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Conserving the Climate

SCALING-UP GLOBAL MARKETS FOR FOREST CARBON

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Resources for the Future

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The Climate Policy Program at Resources for the Future (RFF) provides a framework for policymakers and stakeholders to better understand and address one of the most complex environmental issues of our time: climate change.

The program has two core objectives: to develop domestic policies that are politically and economically viable and to articulate a new architecture for a global climate policy regime. Program scholars work to both support current policy efforts as well as fostering the evolution of these policies over time by making economic analysis more usable and facilitating decisionmaker involvement in developing new tools.

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Conserving the enormous quantity of carbon that the world's forests sequester in their vegetation and in the ground (forest carbon) is absolutely essential to stabilizing Earth's climate system. Land-use changes, mainly tropical deforestation, account for roughly 20 percent of global greenhouse gas emissions, a share greater than either the global transport or industrial sectors. In other words, intentional deforestation is doing more to deepen the climate crisis than all the automobiles or factories in the world.

Forest conservation, unlike advanced clean energy technologies, is something the world could implement both cost-effectively and almost immediately at a global scale. Two major opportunities exist to conserve forests and reduce emissions from deforestation today. First, in December 2007, the international community agreed to negotiate a new climate agreement to trigger deep cuts in greenhouse gas emissions globally, including emissions from the forest sector. Second, the U.S. Congress is considering major climate change legislation that would reduce domestic emissions and help developing nations conserve forests.

Market-based mechanisms lie at the heart of both the domestic and the international initiatives. Greenhouse gas emitters will receive regulatory and other credits for investing in tradable forest carbon assets generated by conservation activities. Today, the forest carbon market is less than $100 million, only 0.16 percent of the $64 billion worldwide market for carbon-denominated assets (Hamilton et al. 2008; Capoor and Ambrosi 2008). Scaling up these forest carbon markets is one of the greatest challenges facing new climate policies.

This paper recommends five concrete actions the international community should take now to accelerate the development of global markets for forest carbon assets. (Separate policy recommendations

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for how the United States should speed the development of domestic markets for global forest carbon assets are explained in a companion discussion paper.) Before considering what the international community could do now to conserve forests and reduce emissions from the forest sector, let us quickly review the role of forests in climate change and international climate change policy.

Forests and Climate Change

Tropical forests, which hold most of the world's forest carbon—and the majority of known terrestrial species—are disappearing at the alarming rate of 5 percent per decade globally. Each year, more than 13 million hectares of forest is lost (FAO 2006), along with ecosystem functions and countless species, many of them still unknown. Well over 90 percent of global deforestation today occurs in two dozen tropical forest countries. In fact, just two countries (Indonesia and Brazil) are responsible for 50 percent of global deforestation (FAO 2006). The United Nations figures probably underestimate emissions from the forest sector because they do not account for forest degradation, such as the conversion of a rich primary forest into a less vegetated, sparsely wooded ecosystem. The major drivers of tropical deforestation and forest degradation today are farming, ranching, and logging, with farming and ranching accounting for at least 75 percent of deforestation (Butler 2008; Geist and Lambin 2001). Market pressure is increasing to convert native forests to agricultural land. European and American initiatives to promote alternative energy sources are increasing demand for transportation biofuels, which in turn increases pressure to convert remaining forests to other uses. Often, fire is the most cost-effective way to clear land for agriculture, releasing tremendous amounts of carbon previously stored in vegetation and soil. Absent a dramatic change in course, by the middle of this century only fragmented islands of tropical forest may remain amid an ocean of ecological change, with potentially devastating consequences for the poor and the planet.

Importantly, however, limiting deforestation and forest degradation globally would cost-effectively reduce the accumulation of carbon dioxide in the atmosphere, thereby slowing climate change almost immediately. Leading economic studies predict that costs to reduce emissions from deforestation are equal to or less than costs of most other emissions mitigation strategies, although these studies offer quite a range of cost predictions. According to the 2006 Stern Review, for example, a mere $5 billion a year for forest conservation could reduce deforestation by 70 percent globally, or less than $2 per ton of carbon dioxide (tCO_2). The Intergovernmental Panel on Climate Change (2007) predicts that reducing carbon emissions from deforestation will be more costly; it estimates that at least 50 percent of emissions from deforestation could be mitigated for less than $100/$tCO_2$. The World Bank believes the opportunity cost of forest conservation is less than $5/$tCO_2$ in several major developing countries (Chomitz 2007)—a small fraction of the price of nonforestry carbon securities today in Europe.

The difference in those cost estimates results from different methods of analysis as well as regional differences in drivers of deforestation. For example, regions with a high demand for biofuel production have higher opportunity costs for nonforest land-use activities. Regardless of the discrepancies, however, with sound forest-friendly rules in place, global carbon markets would generate several billion dollars a year to reduce emissions from deforestation. Unlike some technology-dependent climate solutions, such as capturing emissions from coal-fired power plants, know-how for forest conservation is available today and could be deployed at a global scale almost immediately.

In addition, strategies to reduce deforestation have additional benefits: the conservation of biodiversity, the provision of clean water and other ecosystem goods and services, and the improvement of livelihoods for neighboring communities. Those living in extreme poverty are particularly dependent on forests for their food, water, fuel, and livelihood (Chomitz 2007).

The 1997 Kyoto Protocol, through its Clean Development Mechanism (CDM), allows developed countries and the commercial entities they regulate to meet part of their Kyoto emissions targets by investing in emissions mitigation projects in the developing world. Carbon "offsets" from reforestation (replanting after harvesting or clearing) and afforestation (planting unforested land) are eligible under the CDM program, but projects that reduce emissions from deforestation and forest degradation are not. In other words, Kyoto provides no incentives to reduce deforestation, one of the world's leading emissions sources—to the detriment of the climate, forest ecosystems, and local communities.

In December 2007, in Bali, Indonesia, the parties to the U.N. Framework Convention on Climate Change agreed to launch a comprehensive process to create a long-term approach to international climate cooperation extending beyond 2012, with a view to concluding new arrangements by the end of 2009. As part of this new global negotiating process, countries agreed to explore "policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries." In doing so, countries pledged to consider "various approaches, including opportunities for using markets, to enhance the cost-effectiveness of, and to promote, mitigation actions, bearing in mind different circumstances of developed and developing countries" (UNFCCC 2008).

The international community also agreed to an ambitious program of work to resolve methodological questions relating to measurement, monitoring, verification, and other technical issues regarding forest carbon. Initial scientific and technical recommendations are expected at the next global climate change meeting in December 2008, with a goal of reaching consensus on the remaining methodological questions by the end of 2009. The Bali agreement, furthermore, rhetorically encourages developing countries, donor countries, international institutions, conservation groups, and the private sector to take immediate action now, including demonstration activities, to mitigate emissions from the forest sector.

Five Recommendations for Action

The Bali agreement is a sound beginning. Yet if forests are going to play a prominent role in the international strategy to mitigate climate change, more must be done now, given the urgency of the climate crisis and the many benefits of forest conservation. The remainder of this paper explains how the international community can accelerate action to mitigate emissions from the forest sector in developing countries even before the next global climate agreement.

1. Technical Issues

A decade ago, carbon abatement and sequestration programs in forests were considered risky and potentially unhelpful. Many believed that changes in forest carbon stocks could not be measured,

monitored, or verified. Others argued that reducing deforestation in some locations might simply increase deforestation elsewhere ("leakage"), assuming global demand for crops, livestock, and timber remained unchanged. Another concern was the risk of "impermanence" with forest emissions abatement, since forests are constantly changing and evolving. Forests spared from logging today could be logged tomorrow—or destroyed by fire, pests, or climate change. In the Kyoto process, the international community failed to find solutions to these technical challenges. This is why forests remain outside the mainstream of climate policy and regulation, not only under Kyoto but also under European and other emissions limitation systems. Today, as the Bali agreement demonstrates, a broad political consensus exists for including forest carbon in future climate policy frameworks. Thanks to scientific advancements and a deeper understanding of the issues among policymakers, past technical problems now appear manageable.

Measurement and verification. Many experts agree that existing satellite technology, together with on-the-ground statistical sampling, can provide accurate and affordable information about forest carbon stocks at a range of scales, from global to regional, national, and local. One remaining problem is that forest carbon inventories have not yet been carried out for some forests experiencing high deforestation.

Leakage. Although the risk of leakage from actions to reduce deforestation is real, the same risk exists for other sectors and carbon assets. For example, African importers may choose to purchase products from China rather than Europe because Chinese manufacturers currently face no carbon constraints, making these products cheaper. As a result, the benefits from reduced carbon emissions in Europe would be diluted by increased carbon emissions in China. As with leakage in other sectors, leakage in the forest sector can be eliminated only by developing a global policy framework that applies everywhere.

In the absence of a global policy, leakage can be minimized through project designs that specifically address expected sources of leakage. For example, activity-shifting leakage, which occurs when the agents of deforestation move their activities elsewhere, can be minimized by designing forest conservation activities to address the agents of deforestation both inside and outside the main project area. Because loggers, farmers, and ranchers are more likely to move 5 miles down the road than move 500 miles, purchasing logging concessions in abutting forests and creating nonagricultural employment would reduce activity-shifting leakage. Market leakage, which may occur when forest conservation activities in one area force up the market price for timber, livestock, and crops, thus driving deforestation somewhere else, can be accounted for by evaluating and measuring changes in forest carbon stocks at a sufficiently large scale and by modeling market effects on forest conservation activities. At the project or landscape scale, scientists have demonstrated in specific case studies that both types of leakage can be predicted during the project design and can be measured when verifying changes in carbon stocks. As a result, leakage can be accounted for in the calculation of salable credits, and thus it can be offset or neutralized.

> The international community should resolve methodological issues quickly and pragmatically, with a view to providing strong incentives for forest conservation and restoration. A balance must be struck between safeguarding the quality of forest carbon assets and the urgency of improving sustainable forest management.

Impermanence. The risk of impermanence also is not unique to the forestry sector. Consider a decision to avoid emissions from a proposed coal-fired power plant by financing a wind turbine plant instead. The carbon in the coal is not permanently prevented from being emitted at a future time. In fact, the coal remains in the ground and can be exploited at any time. As in other sectors, the risk of impermanence in the forest sector varies depending on the context. Several reasonable proposals for managing the impermanence problem exist, ranging from mandatory reserve accounts to insurance schemes and liability rules. The potential solutions to the impermanence issue may have different effects on the value of forest carbon assets and, therefore, the incentives for forest conservation. Further, different solutions to the impermanence issue may be more or less appropriate in particular areas, depending on the drivers of deforestation and the breadth and scale of conservation activities.

In short, although the technical and methodological challenges are not trivial, credible solutions exist. The Bali agreement creates an ambitious two-year timetable for finalizing policy rules and concrete methodologies. There is room for optimism, given the evident political will that now exists in this area. Nevertheless, opposition to and confusion about the benefits of fully including forestry in a new agreement lingers in some quarters. Some advocacy groups and stakeholders are proposing rules that would unnecessarily raise the cost of forest carbon assets or otherwise restrict the scope and benefits of mitigation activities in the forest sector. Technical methodologies must be evaluated based on both their environmental integrity and their cost-effectiveness. The international community must strike a balance between its desire for quality forest carbon offsets and its interest in creating simple, workable policy frameworks that can transform the forest sector for the benefit of the climate, biodiversity, and local communities.

2. Sustainable Development Mechanisms

The next international climate agreement must develop innovative approaches and mechanisms to finance emissions mitigation in developing countries. This is especially true for the forest sector, which was largely excluded from Kyoto. Sound management of forest carbon is a global public good, and rewarding developing countries that manage forests for global benefits is both necessary and fair. Today, however, there are few incentives to manage forests for their carbon assets but ample market incentives to harvest forests for timber products or convert them to agricultural land . As a result, today forests contribute to economic development through exploitation and conversion but not through their valuable climate stabilization.

Developing countries have diverse national circumstances and interests, and no single sustainable development mechanism will work for all tropical forest countries. That is why the international community should seek to design flexible global policy frameworks that create incentives for many types of forest conservation activities appropriate for differing national circumstances. Developing countries, in short, need options, not a one-size-fits-all approach. Three approaches have promise.

First, forest carbon offsets or credits could be generated through tangible, place-based projects, analogous to today's Clean Development Mechanism activities. These projects would generate forest carbon securities based on conservation in a particular location. For the least developed countries in particular, which have large forests and limited capacity, this project mechanism may provide the most realistic and immediate means to mitigate emissions and generate new funding for sustainable

development. Project-based offsets in the forest sector are particularly controversial because their small scale makes them vulnerable to activity-based leakage (where the agents of deforestation merely move elsewhere). Any project-based approach should calculate and discount for leakage according to environmentally and commercially reasonable rules. The international community, for example, may wish to impose a minimum size requirement on forest carbon projects to help minimize activity-based leakage. It might also require sustainable development plans for areas surrounding the conservation area to ensure that local communities have alternative livelihoods and contribute to conservation efforts.

> To better reflect the diversity of their national circumstances and interests, the international community should create multiple ways for developing countries to originate forest carbon credits, including by designing and implementing projects, policies, programs or sector-wide goals.

Second, developing nations could generate forest carbon credits and offsets through new government policies and programs. For example, a developing country that enacts and enforces new laws that limit forest conversion for agriculture could sell offsets reflecting the actual emissions mitigation benefits of these new laws. Similarly, a country that increases government spending on forest law enforcement in ways that demonstrably reduce illegal logging could generate forest carbon offsets for sale on international markets. In contrast to place-based projects, which are implemented by the private sector or a public entity, program- or policy-based forest conservation activities need to be implemented by governments. While many tropical forest nations face governance and capacity challenges, successful policies and programs could significantly reduce forest sector emissions, generating large volumes of forest carbon credits.

For both policies and programs, compensation for government initiatives to reduce deforestation should be *ex post* and reflect actual changes in deforestation to ensure proper implementation and maintain environmental integrity. Also, just as with forestry projects, program- and policy-based offsets would need to account for leakage. The idea of rewarding developing countries for policies and programs that abate emissions is not new but it has not been applied to deforestation yet. The governing body of the CDM recently approved the idea of program-based CDM credits, for example, but forests are largely excluded from the CDM, as noted above.

Third, developing countries could generate forest carbon offsets or credits by establishing or improving emissions mitigation goals or targets for the forest sector. These goals could be expressed as a percentage change from a reference rate of deforestation, such as a change from a business-as-usual scenario. There are several options for how this might work. A developing country could assume a legally binding national or forest sector–only emissions target. Alternatively, a tropical forest nation could adopt nonbinding sector-wide goals that would act like a financial options contract: the country would have no obligation to reduce deforestation, but if it did, it could sell forest carbon credits. A hybrid approach could give countries a nonbinding target below which they could generate forest carbon credits for sale, and a higher, binding target above which there might be appropriate legal consequences (Philibert 2000; Philibert and Pershing 2001). Because national or sector-wide emissions mitigation goals would likely result in the most substantial and permanent emissions mitigation, minimize leakage, and mobilize the highest levels of financial resources for sustainable development (compared with the project-level, policy,

and programmatic approaches discussed above), the international community should create the strongest possible positive incentives for developing countries to participate in the broadest scale forest conservation mechanisms, including by providing technical assistance to aid local implementation.

Of course, the international community must adopt appropriate accounting and monitoring rules that guard against double- and triple-counting of offsets and credits in countries that pursue multiple approaches simultaneously.

3. Equal Treatment

The international community must decide whether forest carbon offsets and credits should be treated identically to other, more traditional types of offsets, such as carbon assets from renewable energy. Unnecessary, artificial limits on the forest carbon market would merely reduce sustainable development financing for developing countries, increase mitigation costs, and slow action against climate change while increasing the complexity and inefficiency of global carbon markets. Nevertheless, three arguments are sometimes advanced against making all carbon assets fully fungible.

First, some have argued that the technical issues—measurement, leakage, impermanence—make forestry offsets less "real" and the associated climate benefits questionable. They argue that forestry offsets should be treated differently so as not to undermine the integrity of the entire greenhouse gas offset market. As noted above, however, forest carbon can now be measured, monitored, and verified, and workable solutions exist to the problems of leakage and impermanence. The international community should continue to promote dialogue on the technical issues to create consensus standards that provide quality assurances that all nations can endorse. This work is ongoing and good progress is being made. The working assumption should be that when specific methodologies are agreed upon next year, they will create appropriate and sufficient safeguards against sham forest carbon assets.

> Public and private entities should sponsor further research on the likely impact on carbon markets of making forest carbon credits and offsets fungible with other carbon assets.

Second, some fear that forest carbon offsets will be too inexpensive and flood the market, thereby driving down the cost of meeting global climate goals. Carbon prices that are too low would reduce incentives to innovate and adopt much-needed clean energy technologies, increasing long-term mitigation costs and delaying mitigation efforts. However, low-cost forest carbon offsets could allow countries to set more aggressive emissions reductions targets. That said, uncertainty about the price and volume of forest carbon assets could have a chilling effect on ambitious emissions reduction goals and forest conservation activities. Therefore, to understand exactly how forest carbon offsets would affect the global carbon market, further analysis is needed urgently.

Third, there is concern that forest carbon offsets would increase the price volatility of carbon markets. Because emissions from deforestation are concentrated in a small number of countries, a single country's success or failure in reducing emissions from the forest sector could significantly affect the

supply of forest carbon credits and thus the price of carbon generally. In addition, because deforestation rates may change rather quickly as a result of changes in government policy, the volume of forest carbon assets may swing unexpectedly from one year to the next. Whether forest carbon markets would lead to price volatility in the broader carbon market if all carbon assets were fungible is uncertain. As a result, policymakers should give serious attention to mechanisms such as "banking and borrowing" (allowing regulated entities to transfer tradable emissions reduction credits from one regulatory compliance period to another), which would dampen potential short-term price volatility.

4. Demonstration Projects

The urgency of the climate crisis and the cobenefits of managing forests for their carbon value argue for bold action. While essential, negotiating a new climate agreement is not enough. The Bali negotiating process envisions that an agreement would be struck in December 2009 and take effect in 2013. Many experts consider this schedule somewhat optimistic, yet even this rosy scenario implies a five-year delay before new rules for the forestry sector take effect. If activities that clear forests continue unabated during those five years, deforestation will emit 8 billion tons of carbon into the atmosphere, an amount greater than yearly emissions worldwide. Further, experience has shown that international negotiations often take years longer than expected. The Uruguay and Doha trade rounds, which dragged on for years and years, are but two examples. On climate change, speedy action has proven particularly difficult. Countries agreed to negotiate the Kyoto Protocol in 1995, but the agreement did not enter into force until 2005 and its environmental efforts did not come into play until 2008.

> Developed and developing countries should pursue large-scale demonstration projects to build local capacity, experiment with forest conservation strategies and test technical methodologies.

This is why governments, companies, and nongovernmental groups should design and implement large-scale demonstration projects to conserve forest carbon, particularly by reducing emissions from deforestation and forest degradation. In Bali, the World Bank announced the creation of the Forest Carbon Partnership Facility (FCPF), a public-private effort to reduce emissions from deforestation and forest degradation in developing countries by offering them performance-based positive financial incentives. Already, more than 20 developing countries have expressed an interest in participating. Yet the World Bank envisions that its $200 million FCPF incentive fund will purchase carbon assets in only three to five countries. Worldwide, official development assistance for sustainable development in rural communities exceeds $10 billion per year. Much more must be done to mainstream forest conservation into these existing lending and foreign aid programs. In addition, international institutions and donor governments could create stronger incentives for private investment—by sharing political and performance risks in tropical forest countries, for example, or by offering private investors limited performance guarantees. Innovative policy mechanisms are needed to tap much-needed private capital in the absence of agreed-upon rules about when forest carbon assets will have compliance value under various emissions reduction policy frameworks.

5. Credit for Early Action

Perhaps the most effective means for mobilizing immediate action would be to provide investors concrete assurances that forest conservation and restoration today will be recognized by, and have value under, future global and national policy frameworks. In other words, forest conservation and restoration activities undertaken prior to the effective date of the new climate agreement would count toward new emissions mitigation efforts. Private financial flows would skyrocket if investors had confidence that new forestry activities would help them comply with future emissions mitigation targets or goals. Importantly, credit for early action would not inhibit aggressive mitigation goals in other sectors under a future climate agreement. When countries set new emissions mitigation goals, they could take into account progress already made in the forest sector.

> The international community should agree that reductions in emissions from deforestation and forest degradation achieved from January 1, 2009 until the next global climate agreement takes effect will count toward compliance with any post-2012 emission reduction commitments.

To provide credit for early action, of course, the international community must agree to minimum methodologies and quality control standards for forestry offsets. Despite progress toward finding solutions to the technical challenges of measurement, leakage, and impermanence, reaching international consensus on long-term rules could take time. In the short term, the international community at the next global climate conference later this year could agree to interim rules that would govern the early-action credit market until final rules are adopted. These interim rules would have to stipulate that forest carbon offsets developed under the interim rules will count toward future emissions efforts, regardless of the final rules. Suitable interim methodologies already exist, such as the Voluntary Carbon Standard and the Climate, Community, and Biodiversity Alliance standards. By providing a "safe harbor" for countries and companies that invest now, the international community could mobilize action today without compromising future climate policy frameworks.

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