



Policy Impacts on Deforestation Lessons from Past Experiences to Inform New Initiatives

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National and international efforts to reduce deforestation during the last few decades, while having some impact, have failed to substantially slow the loss of the world's tropical forests. Tropical deforestation is widespread and accounts for about 17% of anthropogenic greenhouse gas (GHG) emissions. New global concern about climate change, together with the realization that reducing emissions from deforestation and degradation (REDD) can play a large role in climate change mitigation, makes it critical to learn from previous influences on rates of deforestation.

Within the UN Framework Convention on Climate Change (UNFCCC), international negotiators are considering whether to include incentives for REDD and other forest carbon activities in a post-2012 climate treaty. On a parallel track, the U.S. Congress is developing legislative proposals for a long-term GHG cap-and-trade program that includes REDD, possibly other international forest-carbon activities, and other international GHG-mitigation actions.¹

Climate policies that target reduced deforestation may mobilize new and sustained funding for forest conservation in developing countries. Climate-related incentives for forest conservation give U.S. policymakers and the international community a new way to influence programs and policies that affect deforestation. New programs are likely to be performance-based, with a strong emphasis upon the monitoring, reporting, and verification of results. This emphasis, alongside financial incentives, could increase policy impacts on deforestation rates.

Lessons on the drivers of deforestation will help to design new policies and programs that are effective, efficient, and equitable. It is in the interest of countries and private entities interested in purchasing or financing any emission reductions, as well as the tropical forest nations that would host reduction activities, to understand what has worked in reducing forest loss and degradation and what has not, and the reasons for these different outcomes. Investments and policies then can more effectively embrace and extend what has worked while reducing the risk of further failures.

This brief aims to inform U.S. and international policymakers by analyzing the dominant influences on deforestation, be those forest policies, other policies that influence the forest, or non-policy factors such as trends in commodity prices. It provides examples of previous policies and derives lessons from their successes and failures, then links these observations on the past to key decisions that policymakers must soon make with regard to climate policy deliberations.

Deforestation Drivers

Agricultural expansion is the primary driver of deforestation within the tropics. When tropical forests are cleared, they are almost always converted to agricultural crops, pasture, or plantations for timber, biofuel, and fiber. Thus the fundamental drivers of deforestation are the benefits from the conversion of forest for production. Incentives to clear forests arise from local and global demand for commodities. Deforestation pressures are exacerbated by government policies in support of agricultural expansion, ranging

¹ The American Clean Energy and Security Act of 2009 (H.R. 2454), passed by the U.S. House Energy and Commerce Committee on May 21 (with consideration by the full House pending), allows capped entities to offset part of their emissions with tropical deforestation reduction credits. It permits up to 1 billion tons of emissions compliance annually using international offsets (including but not limited to reduced deforestation credits), though use of international offsets may rise to 1.5 billion tons if the supply of domestic offsets is insufficient. It also establishes a program to generate reductions beyond the cap by building government capacity to reduce deforestation, financing subnational projects, and financing "leakage prevention activities" to preserve carbon stocks in forests, forested wetlands, and forested peatlands. This would be financed by a certain percentage of allowance value.

from road construction and maintenance to cheap credit to easier access to formal land titles when forested lands have been cleared.

The lack of profitable alternatives in sustainable forest management is also a driver of deforestation. In the tropics, logging operations often remove only high-value native timber and then abandon the remaining forest, leaving it degraded, accessible, and vulnerable to clearing. The low timber prices that can be caused by unsustainable and often illegal logging practices, along with governments' failures to provide credit or tenure security for forest operations, all discourage long-term forest management. Further, other services that are provided by forests, such as species habitat and water quality, are often ignored and almost always undervalued in land-use decisions that affect the forest. Climate policies that provide funding for REDD could change these defaults, leading local actors to value forest services and making it profitable to manage the forests for the many local and global goods they provide, including forest carbon.

Evidence on International Policies

Various multi- and bilateral initiatives have aimed to reduce deforestation and increase transparency and monitoring in the forest sector. Yet with few exceptions, their primary aim—substantially reducing rates of deforestation in tropical nations—has not been achieved. Few initiatives have efficiently addressed critical underlying drivers of deforestation. In some cases, the drivers were not even targeted. In others, programs did not exert substantial and sustained influence on enforcement or on relevant economic conditions and rural development practices.

Specific external policy experiences

Conditional Loans. The amount of loans and development assistance contingent upon forestry reform has risen in recent decades, with significant sums spent to create and improve management of protected areas. Success in reducing deforestation, however, has been mixed. Corruption has hampered implementation, while coordination with stakeholders both large and small who influence land choices has often been insufficient. Transforming the relevant local institutions is complex and slow, particularly if external pressure for reform is not met with internal support for changes. Many loan covenants overreach, asserting sweeping reforms without connecting all of the conditions in question to national or local development priorities.

Donor Coordination. Donor coordination has aimed to increase the effectiveness and efficiency of development assistance. The Tropical Forestry Action Program (TFAP), for instance, was founded by UN agencies, the World Bank, and the World Resources Institute in 1985 as an ambitious attempt at donor coordination within the forestry sector. Its effectiveness appears

to have been limited. The TFAP increased forest aid, coordinated spending, and developed national forest management plans. However by focusing almost exclusively upon the forest sector, it neglected important deforestation drivers such as agricultural and infrastructural expansion. This may have resulted from insufficient participation in policy development by civil society and by the forest-dependent communities, a gap that also lost the political support of those actors.

Debt Relief. Governments' debt to foreign countries and international banks may also encourage tropical deforestation. Many have suggested that debt leads tropical governments to raise revenues to service their debts, typically through timber royalties or taxes on agricultural exports. During the late 1990s, Indonesia was pressed by international financial institutions to increase exports of timber, paper pulp, and palm oil, all of which affect forests. Indebtedness may also restrict forest enforcement. Under the 1998 Tropical Forest Conservation Act, the U.S. reduced the debts of twelve Latin American countries and Botswana by 2007, in eight cases with substantial contributions from major environmental organizations. But drawing a direct link between debt and deforestation is difficult and evaluations of the impact of debt swaps on forest loss are few. A 2007 U.S. government evaluation of a debt-swap initiative in El Salvador did not quantify forest impacts but suggested that results fell short of overambitious targets.

Demand Management. Commodities from “forest-unfriendly” production such as destructive and often illegal logging are traded globally. This implies a potential role for global intervention on the demand side. There have been many efforts to lower demand for production that causes deforestation, such as boycotts based on the “hamburger connection” to clearing in Central America, as well as efforts to raise the demand for “forest-friendly” commodities, such as certified timber, nontimber forest products, ecotourism and “bird-friendly” coffee or cacao. Such campaigns have rarely shifted global prices significantly, given large markets and the fact that not all the buyers are concerned enough to adjust their purchasing habits. However these interventions do seem to be capable of increasing the relative profitability of sustainable forest management by reducing the costs of marketing and lowering risks involved in selling forest-friendly goods.

Another intervention is reciprocal trade controls—laws in importing nations that provide a legal basis for monitoring and seizing illicit trade. Such restrictions may complement exporting nations' domestic laws as well as international rules like those adopted under the Convention on International Trade in Endangered Species (CITES). Indonesia's listing of ramin as restricted under CITES is claimed to have reduced illegal trade, although some illegal exports continue. Blocking trade

in this way is an effort to reduce payoffs from activities that degrade forests.

The European Union's 2003 FLEGT Action Plan aims to prevent illegal imports into the EU. Producer countries enter into voluntary agreements with the EU. Evidence of its effectiveness is still lacking, and may be case-specific, but studies suggest that voluntary bilateral agreements may be less effective than legally binding controls upon imports of timber. A recent example of the latter is a 2008 amendment to the U.S. Lacey Act that makes it illegal to import into the U.S. plants that were harvested or traded in violation of the supplier country's laws. This ban applies not only to timber but also to goods containing wood products, such as furniture. Importers are now required to declare the country of origin, quantity, and the plant species of their products. While the effects of this law have yet to be seen, it is believed to be increasing the transparency of the supply chain for wood products in the private sector. Such standards need to be adopted consistently by both exporters and importers if any such policy's full potential is to be realized.

Evidence on Domestic Policies

Various national and subnational initiatives have aimed to conserve forests, including through legal protection as well as compensation such as via payment for ecosystem services. Their primary aim—reducing deforestation—has typically been only partially achieved due to limitations in how deforestation drivers are addressed. Many initiatives were implemented in areas facing relatively low deforestation threat. That fails to address key drivers and, inevitably, limits impacts on forest. Impact can be increased by: (1) targeting additionality by locating effort where the forest would in fact be cleared in the absence of policy; (2) limiting leakage (shifts in deforestation to alternative locations) by closing loopholes and expanding programs' scope to count all clearing; and (3) adjusting policies that do not explicitly concern conservation but are highly influential, such as transport networks, agricultural subsidies, and land tenure regimes.

Domestic forest policies

Protected Areas. Setting aside forest for permanent protection is the most common explicit forest conservation policy. Analysis shows, however, that protected areas tend to be on land with relatively low threat of deforestation. Thus, there may be little deforestation in areas that are protected but also little change relative to what would happen without the protection and thus much less avoided deforestation than typically assumed (based on studies using global data and of Costa Rica, the Brazilian Amazon, and Mexico). Such analyses also indicate where impact could be high. If deforestation threats are relatively high and enforcement is relatively strong, such as within the Chico Mendes Extractive Reserve in the Brazilian Amazon near the Interoceanic

Highway, then there can be significant benefits in terms of avoided deforestation.

Ecopayments. Payments for ecosystems services such as water quality, species habitat, or carbon storage reward landowners for limiting use of their land and conserving ecosystems such as forests. Most programs are voluntary, however. Landowners often will volunteer their least productive land, capturing payments for retaining forest that might well have remained without financial reward. During the initial period of Costa Rica's pioneering program, payments were not targeted and forest receiving payment was largely non-additional to the status quo. However, as for protected areas, policy could explicitly aim for forest under threat. Costa Rica's payments still do not explicitly focus on such additionality but shifts in how the payments are allocated have removed the bias towards forest under low threat, and as a result, impact has risen.

Local Engagement. The example of Brazil's PPG7 suggests that local engagement and stakeholder support can raise impact. Extractive reserves and indigenous lands were created with not only boundaries delimiting uses but also crucially a network of invested stakeholders. Their involvement appears to have raised management effectiveness and with low amounts of external funds. PPG7 also modernized scientific research centers, trained thousands of people in fire prevention and control, and built capacity for environmental monitoring such as that used in Mato Grosso's state environmental agency to track land use on large properties. Yet for any such enforcement program, even high capacity can have a low impact absent local political will and effective coordination across the relevant agencies at multiple levels of government.

Concessions. Poor concession design has accelerated forest loss. In the large tropical forests of Africa and Asia, and increasingly in Latin America, logging is often practiced through private concessions within government-owned forests. Many are held by large foreign firms. With variations by country, concessions are most often contracts between government owner and harvester, won by bidding, that designate a specific volume or area to harvest. Concessions have more recently specified environmentally sensitive logging methods such as preservation of certain species and reduced environmental impact. Poorly designed contracts, including royalty structures, fail to capture appropriate revenue, protect habitat, or enforce the agreed methods.

Many tropical countries have outlawed the export of whole unprocessed logs, partly in an effort to reduce pressure on forests. Such initiatives can complement external limitations on illegal imports. They generally decrease timber prices in domestic markets and are criticized for reducing incentives for sustainable forest

management. But lower timber prices also lead to reduced returns from harvesting forests, fewer logging roads, and lower profits in agriculture. If tenure is insecure and discount rates are high, the profits from forested land may not drop as much as those from clearing. Thus, a ban could slow deforestation if it is adequately enforced.

Corruption is a problem, yielding larger concessions (more clearing) and less stringent regulation and enforcement. It appears to be more common when discretionary power is held by officials exposed to bribes, as well as when rents to government-owned resources are high and when there is a low probability of detection or punishment. With sufficient resources, in principle corruption can be limited by enforcement. That is harder when forest is more remote. Leakage can result from such weakness. Concessions which enforce restrictions drive loggers to move into smallholder lands or local public forests that are more easily logged unsustainably.

Domestic nonforest policies

As suggested above, adjusting domestic policies with significant effects on deforestation may be as important for outcomes as optimizing the forest-focused domestic policies. However, little experimentation of this type has occurred, to our knowledge. Thus we describe lessons on how these factors affect deforestation and simply suggest that such policies could be adjusted.

Infrastructure Policies. Access and transport costs are essential determinants of both agriculture and forestry. Road investments lower transport cost and often lead to both more economic output and more deforestation. Critically, though, their impacts vary across space. Specifically, road investments appear to increase deforestation less when they are in already developed areas with prior roads and deforestation. Thus a road network's total forest impact can be mitigated by network design (analogously, pipeline-network design can avoid forest loss). The government of the Brazilian Amazon state of Acre argues that deforestation can be lower if public actors sequence road construction with policies that clarify tenure and provide services, thereby raising quality of life while preserving natural wealth. One example could be creating a buffer of parks around roads, imitating how the Chico Mendes Reserve in Brazil has functioned.

Agricultural Policies. Agricultural commodity prices and production costs are important drivers of deforestation. Many governments subsidize agriculture through output prices (import tariffs, subsidized processing), input prices (interest rates, fertilizer costs), and lower taxes; they also encourage agriculture by facilitating tenure for cleared land and reducing other risks (pests, disease) through investment in agricultural research and development. Without equal support

for forest management, all these encourage clearing. When these subsidies are provided in the context of colonization projects, deforestation impact is magnified by migration and the resulting expansion in the labor supply, as demonstrated by the rapid deforestation within INCRA settlements in the Brazilian Amazon.

Demands for biofuels that can be profitably cultivated in areas of tropical forest, such as oil palm in Indonesia, are another deforestation driver. If these biofuels compete for tropical land, as sugar cane may compete with soy for land in São Paulo, that could raise deforestation by pushing soy into forested areas. When biofuels are cultivated on croplands in places such as the U.S. (e.g., in response to subsidies for corn ethanol), this too could lead soy to expand into forested areas by reducing the supply of soy from the U.S. (an international policy impact). Local subsidies to cultivate the already cleared lands, on the other hand, could reduce deforestation.

Land Tenure. Tenure regimes in which those clearing land acquire squatter's rights and eventually title have long promoted deforestation. While clearing may often be for cattle or for agriculture, even clearing not leading to any profitable use may allow acquisition of title, which permits future resale. When it consolidates land claims in this way, which at times occurs where traditional land tenure exists but still is not officially recognized, deforestation is encouraged.

Risk of losing land or forest through expropriation or illegal logging reduces incentives for long-term sustainable management. Yet it can be difficult to stop expropriation through illegal logging where timber trespass can occur in private forest, a risk that varies by setting. These risks of infringement may rise with population growth and migration to rural areas for employment and resource ownership. Up to 80% of all logging in Latin America is thought to be illegal, though this includes everything from trespass to failure to have done all of the requisite paperwork (both of which increase with corruption). Illegal wood also dampens global prices.

Lessons Learned for the Inclusion of International Forest Carbon in Climate Policy

Neither too easy nor too hard

Two opposite schools of thought are emerging regarding the role of international forest carbon and REDD in U.S. and global climate policy. One is that opportunities to reduce carbon emissions are cheap and abundant, and if they generate carbon credits, these credits can "flood" cap-and-trade programs, reducing incentives for emissions reduction in rich countries. The other is that reducing global deforestation is so daunting that significant reductions of this type are nearly impossible.

The first view is guided in part by the notion that the cost of stopping such deforestation equals the opportunity cost of the alternative land use (e.g., revenues generated by agriculture). These revenues are often low, seemingly suggesting that conserving forests is relatively cheap. This view also stems from concern that negotiations may produce erroneous high deforestation emission baselines, yielding credits not backed by real emission reductions. The second view is underpinned by the failures of previous efforts to reduce deforestation as well as concerns that many countries still lack the governance capacity to effectively implement new such programs.

Reality lies in between these extremes. There are opportunities to avoid deforestation in much of the tropics, and at low cost compared to other efforts to reduce GHG emissions. Yet claims about the size of the opportunities immediately available have likely been overstated. Actual costs of reducing deforestation include costs to reform land tenure, distribute payments, and establish, manage, and monitor protected areas. Further, continued demand for wood and agricultural products, population pressures, weak governance, and other institutional factors are limits on short-run dramatic reductions in deforestation. Thus commonly used measures of opportunity costs provide a minimum, not a typical, cost estimate for implementing REDD.

This realization feeds into the second view, and indeed reviewing the results of past efforts to halt tropical deforestation is sobering. Many policies did not target drivers behind deforestation and thus were largely ineffective. In many cases this was due to insufficient consideration of how to target lands under real threat of deforestation. Interventions often failed due to limited local engagement and insufficient stakeholder participation, while weak governance, corruption, and lack of land titles and law enforcement created further barriers. In addition, previous programs almost universally lacked self-evaluation mechanisms, which limited learning and modification. However, as we have discussed, many features of past policies could be drastically improved.

Middle ground: Designing policy to make more REDD feasible

The prospect of rewards for international forest carbon conservation under future U.S. and international climate policies has brought new energy to the protection of tropical forests. Yet the debate has not been informed by close consideration of the international and domestic policies required if REDD is to play a significant role. In summary, we believe that international intervention can lower deforestation with the support of local actors and smart policy design.

Past failures suggest that there are potential benefits from program requirements that are broad enough to encourage locally-appropriate interventions. For instance, if comprehensive monitoring captures GHG emissions reductions, then requirements and incentives can be based on that aggregate outcome, and other details may be left to local actors better placed to significantly and sustainably shift relevant processes. This avoids the difficulties of monitoring and rewarding local process. Generally, consultation with those affected by these policies can aid development of effective and sustainable policy.

Such policies may not immediately come to pass, and even if the above describes future international regimes, domestic actors will have to decide how to try to lower GHG emissions to capture incentive payments. For these reasons, there is value in learning further from both the successes and the failures of previous types of forest interventions. Drawing from all the above: we can ask skeptically whether loan conditionality is likely to work without changed practices; we can strongly encourage bringing the locally forest-dependent into discussions; we can shift protected areas and ecopayments towards areas of higher forest threats; we can evaluate whether carbon-based payments justify, in local development terms alone, shifts in roads or subsidies.

Moving forward:

- the U.S., in concert with international actors, can help forested countries with the costs of conserving forest carbon, including with costs of strengthening relevant institutions
- international forest carbon policies can adopt performance indicators so that incentives can be effectively applied; monitoring and evaluation will permit ongoing learning
- forested countries can rethink not only forest policy but also how agriculture and infrastructure policies will affect forests; strategies will differ as a function of local context
- the U.S. and international actors can re-examine whether actions could work better together, e.g., influences on commodity demand and subsidies for agriculture or biofuels

In summary, it is possible to identify important deforestation drivers and to align local, regional, national, and international incentives in many settings. Climate protection provides a new way for forest protection to contribute and to succeed if we learn lessons from the past.

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