2010b, 1) This objective emphasized support for national scale programs, pay-for-performance financing, and developing country mitigation commitments, for countries with near-term mitigation potential, longer-term but high mitigation potential, and commitment and innovative approaches to REDD+.
- "REDD+ Demonstration": Achieving or demonstrating scalable approaches to achieving cost-effective and sustainable net emissions reductions, in countries with political will and existing programs (USAID 2010b, 2).

Funding to meet these objectives would come primarily from the Sustainable Landscapes pillar of the Obama administration's budget for the GCCI, which included bilateral funding through USAID and State, and multilateral funding through State and Treasury. Secondary or indirect funding through other programs and agencies would also contribute, with biodiversity funds explicitly included if certain criteria are met.

In total, the administration's Sustainable Landscapes budget for fiscal year 2010 reflects this strategy. The vast majority of core funding is through the GCCI; the dominant source of indirect funding is USAID's biodiversity program; and only $5 million or so is coming from sources other than State, Treasury, or USAID (see Appendix 1).

Opportunities and Recommendations

The whole-of-government approach proposed in this paper is an initial attempt to discuss the scoping and coordination options for U.S. government actions that affect tropical deforestation. The approach recommends broadening the strategic goals of the United States in tropical forest conservation to a fuller and more comprehensive course of action on reducing deforestation and forest degradation through every available lever within the federal government. This course of action would push departments, agencies, and program units not actively engaged on deforestation issues to execute their missions in ways that consider tropical forest goals.

A whole-of-government approach consists of focusing the actions of existing agencies on forestry as well as coordinating across agencies. Within these two areas, we identify a few specific ways in which a whole-of-government approach can have an immediate and useful impact. In the context of existing agencies, we examine the integration of deforestation into broader trade concerns and incentives to integrate bilateral foreign aid programs. In the context of greater coordination, we discuss facilitating information sharing between federal actors and tropical forest countries. We also highlight the importance of investigating the link between domestic agricultural policies and land use change abroad—and adjusting these policies as needed to meet multiple objectives. In addition, case studies on the Lacey Act and on biofuels policy tackle two specific policy issues in more depth, while Appendix 2 presents a broad sweep through the U.S. government to identify organizational opportunities for coordination and/or focusing.

Target Tropical Deforestation in U.S. Trade Policy

Demand for globally traded commodities such as timber, pulp, soy, beef, and palm oil is the dominant driver of tropical forest loss in most regions. As developing countries further integrate into international commodities markets, price dynamics and a growing demand for their agricultural goods and forest products will increase the short-term incentives for clearing forests even further. While the U.S. government has acknowledged this dynamic, it has not focused sufficiently on deforestation in its approach to trade. If a whole-of-government approach is to maximize the United States' impact on tropical deforestation, halting deforestation must be a clear priority for the United States in global trade discussions and bilateral trade agreement

negotiations. While a full analysis of the opportunities to increase leverage on tropical deforestation through U.S. trade policy is outside the scope of this paper, a few specific recommendations for advancing a whole-of-government in this area are immediately clear.

First and foremost, the United States should take more complete advantage of one of the world's strongest existing legal instruments to prevent the flow of illegal timber and forest products—the Lacey Act. The case study on the next page includes a more complete treatment of this opportunity.

Second, when negotiating trade agreements that include tropical-forest countries, the United States should seek to ensure that parties take the following three actions:

- identify and mitigate trade-related drivers of forest loss;
- fully implement existing laws and regulations for the forest sector and trade of endangered species (e.g., CITES);
- and develop and promote the tools that enable and strengthen legal and sustainable trade of commodities that are historical drivers of deforestation.

Tools could include technical instruments, such as systems to verify legal origin and chain of custody of products. They also could include mechanisms to increase transparency of information, such as the statutes of protected areas and concessions. Finally, they could include processes to ensure participation by local communities, nongovernmental organizations, and the private sector. The groundbreaking Annex on Forest Sector Governance in the recent bilateral trade agreement with Peru[5] serves as one possible example. In it, Peru agreed to substantial commitment for reform and investment, and the United States agreed to provide complementary support for capacity building.

Third, the United States should consider more strongly linking market access for agriculture and forest products to the success of source nations in demonstrably preventing forest loss. To be sure, governmental officials must carefully analyze complicated issues to ensure that U.S. actions are consistent with America's international trade commitments, including under the World Trade Organization. But its jurisprudence over the past two decades relating to the environment and natural resources has demonstrated that trade law need not stand in the way of nations taking legitimate actions in pursuit of global environmental objectives, particularly when

[5] The United States–Peru Trade Promotion Agreement was signed in 2006 and entered into force in 2009.

they act multilaterally.[6] If done thoughtfully, a comprehensive whole-of-government approach to deforestation could include trade provisions—in the form of enhanced access and penalties—as important incentives for tropical countries to achieve deforestation prevention goals and for all countries to remove products of deforestation from their supply chains.

Finally, it is critical that U.S. trade representatives have the knowledge and support they need to raise and negotiate this complex issue successfully. Additional cooperation and engagement by the U.S. trade agencies in a whole-of-government approach to deforestation would be a step in the right direction, as would briefings from deforestation experts in State, USAID, and the USFS Office of International Programs.

Case Study: The Lacey Act

The Lacey Act of 1900 (16 U.S.C. §§ 3371–3378–3378) is a conservation law introduced by Iowa Representative John F. Lacey. It protects plants and wildlife, most notably prohibiting trade in wildlife, fish, and plants that have been illegally taken, transported, or sold. The Lacey Act was most recently amended in May 22, 2008, when The Food, Conservation, and Energy Act of 2008 expanded its protection to a broader range of plants and plant products, including wood. Under the 2008 amendments, the Lacey Act now prohibits trade of timber that was harvested illegally according to the laws in the country in which it originated. It also requires certain importers to declare the species, country of origin, volume, and value of any wood-related imports, even finished products. Failure to do so, or to do so incorrectly, results in a violation.

The Lacey Act is unique in that it is a fact-based statute, rather than a document–based statute. Thus, documentation itself is not a sufficient guarantee of legality. Violations to the Lacey Act can result in penalties such as fines, forfeiture of goods and vessels, or jail time, depending on the severity of the infraction. Penalties are steepest for those who knowingly import illegal wood, and smallest for those who unknowingly import illegal wood and exercise due care in their supply chain management. Processing of Lacey Act declarations is the responsibility of the Animal and Plant Health Inspection Service (APHIS) of the USDA. Most responsibility for investigating cases of illegal plant importation rests with the Department of Interior's Fish and Wildlife Service. This work is supported by the Department of Homeland Security's Customs and Border Protection, which controls customs, and the Department of Justice, which carries out investigations in the case of infractions. Interagency coordination is ongoing in order to identify and define the best ways to implement the law.

[6] For example, the World Trade Organization (WTO) Appellate Body made clear in its "shrimp–turtle" decision of 1998 (WTO case 58) that even though it ruled against the U.S. turtle protection laws, it had "*not* decided that sovereign states should not act together bilaterally, plurilaterally or multilaterally, either within the WTO or in other international fora, to protect endangered species or to otherwise protect the environment. Clearly, they should and do." An earlier series of unadopted rulings under the General Agreement on Tariffs and Trade regarding the tuna–dolphin disputes, also left clear windows open for the application of environmental standards.

Enforcement of the Lacey Act has significant implications for tropical deforestation. The United States imports significant amounts of wood products from Brazil, Bolivia, Indonesia, Malaysia, Peru, and Thailand, all of which are known to have significant illegal logging activities (Toyne et al. 2002). While the proportion of timber harvested illegally is difficult to quantify, in some forest countries, as much as 80–90 percent of harvested timber may be illegal. For example, Toyne et al. (2002) estimate rates of illegal logging in Brazil between 80 and 85 percent. More recent estimates give a range of 35–90 percent (Lawson and McFaul 2010). Past estimates of illegal logging in Indonesia suggest a rate of between 51–73 percent (Toyne et al. 2002), though these may have fallen to 20–40 percent in recent years (Lawson and McFaul 2010).

By preventing illegal tropical timber from reaching markets in the United States, wide enforcement of the act can encourage sourcing of wood products from other countries or from sources whose legality is verifiable. It can also encourage wider compliance with local land tenure laws among those hoping to market within the United States. Both effects are likely to decrease leakage, which is linked with high commodity demand and weak land tenure.

The Lacey Act and nascent international efforts to slow illegal logging have been showing signs of effectiveness. Rough estimates indicate that since the 2000s, around 17 million hectares of forest may have been protected from degradation or deforestation (Lawson and McFaul 2010). Most of these programs are only in their infancy. Full and effective implementation of the law could provide international leadership, spearhead further progress, and increase industry awareness in the growing suite of international efforts.

Full support for the Lacey Act will require efforts and coordination from a number of agencies, so a whole-of-government approach is critical. Although the U.S. Fish and Wildlife Service contributes to Lacey Act implementation—including expertise on plant-related cases—the processing of declarations rests with APHIS. Currently, APHIS activities for the Lacey Act operate without dedicated funding. Greater levels of dedicated funding to APHIS for Lacey Act implementation would streamline this process and free resources and personnel for targeted, proactive enforcement.

The Lacey Act's effectiveness will benefit from additional funding to related programs. For example, USAID participates in capacity-building activities with governments, civil society, and forest-product suppliers to help countries define legality, clarify supply chains, and support legal sourcing. Funding to USFS would also support capacity-building and training programs in source and processing countries through its Office of International Programs, and domestic expertise could help corroborate Lacey Act cases via the development of new technologies, such as DNA timber tracking. Strong enforcement of the Lacey Act fits well within the broader suite of forest conservation efforts by the U.S. government and aids efforts to create coordinated reductions to the largest classes of imports that drive deforestation.

Provide Incentives for Bilateral Aid Integration

With foreign aid budgets already seeing some contraction given broad concerns about budget deficits and federal debt, bilateral aid initiatives increasingly will need to achieve

multiple outcomes through integrated goals and program criteria. As noted earlier, the trend is moving toward this type of approach, with the Feed the Future program as an indicator. But it is unclear in this case if the agency's foreign missions will follow the Washington office's lead. In practice, USAID often works from the bottom up to define in-country programs, and staff in the field face substantial disincentives to achieve multiple objectives in an integrated program. For example, adding additional objectives would multiply the number of criteria a program would need to meet, increase monitoring and reporting requirements, and exacerbate an administrative burden that is already seen as prohibitive—with no clear benefit to the individual decisionmaker at the mission and regional level.

While problems of silos and integration extend well beyond this issue, a successful whole-of-government approach to slowing tropical deforestation would need to overcome these types of institutional barriers that hold back integration into related programs. Efforts are ongoing at USAID to address strategic issues such as these, for example in the new Bureau of Policy, Planning, and Learning created in 2010. These efforts should continue, and USAID should investigate and pilot new ways to remove the burden associated with integration and provide positive incentives. For example, USAID could set aside a portion of funding for a given initiative to be granted to related programs outside the initiative that integrate and achieve its goals as secondary outcomes. Design criteria should allow for programs to join initiatives as "second-tier" objectives, with less stringent requirements. USAID should explore options and pilot accounting methods that clarify procedures and transparency for the type of "double counting" that integration might lead to, while attempting to reduce reporting burdens as much as is practicable.

Increase Information Sharing

While the U.S. government can affect international deforestation by addressing standards for agriculture and forest product imports, it also can make a strong impact through exporting its unparalleled ability to gather and process information on land cover and land use change over time. Sharing information across agencies and nations on deforestation issues represents one of the most immediate changes that can lay groundwork for a successful whole-of-government effort.

The United States should be working with at-risk forested nations to ensure that they can access and develop the technical know-how to use helpful datasets, such as remote-sensing images. Current efforts to improve international data sharing and usage, including the SilvaCarbon initiative and SERVIR, have helped lay the groundwork for effective distribution of

forest information. The next step is to continue supporting these programs while encouraging their growth and refinement.

Making forest monitoring a priority for involved agencies also will support this worldwide task. The United States should help establish institutions and programs to monitor forests at a high level of detail and temporal frequency, especially in high-risk areas in Southeast Asia and the Congo Basin. The launch of space-based vegetation monitoring satellites and use of excess military monitoring platforms to provide forest monitoring data in peacetime will further increase the United States' ability to provide valuable global goods in deforestation information.

Key to creating free exchange of data is building clear input, sharing, and output points portal for agencies that create and analyze forest data. Ensuring that science agencies such as the USGS, NASA, the National Science Foundation, and the DOE National Laboratories, management agencies like the Forest Service and U.S. Fish and Wildlife Service, and technical agencies like the National Institute for Standards and Technology have a single clearinghouse for data inputs and outputs will help ensure that the best technical information is available to vulnerable nations in an easily accessed location. Similarly, these initiatives can provide venues to increase information sharing among the agencies themselves. Improved coordination and increasing flows of information between different actors within the federal government will help highlight unnecessary redundancies and streamline data gathering and analysis of changing land use patterns.

Research Agricultural Policy Levers

Any whole-of-government approach to deforestation must explicitly acknowledge links between deforestation and other critical land use issues like agriculture, conservation, food security, and a changing climate. Moreover, it should advance a more holistic ethic that accounts for the interconnectedness of human activity on land and natural responses to stressors.

Before establishing a more complete response to dynamic land use as part of the whole-of-government approach, however, more must be done to identify specific programs that exercise leverage on tropical deforestation dynamics as well as understand the legal authorities and missions of these programs. Further research should aim to estimate the size of these programs' impacts on tropical forests, explore in full detail how these programs could be adjusted to alter their impact while still meeting their primary goals, and propose mechanisms for coordination across the government. This is a task that will require coordinated effort by experts in many fields, many of whom are housed in different branches of the United States government and

across different silos of academia. As such, understanding and implementing a land use ethic is an effort that the government can both undertake itself and support.

Case Study: Biofuels Policies and Subsidies

Biofuels, or combustible fuels derived from biological sources, have been lauded as a solution to high greenhouse gas emissions from the combustion of fossil fuels. The use of plant-based matter for biofuels offers a renewable domestic source of fuel. In the United States, commonly grown agronomic crops such as corn and soybeans supply the feed stocks for biofuel production. However, some indirect effects of biofuels production, particularly land use decisions, may offset or exceed carbon gains through carbon losses in other sectors. High monetary returns for biofuels production create a ripple effect supporting increased land conversion for agronomic crops, which drives tropical deforestation (Laurance 2007; Fargione et al. 2008; Searchinger et al. 2008).

When producers receive high returns for biofuels, they are driven to produce more crops for bioenergy. In some cases, this can lead directly to tropical deforestation, particularly when tropical crops are the biofuel precursor. For example, between 1990 and 2005, more than 1 million hectares of rainforest in Malaysia and 1.7–3 million hectares of forest in Indonesia were lost to oil palm production, a precursor for biodiesel (Fitzherbert et al. 2008). In other cases, the link to tropical deforestation is less direct. For example, in the United States, price supports and subsidies for corn for bioethanol have caused producers to grow corn over other crops, such as soy. Since global demand for soy has not diminished, soy production is displaced to other areas. Some displaced soy production has shifted to tropical regions, where it contributes significantly to deforestation through the process known as indirect land use change. For example, between 2001 and 2004, direct clearing for cropland in the Brazilian state of Mato Grosso alone totaled over 540,000 hectares and was directly correlated with mean annual soybean prices (Morton 2006).

Currently, a great deal of federal monetary support exists for biofuels production and use. The large variety of existing biofuels programs means that complementary, multilayered supports exist to promote biofuel production and use. For example, tariffs on imports of ethanol and biodiesel, which discourage imports and promote domestic sources of biofuels, ensure that domestic producers can dominate markets. Renewable fuels standards, which exist at both the federal and state levels, further ensure that markets of a certain size exist. Production payments, such the Volumetric Ethanol Excise Tax Credit, provide tax credits or payments to users for production and may be layered with state-level payments. Subsidies also exist for inputs to the biofuels process, such as general or production-related capital. Precursor crops, particularly corn, are heavily subsidized; as the percentage of these crops used for biofuels rises, so does the subsidy capture by the biofuels industry. Overall, aggregate support for the biofuels industry in the United States is very high. Estimates of support in 2006 are between $5,123 and $6,782 million for corn ethanol, or between 42 percent and 55 percent of the total market price per gallon (Koplow 2006).

Biofuels still have a role to play as a carbon-neutral fuel source. However, past implementation of biofuels support has promoted tropical deforestation through shifting crop choices. Careful future

implementation can promote biofuel development and use while minimizing contributions to tropical deforestation. For example, redirecting subsidies from corn ethanol to waste cellulosic ethanol or increasing funding for biofuels production on degraded lands reduces land use pressures but allows further development of sustainable ethanol sources.

Reduction of subsidies in general, as has been proposed in some austerity measures, is also likely to reduce pressure on tropical forests. This complex issue requires careful consideration of impacts and costs to determine the best way forward. Because many biofuels standards are enacted in law, many of these issues require action in the legislative branch. However, some aspects of biofuel policies are managed by the Department of Energy and the Environmental Protection Agency. The USDA also administers individual grants related to biofuels. In addition, individual states administer, legislate, and support many programs. Coordination of these agencies' grant-making strategies and research programs focused on the long-term effects of biofuels policies will have the most effect on biofuels production in the absence of national legislative action.

Summary of Recommendations

- **Target deforestation in U.S. trade policy.** First and foremost, the United States should strengthen, enforce, and fully support the implementation of the Lacey Act Amendments of 2008. When negotiating trade agreements that include tropical forest countries, the United States should seek to ensure that parties identify trade-related drivers of forest loss and take appropriate actions to mitigate them, fully implement existing laws and regulations for the forest sector, and develop the tools that enable sustainable trade of commodities that are historical drivers of deforestation. The United States should consider linking tariffs for agriculture and forest products more clearly to the success of source nations in demonstrably preventing forest loss.
- **Provide incentives for bilateral aid integration.** With foreign aid budgets likely to be constrained in the near term by concerns about budget deficits and federal debt, bilateral aid initiatives will increasingly need to achieve multiple outcomes through integrated goals and program criteria. The U.S. Agency for International Development (USAID) should undertake enhanced efforts to investigate and pilot new ways to provide positive incentives and remove disincentives for staff in the field to achieve multiple objectives in an integrated program.
- **Increase knowledge sharing.** The United States should continue and increase efforts to ensure that at-risk forested nations can access and use information and datasets, by building clear input, sharing, and output points where agencies can freely exchange their forest knowledge and data.

- **Research agricultural policy levers.** A whole-of-government approach to deforestation must acknowledge links between deforestation and other critical land use issues like agriculture, conservation, food security, and a changing climate. The U.S. government should undertake a broad, coordinated effort to identify specific programs that exercise leverage on tropical deforestation dynamics, understand how these programs could be adjusted to alter their impact while still meeting their primary goals, and propose mechanisms for incentivizing these adjustments and coordinating across the government.

Looking Forward

This paper advocates for a whole-of-government approach to be applied to reducing deforestation in developing and tropical countries. Our reasons are three-fold: most of the world's deforestation and degradation takes place in these forests, economic status is closely linked to the drivers of deforestation and degradation, and developing country forests and transfers from developed to developing countries have taken a prominent place in international climate negotiations (Chomitz 2007). As the approach is better defined and existing levers are revealed, connections with other types of land use and their implications for greenhouse gas emissions, food security, and biodiversity will certainly emerge. Not only will a whole-of-government approach to deforestation have a bigger impact on tropical forests, it also can catalyze and expand thinking in the federal government to comprehensively address all land use pressures and drivers of unsustainable land use. The more inclusive consideration of agricultural and trade policy required for such a land use ethic is far beyond the scope of this paper, but it is necessary to effectively address emerging issues of food security and changing climate. A whole-of-government approach to deforestation can create opportunities to better understand and further impact one critical area of land-use change while providing the federal government a stepping stone toward a more holistic vision of all land use changes and pressures in the future.

References

Chomitz, Kenneth M. 2007. *At Loggerheads? Agricultural Expansion, Poverty Reduction, and Environment in the Tropical Forests*. Washington, DC: The International Bank for Reconstruction and Development / The World Bank.

Fargione, Joseph, Jason Hill, David Tilman, Stephen Polasky, and Peter Hawthorne. 2008. Land Clearing and the Biofuel Carbon Debt. *Science* 319(5867): 1235–38.

Fitzherbert, Emily, Matthew Struebig, Alexandra Morel, Finn Danielsen, Carsten Brühl, Paul Donald, and Ben Phalan. 2008. How Will Oil Palm Expansion Affect Biodiversity? *Trends in Ecology and Evolution* 23(10): 538–45.

Koplow, Doug. 2006. *Biofuels—at What Cost? Government Support for Ethanol and Biodiesel in the United States*. Geneva, Switzerland: International Institute for Sustainable Development.

Kram, Megan. 2005. Building a Better Business through Responsible Purchasing. Washington, DC: North America Forest and Trade Network.

Laurance, William. 2007. Switch to Corn Promotes Amazon Deforestation. *Science* 318(5857): 1721.

Lawlor, Kathleen, and Lydia Olander. 2009. U.S. Government Funding for Forests in Developing Countries and the New REDD+ Landscape. Nicholas Institute Briefing Memo. Durham, NC: Duke University.

Lawson, Sam, and Larry McFaul. 2010. *Illegal Logging and Related Trade: Indicators of the Global Response*. London: Chatham House.

Morton, Douglas, Ruth DeFries, Yosio Shimabukuro, Liana Anderson, Egidio Arai, Fernando del Bon Espirito-Santo, Ramon Freitas, and Jeff Morisette. 2006. Cropland Expansion Changes Deforestation Dynamics in the Southern Brazilian Amazon. *Science* 103(39): 14637–41.

OECD (Organisation for Economic Co-operation and Development). 2006. Whole of Government Approaches to Fragile States. DAC Reference Document. Paris: OECD, 14. http://www.oecd.org/dataoecd/15/24/37826256.pdf (accessed March 2011).

Searchinger, Timothy, Ralph Heimlich, R.A. Houghton, Fengxia Dong, Amani Elobeid, Jacinto Fabiosa, Simla Tokgoz, Dermot Hayes, and Tun-Hsiang Yu. 2008. Use of U.S.

Croplands for Biofuels Increases Greenhouse Gases through Emissions from Land Use Change. *Science* 319(5867): 1238–40.

Toyne, Paul, Cliona O'Brien, and Rod Nelson. 2002. The Timber Footprint of the G8 and China: Making the Case for Green Procurement by Government. Geneva, Switzerland: Worldwide Fund for Nature.

USAID (U.S. Agency for International Development). 2010a. *Biodiversity Conservation and Forestry Programs Annual Report*. Washington, DC.

USAID. 2010b. Strategic Choices for United States Fast Start Financing for REDD+. Washington, DC. http://www.usaid.gov/climate/redd/ (accessed May 23, 2011).

West, Terry. 1992. USDA Forest Service Involvement in Post World War II International Forestry. In *Changing Tropical Forests: Historical Perspectives on Today's Challenges in Central and South America*, edited by H.K. Steen and R.P. Tucker. Durham, NC: Forest History Society, 277–291.

Appendix 1. Existing U.S. Tropical Forest Programs and Funding

Program	FY2008	FY2009	FY2010	FY2011	FY2012 request
State and foreign operations (budget function 150: international affairs)					
USAID	**106.1**	**103.7**	**152.0**	**152.1**	**213.0**
Biodiversity	195.0	195.0	205.0	205.4[b]	79.1
Biodiversity in tropical forests[a]	*102.3*	*92.4*	*77.1*	*77.1*[b]	*0.0*
Non-biodiversity tropical forestry	3.7	11.3			
Sustainable Landscapes program			75.0	75.1[b]	213.0
Department of State	**6.6**	**13.0**	**35.9**	**32.7**	**35.1**
World Bank Forest Carbon Partnership Facility		5.0	10.0	9.4[b]	20.5
International conservation organizations[c]	6.6	6.6	7.5	7.5	7.6
Other State		1.5	18.4	15.8[b]	7.0
Department of the Treasury[d]	**33.2**	**32.9**	**54.0**	**51.2**	**180.0**
Global Environment Facility (total)	81.8	80.0	86.5	90.0	143.8
Global Environment Facility forest programs[e]	*13.2*	*12.9*	*14.0*	*21.2*	*35.0*
World Bank Forest Investment Program			20.0	13.3[b]	130.0
Tropical Forest Conservation Act	20.0	20.0	20.0	16.7[b]	15.0
Total 150 account	**145.8**	**149.7**	**241.9**	**236.1**	**428.1**
Non-150 account programs					
Department of Agriculture	**7.5**	**9.0**	**9.8**	**9.8**	**6.0**
U.S. Forest Service Office of International Programs	7.5	9.0	9.8	9.8	6.0[f]
Department of the Interior	**25.0**	**29.3**	**31.8**	**29.3**	**28.6**
Fish and Wildlife Service (FWS) Office of International Affairs[g]	11.6	13.4	14.4	14.4[b]	13.0
FWS Neotropical Migratory Bird Conservation Act	4.5	5.0	5.0	4.0	5.0
FWS Multinational Species Conservation Fund	8.0	10.0	11.5	10.0	9.8
National Park Service Office of International Affairs	0.9	0.9	0.9	0.9[b]	0.9
Total non-150 account, partly to tropical forests	**32.5**	**38.3**	**41.6**	**39.1**	**34.6**

Notes: (a) Figures for FY2008 and FY2009 are from USAID (2010) and based on ex-post analysis of spending; the figure for FY2010 is an estimate that was included in FY2011 State budget summaries and will likely change; the figure for FY2011 assumes a similar proportion of biodiversity funding to forests as the FY2010 estimate. (b) The Full-Year Continuing Appropriations Act of 2011 did not set the budget for this program; this estimate applies the percentage cut of the containing account proportionally (Development Assistance, Economic Support Fund, or International Organizations and Programs). (c) Includes Convention on Trade in Endangered Species, International Tropical Timber Organization, International Union for Conservation of Nature, Ramsar Convention on Wetlands, United Nations Environment Programme and United Nations Convention to Combat Desertification. (d) The U.S. share of funding from multilateral development banks to tropical forestry and conservation is not included here, and may be large (Lawlor and Olander 2009). (e) 23.5 percent of Global Environment Facility 5 (GEF5) contributions and 16.2 percent of GEF4 contributions are assumed to go toward forests. (f) The $6 million figure is from the FY2012 U.S. Forest Service Congressional Budget Justification. (g) Funding supports the International Wildlife Trade program and Wildlife Without Borders.

Appendix 2. Opportunities to Expand Coordination and Impact

Department	Organization	Opportunities
Executive Office of the President	Council on Environmental Quality	Coordination of domestic environmental efforts; domestic environmental policy advising
	Council of Economic Advisers	Economic policy analysis and advising
	National Security Council	Foreign policy advising
	United States Trade Representative	Review of environmental issues in trade agreements; reporting on barriers to greenhouse gas reduction technologies; environmental representation in trade negotiations
	Office of Science and Technology Policy	Scientific policy advising; coordination of Executive branch science and technical work
Department of Agriculture	Agricultural Marketing Service	Labeling schemes; setting international standards
	Agricultural Research Service	International research programs; technology transfer; partnering
	Animal and Plant Health Inspection Service	Lacey Act administration; international capacity building
	Economic Research Service	Resource, conservation, and international research
	Farm Service Agency	Conservation Reserve; other conservation programs
	Foreign Agricultural Service	Scientific exchange; development of natural resources and sustainable agriculture
	Forest Service	International programs; forestry research; Forest Inventory and Analysis program
	National Agricultural Statistics Service	International development
	National Institute of Food and Agriculture	Research funding
	Natural Resources Conservation Service	International technical assistance and exchanges
Department of Commerce	Bureau of Commerce, Economic Development Administration	Grantsmanship
	Bureau of Commerce, National Institute of Standards and Technology	Climate satellite work, emissions quantification, carbon footprint and lifecycle analysis
	National Environmental Satellite, Data, and Information Service of the National Oceanic and Atmospheric Administration (NOAA)	Global remote-sensing datasets
	NOAA Ocean and Atmospheric Research	Research in global carbon cycle, greenhouse gases, and climate modeling
Department of Energy	Energy Efficiency and Renewable Energy	International partnerships and initiatives
	Energy Information	International statistics
	Office of Science	Research, including biofuels and carbon sequestration, undertaken at National Laboratories
Department of the	Bureau of Land Management	Capacity building, including land tenure

Interior		
	Fish and Wildlife Service	Lacey Act administration; Endangered Species Act and Neotropical Migratory Bird Conservation Act; international wildlife protection programs, technical assistance, grantsmanship
	Geological Survey	Contribution to the Group on Earth Observation; technical assistance; global reference datasets
	National Park Service	Technical assistance and exchange; World Protected Areas leadership forum; funding
	Bureau of Engraving and Printing	Procurement
Department of State	Bureau of Western Hemisphere Affairs	Energy and Climate Partnership of the Americas
	Bureau of Oceans and International Environmental and Scientific Affairs	Advancement of U.S. foreign policy environmental goals; bilateral climate change initiatives; Asia-Pacific Partnership on Clean Development and Climate; international science and technology cooperation, often through 12 regional environmental hubs; United Nations Framework Convention on Climate Change processes.
Department of the Treasury	Office of Development Policy and Debt	Development policy; financing proposals; procurement for multinational development banks
	Office of Environment and Energy	Leadership of energy and environment finance efforts in the G-20; assistance with finance issues in the G-20; management of multilateral funding and the Tropical Forest Conservation Act; assistance in creating national policy
Independent agencies and others		
Environmental Protection Agency		Greenhouse gas inventory capacity building; technical assistance; collaborations; grantsmanship
Inter-American Foundation		Partnership funding
National Aeronautics and Space Administration		SERVIR; satellite systems, Earth imagery data collection and dissemination
National Science Foundation		Research grantsmanship
U.S. Trade and Development Agency		Grantsmanship for partnerships
U.S. Agency for International Development		Funding through Sustainable Landscapes and Biodiversity; REDD Fast-Start Financing; Sustainable Forest Products Global Alliance; climate change funding, international negotiations and agriculture programs
Smithsonian Institution		Research in tropical forests
International Trade Commission		Trade policy; trade and tariff information services
Millennium Challenge Corporation		Land tenure reform; support for implementing low-emissions development strategies in rural forested areas
Generalized Services Administration		Procurement, including energy and environment services