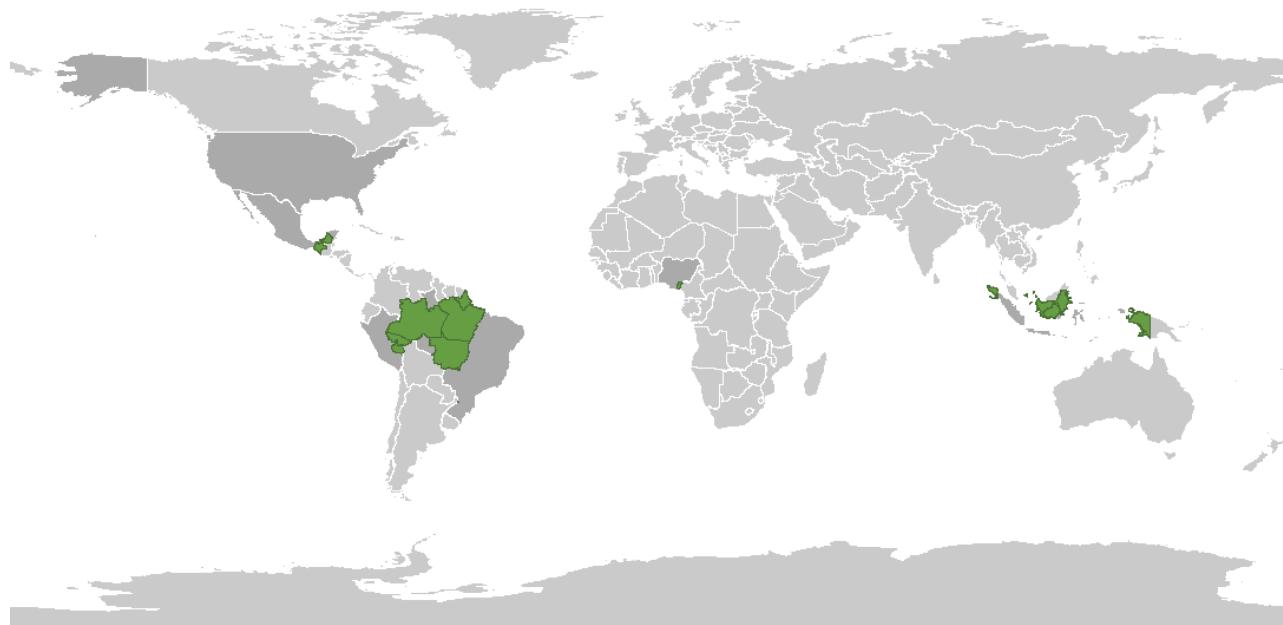


Overview of Subnational Programs to Reduce Emissions from Deforestation and Forest Degradation (REDD) as Part of the Governors' Climate and Forests Task Force

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Technical Update, July 2012

EPRI Project Manager

A. Diamant

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ABSTRACT

Rapid reductions in global greenhouse gas (GHG) emissions will be needed if the nations of the world are to succeed in reducing the risks of climate change. Globally, tropical deforestation and land-use change causes approximately 15% of annual GHG emissions. Many scientists, economists, and policymakers agree that reducing tropical deforestation can significantly reduce GHG emissions in a cost-effective manner. Because the development of a new international climate treaty that could take effect when the Kyoto Protocol's first commitment period sunsets at the end of this year continues to be delayed, efforts now are under way outside the formal international negotiations conducted under the United Nations Framework Convention on Climate Change to realize the potential for reduced emissions from deforestation and degradation and additional forest carbon sequestration (REDD+) activities to reduce near-term GHG emissions.

One of the most promising alternative pathways to begin to realize this potential and provide proof-of-concept that REDD+ could become an important source of low-cost, high-volume GHG emissions offsets is the Governors' Climate and Forests Task Force (GCF). The GCF is composed of representatives from 16 states and provinces of Brazil, Indonesia, Mexico, Nigeria, Peru, and the United States, including 14 states and provinces located in tropical forest nations that are developing jurisdiction-wide REDD+ programs capable of coming into alignment with California's new statewide GHG cap-and-trade program and other emerging market and non-market opportunities.

This report reviews the status of these REDD+ programs, assesses progress made toward the development of nine essential components of REDD+ programs, and evaluates the potential of these programs to provide high-quality GHG emissions offsets that could be used for compliance purposes in emerging GHG cap-and-trade systems in California and elsewhere or transferred into other systems of performance-based compensation.

The report presents four detailed case studies of evolving REDD+ programs. It includes the two states (Acre, Brazil, and Chiapas, Mexico) that have signed a memorandum of understanding to link their REDD+ programs with California's new GHG cap-and-trade system. It also includes the state that has achieved the greatest emissions reductions (Mato Grosso, Brazil) and one of the most mature REDD+ programs in Indonesia (Aceh).

Keywords

Avoided deforestation
Reduced emissions from deforestation and degradation (REDD)
Forestry
Greenhouse gas emission offsets
Greenhouse gas emissions
Offsets

GLOSSARY OF TERMS

The following abbreviations, acronyms, and terms are used in this report:

ACR	American Carbon Registry of Winrock International.
AFOLU	Agriculture, forestry, and other land use.
Annex I countries, non–Annex I countries	Countries listed, or not listed, in Annex I of the United Nations Framework Convention on Climate Change. Annex I is a list of industrialized countries, and non–Annex I countries are developing countries.
Baseline	The schedule of greenhouse gas emissions related to an emissions reduction project that would be expected to occur in the absence of the project.
BAU	Business as usual.
BOVESPA	Brazilian Stock Exchange of São Paulo.
Cancun Agreements	Agreements made during the 16th Conference of the Parties of the United Nations Framework Convention on Climate Change held in Cancun, Mexico, in 2010.
CAR	The Climate Action Reserve. Previously the California Climate Action Registry.
CCAE	The State Environmental Advisory Council of Chiapas, Mexico.
CCB (standards)	The Climate Community and Biodiversity Project Design standards, a voluntary standard for forest carbon related projects.
CCBA	The Climate, Community and Biodiversity Alliance.
CCCICCCCH	The Intersecretarial Commission for Climate Change Coordination of Chiapas, Mexico.
CDM	The United Nations' Clean Development Mechanism.
CERs	Certified Emission Reductions.
CIES	The Company for Ecological Service Incentives of Acre, Brazil.
Clean Development Mechanism (CDM)	A provision described in Article 12 of the Kyoto Protocol that allows tradable credits, called Certified Emission Reductions, to be generated through emissions reduction projects in developing countries. These credits can be used by industrialized countries for compliance with their Kyoto commitments.
CONAFOR	The National Forestry Commission of Mexico.

CONABIO	The National Commission for Knowledge and Use of Biodiversity of Mexico.
CONEVAL	The National Council for Evaluation of Social Development Policy of Mexico.
Conference of the Parties (COP)	The main operational body of the United Nations Framework Convention on Climate Change, representing all countries that have ratified the Convention. The Conference meets annually. COP17 was held in Durban, South Africa, in December 2011.
COP15	The 15th Conference of the Parties to the United Nations Framework Convention on Climate Change that took place in Copenhagen, Denmark, in December 2009.
Copenhagen Accord	The Copenhagen Accord is a document that delegates at the COP15 to the United Nations Framework Convention on Climate Change agreed to “take note of” at the final plenary on December 18, 2009, in Copenhagen, Denmark. The Accord was agreed to by the United States, China, India, South Africa, and Brazil.
CTC-REDD+	The technical advisory committee for REDD+ for Mexico.
Chiapas CTC-REDD+	The technical advisory committee for REDD+ for Chiapas, Mexico.
CVM	The Validation and Monitoring Commission of Acre, Brazil. It is an entity within the System for Incentives of Environmental Services in the state of Acre.
DECOFOS	The project for the Development of Sustainable Forestry Practices in Communities of Southern Mexico.
Deforestation	An activity included under Article 3.3 of the Kyoto Protocol; more generally, the conversion of forested land to some other land use following forest clearance (such as by harvesting or forest fire).
ESP-USAID	The Environmental Services Program of the United States Agency for International Development.
EU ETS	European Union Emissions Trading Scheme.
FAO	United Nations Food and Agriculture Organization.
FCPF	Forest Carbon Partnership Facility.
FEPAF	The Foundation of Agricultural and Forest Study and Research in Brazil.
FFI	Fauna and Flora International.

FFI-AFEP	Fauna and Flora International Aceh Forest and Environment Program.
FIP	Forest Investment Program.
Forest management	An activity included under Article 3.4 of the Kyoto Protocol; more generally, the management of forests to reduce emissions of carbon and/or increase the sequestration of carbon.
FPIC	Free, prior and informed consent.
GCF	The Governors' Climate and Forests Task Force. It was formed in 2008 and currently has 16 member states from the United States, Brazil, Indonesia, Mexico, Nigeria, and Peru.
GCF Fund	Governors' Climate and Forests Fund.
GHG	Greenhouse gas. This term usually is used to refer to the collection of six types of greenhouse gases regulated by the Kyoto Protocol (CO ₂ , CH ₄ , N ₂ O, SF ₆ , PFCs, and HFCs).
GIS	Geographical information system.
IBAMA	The Brazilian Environmental and Renewable Resources Institute.
IMC	The Climate Change Institute of Acre, Brazil.
INEGI	The National Institute of Statistics and Geography of Mexico.
IPAM	Amazon Environmental Research Institute.
IPCC	The United Nations Intergovernmental Panel on Climate Change.
Kyoto Protocol (KP)	A protocol under the United Nations Framework Convention on Climate Change in which, <i>inter alia</i> , industrialized countries took on binding commitments to reduce their greenhouse gas emissions in a first commitment period (cp1), 2008–2012.
Leakage	A greenhouse gas effect occurring outside the boundary of what is being reported or accounted for as an emissions reduction project or activity that is caused by the project or activity and reduces its environmental benefit.
LIDAR	Light detection and ranging.
LUCF	Land use change and forestry, a sector for emissions reporting purposes under the United Nations Framework Convention on Climate Change.
LULUCF	Land use, land use change, and forestry, a sector covered under Articles 3.3 and 3.4 of the Kyoto Protocol; becoming used more generally than just related to the Kyoto Protocol.

MODIS	Moderate resolution imaging spectrometer.
MOU	Memorandum of understanding.
MRV	Monitoring, reporting, and verification standards.
NCPF	National Climate Change Policy of Brazil.
Nested	Refers to projects that reduce emissions from deforestation and degradation (REDD) developed as part of a larger, jurisdiction-wide REDD program or that exist before the development of the program and are brought into alignment <i>ex post</i> .
NSPS	New Source Performance Standards promulgated under the Clean Air Act.
PACCCH	Climate Change Action Program for the State of Chiapas, Mexico.
REDD	Reduced emissions from deforestation and degradation.
REDD+	Reduced emissions from deforestation and degradation combined with net forest sequestration from regrowth and afforestation activities.
Reference Level	Emissions of greenhouse gases to the atmosphere that would take place under business-as-usual circumstances (such as in the absence of a REDD program or other activities to reduce greenhouse gas emissions).
Reforestation	An activity included under Article 3.3 of the Kyoto Protocol; more generally, establishing forests on land that has in recent past times been forested but in more recent times has been under some other land use.
Removals	The sequestration of carbon from the atmosphere (the opposite of emissions); a process that does this is called a <i>sink</i> .
ROW	REDD Offset Working Group.
SAGARPA	Ministry of Agriculture, Livestock, Rural Development, Fisheries, and Food of Mexico.
SAR	Synthetic aperture radar.
SEF	The State Forest Agency of Acre, Brazil.
SEHMAHN	The Secretary of Environment and Natural History of Chiapas, Mexico.
SEMA	State Environmental Agency.

SEMANART	The Ministry of Environment and Natural Resources of Mexico.
Sequestration	The absorption of greenhouse gases from the atmosphere by some process; normally refers to absorption of CO ₂ but can also apply to other greenhouse gases (such as methane).
Sink	A process that removes carbon from the atmosphere (such as a growing forest).
SISA	The Environmental Service Incentive System of Acre, Brazil.
TFG	The Tropical Forest Group.
Storage	Keeping sequestered carbon out of the atmosphere.
UNDrip	United Nations Declaration on the Rights of Indigenous People.
UNDP	United Nations Development Program.
UNEP	United Nations Environment Program.
UNFCCC	United Nations Framework Convention on Climate Change, the multilateral environmental agreement to address the risk of global climate change.
USAID	United States Agency for International Development.
VCS	Verified Carbon Standard.
WWF Aceh	World Wildlife Federation, Aceh, Indonesia.

EXECUTIVE SUMMARY

Rapid reductions in global greenhouse gas (GHG) emissions will be needed if the nations of the world are to succeed in reducing the risks of climate change. Globally, tropical deforestation and land-use change causes approximately 15% of annual GHG emissions. Many scientists, economists, and policymakers agree that reducing tropical deforestation can significantly reduce GHG emissions in a cost-effective manner. Because the development of a new international climate treaty that could take effect when the Kyoto Protocol's first commitment period sunsets at the end of this year continues to be delayed, efforts now are under way outside the formal international negotiations conducted under the United Nations Framework Convention on Climate Change to realize the potential for reduced emissions from deforestation and degradation and additional forest carbon sequestration (REDD+) activities to reduce near-term GHG emissions.

One of the most promising alternative pathways to begin to realize this potential and provide proof-of-concept that REDD+ could become an important source of low-cost, high-volume GHG emissions offsets is the Governors' Climate and Forests Task Force (GCF). The GCF is composed of representatives from 16 states and provinces of Brazil, Indonesia, Mexico, Nigeria, Peru, and the United States, including 14 states and provinces located in tropical forest nations that are developing jurisdiction-wide REDD+ programs capable of coming into alignment with California's new statewide GHG cap-and-trade program and other emerging market and non-market opportunities.

This report reviews the status of 13 of these REDD+ programs, assesses progress made towards the development of nine essential components of REDD+ programs, and evaluates the potential of these programs to provide high-quality offsets that could be issued into emerging cap-and-trade systems in California and elsewhere or transferred into other systems of performance-based compensation.

The report presents four detailed case studies of REDD+ programs. It includes the two states (Acre, Brazil, and Chiapas, Mexico) that have signed a formal memorandum of understanding to link their REDD+ programs with California's new GHG cap-and-trade regulations. It also includes the state that has achieved the greatest emissions reductions (Mato Grosso, Brazil) and one of the most mature REDD+ programs in Indonesia (Aceh).

This analysis is framed by the transition from *project-level* REDD+ activities to *jurisdiction-wide* REDD+ programs. Most REDD+ activities to-date have focused on projects that are appealing to private sector developers because they are independent of governmental institutions and policies, have well-defined geographical boundaries, and risks that are relatively easy to measure and manage. A fundamental premise of this report is that the success of REDD+ in significantly reducing emissions from deforestation and forest degradation, and increasing forest carbon sequestration, will depend upon its transition from a focus on projects to jurisdiction-wide programs operating across entire nations, states, or provinces. For REDD+ to achieve scale, we assume it must affect policy and institutional innovation, and the alignment of policies across a range of ministries and agencies to redirect rural development in ways that favor the maintenance or reestablishment of forests.

A central feature of statewide and province-wide REDD+ programs is the *jurisdiction-wide reference level*. If it is developed in a way that is compatible with the national reference level, subnational governments can potentially gain greater freedom to develop REDD+ programs that are tailored to their particular cultural, legal, economic, and ecological circumstances, while substantially lowering transaction costs.

This report evaluates the REDD+ programs of the GCF in the context of nine elements identified by the authors as essential to providing REDD+ offsets into regulated carbon markets. These elements include the following:

- **Scope.** The scope of the REDD+ program refers to the types of carbon that will be included in the system. The three categories of carbon that might be included in REDD+ are (1) emissions reductions from reduced deforestation, (2) emissions reductions from reduced forest degradation, and (3) forest carbon enhancement through regeneration, restoration, and tree plantations.
- **Reference level and target.** A jurisdiction-wide reference level that defines the business-as-usual level of emissions from deforestation, forest degradation, and forest carbon enhancement. Deforestation and/or GHG emission targets can be established and legally adopted together with a definition of the reference level. The target provides the state with a specific goal that can facilitate planning, programmatic investments, and future evaluations of program efficacy.
- **Nesting.** A system for nesting that reconciles the state- or province-level program with the national REDD+ program and that reconciles projects with the state/province system.
- **Offset issuance and tracking.** A system to define, issue, register, and track offset credits is necessary.
- **Emissions monitoring, reporting and verification.** A system for monitoring, reporting, and verifying program-related changes in carbon emissions.
- **Social and environmental safeguards.** A system to establish and implement social and environmental safeguards to ensure that carbon emissions reductions are achieved in a manner that protects and enhances the rights and interests of local, forest-dependent communities and other stakeholders and does not cause damage to ecological systems.
- **Legal and institutional frameworks.** A successful REDD+ program must develop a legal and institutional framework that formalizes the rules, responsibilities, and competencies for executing the program.
- **REDD+ planning.** A REDD+ plan that lays out the law enforcement, programmatic actions, policy alignment, and policy innovations that, together, could sustainably reduce carbon emissions.
- **Financing.** A viable strategy to obtain sustained sources of financing needed to support the design, implementation, and long-term maintenance of REDD+ programs. Donations, grants, and investments from the public and private sectors are all possible sources of financing. Innovative institutional approaches, such as public–private partnerships, can help jurisdictions to create financially viable REDD+ programs.

Principal Findings

The principal findings presented below are based on the four in-depth case studies described in this report along with the nine brief overviews of state- and province-level REDD+ programs under development within the GCF that are described in the appendices. These principal findings include the following:

- State and provincial REDD+ programs can be divided into three general categories: (1) *fully integrated*, jurisdiction-wide programs (such as Acre); (2) *nested* programs that begin through project-level initiatives and are then reconciled within a loose jurisdictional framework; and (3) *project-based* programs, in which a jurisdiction-wide reference level is adopted but the REDD+ program is composed of projects alone.
- All participating subnational governments have made important progress toward establishing one of these forms of jurisdiction-wide REDD+ programs, but none have completed this process. The most advanced program could be ready to issue GHG emissions offsets within as few as three years; the others likely will require five years or longer to reach fruition.
- Many subnational governments have implemented politically risky actions to reduce pressures on forests. These actions include moratoria on logging, implementation of aggressive land-use laws (such as in Brazil), design and implementation of statewide land-use zoning, and intensification of cattle ranching.
- Many subnational governments also have started to deliver REDD+ benefits on the ground, especially to communities in or near forests; most have already organized some type of public consultation process.
- Most states have begun to develop the laws and institutions to implement their REDD+ programs, and one state (Acre) has established the legal and institutional framework necessary to complete the design and implementation of its REDD+ program.
- Most subnational governments have not begun to realize the potential advantages of jurisdiction-wide REDD+ over project-based REDD+ (such as integration with rural development policies, lower transaction costs, and increased likelihood to achieve large-scale, sustainable emissions reductions). Rather, there is a strong tendency in most subnational governments to continue to focus on individual projects.
- One effect of the continuing focus on projects is the low level of attention that many subnational governments have given to defining jurisdiction-wide reference levels. Some states have been delayed in this effort as a result of unnecessary levels of detail in the quantification of forest carbon fluxes and dynamics.
- A second effect of this project-based focus has been a general lack of progress in designing comprehensive programs to systematically redirect or slow the drivers of deforestation and forest degradation.
- Few programs have been able to attract public or private financing, and state/provincial political support for REDD+ is rapidly flagging. Very little of the “fast-track” international REDD+ finance is available to state and provincial programs.
- Despite the slow progress made on several key issues and systems, the GCF states and provinces have performed. Emissions reductions from avoided deforestation alone within the GCF members of the Brazilian Amazon totaled 1.7 GtCO₂e cumulatively from 2006 to 2010 and are on track to achieve 5.4 GtCO₂e reductions from 2011 to 2020. Put another way, these

subnational entities have achieved emissions reductions that now represent a ~1% reduction in global anthropogenic GHG emissions, similar in scale to the emissions reductions contained in the Kyoto Protocol.

For these subnational governments to sustain and deepen these emissions reductions, the following key changes are indicated by our analyses:

- To achieve its potential, REDD+ must transition from its current status (in most states and provinces, at least) as a highly complicated and confusing funding mechanism that has promised far more economic benefits than it has delivered, to become the first step in a statewide, cross-agency transition to a low-emission rural development model that features low-carbon agricultural and livestock sectors and improved livelihoods for forest-dependent sectors (such as indigenous people and traditional forest dwellers).
- For this transition to take place, subnational governments must exercise the freedom and flexibility allowed by the jurisdictional focus as they begin to realize the potential advantages of reorienting their REDD+ efforts away from projects toward the jurisdiction level.
- For this transition to succeed, GCF states and provinces must also begin to realize tangible, substantial benefits from their efforts to date as they continue to build jurisdictional REDD+ programs that eventually could deliver large volumes of high-quality emissions reductions.

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1

JURISDICTION-WIDE APPROACHES TO REDD+ AND OPPORTUNITIES FOR COMPLIANCE MARKETS

GHG Emissions Trading Programs

Rapid reductions in global emissions will be needed if the nations of the world are to succeed in minimizing the risks of climate change. Many economists, policy experts and other observers believe one of the most efficient ways to achieve these emissions reductions is to implement an emissions trading program, also called a “cap-and-trade” program.

With this approach, a declining numeric GHG emission “cap” is placed on national or sectoral emissions. “Emissions allowances” can then be allocated and/or auctioned to the regulated entities whose emissions are covered by the cap. Each covered entity in turn is required to submit an emissions allowance for each ton of GHG missions they emit during a given compliance period, and the sum of all available emissions allowances is set equal to the overall cap. To comply, covered entities can reduce emissions in their own operations, purchase emissions allowances in the newly created emissions allowance market, or purchase emissions offsets from entities that reduce emissions, but operate in sectors or regions outside of the emissions cap.

This market-based regulatory approach is designed to drive each covered entity to optimize their emissions during each compliance period, and to drive the economy to achieve the necessary emissions reductions at the lowest social cost. To date, GHG emissions trading has been used successfully in the United States to reduce sulfur dioxide emissions (SO_2) as required by the 1990 Clean Air Act. This approach also has been adopted in the 27-nation European Union, Australia, New Zealand, the nine member states of the Regional Greenhouse Gas Initiative (RGGI) in the northeast U.S., California and Quebec to reduce their GHG emissions. GHG emissions trading programs also are now being designed in Japan, Mexico, South Korea, and China is planning to begin operating pilot trading programs later this year in several provinces.

As part of a GHG cap-and-trade program, covered entities as well as society at large can lower their expected compliance costs by substituting qualifying *emissions offsets* from sectors and geographic regions located outside of the GHG emissions cap where it may be possible to reduce emissions at lower cost than can be achieved either by the covered entities themselves or by other sources covered by the cap. The ability of GHG emissions offsets to reduce compliance costs and enhance flexibility is one of the major reasons they now play a key role in evolving climate policy in the U.S. and internationally.

As mentioned above, the “cap-and-trade” approach to reducing GHG emissions already has been implemented in the EU to help the 27 nations comply with their national obligations under the Kyoto Protocol at lowest cost. The EU Emissions Trading Scheme (EU ETS) is the largest emissions trading program in the world today, and in turn is “linked” to the United Nations’ Clean Development Mechanism (CDM) – the world’s largest GHG offsets program. The CDM issues offsets for emission reductions achieved by qualifying emissions reduction and

sequestration projects implemented in countries located in the *developing* world (i.e., the “non-Annex 1 countries.”).

Although comprehensive federal energy and climate legislation currently is stalled in the U.S. Congress, most observers believe it is likely the U.S. electric sector will face “carbon constraints” in the future, which could take the form of a GHG emissions cap-and-trade program and/or direct regulation. In the near term, the electric sector may face direct regulation by the U.S. Environmental Protection Agency (EPA), as the agency seeks to implement New Source Performance Standards (NSPS) that will require direct CO₂e emissions reductions from new and/or existing power plants. It is also possible that offsets could play a role in the implementation of any future NSPS. At the subnational level, RGGI has been operating a compliance cap-and-trade program covering CO₂e emissions from the power sector in nine northeastern and mid-Atlantic states since 2009. As noted, California also is moving ahead with implementation of its state-wide cap-and-trade program under AB 32, which covers the electric power sector. Both the RGGI and California cap-and-trade programs allow covered entities to meet a portion of their overall GHG compliance by using certain specified types of offsets.

Tropical Forests and Climate Change

One of the most promising sources of inexpensive, high quality, offsets that could be provided in large volumes internationally is the reduction of carbon emissions from the clearing and degradation of tropical forests. Globally, forest conversion to agriculture or livestock and degradation through logging and fire contribute 12-17% of anthropogenic emissions.^{1, 2} A large share of these emissions potentially could be reduced at low cost by redirecting agricultural expansion onto lands that are already cleared, but utilized below their productive potential. As currently framed within UNFCCC negotiations, “REDD+” (an abbreviation for Reductions in Emissions from Deforestation and forest Degradation) is an approach that would compensate tropical nations that succeed in lowering carbon emissions from deforestation and forest degradation and enhancing forest carbon (represented by the “+”) through forest regeneration and restoration.

REDD+ was a prominent component of the Copenhagen Accord. The UN reached agreement on key components of the general architecture of a REDD+ program in Cancun,³ at the 16th Conference of the Parties (COP), and provided additional elaboration on key aspects of this in the context of the Durban Platform adopted at the recent COP-17.⁴ The progress on REDD+ within the UN climate negotiations has been accompanied by parallel initiatives that have been building the capacity of nations to participate in REDD+ and will soon begin to finance REDD+ programs. Thirty-five tropical nations have formally expressed interest in developing REDD+

¹ Corinne Le Quere et al., *Trends in the Sources and Sinks of Carbon Dioxide*, Nature Geoscience, nora.nerc.ac.uk/8576/1/LeQuere09.pdf (last visited May 17, 2012).

² S. Solomon et al., Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, IPCC Fourth Assessment Report (AR4) page 996 (2007).

³ <http://cancun.unfccc.int/>

⁴ http://unfccc.int/files/meetings/durban_nov_2011/decisions/application/pdf/cop17_safeguards.pdf

programs via the World Bank's Forest Carbon Partnership Facility (FCPF).⁵ The UN REDD Program, which includes the Food and Agriculture Organization (FAO), the UN Environmental Program (UNEP), and the UN Development Program (UNDP), has committed \$100 million to support REDD+ activities.⁶ The REDD+ Partnership⁷ is helping coordinate disbursement of more than US\$4 billion in donor commitments for REDD+ announced in Copenhagen in 2009.

Despite such progress, however, it is important to recognize that global climate policy development has stalled, with important implications for REDD+. Over the last couple of years there have been major setbacks in international and national efforts to develop GHG reduction programs, as evidenced by the failure of the UNFCCC to produce a “global deal,” and the lack of progress on national mitigation actions by the U.S. and other major emitters. Notwithstanding the modest progress embodied in the recently adopted Cancun Agreements and the Durban Platform, it seems unlikely that the U.N. process will generate any significant breakthroughs in the near term, and the prospects for federal climate legislation in the U.S. in the near future appear to be limited at best. Simply put, the top-down comprehensive approach to climate policy embodied in the Kyoto Protocol, and efforts to forge a successor regime, have given way to a much messier, fragmented architecture of loosely linked GHG compliance systems operating at multiple levels.⁸ Adapting to this new world will require new thinking and new approaches to climate governance.

Although REDD+ has stood out in recent years as one of the few areas of consensus in the international climate negotiations, it has been hindered by the deeper political stalemate that marks contemporary climate policy. And yet, if one looks underneath the international process, it is clear that efforts to realize the potential of REDD+ to protect tropical forests at scale are proceeding at multiple levels of governance, with considerable innovation in terms of program design and the exploration of new opportunities for forest carbon and low emissions rural development. Given the current breakdown in international climate policy, it is an appropriate time to reassess how to move REDD+ forward in a manner that harnesses this dynamism by building upon activities already happening on the ground. Top-down approaches to REDD+ architecture are likely to need to be matched with attention to, and support for, important tactical opportunities happening in real-time all over the world.

One important international effort designed to further the development of REDD+ around the world is the Governors' Climate and Forests Task Force (GCF). The GCF is a consortium of states and provinces from around the world that is seeking to link the development of state- and province-level REDD+ programs in Brazil, Indonesia, Nigeria, Peru, and Mexico with emerging carbon market and other pay-for-performance opportunities that exist today in California and elsewhere. Since its establishment in 2008, the GCF has emerged as an important source of innovation in REDD+ program development, providing a potential pathway to REDD+ markets at scale in the context of the current fragmentation of international climate policy.

⁵ www.forestcarbonpartnership.org/fcp

⁶ <http://www.un-redd.org/>

⁷ www.reddpluspartnership.org/en/

⁸ William Boyd, *Climate Change, Fragmentation, and the Challenges of Global Environmental Law: Elements of a Post-Copenhagen Assemblage*, 32 University of Pennsylvania Journal of International Law 457-550 (2010).

The purpose of this report is to evaluate the current status of the GCF and the larger ongoing effort to build REDD+ programs at jurisdictional scale capable of generating compliance grade emissions reductions from REDD+ that could qualify as offsets in emerging GHG cap-and-trade systems, such as the one being developed in California. An important target audience of this analysis includes electric companies who may face carbon emissions constraints in the future and may seek to develop or purchase emissions reduction offsets as part of state, regional or national climate change mitigation programs. We hope the analysis and insights described here also will be useful to the broader climate change mitigation community and members of the public.

In this introductory chapter, we review the conceptual framework used to evaluate REDD+ program development, the necessary elements for these programs to operate, and the history of the GCF. In Chapter Two, we summarize the core elements of jurisdictional REDD+ programs. In Chapter Three we provide an analysis of four key emerging REDD+ programs. In Chapter Four, we identify several key lessons from the GCF experience to date. Finally, we present in the appendices a summary of the status of nine state- and province-level REDD+ programs under development within the GCF.

Conceptual Framework: The Transition from “Projects” to “Jurisdiction-wide” REDD

An important assumption underlying this report is that, if successful, REDD+ will incentivize development of programs that lower carbon emissions from deforestation and forest degradation across entire political jurisdictions in a sustainable manner. The level at which jurisdictional approaches to REDD+ is being articulated varies across the different policy processes that are seeking to incorporate REDD+ in climate mitigation efforts. The UNFCCC negotiations on REDD+ focus on the *national level*, but allow subnational crediting for an initial ramp-up period. The focus of the GCF is at the level of *subnational* governments, but with a goal of achieving compatibility and harmonization with the national regimes under development.

Although jurisdiction-wide reductions in emissions are the goal of REDD+, many of the activities on the ground that REDD+ has stimulated are being implemented by individual “projects” that were initiated to access opportunities in the voluntary and “pre-compliance” carbon market. Generally, these projects are isolated from public policies and government institutions, which is part of their appeal to private investors and philanthropic funders of REDD+. REDD+ projects have precisely defined geographical boundaries that make it easier to manage non-performance risk, clearly defined project proponents that make it easier to negotiate contracts and manage risk, emission reductions that can be relatively clearly quantified in a manner compatible with offset market transactions, and defined property rights to forest and carbon resources that facilitate clear ownership of carbon offsets. Also, to date individual emissions reduction projects have been the norm in the evolving carbon offset markets rather than approaches that rely on achieving emissions reductions at a larger sectoral scale that involves multiple entities, government bodies and coordination of many activities and actions that are beyond a project proponents usual operational control or ownership. Because of these attributes, individual REDD+ projects have been attractive to early movers engaged in developing, financing and implementing REDD+ activities. As we discuss in the next section, however, it is precisely the policy and government institutional innovation at the jurisdictional level that is necessary for REDD+ to achieve its potential to generate emissions reductions at

scale, some of which could provide a basis for creating significant volumes of high-quality emissions offsets.

A key feature of jurisdictional REDD+ is the focus on the jurisdiction-wide emission reference level, as shown in Figure 1-1. By defining performance at the level of the entire jurisdiction, the state or provincial government (in the case of the GCF) is likely to have a strong incentive and the necessary flexibility to align its policies, improve law enforcement, institutionalize stakeholder consultation processes and compliance with social and environmental safeguards, and strengthen or build new institutions to increase the likelihood of success.

For example, as part of their REDD+ programs, subnational governments can realign their agricultural and forestry loan programs in ways that reinforce farming and forestry systems that do not depend upon deforestation, and instead favor agricultural intensification, forest regeneration and restoration. Several economies of scale potentially also may be realized. Subnational governments potentially can move beyond project-level carbon accounting to define emissions allowances across rural sectors in a way that is most consistent with the subnational government's REDD+ strategy. Forest monitoring can be provided by state-level systems, potentially reducing the costs of project-by-project monitoring and thereby reducing the MRV costs per unit of emissions reduction. Consultation processes and compliance with social and environmental safeguards can be built into REDD+ legislation, simplifying and also lowering the costs of these important elements of REDD+ by providing a more systematic and uniform approach to consultation and protection of rights and interests across REDD+ activities rather than having to develop individual consultation processes and new social and environmental safeguards for individual REDD+ projects as they are developed.

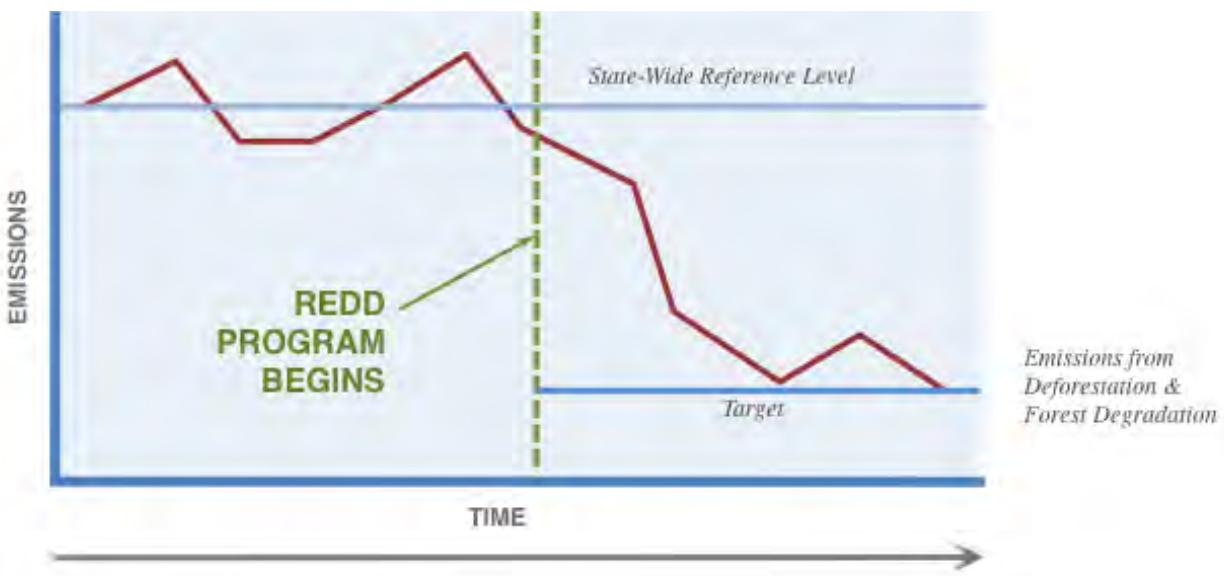


Figure 1-1
Hypothetical Jurisdiction-wide Reference Level and Performance Period

Figure 1-1 illustrates a state-wide reference level of emissions from deforestation and degradation and a target for future emissions. The difference in these emissions levels represent emissions reductions that result from implementation of a subnational REDD+ program.

But jurisdictional REDD+ also presents important challenges, especially where the governance capacity of state and provincial governments is limited. In most subnational governments, governmental institutions are underfunded, understaffed, and fragmented across areas of sectoral responsibility. Legal and policy frameworks for governing vast rural territories may be non-existent, incomplete or designed to facilitate logging, mining, and other forms of natural resource extraction. Also, potential investors in REDD+ activities and resulting GHG offsets are wary of activities that depend directly upon governmental institutions to be implemented effectively.

The analysis presented in this report should be understood within the ongoing transition from *project-focused* REDD+ to policies and programs focused on achieving *jurisdictional* REDD+.

The progress of state and provincial REDD+ programs under development within the GCF represent steps that have been taken to align with this transition. There are at least three general paths that governments can take to implement jurisdictional REDD, as summarized in Figure 1-

2. For states and provinces that make a formal commitment to develop jurisdiction-wide reductions in emissions from deforestation and forest degradation, these paths reflect varying levels of involvement of governmental policies and institutions in the development of REDD+ programs, and varying levels of attention to the balance between REDD+ projects (past, present, and future) and jurisdictional programs.

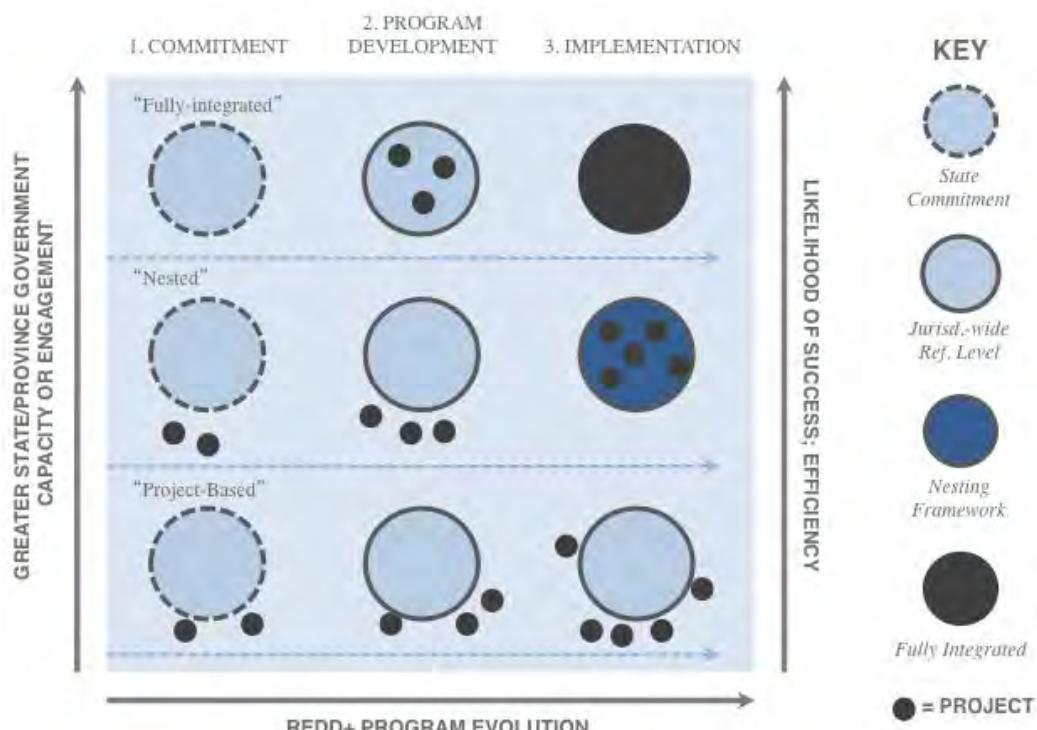


Figure 1-2
Three Pathways to Create Jurisdiction-wide REDD+

At one end of the spectrum are states that may develop fully integrated REDD+ programs within which projects can be developed, referred to here as “*fully-integrated REDD*.” This approach would involve designing and building a comprehensive jurisdictional REDD+ program from the outset, rather than starting with a collection of projects and pilot activities. This is the approach being implemented today by the Brazilian state of Acre. Making this work, of course, requires a significant level of institutional capacity and political commitment. Moreover, it is important to recognize that this approach can include projects that are “nested” into the jurisdictional program. These nested projects, however, need to be identified and implemented *ex ante* as part of the state or provincial REDD+ program, and potentially could be eligible for crediting and/or revenue allocation under the terms of such a program, rather than being directly credited by third-party offset standards or external GHG compliance systems. This fully-integrated REDD+ program can, in turn, be nested within a federal REDD+ program.

An intermediate pathway for managing the transition from project-level activities to jurisdiction-wide programs is through “nesting,” in which grandfathered projects are linked to local or state jurisdictional REDD+ programs with the total amount of emissions reductions that can be assigned to all projects constrained by the jurisdiction-wide reference level. The transition from projects to jurisdictional REDD+ was one focus of an earlier EPRI report⁹ that examined the theoretical dimensions of REDD+ nesting architectures. In a nested approach, offset credits could be issued directly from the GHG compliance system (or approved third-party offset standard) to the eligible project-level activity after reconciling project-level performance with state or province-level performance. The involvement of the state or provincial government could be limited initially to the provision of state-level accounting and MRV, but could grow to be more robust over time as the elements of a fully functioning REDD+ program are developed.

Lastly, some subnational governments may decide to pursue emissions reductions below the jurisdictional reference level with a very low level of involvement from state government policies and institutions. This minimalist approach would involve a state or province implementing the minimum conditions for REDD+, but then relying entirely on project activities to achieve emissions reductions. These “project-based” programs rely upon interventions of funding and innovation through projects in a REDD+ system marked by an overarching state framework that is quite “thin” compared to fully formed jurisdictional REDD+ programs. This “thin” system likely would be limited mainly to accounting and MRV policies. However, this minimal approach is likely to be less viable over time as expectations for state and provincial government policies in this area increase. Also, if REDD+ markets do materialize at large scale, the potentially lower transactions costs associated with jurisdictional REDD+ may lead to competitive advantage being enjoyed by more robust jurisdictional REDD+ programs.

The assumption that the success of REDD+ at scale will depend upon the development of jurisdiction-wide frameworks achieved by a variety of pathways provides a foundation upon which to evaluate the progress of GCF state and provincial REDD+ programs. For jurisdictional REDD+ to succeed, the author’s believe it must change the trajectory of rural development. This can be done by shifting incentives away from activities that convert forests to agriculture and

⁹Brazil’s Emerging Sectoral Framework for Reducing Emissions from Deforestation and Degradation (REDD) and the Potential to Deliver Greenhouse Gas Emissions Offsets from Avoided Deforestation in the Amazon’s Xingu River Basin, Electric Power Research Institute (EPRI), Palo Alto, CA: 2010 1021606 [hereinafter EPRI 2010].

livestock or that degrade forests through logging and fire, and towards activities that protect forests and encourage forest regeneration.

The Governors' Climate and Forest Task Force

The GCF is an alliance of sixteen subnational governments from six nations that together comprise more than 20% of the world's tropical forests, including 75% of Brazil's Amazon forests, and more than half of Indonesia's forests (Figure 1-3).¹⁰ Since it was established in early 2009, the GCF has been quietly designing the policy architecture to link GHG compliance systems, focusing initially on linking California's emerging GHG cap-and-trade system with state- and province-level REDD+ programs in Brazil, Indonesia, Nigeria, Peru, and Mexico.



Figure 1-3
GCF Subnational Governments

One of the goals of the GCF is to establish a platform to synchronize efforts across tropical forest jurisdictions to develop policies and programs that can provide realistic pathways to achieve rural development while maintaining and enhancing intact forest resources. The GCF is focused on generating compliance-grade REDD+ assets that can be used as part of both market-based and non-market programs designed to mitigate climate change. These approaches include “pay-for-performance” public finance programs, integration with evolving carbon markets that may recognize REDD-based offsets for compliance, and ongoing efforts to de-carbonize supply chains in the agriculture and food-processing sectors.

To date, GCF governments have imposed logging bans, implemented “wall-to-wall” land-use zoning, and rural law enforcement programs. Some early mover GCF states and provinces are in

¹⁰ See GCF website (www.gcftaskforce.org) for more information on the GCF.

the process of adopting comprehensive state-level REDD+ programs, and enacting (or implementing) novel legislation to create incentives to protect forests and penalize forest destruction. These subnational governments are trying to increase the economic value of their standing forests, while they are building their economies by growing forest-dependent industries.

Not surprisingly, the ongoing progress achieved by GCF members is fragile, threatened by political turnover in many member states and provinces, and by the challenge faced by GCF Governors who must decide if their REDD+ efforts are likely to provide jobs and economic gain sufficient to compensate for the foregone opportunities associated with various deforestation activities. Most, if not all, GCF states and provinces have yet to realize any financial benefits from their REDD+ efforts. And, much of the current international financial resources dedicated to REDD+ efforts (e.g., UN REDD+ and the World Bank's Forest Carbon Partnership Fund [FCPF]) has not directly funded subnational governments. Moreover, although there are strong public finance commitments for REDD+, with funds already pledged and allocated, very few REDD+ financing initiatives have reached their operational potential. These developments are occurring at the time when state- and province-level activities are emerging as important examples of innovative, "bottom-up" efforts to develop regulations and programs to integrate REDD+ offsets into GHG compliance programs such as California's cap-and-trade program, and are poised to explore other opportunities to link REDD+ to other GHG mitigation efforts, such as the sustainable supply chain programs being developed through various agricultural commodity "roundtables."

This report focuses specifically on the potential for GCF states and provinces to generate emissions reductions from REDD+ activities within the next three to five years that could be accepted as offsets in existing and emerging GHG compliance systems and other market and non-market opportunities. By highlighting the critical proof-of-concept experiences of the GCF, it seeks to analyze the prospects for ongoing efforts to make REDD+ a viable part of climate mitigation at scale.

Brief history of the GCF

The GCF was formally established in 2009 as a result of a Memoranda of Understanding (MOU) signed at the First Governors' Global Climate Summit hosted by California Governor Arnold Schwarzenegger in Los Angeles in November 2008. The initial MOU included three U.S. states (California, Illinois, and Wisconsin), four Brazilian states (Amazonas, Amapá, Mato Grosso, and Pará), and two Indonesian provinces (Aceh and Papua). A fifth Brazilian state, Acre, joined the GCF as one of the ten founding members at the first GCF meeting held in early 2009. Since 2009, the GCF has grown to include 16 states and provinces from six different countries (Figure 1-3). This report focuses only on California in the U.S., since Wisconsin left the GCF in 2011, and Illinois has not developed legislation that creates demand for international GHG offsets.

From its inception, the GCF has operated as a unique subnational collaboration for sharing experiences and best practices on REDD+ program development, raising awareness and promoting consensus on the elements of jurisdictional REDD+, building technical, legal and institutional capacity, and developing recommendations for policymakers and regulatory authorities considering ways to integrate REDD+ and other forest carbon activities into emerging GHG compliance systems.

The GCF includes some of the most advanced jurisdictions in the world (at any level of governance) seeking to build comprehensive REDD+ programs, as well as the only jurisdiction in the world (i.e., California) actively considering regulations to recognize compliance offsets generated from eligible REDD+ programs. To move this effort forward, California, Acre, and Chiapas (all of which are GCF members) signed an MOU in the fall of 2010 that committed the three states to work together to develop specific recommendations for California regulators to consider as part of their efforts to recognize REDD+ offsets from jurisdictional REDD+ programs in GCF states and provinces. A REDD Offset Working Group (ROW) was established to provide recommendations to the three MOU states and the broader GCF. The ROW held meetings throughout 2011, and is expected to issue its final recommendations in the second half of 2012.

Current GCF activities

Since its inception, the GCF has focused on four principal areas:

1. Developing high-quality sub-national REDD+ frameworks and capacity in states and provinces in key tropical forest countries capable of generating compliance-grade emissions reductions from REDD+;
2. Providing input on policy and regulatory design of REDD+ provisions in emerging GHG compliance markets, such as California;
3. Mobilizing finance for subnational REDD+ activities on a pay-for-performance basis; and,
4. Developing institutions and frameworks to link subnational REDD+ activities with ongoing national and international climate mitigation efforts.

As part of its work plan for 2011 and 2012, the GCF is developing a comprehensive REDD+ Knowledge Database that will provide an open, web-based source of information for individual GCF member states and provinces. An initial version of the GCF Knowledge Database is expected to be available online in 2012. Information to be contained in this database includes:

- Current status and trends regarding land use and deforestation;
- Forest carbon accounting efforts and methodologies;
- REDD+ implementation activities; and,
- REDD+ related financial flows.

The GCF also has established a new, independent Governors' Climate & Forests Fund (GCF Fund) to support collective needs identified across the GCF states and provinces and innovative proof-of-concept activities in specific areas. The U.S. Department of State provided an initial seed grant of \$1.5 million to the GCF Fund in August 2011, and the GCF Fund currently is seeking matching contributions.

REDD+ program development in GCF states & provinces

As discussed above, GCF states and provinces have emerged as early movers in the effort to build comprehensive, jurisdiction-wide approaches to REDD+. It is important to recognize, however, that progress across the individual GCF states and provinces has been uneven, and that

there is still considerable work to do given differences in political circumstances, policy priorities, institutional capacity, legal frameworks, and financial support.

As of early 2012, none of the individual GCF states and provinces is currently in a position to generate compliance-grade offsets, and it will take considerable additional investment of time, resources, institutional capacity, and political commitment before any of these states and provinces are able to do so. That said, all of the GCF states and provinces have made progress in some of the key areas of REDD+ program development, and some have made significant progress in putting the different pieces together. Moreover, the GCF process is promoting considerable information sharing and cross-jurisdictional learning about REDD+ program development across the GCF member states and provinces, and has provided the first opportunity in the world to consider the policy and regulatory design issues involved in linking jurisdictional REDD+ programs with emerging GHG compliance systems.

2

OPTIONS AND APPROACHES FOR THE DESIGN OF JURISDICTION-WIDE REDD

Progress to develop REDD+ programs and institutions must be measured against a clear definition of success. Here, we describe generically the minimum conditions and elements the authors believe are necessary for a jurisdictional REDD+ program to deliver offsets into GHG compliance regimes, such as the GHG cap-and-trade program recently implemented in California. Our view of these conditions and elements has been informed by our participation in and review of several policy and market processes related to REDD+ that are ongoing around the world today, including: the development of REDD+ within the UNFCCC and the EU ETS; recommendations now being formulated for REDD+ offsets to be used in California's new GHG cap-and-trade program by the ROW); ongoing discussions within the GCF regarding the elements of compliance-grade REDD+ programs; and, the development of protocols and methodologies for REDD+ at both project and jurisdictional scale in the voluntary carbon market.

Defining the Scope of REDD+

Jurisdictions developing GHG emission offset programs based on REDD+ must determine the types of changes in forest carbon fluxes to the atmosphere that can be credited in the offset program. REDD+ programs can reduce net emissions of carbon to the atmosphere by lowering emissions from deforestation and forest degradation, or by sequestering carbon from the atmosphere by enhancing forest carbon stocks. The choice of forest carbon emissions that are either required or allowed as part of evolving REDD+ programs needs to reflect a number of considerations, including: technical capacity to monitor each type of carbon flux; potential impacts on carbon emissions; the inter-dependencies between different types of carbon fluxes; and, the potential social and ecological costs and benefits of pursuing one type of emission reduction over another.

Forests are dynamic ecosystems, absorbing and emitting large amounts of carbon each year. Most of this carbon is absorbed in the form of carbon dioxide (CO₂) through photosynthesis and emitted as CO₂ through respiration. In general, *mature* forests are in equilibrium with the atmosphere, with absorption of CO₂ through photosynthesis being roughly equivalent to emissions from respiration (decay). Net emissions of CO₂ to the atmosphere take place when mature forests are cut down and converted to agricultural or livestock production systems that contain less plant carbon than the forests themselves. This type of anthropogenic emission is referred to as *deforestation* (Figure 2–1). Net emissions also take place when mature forests are degraded through selective logging or fire. This type of anthropogenic emission is referred to as *degradation*. Forests that have either been restored or are regrowing following deforestation through natural regeneration, and tree plantations established to grow fiber, charcoal, timber or other products, remove CO₂ from the atmosphere and store it in wood, roots, and soil organic matter. Degraded forests also can accumulate carbon if they are allowed to recover. We call carbon uptake through these processes *forest carbon enhancement*. These three general categories of emissions are the focus of this report: *avoided deforestation* (the first “D” in

REDD+), *avoided degradation* (the second “D” in REDD+), and *carbon enhancement* in regrowing or planted forests (the “+” in REDD+). These three types of changes in carbon flux, and some of the variations within each type, are illustrated in Figure 2-1. In addition, Figure 2-1 shows possible types of changes in the flux of carbon to the atmosphere that potentially could be included in a jurisdiction-wide REDD+ program.

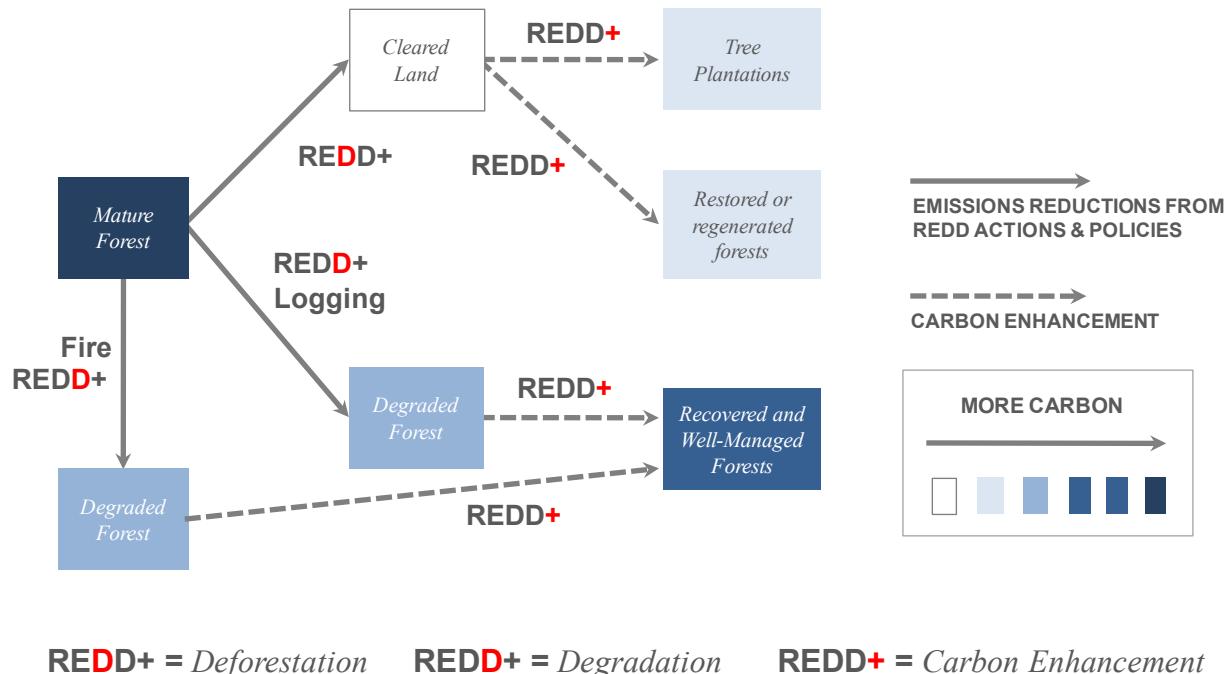


Figure 2-1
Types of REDD+ Emissions Reductions and Carbon Enhancement.

Thus, tropical forest states and provinces developing jurisdiction-wide REDD+ programs will have to determine the scope of their programs, and whether and how particular activities will be phased in and accounted for over time. Similarly, rules and standards in both the compliance markets and the voluntary markets will need to define the types of carbon fluxes that are eligible for crediting. As one moves from deforestation to degradation to carbon enhancement the level of complexity may increase, and the uncertainties and the overall costs associated with measuring, reporting, and verifying emissions reductions also may increase. Given the fragmented nature of the world’s evolving carbon markets, and the proliferation of different approaches to REDD+ at multiple scales, it is likely to be important for jurisdictions to maintain flexibility on the issue of scope. Where possible, jurisdictions may want to consider adopting a phased approach that would allow them to bring additional activities into their REDD+ programs as carbon markets and methodologies allow.

Jurisdiction-wide Reference Level and Target

A fundamental ingredient of jurisdictional REDD+ is a baseline or reference level that provides an estimate of the future GHG emissions from deforestation and forest degradation that would take place in the absence of REDD. To be effective as a foundation to create REDD+-based offsets, the reference level must be technically rigorous. It must be agreed upon by both jurisdictions that plan to accept REDD offsets for compliance and those that plan to be sources of

offset supply. It must be formally adopted by law, and it must be implemented programmatically as the basis for estimating emissions reductions. A simple, illustrative example is presented in Figure 2-2. This figure illustrates a crediting reference level, insurance buffer pool, the emission reduction target, and remaining emissions reductions that might qualify as offsets. These concepts are discussed further below.

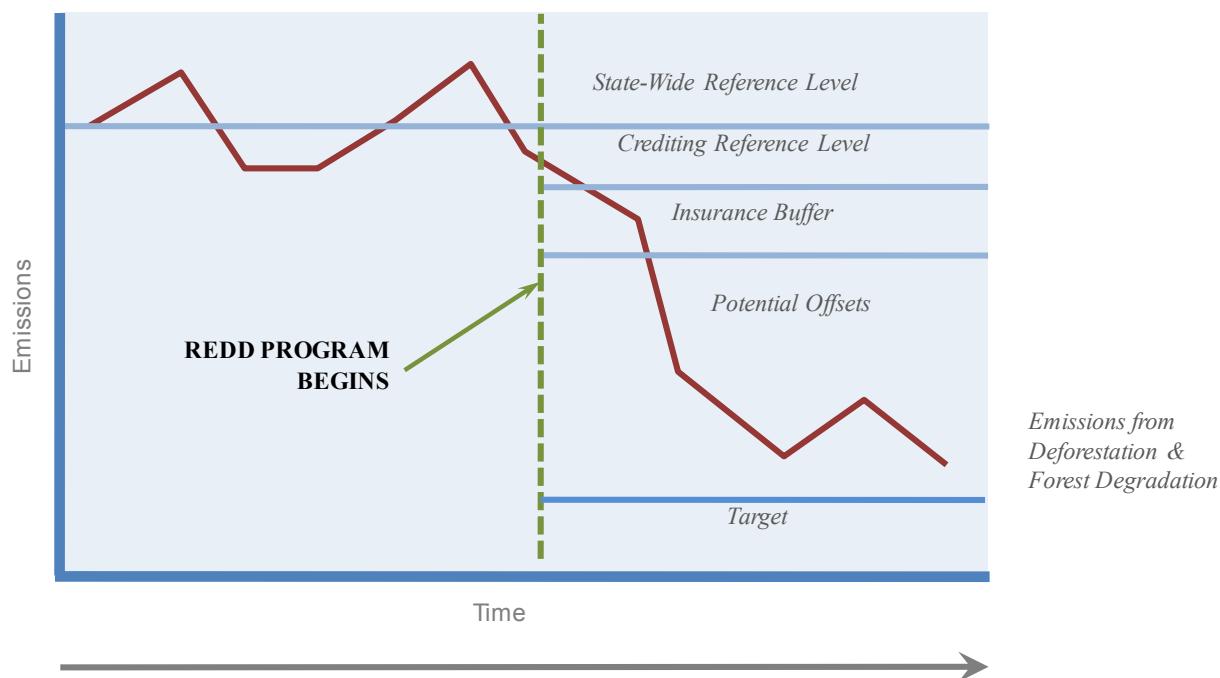


Figure 2-2
Hypothetical State-wide Deforestation Reference Level

It is not a trivial undertaking to estimate future GHG emissions from deforestation, forest degradation, and forest carbon enhancement across entire jurisdictions. Year-to-year variation in these emissions and sequestration can be high because of the effect of changing economic, policy, and market conditions on landholder decision-making.¹¹ Rates of deforestation also vary over time as a consequence of agricultural frontier evolution. Forest conversion to agriculture and grazing lands tends to accelerate, stabilize, then decline as agricultural frontiers open, become consolidated, and eventually deplete available forest lands through a pattern that is called the “forest transition.”¹² Computer models have been developed to simulate future deforestation,^{13, 14, 15} but there is not a widely agreed upon approach to this simulation. As a

¹¹ Daniel Nepstad et al., *The End of Deforestation in the Brazilian Amazon*, SCIENCE 326 (2009), pp. 1350-1351.

¹² Thomas K. Rudel, et al., Forest Transitions: Towards a Global Understanding of Land Use Change, GLOBAL Environmental Change-Human and Policy Dimensions 15 (2005), pp. 23-31.

¹³ EPRI 2010. See *supra* note 9.

¹⁴ Britaldo Soares-Filho et al., *Modeling Conservation in the Amazon Basin*, NATURE 440 (2006), pp. 520-523, <http://www.nature.com/nature/journal/v440/n7083/abs/nature04389.html> (last visited May 17, 2012).

result, historical rates of GHG emissions over five to ten-year periods often have been used to estimate the reference level.

It is assumed in some processes that the reference level should decline over time, signifying a smaller potential flow of REDD+ revenues into the system as well as a decline in the quantity of offsets that may be generated by REDD+ over time. For example, Brazil's reference level for the Amazon region is the average of the preceding ten years for each successive five-year period, and therefore declines steeply as reductions in emissions are achieved. One rationale for choosing a declining reference level is that the economic dynamics of agricultural frontiers that are expanding into forests can be shifted over time so that the expansion of agricultural production can proceed as deforestation declines with declining costs to the regional economy. For example, agricultural production could expand through intensification (higher yields per area) while the economic output of forestry activities, such as forest management for timber and non-timber products develop sufficiently to lower the opportunity costs associated with forest maintenance. Some have argued that the reference level must be maintained at a high level for several decades into the future since many of the costs of lowering the rate of deforestation and forest degradation continue into the future.¹⁶ Two important considerations for determining the rate at which the reference level declines over time – if at all – are: (i) the amount of REDD+ revenues a nation or state will need to successfully develop and carry out its REDD+ program; and (ii) the level at which REDD+ nations or states should finance their programs through internal sources.

National and subnational governments can facilitate the development and implementation of their jurisdictional REDD+ programs by clearly identifying the “official” reference level. Here, too, Brazil provides an illustrative example. The reference level for the Amazon Region of Brazil has been defined differently in documentation for (i) the Amazon Fund,¹⁷ (ii) the GHG reduction commitment announced by Brazil at the COP15 in Copenhagen; (iii) Brazil's National Climate Change Plan, and (iv) in the Brazilian National Policy on Climate Change (PNMC). As a result, potential emissions reductions below the Amazon reference level by 2020 vary by a factor of two.

Once a reference level is established, a crediting reference level also may be necessary. The crediting reference level establishes the level of emissions below which offsets can be issued, and is often established at a lower level of emissions than the business-as-usual (BAU) reference level. The difference between the reference level and the crediting reference level is often thought to represent the REDD+ state's own contribution to achieving global emissions reductions. The establishment of the crediting level relative to the state-wide reference level is critical because it implicitly defines emissions levels below which further emissions reductions must be achieved to be sold externally as compliance offsets.

¹⁵ Britaldo Soares-Filho et al., *Role of Brazilian Amazon Protected Areas in Climate Change Mitigation*, Proceedings of the National Academy of Sciences 107 (2010) 10821-10826, <http://www.pnas.org/content/early/2010/05/24/0913048107.short> (last visited May 17, 2012).

¹⁶ Daniel Nepstad et al., *The Costs and Benefits of Reducing Carbon Emissions from Deforestation and Forest Degradation in the Brazilian Amazon*, United Nations Framework Convention on Climate Change Conference of the Parties (COP), Thirteenth Session, The Woods Hole Research Center 2007, p. 26.

¹⁷ See more at www.amazonfund.org

In addition, an insurance buffer may be established below the crediting reference level to provide a buffer against potential performance reversals, and provide a mechanism to compensate for possible emissions leakage. If an insurance buffer is included than offsets may not be issued unless reductions in REDD emissions are below this insurance buffer level.

In conjunction with defining appropriate reference levels, GHG emission targets may be established and legally adopted together with the definition of the reference level. The target provides the state with a specific goal that facilitates planning. It also can be used more formally as a legal cap within which a system of emissions allowances can be created. Reference levels and targets can be developed, where possible, in collaboration with other neighboring states or provinces, and provisions can be adopted to coordinate and reconcile with national reference levels and targets.

A Mechanism to “Nest” Different Levels of REDD+ Activities

The integrity of jurisdictional REDD+ will depend upon the development of transparent, rigorous systems for integrating and reconciling projects within the state-wide emissions accounting system, commonly known as “nesting” in the REDD+ literature. In the absence of nesting, offset credits flowing from projects potentially could add up to a quantity that is more than the maximum number of credits defined by the jurisdiction-wide crediting reference level (Figure 1-2). Nesting can take place *ex post*, with project activities preceding the development of the jurisdictional REDD+ framework (“project-based” and “nested” pathways in Figure 1-2), or it can be established *ex ante* through a pathway of “fully-integrated” REDD+ program development (Figure 1-2).

Nesting is a topic of considerable debate among forest carbon market experts. Proposals for nesting systems vary in the degree to which they emphasize projects versus the public policy and institutional frameworks that jurisdiction-wide REDD+ ultimately will require.^{18,19,20} At one extreme, a “bottom-up” approach to nesting simply adds up the emissions reductions of REDD+ projects and ensures they do not exceed the jurisdiction-wide reference level.^{21,22} By placing little emphasis on the role of government in REDD+, this approach is likely to do little to foster the jurisdiction-wide policy alignment, institutional innovation, and law enforcement that will ultimately be necessary for REDD+ to eventually transition to low-emission rural development. At the other extreme, a “top-down” approach to nesting begins with the national reference level, allocating potential REDD+ revenues among successively lower jurisdictional levels (e.g. state,

¹⁸ Rane Cortez, et al., *A Nested Approach to REDD+: Structuring Effective and Transparent Incentive Mechanisms for REDD+ Implementation At Multiple Scales*, The Nature Conservancy 2010, p. 46.

¹⁹ Thiago Chagas, *Nested Approaches to REDD+: An Overview of Issues and Options*, FOREST TRENDS & CLIMATE FOCUS 2011, p. 50.

²⁰ EPRI 2010. See supra note 9

²¹ Lucio Pedroni et al., Creating Incentives for Avoiding Further Deforestation: The Nested Approach, CLIMATE POLICY 9 (2009) pp. 207-220.

²² Lucio Pedroni, Manuel E. Porrua and Mariano C. Cenamo, A Nested Approach to REDD+: How Could It Be Implemented? In *Pathways for Implementing REDD+: Experiences from Carbon Markets and Communities*, UNEP RISOE Centre 2010.

county, community or private landholding), or among sectors (large-scale landholders, smallholders, indigenous groups, protected areas, logging industry) to compensate for performance that contributes to achieving the national REDD+ program target. This approach faces the challenges of accurately estimating the contribution of each jurisdiction or sector to national emissions, and allocating REDD+ revenues in the most efficient, effective, and equitable manner to achieve emissions reductions.²³

At COP17 in Durban, South Africa, international climate negotiators adopted an agreement on REDD+ that provides national and subnational governments with considerable freedom to choose the nesting architecture that will most effectively allow them to achieve emissions reductions below the crediting reference level given their particular legal, economic, and political context.

A System to Define, Register, Issue, and Track Offsets

A successful jurisdictional REDD+ program must define an emission reduction credit, or offset, in a way that is compatible with both its own state and national legal frameworks, and with the regulatory framework(s) adopted by jurisdictions where the offset credits are intended to be used for compliance with GHG emissions reduction mandates. Any definition of offsets must be constrained by the jurisdiction-wide reference level, and be consistent with the jurisdiction's overall REDD+ strategy. In addition to defining the asset class itself, and the entitlements that accompany an offset, each jurisdiction must establish the mechanism for legally issuing, registering and tracking offsets. It also must determine how liability for offsets will be addressed in the event that there is a performance reversal that results in emissions rates going up or some other problem with issued offsets that may render them unusable for compliance.

It is important to remember that offset credits generated by jurisdictional REDD+ programs are tied to emissions reductions at the jurisdictional scale. Offset credits are not necessarily rights to carbon or forests *per se*, but instead are likely to be considered assets created by regulations that are tied to reductions in emissions. Consequently, there must be sufficient evidence of clear title to the avoided emissions so they can be properly credited, tracked and allowed to be used in relevant markets for compliance. For nested REDD+ projects, project developers or sponsors also will need to demonstrate clear evidence of title to any avoided emissions claimed for crediting, including any relevant agreements and/or other evidence of agreement with the host jurisdiction regarding project crediting. In the absence of clear evidence of title, no one will be willing to buy the offsets. This evidence of clear title also will be necessary to prevent double counting towards the reduction target, and disputes over offset ownership as well as to facilitate the ability to sell or assign such assets. In all cases, the underlying entitlements with respect to emissions, carbon, forests, and/or land need not be resolved for offsets to be issued and traded. These issues almost certainly will be resolved differently by different host jurisdictions in the context of relevant legal frameworks and safeguards provisions.

Different jurisdictions also are likely to define the asset class created by avoided emissions in different ways depending on the applicable laws and legal context. Thus, as discussed in Section

²³ Andrea Cattaneo et al, *On International Equity in Reducing Emissions from Deforestation*, Environmental Science & Policy 13 (2011) pp. 742-753.

Three below, the Acre State System for Environmental Services defines avoided emissions with respect to its efforts to reduce deforestation and degradation as *environmental services* for reasons having to do in part with the division of authority between the federal government and the states over forests and carbon. In Indonesia, where there is a non-federal system of governance, any tradable credits from provincial level REDD+ programs almost certainly would have to proceed on the basis of a decision by the relevant national authorities to define and grant title to the asset class.

In addition to defining the asset class that will count as offset credits and providing requisite legal certainty with respect to title and the ability to transfer such credits, jurisdictional REDD+ programs will need to elaborate a system for issuing, registering, and tracking these credits. Offset credits potentially can be issued by any of three possible agents: (i) the regulatory authority that is recognizing REDD+ offsets as eligible for compliance (e.g., the State of California); (ii) the regulatory authority of the state or province where REDD+ offsets are generated (e.g., the State of Acre); or, (iii) a third-party offset standard (e.g., the American Carbon Registry [ACR], the Climate Action Reserve [CAR], the Verified Carbon Standard [VCS], and others). The precise pathway by which credits are issued will depend upon the design of the jurisdictional REDD+ program, and/or the requirements of the relevant market into which the credits are expected to be sold. Regardless of the particular crediting pathway that is adopted, however, the REDD+ jurisdiction will need a robust registry infrastructure to register and track offset credits.²⁴

A System to Monitor, Report, and Verify Emissions

To monitor changes in aboveground carbon stocks, including carbon losses through deforestation and forest degradation, and carbon enhancement through forest regrowth, recovery following logging or fire, restoration, or plantations, several types of information are required at the jurisdictional level, including:

- (i) The rate of change in forest cover;
- (ii) The amount of carbon stored in the forest (“carbon density” in units such as tons of carbon per hectare);
- (iii) The amount of carbon stored in the vegetation that replaces the forest; and,
- (iv) The rate of carbon accumulation by recovering or planted forests.

It would be impossible to gather this information through direct field measurements for entire jurisdictions, and a number of approaches have been developed to provide estimates. In general, field measurements can provide accurate estimates of forest carbon stocks for small areas, but are too expensive and slow to do over very large areas. It is also difficult to map deforestation and forest degradation using ground measurements. The most cost-effective and reliable approaches combine field measurements and data provided by satellites, or sensors mounted on airplanes where this technology is available. Satellite imagery can be used to measure forest cover, including canopy loss, disturbance and secondary forest area. Satellites provide a

²⁴ EPRI 2010. See supra note 9.

convenient way to monitor changes in forest cover associated with deforestation, degradation and regrowth. These changes in cover can be used in conjunction with base maps of forest carbon densities, and the density of carbon in the vegetation that replaces the forests, to estimate carbon sequestration and emissions.

The Intergovernmental Panel on Climate Change (IPCC)²⁵ has provided additional guidelines to assist jurisdictions (usually nations) with developing their own carbon assessment methodologies. These guidelines are organized into three “Tiers”, each providing successively increased accuracy, and thus potentially higher financial returns for monitoring and verifying carbon stocks and emissions. The Tier I approach is the most general, and is based on mapping estimates of forest cover used in conjunction with generic forest carbon density values (e.g., tons of carbon per hectare). Using this approach, a map of forest types is developed and the average carbon density of each forest type is estimated based on measurements of field plots. The area of each forest type that is deforested or degraded is combined with average forest carbon density, using emissions factors, to estimate emissions. Tiers II and III approaches provide increased detail on carbon stocks and emissions at regional and national levels using a combination of plot inventory, satellite mapping and carbon modeling approaches. To achieve Tier III levels of accuracy, both aboveground and belowground live and dead carbon stocks must be estimated and modeled. However, it is well known that aboveground carbon stocks (i.e., tree stems, branches and leaves) are far more susceptible to rapid emission to the atmosphere through clearing and/or burning than are the belowground stocks of carbon locked up in soils. As a result, a great deal of technical work has focused on developing geographically-explicit methods to monitor changes in aboveground carbon stocks at jurisdictional scales.

Area of deforestation, forest degradation, and growing forests

Private, academic, and governmental entities routinely calculate deforestation in many regions of the world using a variety of satellite imaging systems. The resolution of the images strongly affects the accuracy and uncertainty of the deforestation estimates. NASA is the top provider of freely available satellite imagery used to monitor deforestation. The NASA Terra Moderate Resolution Imaging Spectrometer (MODIS) satellite collects daily coverages globally, which when reduced through cloud screening and other procedures, results in wall-to-wall mapping of forests on 8, 16 and 30 day time steps. However, MODIS and other satellite sensors like it produce maps at resolutions that are too coarse to capture most of the small-scale deforestation (< 1 ha) and most of the degradation (e.g. logging). NASA’s Land Remote Sensing Satellite System (LANDSAT) series solves the resolution issue by providing coverage at 30-meter (< 0.1 ha) resolution on a 16-day repeat basis. Other technologies also are becoming available to support deforestation, degradation and regrowth monitoring.

Maps of forest carbon

Carbon densities traditionally have been measured using field inventory plots. Plots-based inventories are important and generally accurate when measured correctly, but they also are time consuming and limited in geographic representativeness, which constrains their use for geographically-explicit carbon mapping. Other complementary approaches and technologies are

²⁵ IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4: Agriculture, Forestry and Other Land Use, Intergovernmental Panel on Climate Change, 2006.

appropriate to build from plot networks, and airborne measurements have proven valuable doing so. The latest airborne approaches, particularly Light Detection and Ranging (LIDAR) and Synthetic Aperture Radar (SAR), can be used to estimate aboveground carbon stocks over large areas, with high precision and accuracy, and at reasonable cost. LIDAR sensors employ laser technology to create three-dimensional images of above-ground vegetation, and are capable of making very accurate assessments of above-ground carbon storage. LIDAR mapping in particular, when combined with an affordable number of field calibration plots, can be used to develop carbon base maps and to initiate a long-term monitoring program. Once a carbon base map is created, monitoring can rely mostly on low-cost satellite data and the methods described above to identify and quantify changes to the base map over time. Important progress has also been made in recent years to map the aboveground carbon density of all tropical forests. One approach blends MODIS imagery, data from a satellite-based laser sensor, and forest measurements made in the field to estimate forest carbon density for every 500 x 500 meter “pixel” of the Tropics.²⁶

Rates of forest carbon uptake

Monitoring the amount of carbon taken up by forests, including uptake associated with carbon enhancement procedures (e.g. silvicultural practices) is the most challenging step technically, but several methods to estimate uptake have proven useful at jurisdictional scales. One approach is to apply generic carbon uptake increments to forests remaining as forests annually. This approach is valid for intact forests that usually maintain relatively slow, steady rates of carbon sequestration. Errors arise, however, when including newly regrowing forests, such as in young forests established after agricultural land abandonment. In these situations, field plots can be placed tactically in newly regrowing forests to assess growth rates. Airborne LIDAR has proven particularly efficient in these cases because large areas of regrowing forest can be quickly assessed.²⁷ Whatever approach is used, the age-dependent rate at which regrowing forests accumulate carbon can then be used in jurisdictional bookkeeping models to account for carbon gains.

Social and Environmental Safeguards

REDD+ programs potentially can have adverse effects on rural communities, biodiversity, water resources, or labor relations. Without adequate safeguards to protect against such adverse effects, REDD+ programs are likely to lack legitimacy among local communities and other constituents, investors may lack the necessary social license to operate in these jurisdictions, and the regulated entities seeking compliance grade offsets will lack certainty about the long-range viability of the programs and the resulting offsets. For these reasons, it is necessary for REDD+ programs to establish the minimum standards for social and environmental performance. Once established, these “safeguards” must be used to evaluate the projects and activities that are developed within the program, and to monitor performance as the program or project is implemented. The challenge of adopting and implementing such safeguards will depend in part on the scope of the

²⁶ Alessandro Baccini, et al., *Estimated Carbon Dioxide Emissions from Tropical Deforestation Improved by Carbon-Density Maps*. Nature Climate Change 2 (2012).

²⁷ Gregory P. Asner et al., *High-Resolution Forest Carbon Stocks and Emissions in the Amazon*, Proceedings of the National Academy of Sciences 107 (2010) pp. 16738-16742.

REDD+ program. As scope increases from deforestation to include degradation and carbon enhancement, the complexity of defining and implementing environmental and social safeguards may also increase.

The whole topic of safeguards, particularly those involving protection of indigenous peoples' rights/interests and benefit sharing, is a sensitive topic, and one that poses particular implementation challenges at the subnational level. This occurs because some of these issues inevitably touch on issues of national and international law. For example, current REDD+ policy discussions are divided over the need to sort out *ex ante* difficult questions regarding land tenure as a prerequisite to a functioning REDD+ program capable of generating compliance grade credits that could be accepted into a GHG compliance system. While these issues likely will have to be addressed in the context of emerging REDD+ programs, it is probably not realistic to expect that all land tenure issues will be fully resolved before a REDD+ program can proceed. It is important for the long-term success of REDD+ programs that appropriate safeguards be adopted and enforced to ensure that the rights and interests of local forest dependent communities are protected and, where possible, enhanced.

One of the most important elements of social safeguards is stakeholder participation. At the international level, there has been a strong push to embed the principle of Free Prior Informed Consent (FPIC) in the requirements associated with any international REDD+ mechanism. While these issues are still being debated, states and provinces seeking to develop REDD+ programs will need to develop effective systems to accommodate consultation across relevant stakeholders to give their programs legitimacy and ensure their long-term viability. Likewise, some of the jurisdictions with evolving GHG compliance programs that may be interested in using REDD+ offsets, such as California, likely will require host jurisdictions to adopt mechanisms to guarantee stakeholder participation in REDD+ program design and implementation. Again, such mechanisms inevitably will vary across jurisdictions depending on the local political, legal and social context. There is no "one size fits all" approach. The key point is that REDD+ likely cannot succeed at either the project or the jurisdictional scale without participation of relevant communities and stakeholders.

Ongoing efforts to define REDD+ safeguards are proceeding under the UNFCCC, the World Bank's FCPF, the CARE Climate, Community and Biodiversity Alliance (CCBA) REDD+ Social and Environmental Safeguards program and other efforts. Harmonization and streamlining where possible across these different processes will be important to reduce the complexity of REDD+, and ensure that the costs of implementing such safeguards do not overwhelm the entire effort and render it unworkable.

Legal and Institutional Framework

All of these minimum conditions for jurisdictional REDD+ will need to be addressed in the state's or province's legal framework and embedded within appropriate government institutions. Depending on the jurisdiction, and whether it operates within a federal or non-federal system of government, the relevant laws and regulations could take a number of forms, including state or provincial legislation and regulations, national laws and/or decrees, or specific agreements that define the relationship between different levels of governance with respect to REDD+.

Irrespective of the precise form of the legal framework, it will need to define the asset class, elaborate the relevant entitlements, and establish the substantive and procedural requirements

associated with jurisdictional REDD. Among other things, this will require clear delegation of authority to specific governmental entities to conduct or oversee monitoring, reporting, and verifying emissions; monitoring social and environmental performance of key activities and ensuring participation of relevant stakeholders; ensuring the issuance, registration, and tracking of REDD+ credits; and, defining ongoing program review and performance. This framework also must ensure compatibility with national laws governing land ownership, taxation, and states' rights to enter into contracts or agreements with foreign jurisdictions, and other issues. Finally, it also must delineate the respective division of authority between national and state/province authorities regarding accounting and MRV, and where relevant, the allocation of emissions reductions achieved at the state/province level to achievement of national targets.

A Plan to Reduce Deforestation and Emissions below the Reference Level

Jurisdictional REDD+ programs likely will not succeed without a plan and accompanying policy framework to achieve emissions reductions from deforestation and forest degradation. If emissions do not decline, REDD+ fails. Consequently, some of the emerging market opportunities for sector- or jurisdiction-wide approaches to REDD+ require proof that the relevant jurisdiction adopts a REDD+ plan. For example, California's GHG cap and trade program regulations requires jurisdictions to have adopted a REDD+ plan to be eligible to contribute compliance offsets into the California program.²⁸ To be effective, such a plan will likely need to address the drivers of deforestation and degradation, and may need to incorporate both economic incentives and "command and control" measures. It likely will need to support and increase the economic viability of rural sectors (including most indigenous and traditional groups) whose livelihoods depend upon healthy, intact forests, and who historically have often defended their territories from deforesters. It also can achieve emissions reductions by strengthening networks of other types of protected areas, including biological reserves. For REDD+ to be politically and economically sustainable over the long term, it may need to be incorporated into the state's or province's rural development strategy, fostering economic growth, jobs, and improvements of rural services in the areas of education, justice, law enforcement, and health. As such, the REDD+ plan may need to integrate programs and policies of all of the institutions and ministries that play a role in rural development, and not be focused solely on a singular institutional home within government (often the agency responsible for environment, forestry, or climate). If REDD+ is visibly associated with improving the livelihoods of the state's or province's citizens, it is more likely that REDD+ will survive inevitable political transitions.

For most states and provinces, many years will be needed to incorporate REDD+ into rural development strategies. State and provincial institutions often are understaffed, underfunded, bureaucratically inefficient, financially dependent upon concessions and other forms of natural resource harvesting or mining, and highly vulnerable to political transitions. Each state and province must approach development of REDD+ within the context of their existing institutional, legal, and economic circumstances, and do what is possible. Many governments only will be capable of achieving the minimum conditions for implementing a jurisdictional REDD+ framework. These jurisdictions may pursue the "project-based" pathway and turn to project

²⁸ California Code of Regulations, Section 95994, (a), (1) (published in 12/21/2011). Available at: <http://www.arb.ca.gov/regact/2010/capandtrade10/finalrevfro.pdf> (last accessed in May, 27, 2012).

developers who can bring innovation, technical expertise, and funding to bear upon emissions reductions in geographically-defined areas within the state or province (Figure 1-2). Other governments may issue bans or moratoria on activities that are causing deforestation and degradation of forests, and may pursue “nested” program pathways. Some exceptional jurisdictions are now developing “fully integrated” programs in which policies are aligned, new institutional innovations are being implemented, and projects are being developed within the context of this REDD+ programmatic framework (Figure 1-2).

In sum, the long-term sustainability of REDD+ will depend upon its incorporation into the state’s or province’s rural development strategy. This will require the alignment of policies, institutions, rural credit programs, and law enforcement capabilities to grow the rural economy, create jobs, and deliver services as it slows deforestation and forest degradation. But, as a practical matter, states and provinces must start with the actions they realistically can take, which may be a simple decree or implementation of some REDD+ projects.

Financing

Performance-based financing is a core feature of REDD+. Potential sources of revenues include pay-for-performance public funders (e.g., the billion dollar commitments that Norway has made to both Brazil and Indonesia that are conditioned up declines in deforestation), private investors and project developers who are operating in the voluntary carbon market, and regulated compliance markets for which REDD+ programs could become a source of offsets.

States and provinces can attract carbon investors and project developers by introducing measures into their REDD programs that reduce investment risks and inspire confidence that the credits and business model underlying the investment opportunities is sound and has a high probability of delivering verifiable emissions reductions. Private sector concerns about jurisdictional REDD+ programs typically include performance risk at the state or provincial level, and concerns about buying offsets from, or investing in, “government” programs that can be bureaucratic or reluctant to enter into contractual relationships. Private investors also are likely to be concerned about having sufficient project collateral available to compensate them if an investment fails to deliver offsets because the agents implementing REDD+ activities failed to achieve the necessary emissions reductions.

The first concern is most relevant in the context of nested projects, and involves a situation in which an individual project successfully achieves expected emissions reductions, but the state or province does not, thereby precluding the nested project from receiving credits. A variety of risk mitigation strategies are being considered to deal with this type of performance failure, including specific liability rules, credit reserves or “buffers,” and insurance instruments. A jurisdictional REDD+ program that is based upon a nested project architecture could consider adopting one or more of these risk mitigation approaches to facilitate project-level investment.

The second concern is more general, reflecting the legacy of the project-based approach to offsets. Investors and project developers are nervous about investing in government programs and/or buying credits that are generated from such programs. They often have limited experience dealing with government entities on a commercial basis, and fear that a deal made by one set of government actors may be undone by future government actors. States and provinces that are establishing jurisdictional REDD+ programs may need to consider as part of these programs, new institutional structures that can facilitate commercial transactions with investors and entities

seeking to buy compliance quality offsets. The Acre REDD+ program has created a model institutional structure in this respect – a public-private development company that would be able to transact in the market, but would be backed by the government. This is discussed in more detail in Section Three below.

Also, as discussed above, because REDD-based offsets may not confer ownership rights to the underlying carbon or forests, particularly if activities are implemented on indigenous lands, investors are likely to need some form of collateral or other financial guarantee for their investment. Jurisdictions who wish to facilitate private investment in REDD+ will need to devise innovative approaches to providing these kinds of financial guarantees or be willing to provide financial guarantees directly based on the jurisdictions own financial balance sheet.

It is also possible that jurisdiction-wide REDD+ can help to facilitate investment of private capital into activities that can achieve REDD+. In a jurisdictional program, the state or province can decide to reduce certain risks faced by investors in individual projects. For example, one of the key risks faced by project investors is “country carbon risk” – the risk that jurisdictions will not develop and manage the carbon regulatory infrastructure to support offsets issuance in a cost effective way. In a jurisdiction wide system, the state is in a position where it can act more like a central administrator and so more directly manage this risk.

3

CASE STUDIES OF KEY SUBNATIONAL REDD+ PROGRAMS (ACEH, ACRE, CHIAPAS, AND MATO GROSSO)

To facilitate better understanding of the status of jurisdictional REDD+ programs being developed within the states and provinces that comprise the GCF, this chapter provides detailed descriptions of the programs under development in Aceh (Indonesia), Acre (Brazil), Chiapas (Mexico), and Mato Grosso (Brazil).

The Acre program is considered by many observers to be the most advanced jurisdictional REDD+ program being developed in the world today. The program evolving in Mato Grosso is arising within the context of already having achieved the largest REDD+ emissions reductions among all of the GCF jurisdictions. The evolving REDD+ program in Aceh is one of the most mature programs among those now being developed in Indonesia. And finally, the REDD+ programs being developed in Acre and Chiapas are the first ones being designed to integrate directly with California's new cap-and-trade system.

Aceh, Indonesia

Overview

Aceh Province has made substantial progress toward developing a comprehensive REDD+ program. Aceh designed legislation to approve projects, built several cross-cutting agencies to address REDD+ related issues, and has begun to classify and measure forests, engage communities in consultations, and nest projects into a jurisdictional framework. The province has increased forest monitoring using both remote sensing and rangers on the ground, and has curtailed illegal logging by implementing a logging moratorium. Aceh also has initiated processes to evaluate existing forest concession holders and province-wide spatial planning, including major efforts to engage local levels of government. Some of the key challenges facing Aceh in developing its REDD+ program include access to adequate financing, coordination of programs across multiple agencies and constituencies, political continuity, alignment with the national government's REDD+ program, and limited institutional and technical capacity.

Because Indonesia is not a federal system (in contrast to Brazil and Mexico), there are constraints on what the provincial governments can do in terms of designing and implementing REDD+ programs. Aceh, however, operates under a special autonomy law, which in theory gives it additional latitude to develop its provincial REDD+ program. The implications of the special autonomy law for Aceh's REDD+ have not been fully elaborated.

Background

The island of Sumatra consists of eight provinces,²⁹ and has experienced some of the highest sustained rates of deforestation in the world. Numerous studies evaluating deforestation rates for the period from the mid 1980s through the mid 2000s have shown annual rates of deforestation of 2-2.5% for the island as a whole. The Indonesian Province of Nanggroe Aceh Darussalam (hereafter referred to as Aceh Province or simply Aceh) lies at the northern tip of Sumatra, and has a population of approximately 4.3 million people. Aceh covers a total land area of 57,000 km² (5,700,000 hectares), of which approximately 60% (3,340,000 hectares) is forested. Figure 3-1 shows Aceh's location in Southeast Asia.

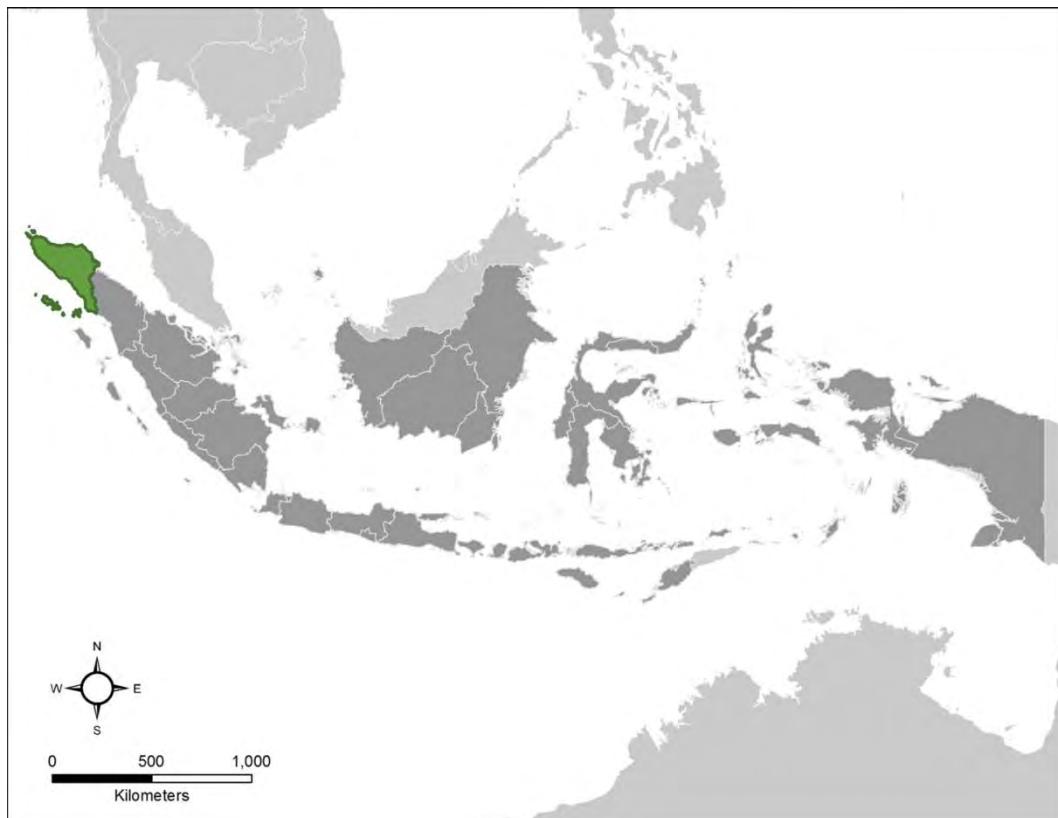


Figure 3-1
Map of Location of Aceh Province, in Western Indonesia on the Island of Sumatra

Today, Aceh retains the largest contiguous area of forest on Sumatra, stretching from the northern capital city of Banda Aceh to the southern Aceh province border. Much of these forests cover the Bukit Barisan Mountains, which run down the spine of northern Sumatra. The Bukit Barisan range has two distinct but connected ecosystems – the Ulu Masen ecosystem in the north and the Leuser ecosystem in the south. The mountain, hill and lowland ecosystems of Aceh support high levels of plant and animal biodiversity including endangered populations of the Sumatran rhinoceros, Sumatran tiger, Sumatran elephant and Sumatran orangutan.

²⁹ These eight provincial jurisdictions include: Aceh, Bengkulu, Jambi, Lampung, Riau, West Sumatra, South Sumatra, and North Sumatra.

Decades of civil conflict between the Government of Indonesia (GOI) and Aceh, stretching back to Indonesian independence from the Dutch in 1945, is probably the largest single reason Aceh's forests were never exploited to the degree of other Sumatran provinces. Prior to the tsunami that devastated parts of Aceh in 2004, the civil conflict between the Gerakan Aceh Merdeka (GAM, or Free Aceh Movement) and the GOI imposed substantial hardship on the people and economy of Aceh. Aceh had been declared a military operation by the GOI, and martial law was imposed there in 2003.

The 2004 tsunami caused massive damage and loss of life.³⁰ To facilitate reconstruction and humanitarian relief after the tsunami, peace negotiations ensued shortly after it struck, concluding in January 2005 with peace accords signed in Helsinki. These and subsequent agreements helped ensure safe and coordinated humanitarian work, ended the conflict, and paved the way for democratic elections in Aceh. Yusuf Irwandi, a former rebel officer, was elected Governor in 2006 as a result of the first elections, which were deemed to be fair and free by international observers.

After being elected, Governor Irwandi's administration embraced a concept of sustainable, "green" development for the province. REDD+ was viewed by the Government of Aceh as a key component of this development agenda. To date, Aceh has been one of the most advanced provinces in Indonesia in terms of the political importance of REDD+, and the implementation of innovative approaches to achieving REDD+. But the recent defeat of Governor Irwandi in provincial elections underscores the challenges of ensuring political continuity for REDD+ and it remains to be seen whether the new Governor will continue on the course established by Governor Irwandi.

Thus, despite REDD+ being a central tenant of Aceh's green development, it faces substantial challenges. In the run up to recent provincial elections, some of the important REDD+ programs were put on hold, and it is not yet clear whether the new Governor of Aceh will continue the programs put in place during Governor Irwandi's tenure. Additionally, uncertainties related to the Government of Indonesia's approach towards REDD+ have made it difficult for provincial REDD+ programs to move forward with key aspects of jurisdictional REDD+, such as the establishment of reference levels, mechanisms for private sector engagement, and coordination with national regulations. Finally, although Aceh has planned a range of activities needed to implement a comprehensive REDD+ program that are in their formative stages, the government and its REDD+ implementation bodies has struggled to secure adequate resources to implement these activities.

Scope

Aceh takes an expansive view of the scope of REDD+ and is implementing activities to reduce deforestation, degradation and to improve forest management under its green development plan.

³⁰ The 2004 tsunami reportedly left more than 150,000 Acehnese dead or missing, 127,000 houses destroyed, a similar number damaged, over 500,000 people left homeless, 230 km of roads destroyed, damage to tens of thousands of hectares of land, and damage to 90% of surface corals and vast areas of mangroves.

Reference Level and Target

Aceh has not proposed either a province-wide reference level or target of deforestation. Reference levels and emissions reduction targets are being discussed in the context of the adoption of a national commitment to reduce deforestation as part of the international climate negotiations, and the implementation of the Indonesia-Norway Letter of Intent (LOI).³¹ These conversations and discussions are ongoing, and have not yet resulted in any kind of pro-rating of a federal reference level to the provinces.

While not province-wide, the Ulu Masen project³² proposed an 85% reduction in deforestation rate for the 750,000 hectares of forests in Ulu Masen. The baseline rate of deforestation approved in 2007 for Ulu Masen was 1.3% per year. Given this, an 85% reduction would imply a deforestation target for the Ulu Masen forests over 30 years of approximately 0.2% per year. This target is not legally binding. No validation or verification of the baseline or the target has been completed against any other generally accepted offset project standard (such as the VCS), although efforts to do so continue to be supported by Carbon Conservation, a private company.

The average deforestation rate (ha/year)³³ for Aceh for the five-year period 2006-2010 is estimated to be 31,283 ha/year, yielding an annual deforestation rate of 0.94%. These estimates have not yet been confirmed or published.³⁴ It is estimated that Aceh lost 407,641 hectares of natural forests between 1985 and 1990; 277,169 hectares of natural forests between 1990 and 2000; and 260,500 hectares of natural forests between 2000 and 2008/2009.³⁵ Due to different methods and timeframes, these analyses cannot clearly demonstrate if Aceh's recent REDD+ efforts are significantly reducing deforestation rates. Recent deforestation rates are not as high as rates in the late 1980s, but they are not substantially different from deforestation rates observed in the 1990s and 2000s. Aceh's REDD+ activities began in earnest in 2007, so until a more recent assessment of the deforestation rate is completed, one can only infer that there has been some progress. However, more measurable progress must be made to reach the low deforestation rates proposed for the Ulu Masen project (which strives to reach a deforestation rate in the relevant area of approximately 1,500 ha/yr).

³¹ The Letter of Intent is a document signed in May 26, 2010, between the Government of Norway and the Government of Indonesia. In the LOI, Indonesia promised to reduce emissions from deforestation and degradation of forests and peat lands, whereas Norway agreed to support Indonesia's actions by making available US\$1 billion on a payment for performance basis.

³² The Ulu Masen project was proposed by the Government of Aceh, Carbon Conservation, and Fauna and Flora International (FFI) and was validated in 2007 to the CCB Standards.

³³ There are 100 hectares per square kilometer.

³⁴ Personal communication with Matthew Linke, FFI, 2011.

³⁵ Yumiko Uryu et al., *Sumatra's Forests, their Wildlife & the Climate Windows in Time: 1985, 1990, 2000 & 2009*, WWF-Indonesia 2010,
[http://www.illegal-logging.info/uploads/wwfindonesia2010sumatranforestswildifeclimatereportfordknbappenas.pdf](http://www.illegal-logging.info/uploads/wwfindonesia2010sumatranforestswildlifeclimatereportfordknbappenas.pdf)

Nesting

Aceh has begun to build the legal framework for nesting projects within the jurisdiction's REDD+ program. The major project is the Ulu Masen project discussed above, with other projects (in the Leusser area) still emerging. Details on how Aceh has begun to nest projects are described in more detail below in the subsection related to legal and institutional arrangements.

Offset Issuance and Tracking

Aceh has not yet begun to develop a system to define, issue, register or track offsets. No offsets have yet been issued for REDD+ projects or programs in Aceh, although the Ulu Masen project has been issued permission by the provincial government³⁶ to develop project validation and verification to create offsets under the VCS. This validation/verification process had not been completed as of the date of this report.

Emissions Monitoring, Reporting and Verification

Deforestation and degradation

Aceh is in the process of completing a comprehensive provincial assessment of deforestation. Data analysis for the five-year period of 2006 through 2010 is on-going as described above. This work is being done in conjunction with the Government of Indonesia and various academic institutions.

Past forest cover monitoring for 2000-2005 was complicated by the variable availability of different data sets. LANDSAT provides better resolution data, but the data are not as complete as the MODIS data.

The 2003-2006 Forest Cover monitoring is based on 1:250 000 scale interpretation of LANDSAT 7 ETM+ overlays for 2002/2003 and 2005/2006. Data from the province is analyzed by BKLH.³⁷ Compilation and reporting on a province level is the responsibility of the national government. Data concerning deforestation and degradation in the districts (Kabupaten) are available from the BKLH, and the data are also used for spatial planning at the province and Kabupaten levels of government.

Small-scale logging and forest fires are the leading cause of degradation in Aceh. To date, Aceh has not conducted comprehensive evaluations of forest degradation. The results of preliminary mapping of illegal logging have not been made public, but reportedly provide the Government of Aceh with information on the locations and approximate extent of these activities. However, more information related to forest degradation is known for the Ulu Masen forest. According to the Ulu Masen CCBA project documents, about 25% of the forests in Ulu Masen are degraded, with most degradation occurring in lower lying, easier-to-access forests. There are no comparable data on forest degradation that are available for the Leusser Ecosystem.

³⁶ Aceh Provincial Decree No. 522/372/2009 designated Ulu Masen forest as a REDD demonstration project area. See also Leo Peskett, *A Case Study, REDD+ Benefit Sharing in Indonesia*, World Bank, 2010.

³⁷ Biro Bina Kependudukan dan Lingkungan Hidup (BKLH) (Bureau for Population and the Environment).

Table 3-1
Aceh: Intact and Disturbed Forests in Ulu Masen by Elevation³⁸

Forest Type		Hectares	Total Carbon (tons C)	Average Carbon (tC/ha)
Elevation (meters)	Condition			
0-500	Intact	132,547	27,834,870	210
	Disturbed	162,759	26,041,440	160
500-1000	Intact	220,814	44,162,800	200
	Disturbed	28,078	4,211,700	150
1000-1500	Intact	143,732	27,309,080	190
	Disturbed	1,309	183,260	140
>1500	Intact	61,289	11,028,520	180
	Disturbed	0	0	n/a
TOTAL		750,528	140,771,670	188

Forest carbon stocks

Initial values of carbon storage shown above in Table 3-1 for the Ulu Masen forests were based on IPCC Tier 1 estimates. These forests are estimated to range from 140 tons of carbon per hectare (tCe/ha) in degraded, higher elevation forests to 210 tC/ha in intact, lower elevation forests. Another study largely concurs, suggesting that on average all of Aceh's forests (not just those in Ulu Masen) store 167 tC₂e/ha.³⁹

Aceh is in the process of finishing the design and execution of a comprehensive survey of its forests, using remote sensing and ground measurements. Aceh's REDD+ Task Force has developed a draft Standard Operating Procedures for Carbon Stock Assessments, with support from Fauna and Flora International (FFI). These procedures include essential components such as:

- Procuring remote sensing data for the project area (on-going).
- Remote sensing analysis on forest and non-forest land cover classes, and their estimated distribution across the province. Initial stratification analysis identified nine categories of potential forest strata, based on LANDSAT 2009 spectral reflectance data, correlated with climate and topographic features of Aceh's forests.

³⁸ Provincial Government of Nanggroe Aceh Darussalam (Aceh), Reducing Carbon Emissions from Deforestation in the Ulu Masen Ecosystem, Aceh, Indonesia: A Triple Benefit Design Note for CCBA Audit, Table 3.

³⁹Tropical Forest Group - TFG 2010. For more information, visit <http://tropicalforestgroup.org/>

- Sampling strategy and plot layout designed according to scientific principles and field-sampling practices (including consideration of measurement error and quality control principles) using transects due to the extreme terrain in many parts of Aceh's forest estate. Initial fieldwork has been completed, and the information from the initial field measurements is helping inform and clarify the next stage in classifying and sampling forest types.
- Data processing and management, including Quality Assurance (QA) check of data transcribing.
- Permanent sampling plots.
- Records management and ISO record-keeping principles and responsibility.
- Data analysis – use of allometric equations, statistical applications, and forest carbon stock models designed to calculate forest dynamics and carbon quantities.
- Field team training.

For the initial work and carbon estimations, forest cover was estimated from 2009 LANDSAT ETM + satellite images, which were derived from the USGS Global Visualization Viewer.

Assistance for this work was provided by FFI, Dr. Florian Siegert and Ente Rood.⁴⁰ The initial categorization of forests in Ulu Masen was divided into nine homogenous units of two key factors – climate and elevation. This research is being updated through continued field measurement and remote sensing programs.

Social and Environmental Safeguards

Procedures adopted by Aceh's emerging REDD+ program acknowledge the rights and role of indigenous peoples and local communities. The social and economic conditions of many Acehnese people depend on forest resources and forest ecosystem services. The Aceh government has stated that it is committed to ensuring that REDD+ benefits are equitably shared among stakeholders, including forest dependent communities and those with customary (ADAT⁴¹) rights to forestland.

The social groups targeted for outreach by the REDD+ Program include: (i) indigenous peoples who have traditional ownership rights to land/forest areas impacted by the REDD+ Program; and (ii) social groups (who may or may not be indigenous peoples) who directly impact the land and forest areas through their daily activities (both legal and illegal, e.g., collecting firewood, logging, conversion to agriculture, grazing). Other social groups to be engaged in Aceh's REDD+ programs include those who rely on the supply of forest products to support their own industry (i.e., small-scale logging mills/manufacturers and parts of the agricultural sector). In this way the REDD+ Program is aimed at benefiting those social groups who directly impact the forest, and those groups who act as part of the “supply-chain” of forest products. The number of

⁴⁰ Forest stratification for carbon density estimation in Ulu Masen, Aceh, Indonesia (unpublished).

⁴¹ ADAT is an Indonesian-Malay set of cultural norms, values, costumes and practices found among specific ethnic groups in Indonesia. It is commonly used as reference to customary communities.

people who may directly benefit cannot be quantified at this time because the program itself is still under development. While robust and sincere community engagement and partnership in REDD+ is the stated goal, achieving this also faces challenges. One study in 2009, conducted by the International Development Law Organization, helped illuminate some of the land and forest tenure issues in Aceh.⁴² After a series of consultations, community interviews, workshops and field interviews, the issues and challenges shown in Table 3-2 were identified.

Table 3-2
Land and Forest Tenure Issues and Challenges in Aceh²⁹

Land Tenure	<p>Insecure land tenure at the local level. The majority of indigenous peoples and local communities living around Aceh's forests do not have certificates of title to their land issued by the Indonesian Government National Land Agency (BPN). In many cases, indigenous peoples and local communities do hold customary or local forms of land documentation, such as letters of permission to cultivate land issued by the Keucik (village leader), sale and purchase agreements, and inheritance documents issued by the local Camat (Sub-district Head) or Land Notary. These local forms of land documentation often are incomplete, with some landowners not having any documentation to their land.</p> <p>Land ownership records across different levels of government (village, sub district, provincial, national) often are inconsistent.</p> <p>No land maps identify geographic areas of customary authority.</p> <p>Customary land boundaries often are identified through traditional methods of demarcation (e.g., rivers, gorges, large trees, valleys, etc.).</p> <p>It is difficult for customary communities to access new areas of land.</p> <p>There is a lot of abandoned or fallow land in Aceh as a result of the conflict. Two issues are exacerbating this:</p> <ul style="list-style-type: none"> • Unclear land ownership status (i.e., uncertainty over who owns a particular area of land – government, company or individual) • Land status is clear and if an owner is identified, the landowner does not permit others to cultivate the land.
Access & Management of Forests	<p>Customary and local communities are highly dependent on forests for custom and economic sustenance.</p>
	<p>Communities have limited information about land/forest boundaries and the status of forests.</p>
	<p>Signboards are the main form of demarcation used to identify protected forest boundaries. These boards often are very widely spaced, making it difficult to determine precise boundaries of protected forests.</p>
	<p>Low level of involvement of communities in the process of forest management led by government including decisions to issue certain permits or licenses.</p>
	<p>Government authorities responsible for managing the ecosystem restrict community access to forests.</p>

⁴² See *Avoiding Deforestation in Aceh, Indonesia: Land, Natural Resource Rights, & Local Communities Project*, International Development Law Organization (IDLO), 2009, http://www.idlo.int/Documents/Aceh/Defo_Report_Phase_1.pdf 2009 .

In Aceh, as elsewhere in Indonesia, there is an ongoing need for analysis of current legal frameworks (national and regional) to further clarify and address issues of land tenure and rights (incorporating land and carbon ownerships rights), in particular those related to local and indigenous communities. There is also a need to further harmonize and develop regional programs and policies, including additional clarity on how the special autonomy laws that Aceh has been granted under the peace agreements affect Aceh's authority to develop a REDD+ program for the province. Any resulting framework would need to be harmonized across provincial and central government regulations.

Legal and Institutional Framework

The two key institutions for coordinating and implementing the “Aceh Green” vision, which is the province’s REDD+ Plan, are the Aceh Green Secretariat and the Government of Aceh REDD+ Task Force. Aceh Green is an evolving program with three priority areas of work: (i) land use, land use change, and forest management, (ii) sustainable economic development, and (iii) green energy (primarily small scale hydro and geothermal). The goal of Aceh Green is to integrate and expand carefully and consciously integrated themes of climate change via renewable energy and land use management, community development, commerce and conservation.⁴³ The goal of Aceh Green is to build a cohesive vision for core protected areas, rehabilitating degraded lands, promoting community forestry and smallholder plantations, and combining these efforts with primarily low lying areas of plantations and other settled land uses.

The Aceh Green Secretariat

This specially convened entity reports directly to the governor and is responsible for developing and implementing in an integrated manner the themes of climate change, renewable energy, land use planning and management, community development, commerce and conservation. The Aceh Green vision is focused on job creation and economic approaches to conservation. The Aceh Green Secretariat is building capacity to deliver the core elements of the government’s post-conflict environmental agenda.

The Government of Aceh REDD+ Task Force

In March 2009, Aceh established the REDD+ Task Force, an inter-governmental group made up of representatives from provincial government agencies (Forestry Department, Legal Bureau, Economic Bureau, and Community Empowerment Agency). The REDD+ Task Force receives important technical assistance from the local FFI program, which Governor Irwandi helped establish during the conflict, prior to the tsunami. The Aceh REDD+ Task Force mandate is to coordinate and advance REDD+ in the Province. To do this, the REDD+ Task Force is responsible for working with private sector actors to attract long-term financing for REDD+ activities and for engaging and coordinating activities with stakeholders, including Aceh NGOs and CSOs, forest communities and local governments on Aceh’s REDD+ program. To date, a range of project developers have begun to develop voluntary market projects in Leusser and Ulu Masen forests. The Task Force is actively developing crediting vehicles, forest carbon

⁴³ “Aceh Green” Concept Paper: Green Economic Development and Investment Strategy for Aceh, Indonesia, Government of Aceh, July 2008
http://www.aceh-eye.org/data_files/english_format/economic/economic_analysis/eco_analysis_2008_07_00.pdf

inventories, community consultation processes, and dealing with external relations and national government alignment.

Developing the capacity of these two agencies will allow Aceh to further advance and integrate REDD+ learning, enhanced forest carbon stock and reference levels, local ownership of REDD+ resources within a manageable governance framework, and other elements. Aceh is emerging from 26 years of civil war and significant capacity and technical knowledge were lost in the tsunami. As a result, these agencies have some capacity to manage and implement the broader “Aceh Green” strategy, but significant efforts must be made to build internal capacity in a range of areas, from technical carbon accounting to forest and land use governance. Rebuilding technical, policy and institutional capacity clearly will be beneficial to the province, and also may help inform the national REDD+ learning processes.

The current spatial plan for Aceh, which was accepted by the national government in 2010, reflects the previous governor’s commitment to stop logging and provides little opportunity for a legal timber industry to continue. Table 3-3 identifies and briefly describes the policies, programs, and existing laws and regulations associated with Aceh’s evolving REDD program.

Table 3-3
Policies and Regulations Relevant to Aceh Green REDD+ Program

Year(s)	Policy/Program	Description
2007 onward	Aceh Logging moratorium	The moratorium is founded on the three principles of redesign, including the review of existing forest concessions, reforestation, and reduction of deforestation and degradation. A review of all forestry (and mining) concessions is being undertaken by the Government of Aceh to determine their legal status, procedural correctness and performance.
2007	Aceh Governor Decree Number 522.1/534/	Created the Team of Aceh Forest Management Strategic Plan (TIPERESKA) focused on redesign (land use and community planning, concession reviews) reforestation, and reductions in deforestation. This effort is being headed by the Aceh Forest Redesign Team.
2008	Permenhut No. 68	Describes the permission and approval procedures of REDD+ demonstration activities.
2009	Permenhut No. 30	Regulates procedures for implementation of REDD+, including requirements that should be fulfilled by developers, verification and certifications, and terms and conditions of REDD’s implementing bodies
2009	Permenhut No 36	Regulates the permission procedures for REDD+ projects involving carbon sequestration and storage. It includes revenues sharing, application, collection, depositing, and procedures to utilize revenues from REDD+ projects. This regulation is still being developed.
2010	Government of Aceh spatial plan	Approved by the GOA, it substantially limits logging. While not wall-to-wall spatial planning, this approved plan has helped to consolidate land use planning efforts within Aceh and in a manner that is coordinated with the GOI.
2009 onward	Aceh Forestry Policy Redesign/ TIPERESKA	Spatial planning, responsibilities/ rights of the provincial government, and institutional development.

REDD+ Planning

As noted above, Aceh's REDD+ program is a system of laws, policies, decrees, agencies and provincial initiatives within an overall policy vision referred to as "Aceh Green." Aceh Green is estimated to have already prevented 500,000 ha of forest from being converted, largely due to the implementation of a logging moratorium. These steps are part of an overall green vision for Aceh Province, of which REDD+ plays a part, and will be integrated into Aceh's spatial planning system, which is currently in the process of being legislated. REDD+ is incorporated in Aceh Green, and is part of five important principles of Aceh's Provincial Government, namely: Green Development, Disaster Mitigation, sensitivity to Conflict and Peace, sensitivity to Gender, and peaceful, universal founding principles of Islam.

All levels of government and civil society have been invited to contribute to the design and implementation of REDD+ activities and initial community consultations have begun. In particular, traditional mukim leaders⁴⁴ have a critical role in the management of land and natural resources in Aceh's rural communities, typically being responsible for between three and eight villages. Though their authority was undermined during the years of conflict, Mukim leaders are now formally recognized under Aceh's Special Autonomy Law.

These laws are complemented by three additional policies.

1. Aceh Policy and Strategy on Law Enforcement

This policy is an evolving strategy across multiple agencies to involve relevant stakeholders in areas with a high risk of degradation and deforestation.

2. Aceh Policy on Evaluation of Forest Permits & Licenses

This policy focuses on the integration of all active licensed activities (including oil palm and mining), and evaluation of competency and cooperation. Results of this evaluation are designed to become a reference for minimum investment and responsibilities for future concession holders.

3. Aceh Policy on Forest Protection and Conflict Resolution Systems

This policy is to enable a forest protection system across three levels of government: forestry police in the Department of Forestry working with forest-crime units for training and operations; forest guard/ rangers whose function it is to patrol forest borders; and community rangers, whose responsibility lies in protecting forests in the immediate vicinity of their villages. To support the policies of Aceh related to forest protection, a coordinated system of forest protection agencies is emerging in Aceh, including:

Community Rangers

Community Rangers are tasked with patrol and monitoring of forest products originating from communities surrounding the forest. This group was formed to reduce pressure on forests as well as to create alternative livelihoods. Community Rangers are mostly ex-GAM combatants, ex-

⁴⁴ A mukim consists of a number of communities or villages with a common ethnic and cultural background under the leadership of the Imeum mukim, a religious leader who also had secular functions. Under the Imeum mukim are specialist community leaders responsible for agriculture, control of forest use, and fisheries in coastal areas.

loggers, hunters, and local people who live in and around the forest. Until now the Government of Aceh has four groups of Community Rangers: Aceh Besar, Aceh Jaya, Pidie, and Aceh Barat.

Mukim Forest Management Model (Pamhut)

In addition to Community Rangers, the Aceh Government also has established a Forest Security Unit (Pamhut) that recruited members between 2007 and 2009. Currently the Government of Aceh has 2,300 Pamhut officers responsible for providing security against the threat of illegal forest activity.

Watershed Forum and the Association of States Mukim

The Government of Aceh also encourages the formation of institutional and community forums for saving forests and the environment, facilitated by the various NGOs working in Aceh (e.g., FFI, Forest and Environment Project (AFEP), World Wildlife Federation (WWF) Aceh, and Indonesia Environmental Services Program (ESP) USAID). To date, three watershed forums have been established in Aceh Besar District (Forsaka, FAMS, and Forsela), with each watershed forum composed of approximately 100 people.

Despite all of the progress made developing an approach to REDD+ that is integrated into a broader development agenda, Aceh continues to face significant policy gaps and institutional constraints that must be rectified before it can generate high quality REDD+ emissions reductions capable of being recognized as offsets in existing and emerging GHG compliance markets. Some of the most important of these gaps and constraints include:

Mechanisms for REDD+ Credit Generation

There is a need to review existing options for credit generation and possible linkages to emerging compliance systems (most notably the program emerging in California), and identify the most viable options for credit issuance and management in the future.

Best Practice Community Engagement

There is a need to review and support community engagement processes for ongoing outreach and FPIC work.

Integration of Private Sector and Public Finance

There is a need to review the role of private sector finance and subnational donor funding, such as any bilateral funding of Aceh Green, bilateral funding of other Aceh REDD+ related activities, or any funds that may be passed to Aceh through the Indonesia-Norway agreement.

Nesting of Subnational Accounting into Emerging National Frameworks.

With a long-term view toward integrating Aceh's REDD credits into the Indonesian national frameworks, more work is needed to ensure alignment between the provincial and national carbon accounting systems to ensure increased market certainty for REDD+ credits.

Developing Local Field Ranger Stations for Forest Protection

Field operations are ongoing with the objectives of reducing forest crime and supporting local dialogues on forest use. The costs for operating ranger stations are expected to continue, and they are in need of more secure funding sources.

Financing

Like many subnational jurisdictions, Aceh continues to struggle to realize the full potential of many of the provincial and project-based activities included in its overall approach to REDD+ and “green” development because of a shortage of funding. The province already has initiated many important REDD+ programs and policies. Fieldwork on both community and carbon elements has begun, and Aceh has started to structure a financial infrastructure to facilitate generation of REDD+ private finance and credits. Currently, REDD+ implementation is funded primarily through provincial budgets and by donors. However, funding shortfalls have caused some programs to be delayed.

More REDD+ funding is needed to enable the Ulu Masen project, and the broader provincial REDD+ effort, to deliver REDD+ solutions through a sustainable landscape approach. It is also hoped that additional funding can be allocated to Aceh’s REDD+ program from the central government, from the GCF Fund, other donors, and from the sale of certified emission reductions from the Ulu Masen project.

Acre, Brazil

Overview

The state of Acre, Brazil, in the southwestern Amazon region, has been building a sustainable forest-based economy for 12 years. Home of martyred grass-roots leader and forest conservationist, Chico Mendes, it was the first state in the GCF to establish comprehensive legislation to create a system of incentives for environmental services. Figure 3-2 shows the location of Acre in South America.

Acre’s initial focus is to build a system of incentives to enhance carbon storage by forests. Acre has adopted a reference level compatible with the national reference level, and it has a forest monitoring system that provides high-resolution state-wide maps of deforestation. It also has engaged Markit – a private financial information services firm that operates a large and diverse environmental registry for carbon, water and biodiversity credits – to help develop a state-wide carbon registry. Acre also is on the verge of creating a novel public-private company to facilitate private and public investments in Acre’s program for ecosystem services, and it has institutionalized broad stakeholder consultation, scientific input, and cross-agency integration within its incentive program. Acre’s deforestation rate has declined 60% below its average for the period 1996-2005. Acre is one of two states selected to develop the first linkage agreements with California’s cap-and-trade program. While the state was successful in its bid for a US\$45 million grant from the Brazilian Government’s “Amazon Fund” (designed to support REDD), it has been slow to finalize additional REDD+ finance, although several promising initiatives are underway.

Background

In 1999, Jorge Viana was elected Governor of Acre on a platform of forest-based sustainable development that he called *Florestania*. This novel approach to socio-economic development has been sustained and expanded across 12 years, and has made many important advances. These include a state-wide program of ecological and economic land-use zoning, which establishes zones of agricultural consolidation, nature reserves, production forests, extractive reserves, indigenous territories, and farm settlements. The government established a subsidy for natural

rubber production, increasing the economic viability of traditional rural communities that depend on the harvest of rubber from native forests, and fostered the creation of processing facilities and value-added industries, such as a Brazil-nut processing cooperative, a natural rubber condom factory, and other forest product industries. Acre has one of the world's highest levels of timber certification, with 60% of its timber production certified by the Forest Stewardship Council (FSC). Acre is one of the first states in the Amazon region to resolve most of its land disputes.



Figure 3-2
Map of Location of Acre State, Brazil, in Southwestern Brazil

Acre occupies 164,221 km² and shares borders with Peru and Bolivia. Long isolated from major economies and markets by distance, Acre benefits from an all-weather highway across the Andes completed in 2011. The highway provides access to the international port in Ilo, Peru, and to important markets in Lima, Cuzco and other cities. The largest contributor to Acre's gross domestic product is the beef industry. Eighty-three percent of the forest that has been cleared supports cattle pastures today.

In 2010, Acre consolidated Florestania with passage of a new law that establishes the foundation for creating incentives for ecosystem services (Law 2.308/2010). This law, called "SISA", the "Sistema de Incentivos para Serviços Ambientais" (Environmental Service Incentive System) establishes principles, and an institutional framework to provide incentives for environmental services through policy innovation, and through public and private investments that flow into the state. Acre's first environmental service to be rolled out through a comprehensive program is carbon storage in forests.

Scope

Acre is beginning its SISA program with a focus on emissions reductions from deforestation, but plans to expand the scope of the program to include forest degradation and forest carbon enhancement as monitoring capacity is further developed.

Reference Level and Target

Acre's SISA law established a preliminary reference level and target that were compatible with the reference level and target established for Brazil's Amazon region by the federal government.⁴⁵ The reference level is adjusted for every five-year compliance period based on the average deforestation and associated emissions for the previous ten years. The target is established as a 42% downward adjustment every five years, as shown in Figure 3–3. Acre also is considering a flat reference level based upon historical emissions from 1996 through 2005.

For the first reference level approach, the state would reduce 182 MtCO₂e from 2006 through 2020, and already has reduced emissions below its target. For the second reference level approach, based upon average deforestation from 1996 to 2005, emissions reductions climb to 298 MtCO₂e. Both calculations assume an average carbon density difference between the forest and the vegetation that replaces it of 132 tC ha⁻¹ and emissions of 3.66 tCO₂e for every ton of forest carbon lost. Acre has submitted an official reference level for the 2006-2010 period to the VCS for validation, and has offered these recent emissions reductions on the Brazilian stock exchange of São Paulo (BOVESPA).

The reference level shown in Figure 3-3 is based upon the revised National Climate Change Plan's region-wide reference level that is adjusted downward every five years (Scenario 1), and the ten-year historical average deforestation rate (Scenario 2). Actual measured deforestation shows that 90 MtCO₂e of emissions from deforestation occurred from 2006 through 2010.

Nesting

Acre is committed to making its definitive reference level compatible with the Brazilian government's reference level for the Amazon region that is still under discussion. Acre does not need to find ways of making REDD+ projects compatible within SISA because there are no existing REDD projects in Acre. The government plans to finalize and implement projects involving private and public investors and project developers as integrated components of the fully operational forest carbon incentive system, and projects are under development.

Offset Issuance and Tracking

Acre has not established a formal mechanism to issue, register, and track offsets or other formal units of carbon emission reduction. It has engaged Markit to develop protocol carbon registries to work within SISA. The Acre Government plans eventually to issue offsets itself, and establish a carbon registry that is inter-operable with a national carbon registry (which also has not yet been developed).

⁴⁵ The target is part of the Brazilian National Policy on Climate Change (PNMC). See Law n. 12.187, of December, 15, 2009, and the Plan for Mitigation of Climate Change available at:
http://www.senado.gov.br/comissoes/CMMC/AP/AP20090519_PNMC_MMA.pdf.

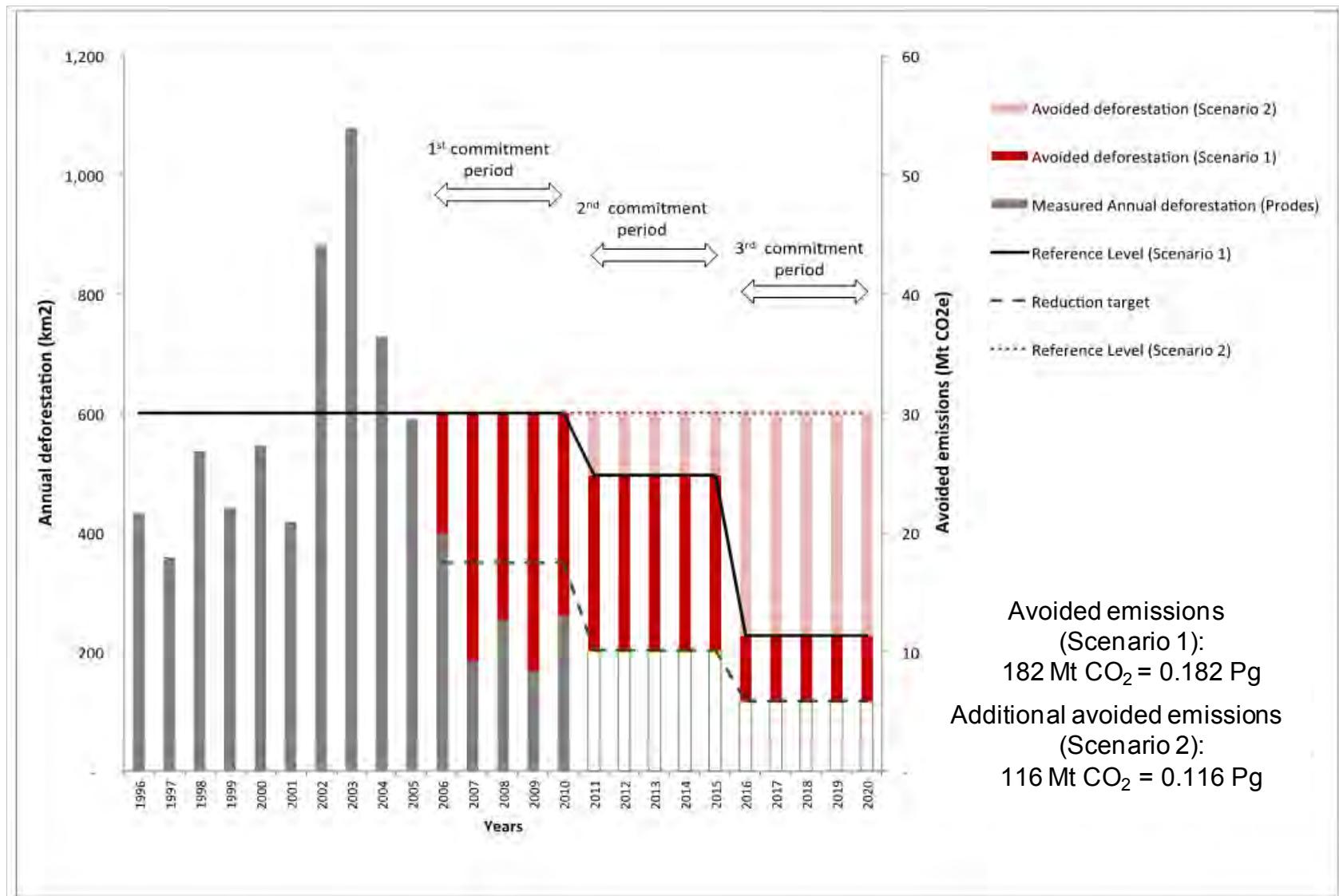


Figure 3-3
Acre's Jurisdiction-wide Deforestation Reference Level

Emissions Monitoring, Reporting and Verification

Acre will use the national deforestation monitoring system⁴⁶ as SISA's official deforestation monitoring and reporting system for the purpose of defining jurisdiction-wide emissions reductions. It also has established a state-wide system of forest monitoring that provides annual, LANDSAT-based maps of new areas of deforestation that are employed as a second source of information about the deforestation rates. It is analyzing different methods for adding to this system the annual mapping of forest degradation through logging and fire, and annual mapping of forest carbon enhancement through the regrowth of secondary forests. It is in the process of purchasing an advanced, airborne LIDAR system to improve the accuracy of this monitoring system.

Social and Environmental Safeguards

Acre is deeply committed to public consultation on all components of SISA. The draft SISA law itself was sent to 72 domestic and international organizations for review, along with 170 people from a range of stakeholders, and was made available for public comment through the government's online portal. SISA institutionalized consultation by establishing a multiple-stakeholder commission charged with reviewing new programs and projects under consideration. Acre has been the leading jurisdiction-wide REDD+ system engaged in the development of the "REDD+ Social and Environmental Standard" (REDD+ SES) initiated by CARE. This standard is being refined as the government tests the feasibility of the new standard. In its initial trial of the REDD+ SES, the state created 90 indicators for the evaluation of REDD+ projects, and found that the framework was cumbersome to implement.

Legal and Institutional Framework

Acre is the only state and province-based REDD+ system evaluated in this report that has *in situ* an operational, comprehensive legal and institutional framework at the jurisdictional level. The SISA law, passed by the state assembly in October 2010, is designed to create incentives for a range of ecosystem services, including the protection of hydrological and soil resources, climate stability, and natural scenic beauty. It builds upon, and is compatible with, the National Climate Change Policy of Brazil (NCCP) made into law in December 2009, the state's laws creating the ecological-economic zoning plan, and the state's directive on valuation of forests and environmental services.

SISA establishes the legal mandate for the creation of several institutions, all of which fall under the Secretaria do Estado de Desenvolvimento Florestal da Industria do Comércio e dos Serviços Ambientais (SEDENs, State Agency for the Development of Forest, Industry, Commerce and Environmental Services)⁴⁷ and the Secretaria Estadual de Meio Ambiente (SEMA, State Environmental Agency). The Instituto de Mudanças Climáticas (IMC, the Climate Change Institute) is charged with creating the law's regulations, registry, and controls for implementing the law and ensuring its integrity. The Companhia de Desenvolvimento de Serviços Ambientais

⁴⁶ Projeto Prodes (PRODES): Monitoramento da Floresta Amazonica Brasileira por Satelite, Instituto Nacional de Pesquisas Espaciais (INPE), 2010.

⁴⁷ SEDENS was created in 2012 by combining the State Forest Agency, SEF, and a portion of the State Agency for the Development of Economy, Industry, Commerce, Services, Science and Technology (SEDICT).

(CDSA, the Company for the Development of Ecosystem Services), soon to be created, will operate as a public-private entity charged with the financial viability of the states incentive programs by attracting investments into the system from the private sector and public donors. The Comitê Científico (Scientific Committee) is responsible for overseeing the technical and scientific integrity of the reference level establishment, monitoring system, and assessment of emissions reductions. The Comissão de Validação e Monitoramento (CVA, Commission of Validation and Monitoring) is responsible for overseeing the implementation of the law, and is comprised of four members from civil society and four from government. Finally, an Ombudsman office functions to hear grievances and complaints about SISA. Figure 3-4 shows the institutional structure created by Acre's SISA program.⁴⁸

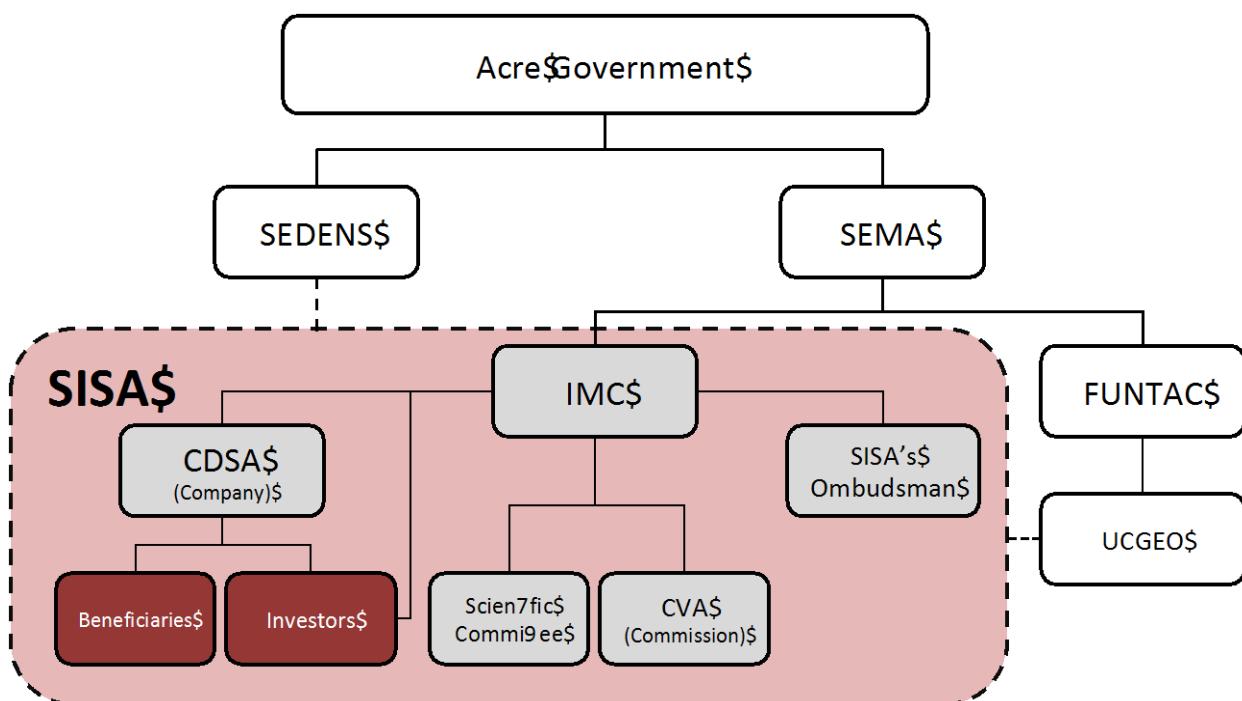


Figure 3-4
Institutional Structure of Acre's “Environmental Service Incentives System” (SISA)

REDD+ Planning

Acre's SISA mandates the creation of sector-specific sub-programs to support the transition to low-emission pathways. Sub-programs are under development for smallholders, indigenous groups, agro-extractive populations (including rubber tappers and Brazil-nut gatherers), medium-

⁴⁸ Alencar et Al. *Acre's Progress Towards Jurisdictional REDD+*. IPAM, (2012), pp 12-13. Acre has also the Geoprocessing Center (UCEGEO) who supports the IMC and it is linked to the Acre Foundation of Technology (FUNTAC), to monitor the losses and gains of carbon as well as other environmental services, subprograms and projects within SISA. The SISA's Ombudsman is an office established to provide a channel of social control, monitoring and participation of the civil society related to the system.

and large-scale cattle producers, protected areas, and the timber sector. None of these sub-programs are completed. Of particular concern in Acre's march towards the development and implementation of a jurisdiction-wide REDD+ program is the lack of progress in engaging the main historical drivers of deforestation – medium- and large-scale cattle ranchers – in an effort to significantly reduce deforestation driven by cattle ranch expansion.

Financing

Acre was the first state in the Amazon to receive a grant from the Brazilian Amazon Fund (R\$66.7 million, approximately US\$45 million), representing a portion of Norway's \$1 billion performance-based commitment to Brazil to achieve REDD-based emissions reductions. This grant will allow Acre's government to develop much of the basic infrastructure for its SISA program, including improving its monitoring system, creating a carbon registry, developing some of the sector-specific sub-programs, and organizing consultation processes.

Acre's main institutional mechanism to attract private sector investment is the CDSA. Although the CDSA has not yet been established, government officials have been actively seeking a variety of investments into the system. These include: (i) large-scale project development with private investors; (ii) a release of recent emissions reduction units (vintage 2006-2010) onto the Brazilian São Paulo Stock Exchange (BOVESPA); (iii) an MOU with the State of California to provide offsets into the state as part of the implementation of the state's cap-and-trade system; and, (iv) a dialogue with São Paulo's state government and industries about possible linkages between this state's cap-and-trade program and offsets from Acre's SISA program.

Chiapas, Mexico

Overview

Chiapas is Mexico's southernmost state, as shown in Figure 3-5. Chiapas has steadily advanced in its REDD+ efforts since 2010, when it first made a formal commitment to establish a REDD+ program. The federal and state governments have implemented early REDD+ actions in Chiapas to create incentives for conservation, sustainable agricultural practices, and capacity building for forest management. In addition, Chiapas enacted climate change legislation that provided the groundwork for the development of a statewide REDD+ strategy. State authorities elaborated a climate action plan with reference levels for REDD+ and with stakeholder engagement they are drafting Chiapas' REDD+ strategy.⁴⁹ Finally, the recently passed national climate change law (*Ley General de Cambio Climático*)⁵⁰ recognizes the importance of state REDD+ programs,⁵¹ as well as their authority to implement economic mechanisms to mitigate climate change.⁵²

⁴⁹ Programa de Acción Ante el Cambio Climático del Estado de Chiapas (2011) [hereinafter “PACCCH 2011”] and CONAPO, <http://www.cambioclimaticochiapas.org/portal/descargas/paccch/paccch.pdf>.

⁵⁰ Passed Bill of General Climate Change, April 17, 2012, Mexico Senate, http://www.senado.gob.mx/sgsp/gaceta/61/3/2011-12-06-1/assets/documentos/Dic_MA_Cambio_climatico1.pdf (last visited May 17, 2012).

⁵¹ *Id.* at art. 2 and 34 *caput*, and § III.

⁵² *Id.* at art. 7, § XXI.

Notwithstanding such progress, many challenges remain to be addressed, including: (i) alignment of the state's commitments to reduce GHG emissions from deforestation with Mexico's national and international commitments; (ii) establishment of REDD+ institutional arrangements, including project nesting; (iii) design of a clear pathway to register REDD+ projects, monitor and verify emission reductions, and issue and retire emission reduction certificates; and, (iv) development of a statewide REDD+ plan with policies and financial mechanisms to redirect the ranching, agricultural and logging activities that are the main drivers of deforestation and forest degradation to alternative economic activities and practices.



Figure 3-5
Map of Location of the State of Chiapas in Southern Mexico

Background

It occupies an area of 74,415 km² and borders Guatemala and the Mexican states of Tabasco, Oaxaca, Veracruz and Campeche. Chiapas has temperate forests in its highlands (with the highest peak reaching 4,093 meters) and a lush tropical forest in the Lacandon zone. The state has a total of 47 different protected areas on federal, state, and private lands, covering 19.8% of the state's geographical area.

Chiapas has vast cultural and ethnic diversity as well. Out of 4.8 million inhabitants, 1.5 million are indigenous people.⁵³ Chiapas was a center of the Mayan civilization and the state's population maintains high linguistic diversity. Nonetheless, Chiapas also faces some significant challenges. The state has the second highest marginalization and poverty rate in the country, with about one quarter of its population (mostly indigenous people) having no access to health and other public services.⁵⁴ Malnutrition rates in Chiapas are also the second highest in Mexico.⁵⁵ Chiapas' population relies heavily on agriculture and cattle ranching for subsistence, as 52% of its inhabitants live in rural areas, as opposed to the national average of 24%.⁵⁶

The main drivers of deforestation in Chiapas are conversion of land from forest to pasture and agriculture. The main drivers of degradation are extraction of wood for commerce, fence posts, and housing materials, forest fires; and conversion to farming. According to the state's GHG inventory, deforestation and forest degradation alone are responsible for 57% of the state's total emissions.⁵⁷ Hence, REDD+ actions could potentially play an important role in reducing CO₂e emissions and improving people's livelihoods in Chiapas.

Mexico stands out among many developing nations because most rural communities have ownership of and clear title to their land. Mexico's constitution⁵⁸ recognizes three types of land ownership, including community ownership through (i) *ejidos* and (ii) communal land, and (iii) private property. In 1992 a constitutional reform allowed *ejidos* to recognize and certify individual land holdings. This measure was intended to stimulate private investment in rural areas, but has exacerbated deforestation as it has fragmented some *ejidos* and weakened collective governance structures.

Ejido governance is strong through community and *ejido* assemblies that operate within a system of agrarian communal authority that provides autonomy on collective land-use decisions. This authority extends to the use of forest land. The environmental services payment program of the National Forestry Commission (CONAFOR) has stimulated protection of communal forests. REDD+ potentially could further facilitate community land use planning and progressively improve forest management.

Chiapas has large areas of communal land such as the Lacandon community and the Maya area in the Chiapas highlands. In addition, Chiapas has areas of land in which property rights remain undefined.

⁵³ Mexico's National Population Council (CONAPO), http://www.conapo.gob.mx/index.php?option=com_content&view=article&id=37&Itemid=235 (last visited, May 17, 2012).

⁵⁴ CONAPO (2005) and National Council of Evaluation of Social Development Policy (CONEVAL), http://www.conapo.gob.mx/publicaciones/margina2005/IM2005_principal.pdf

⁵⁵ PACCCH 2011. *See supra* note 49.

⁵⁶ Mexico's National Institute of Statistics and Geography, INEGI (2010), <http://www.inegi.org.mx/default.aspx>, last visited May 17, 2012.

⁵⁷ PACCCH 2011. *See supra* note 49.

⁵⁸ Constitution of the United States of Mexico, at art. 27.

Scope

Chiapas does not have an officially defined scope for its REDD+ program. However, under the recently approved Climate Change Action Program for the State of Chiapas (PACCCH),⁵⁹ the definition of REDD+ includes deforestation, degradation, and carbon enhancement.

Reference Level and Target

Chiapas has not yet determined its official reference level for its REDD+ program. Levels of deforestation and degradation were estimated under PACCCH, and these rates likely will be used to develop the state's REDD+ reference levels. The historical rates of deforestation and forest degradation from 1993 to 2007⁶⁰ were:

- Average deforestation rates⁶¹ for 1993-2007 = 34,085 ha/year
- Average degradation rates⁶² for 1995-2007 = 48,410 ha/year

Chiapas has set an ambitious goal to reach a net deforestation rate of zero,⁶³ but this is yet to be linked to any timeline or plan of action to reduce deforestation. Significant on-the-ground monitoring and training of community technicians may be needed to improve reference level estimates, and to monitor future declines in CO₂e emissions. Existing maps of aboveground biomass^{64, 65} could be used by the state to improve its emissions estimates.

⁵⁹ PACCCH 2011. See, supra note 49.

⁶⁰ De Jong, et al. 2010. Inventario de emisiones de gases de efecto invernadero provenientes de agricultura, silvicultura y otros usos del suelo y escenario de emisiones futuras para Tabasco. Page 30 in B. De Jong, editor. Informe para la Secretaría de Recursos Naturales y Protección Ambiental del Gobierno de Tabasco. bajo el marco del PEF.

⁶¹ The state's publicly available data do not present average deforestation rates by hectare. These numbers were calculated by the authors as follows: (1) total deforested area from 1993 to 2007 was 477,192 according to PACCCH; (2) total deforestation from 1993-2007 (14 years) at 0.86% /year (PACCCH) was 12.04%, using these numbers the total initial forested area was back calculated to be 3.96 million hectares which is slightly higher but similar to Conservation International's estimate of forested area in Chiapas (3.81 million); 3). This total forested area was multiplied by 0.86% to get the deforestation rate in ha/yr.

⁶² The state's publicly available data do not present average degradation rates by hectare. These numbers were calculated by the authors as follows: (1) total degradation from 1993-2007 was 3%/year (PACCCH); 2) The total conserved forest area was given in the PACCCH as 1.92 million hectares; 3) This number was reduced by 3%/year in a mathematical sequence giving a total degraded area over 14 years of ~670,000 hectares (also given in PACCCH); 4). The average degradation resulting from this calculation is listed above.

⁶³ Chiapas Climate Change Adaptation and Mitigation Law, art. 9, I, a, Government of Mexico, available at http://www.theredddesk.org/sites/default/files/ley_cambio_climatico_chiapas_2.pdf. [hereinafter Chiapas Climate Law].

⁶⁴ See supra note 26.

⁶⁵ Sassan Saatchi et al., Benchmark Map of Forest Carbon Stocks in Tropical Regions Across Three Continents. Proceedings of the National Academy of Sciences, 2011.

Deforestation: Methodologies Used to Calculate Rate

Deforestation rates were estimated using data primarily from the National Forestry and Soil Inventory of CONAFOR 2004-2010 and the National Inventory of Eroded Soils from Mexico's National Institute of Statistics and Geography (INEGI) 2007-2010.

To analyze the deforestation rates and trends, experts utilized maps of vegetation cover and land-use from INEGI series II, III and IV (at a scale of 1:250,000 from the years 1993, 2002 and 2007). The legends of the maps were modified to generate general classes of vegetation, and comparative analysis generated data for trends in coverage changes and deforestation.

Degradation: Methodologies Used to Calculate Rate

To determine the extent of forest degradation in Chiapas, LANDSAT remote sensing images from the years 1990, 1995, 2000, 2005, 2007, and 2009 were reconciled to match the INEGI map series II, III and IV to reduce the error range. Next, these aerial images were compared with maps of forest generated by Conservation International (CI). To analyze forest degradation, the category of “degraded forest” is defined as vegetative cover ranging from 10% to 30%. It was estimated that from 1993 to 2007, the degradation rate was approximately 3%. The uncertainty of forest degradation data was estimated to be 30% to 40%.

Nesting

Chiapas has not yet determined how its program will work under a national REDD+ program, but it is working closely with the national Technical Advisory Committee for REDD+ (CTC-REDD+). It also has not decided if it will nest REDD+ projects under the state’s accounting system, or the type of projects that would qualify. However, the state is likely to clarify this situation in the near future, considering that Chiapas hosts several projects that may generate emissions reductions from REDD+ activities under the state’s system.

Na Bolom (an NGO working in Chiapas) is developing a REDD+ project in Cerro La Cojolita, in the Lancandon zone with an expected start date in 2012. Another project, Scolel’Te, dates back to 1997, and is located in Ocote Biosphere Reserve. Although this project already has generated carbon credits for use in the voluntary market based on the Plan Vivo standard, the project sponsors may seek to convert it into a REDD+ project to be recognized under the state REDD+ strategy.

Furthermore, Pronatura Sur (an NGO) is developing a baseline for forest carbon enhancement in the mangroves of Chiapas’ coastal area, and is expected to introduce an avoided deforestation component in the project. Furthermore, Mexico’s National Commission for Knowledge and Use of Biodiversity (CONABIO) has been appointed by CONAFOR as a main operator for REDD+ early actions on federal lands. Finally, USAID recently approved a grant to The Nature Conservancy (an NGO) to develop a REDD+ project in the Cuxtepec watershed.

Offset Issuance and Tracking

Chiapas does not have official methodologies or standards, or a system for issuing REDD+ credits, but the state’s REDD+ strategy may address this issue in the near future. The only methodology used in the state at this time is the Plan Vivo, which was developed for use in the Scolel’Te project. Other standards are under consideration for the new projects that are being designed.

Chiapas does not have a carbon registry, but the state strategy for REDD+ is likely to define a registry system. It is clear, however, that the State Secretary of Environment and Natural History (SEMAHN) has the authority to register projects to mitigate climate change actions in Chiapas, including REDD+.⁶⁶

Emissions Monitoring, Reporting and Verification

SEMAHN is responsible for collecting data on deforestation and degradation. As explained above, Chiapas recently determined its historic deforestation and forest degradation rates. However, levels of uncertainty are still high: 44% for deforestation, and ranging from 30% to 40% for degradation. Chiapas faces several challenges related to emissions monitoring, including its complex topography, its high levels of biodiversity, and the mosaic pattern of land use.

Deforestation and Degradation

Chiapas still needs to establish an operational system for monitoring deforestation, forest degradation, and forest carbon enhancement. Monitoring methodologies have been designed by the Mexican Carbon Program to reduce uncertainty and lower costs. This has included the design of a community monitoring protocol that has been tested by members of Chiapas' Technical Advisory Committee for REDD+ (Chiapas CTC REDD+). Community monitoring is one of the methods that can reduce cost, and provide the bulk of the data needed to reduce uncertainty. In 2011, the National Forest Inventory was updated throughout the country, and additional sample plots were included in Chiapas to improve estimates. A new set of data likely will be released in mid-2012, and this is expected to reduce uncertainty to 25%. Use of technologies, such as airborne LIDAR, have been considered, but the rolling topography may limit the effectiveness of this approach.

Forest Carbon Stocks

Forest carbon stock of Chiapas has been estimated by projects that have combined multiple satellite-borne sensors and field plots,^{45, 46} but the Chiapas state government has not yet had access to these estimates. The Law of Sustainable Forestry (2008) directed the State Forestry Commission to quantify the carbon stored in Chiapas' forests. However, there is not enough technical capacity within the state institutions to conduct such an analysis at this time.

Social and Environmental Safeguards

Social and Environmental safeguards are described in Chiapas' climate change legislation and PACCCH. SEMAHN was directed by the climate change legislation to engage stakeholders when developing mitigation and adaptation policies,⁶⁷ and to create the State Environmental Advisory Council (CCAE)⁶⁸ to advise the state on climate change policies. The CCAE has not yet been formed.

⁶⁶ Chiapas Climate Law, at art. 21, § VIII, *See supra* note 63.

⁶⁷ Chiapas Climate Law, at art. 27, *see supra* note 63, and Regulation of Chiapas Climate Change Adaptation and Mitigation Law [hereinafter Chiapas Regulation], art. 52.

⁶⁸ Chiapas Regulation, at arts. 53-56.

Furthermore, the PACCCH directs the state REDD+ strategy to observe the following guidelines: (i) increase ecosystem resilience to fires and other climate change effects to reduce the risks of disasters to the people who inhabit these areas;⁶⁹ (ii) strengthen indigenous peoples' capacities and take their traditional cultures and knowledge into consideration;⁷⁰ (iii) provide training programs to strengthen the processes and organizational capacities of local communities and *ejidos* to manage projects, develop sustainably, and share program benefits;⁷¹ and, (iv) ensure that REDD+ related activities contribute to social development of the state and respect rights of indigenous peoples and rural communities in general.⁷²

Chiapas' government is employing different strategies to engage stakeholders. For example, PACCCH was open for public consultation, and in April 2011, SEMAHN organized a PACCCH tour to educate the public about climate change and its effects on Chiapas. SEMAHN also developed a webpage with detailed information about PACCCH and its progress.

The state's legislation does not require the Free, Prior, and Informed Consent (FPIC) of indigenous people or traditional communities prior to the implementation of REDD+ activities on their lands.⁷³ A draft federal law states that: "actions and programs implemented by the government, affecting indigenous rights must contain their FPIC."⁷⁴ Still, indigenous groups are advocating for the adoption of legislation that implements the principles as enunciated in the United Nations Declaration on the Rights of Indigenous People (UNDRIP) which are much more robust than the draft federal law.

Environmental safeguards are also being implemented. The PACCCH directs the state REDD+ strategies to take into account the maintenance and restoration of ecosystem services and the state's wealth of biodiversity.⁷⁵

Legal and Institutional Framework

Legal Framework

Chiapas has enacted several laws relevant to its efforts to establish a jurisdictional REDD+ program. In 2008 it passed the Law for Sustainable Forestry Development. The goals of this law were to: (i) regulate protection, conservation, and restoration of ecosystems and forestry resources; (ii) establish guidelines for forest management;⁷⁶ and (iii) set goals for short, medium, and long-term outcomes. In 2010 Chiapas enacted the state Climate Change Adaptation and

⁶⁹ PACCH (2011), line of action 4.1.1. *See supra*-note 49.

⁷⁰ *Id.* at line of action T.1.3.2.

⁷¹ *Id.* at line of action T.1.3.2.

⁷² *Id.* at line of action M.1.4.

⁷³ According to the Constitution of Mexico, art. 2, § A (VIII), and B it appears that Chiapas has this authority.

⁷⁴ The draft law is available at: <http://www.diputados.gob.mx/documentos/enero/convocatoria.pdf>. *See more* specifically art. 9, § I, e (last visited May 17, 2012).

⁷⁵ PACCH (2011) line of action M.1.4. *See supra* note 49.

⁷⁶ Law for Sustainable Forestry Development for the State of Chiapas of October 29, 2008, art. 4, § II.

Mitigation Legislation,⁷⁷ establishing the basis for a REDD+ strategy. The law sets the state's target deforestation rate at 0%⁷⁸ and encourages the conversion of degraded lands into areas of sustainable use.⁷⁹ It also lays the groundwork for systems that provide payments for ecosystem services,⁸⁰ and the creation of programs to reduce deforestation and forest degradation.⁸¹ Additionally, it directs policies to strengthen the state's infrastructure to forestall wildfires.⁸²

However, Chiapas still does not have a specific REDD+ legal framework. Currently, the state is working on its REDD+ strategy, which will be the main legal basis for REDD+ actions once it is approved.

Chiapas' legislation recognizes the need to align its policies with federal directives⁸³ and the state has been working closely with federal authorities to create a REDD+ strategy integrated with the national strategy.⁸⁴ For example, PACCCH was developed with participation from the federal Ministry of Environment and Natural Resources (SEMARNAT), and its content reiterates the need to create a state program compatible with the federal strategy for climate change.

Mexico's government recently passed a climate change law.⁸⁵ As written, the law establishes: (i) the co-responsibility and need for cooperation between federal, state and municipal governments to address climate change;⁸⁶ (ii) the development polices and action plans by states to mitigate climate change, including emissions reductions from deforestation and forest degradation;⁸⁷ and (iii) the provision of federal technical support to states engaged in developing programs and emissions inventories.⁸⁸

⁷⁷ See Chiapas Climate Law. See supra note 63.

⁷⁸ *Id.* at art. 9, §I, a. However, the law does not establish a date to achieve the 0% rate of deforestation.

⁷⁹ *Id.* at art. 9, § I, b and c.

⁸⁰ *Id.* at art. 9, § I, f.

⁸¹ *Id.* at art. 9, § I, g. The regulation in the law also supports REDD+ actions, art. 2 § XXXI. However, it is unclear if this regulation was enacted yet.

⁸² *Id.* at art. 9, § h.

⁸³ *Id.* at arts. 3, §§III and VIII, and 17 §§II, XI, and XIII.

⁸⁴ For example, all projects hosted in Chiapas from May 2010 to April 2011 related to climate change have been reported to the federal Secretary of Environment (SEMARNAT). Information obtained from Chiapas, Mexico, GCF Database. Expected to be available online in 2012 at www.gcftaskforce.org. See Section One for more information about the GCF Database.

⁸⁵ Passed Bill of General Climate Change, April 17, 2012, Mexico Senate, http://www.senado.gob.mx/sgsp/gaceta/61/3/2011-12-06-1/assets/documentos/Dic_MA_Cambio_climatico1.pdf (last visited May 17, 2012).

⁸⁶ *Id.* at arts. 2, 7, § XXI, 8, § VIII, and 58.

⁸⁷ *Id.* at art. 34, VIII.

⁸⁸ *Id.* at art. 22, X.

As mentioned above, there is not yet a plan detailing how states' REDD+ programs will be integrated within Mexico's national commitments, or the volume of carbon credits that states will be allowed to generate from REDD+ activities.

However, Chiapas has enacted some mechanisms to align policies among sectors and with the federal government to slow deforestation and degradation in the state. The climate change law created the Chiapas' Intersecretarial Commission for Climate Change Coordination (CCICCCCH) to align climate change adaptation and mitigation policies among sectors.⁸⁹ This entity is responsible for approving climate change policies including sectoral programs, actions, and strategies;⁹⁰ it is presided over by the governor and is composed of state secretaries from a range of sectors including environment, transportation, infrastructure, rural, development, and education.⁹¹ The CCICCCCH was formally established in November 2011.

Chiapas also has a State Forestry Advisory Council, also presided over by the governor, with members including: state secretaries of rural affairs, environment, natural resources; officials from municipalities and the federal government; as well as representatives from academia, the forestry industry, and indigenous communities.⁹² The Council was created in 2008 by the law for sustainable forestry (discussed under legal framework), and is responsible for advising and evaluating policies for forest conservation, protection, and restoration.⁹³ If Chiapas successfully links the work of the CCICCCCH with that of the Forestry Advisory Council it could improve alignment of forestry policies in the state. This alignment, however, may be limited by financial resources because in Mexico decentralization of natural resource management has not been accompanied by a concomitant decentralization of funding.

Institutional Framework

Chiapas' 2010 climate change legislation directed SEMAHN and its undersecretary to elaborate, publish, and adopt Chiapas' climate change mitigation and adaptation programs and strategies.⁹⁴ During this process they must: (i) identify, evaluate, approve, and register projects to reduce and capture GHGs;⁹⁵ (ii) create instruments to promote and strengthen institutional and sectoral capacity toward the reduction of GHG emissions and climate adaptation;⁹⁶ and, (iii) create financial incentives, including market mechanisms to advance climate change mitigation and adaptation actions.

⁸⁹ Chiapas Climate Law, art. 13. See supra note 63.

⁹⁰ *Id.* at art. 17.

⁹¹ *Id.* at art. 14, § I -XV.

⁹² Law of Sustainable Forestry, at art. 122. See infra note 76.

⁹³ *Id.* at art. 121.

⁹⁴ *Id.* at art. 21 and 27. *See also* Chiapas Regulation, art. 12, §§ I –V. *See* supra note 67.

⁹⁵ Chiapas Environmental Law, art. 20, § V, and Climate Change Adaptation and Mitigation Law, art. 21, § VIII.

⁹⁶ Power given by the Regulation of Chiapas Climate Change Law, at art. 12, § XIV.

In addition, the climate change legislation calls for the creation of a State Fund,⁹⁷ responsible for collecting and allocating financial resources for mitigation and adaptation efforts in the state (including actions to avoid deforestation and forest degradation).⁹⁸ SEMAHN is responsible for administering the fund.

The 2008 law for sustainable forestry created a Forestry Commission and a Forest Trust Fund. The Commission is responsible for: (i) elaborating an inventory of carbon stored in Chiapas' forests; (ii) promoting mechanisms of payment for forest environmental services, with the highest priority being for services of carbon sequestration for climate change mitigation;⁹⁹ and (iii) certifying, evaluating and monitoring these services. The Trust Fund is responsible for attributing value to forest ecosystem services, and channeling public and private funds for the payment of these services.¹⁰⁰

Chiapas' SEMAHN, Forestry Commission, the Environmental Fund, and the Forest Trust Fund have overlapping authorities. However, because the climate change law is the most recent (2010) and derogated older legislation that may be in contradiction, SEMAHN and the Environmental Fund authorities are likely to supersede the Forestry Commission and Forest Trust Fund authorities.¹⁰¹

In August 2011 Chiapas officially created the CTC-REDD+¹⁰² composed of experts from government, non-governmental organizations and universities to advise the state on REDD policies and strategies. The Chiapas CTC REDD+ program is linked with Mexico's CTC REDD+, and national sessions include a progress report from each state entity. CONAFOR is the head of REDD+ in Mexico, and they are current members of the Chiapas CTC REDD+. Chiapas CTC-REDD+ and the CCAE will advise the CCICCCH.

REDD+ Planning

Over the past few years, Mexico's federal government¹⁰³ and the State of Chiapas have begun to develop a foundation for REDD+ policies in Chiapas. The Mexican government is implementing a number of programs.¹⁰⁴ First, the Development of Forestry Practices in Communities of Southern

⁹⁷ Chiapas Climate Law at art. 29. *See* supra note 63.

⁹⁸ *Id.* at art. 29, § II.

⁹⁹ Law for Sustainable Forestry at, art. 79, § I. *See* supra note 76.

¹⁰⁰ *Id.* at art. 34.

¹⁰¹ This co-relation/comparison analysis was made here because Chiapas listed the Forestry Trust Fund as responsible for channeling funds for payment for forestry environmental services.

¹⁰² Chiapas already had a REDD+ working group, but now the group has an official position as the CTC REDD+, under the umbrella of the state. *See* more at http://www.cambioclimaticochiapas.org/portal/index.php/noticias/ver_noticia/30

¹⁰³ Mexico is implementing early REDD+ program/strategies as part of the process to achieve its readiness for REDD+ (for more information, consult Mexico's R-PP). Chiapas was chosen to host early REDD+ actions because of its high biodiversity and social conditions.

¹⁰⁴ Mexico's government acts through its federal entities: the CONAFOR, the National Commission of Natural Protected Areas (CONANP), and the National Institute of Ecology (INE).

Mexico (DECOFOS)¹⁰⁵ is improving the livelihood of communities in Chiapas by building their capacity to manage forests and creating sustainable business and agricultural practices.

A second program is paying the Naha community in the Lacandon Jungle protected area to protect their forest. The idea is to assign monetary value to conservation of forest biodiversity, and to strengthen the capacity of indigenous peoples' to monitor, conserve and restore forest ecosystems.

A third program, also located in the Lacandon Jungle, is promoting conservation, restoration, and sustainable use on 300,000 ha of forested land. Indigenous people, small landholders, and local *ejidos* are benefiting from this program.¹⁰⁶

Inspired by the federal efforts, Chiapas has pledged one peso of state money for every peso that the federal government invests in REDD+ actions in the state. As a result, in December 2010 Chiapas started its first early REDD+ action project named "Pact for the Respect of Mother Earth: Lacandon Jungle." The project is financed with state funds coming from automobile ownership taxes. It occupies an area of 480,000 ha, and is spread among seven national natural protected areas. The local inhabitants legally living in the area (i.e., indigenous people, small landholders, and *ejidos*) are included in the project. The project aims to protect the forest by discouraging deforestation practices. In exchange, the government provides financial assistance and capacity building to the local population.¹⁰⁷

Overall, Chiapas has made significant advances toward implementation of a statewide REDD+ strategy as summarized in Table 3-4. However the state is still missing essential components necessary to generate compliance grade emissions reductions from a jurisdictional REDD+ program. Chiapas currently is working to address different issues, as it develops the state REDD+ strategy, which is expected to be presented to the CCICCCCH for approval in 2012.

Financing

Most of the financial resources used to develop Chiapas' REDD+ early actions and the state's REDD+ strategy are coming from the federal and state governments, although there is some international financial support.

Chiapas is included in the Forest Investment Program (FIP) – one of the World Bank's climate finance mechanisms. The FIP program seeks to reduce GHG emissions from agricultural practices, with a focus on emissions from the conversion of forest to grasslands, and conversion by slash and burn practices. The program will support projects for community forestry and capacity building, as well as linkage of programs under SAGARPA (Ministry of Agriculture) and CONAFOR. The FIP currently is considering requests for a US\$16.4 million loan and a US\$25.6 million grant.

¹⁰⁵ The project also has financial support from the International Fund of Agrarian Development (FIA).

¹⁰⁶ More information is available online at <http://www.conafor.gob.mx/portal/index.php/tramites-y-servicios/apoyos/convocatoria-programa-especial-para-la-conservacion-restauracion-y-aprovechamiento-sustentable-de-la-selva-lacandona> (last visited May 17, 2012).

¹⁰⁷ Chiapas, Mexico, GCF Database. Expected to be available online in 2012 at www.gcftaskforce.org. See Section One for more information about the GCF Database.

Table 3-4
Summary of REDD+ Progress in Chiapas.

Year	Action	Description	Actor	Status
2010	Climate Change Adaptation and Mitigation Legislation	Set the basis for a REDD+ program to be developed	State of Chiapas	Active
11/2011	PACCCH-Climate Change Action Program for the State of Chiapas	PACCCH is concluded		Approved
11/2011	CCICCH-Chiapas' Intersecretarial Commission for Climate Change Coordination	Responsible for approving strategies and coordinating climate change policies, including REDD+	Governor and state secretaries	Expected to analyze REDD+ strategy proposal in 2012-Active
08/2011	CTC-REDD+ (Chiapas Technical Advisory Committee for REDD)	Advise the CCICCH on REDD+ strategies and policies	Experts from SEMAHN (State Secretary of Environment and Natural History), non-governmental organizations, academic universities and the federal government	Active
–	Chiapas Environmental Council (CCAE)	Advise CCICCH on its REDD+ decisions	Governor, members of the state government, stakeholders, and general society	To be consulted about the REDD+ strategy before it is approved (no veto power)
–	REDD+ Strategy	Being prepared by the CTC-REDD+ (proposal). Then, it is expected to be analyzed and approved by the CCICCH, with advice from the CCAE.	CTC-REDD+, CCAE, and CCICCH	Expected to be presented at any time

Mato Grosso, Brazil

Overview

Mato Grosso is Brazil's most productive geographic region, producing 31% of the national soy harvest and 16% of beef output.¹⁰⁸ Figure 3-5 shows the location of Mato Grosso in South America.



Figure 3-6
Map of Location of Mato Grosso, Brazil

Mato Grosso also is a large GHG emitter. From 1996 through 2005, deforestation rose steadily in the state, averaging approximately 7,600 km² per year. This was equivalent to about half of total deforestation in the Brazilian Amazon region, and approximately 1% of global anthropogenic carbon emissions to the atmosphere.¹⁰⁹ Figure 3-6 shows annual deforestation in Mato Grosso and the Brazilian Legal Amazon region.

Mato Grosso also provides an important example of the potential to reconcile agricultural expansion with forest conservation. From 2005 to 2011, deforestation declined 85% below its ten-year average, while agricultural production continued to increase.¹¹⁰ More than half of the

¹⁰⁸ Brazilian Institute of Geography and Statistics (IBGE, 2011).

¹⁰⁹ Nepstad, *supra* note 11.

¹¹⁰ Marcia N. Macedo et al., *Decoupling of Deforestation and Soy Production in the Southern Amazon During the Late 2000s*, Proceedings of the National Academy of Sciences (2012).

global reduction in carbon emissions from reduced deforestation that has occurred since 2005 took place in Mato Grosso. In part by relying on more intensive cattle ranching techniques than had been previously used, Mato Grosso increased agricultural production at the same time that it achieved significant reductions in deforestation. Higher stocking densities and increased beef yields per hectare opened up space for agricultural expansion onto former pasturelands.

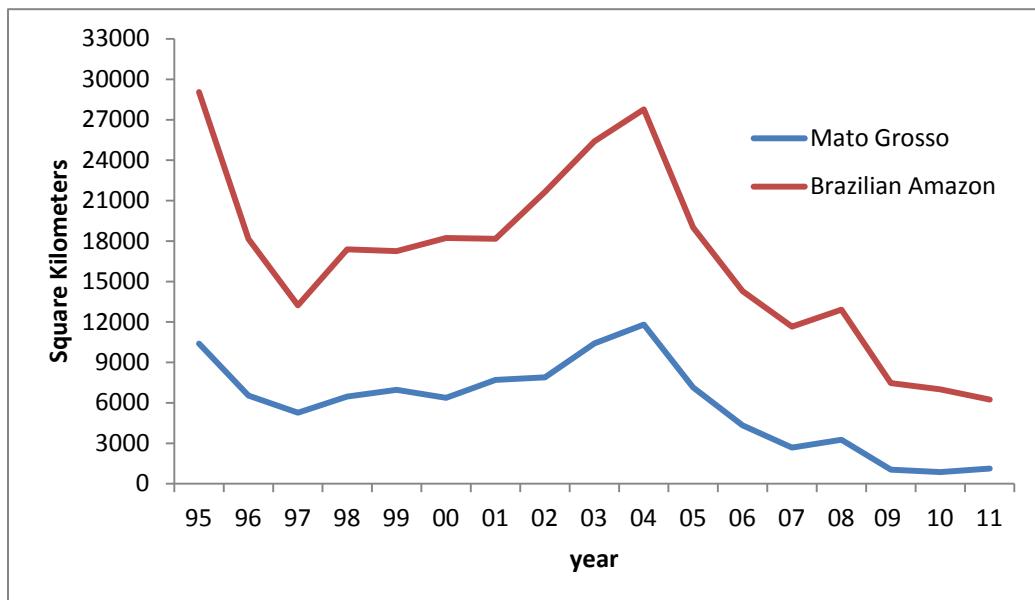


Figure 3-7
Annual Deforestation in Mato Grosso and the Brazilian Legal Amazon Region

Mato Grosso's remarkable record of declining deforestation appears to be the consequence of several interacting factors, including a period of low prices and profitability for soy production beginning in 2005, market transformation that discouraged forest conversion to crops and cattle pasture, heightened enforcement of forest protection laws by government agencies, and other governmental interventions.^{111,112}

This dramatic history of agricultural expansion combined with reduced deforestation is the broader context in which Mato Grosso is developing its fledgling REDD+ program. One key issue to be addressed in Mato Grosso is the extent to which a REDD+ program can effectively engage an agricultural sector that generates more than \$7 billion in revenues each year as the prices of soy and other agricultural commodities may rise over time.¹¹³ Can REDD+ continue to contain or further lower deforestation rates, while allowing agricultural expansion to occur onto existing pasturelands?

¹¹¹ Daniel Nepstad, David G. McGrath and Britaldo Soares-Filho, *Systemic Conservation, REDD, and the Future of the Amazon Basin*, Conservation Biology 25 (2011) pp. 1113-1116.

¹¹² Soares-Filho et al. supra note 15.

¹¹³ Organization for Economic Co-Operation and Development (OECD) and Food and Agriculture Organization of the United Nations (FAO) Agricultural Outlook 2010-2019 248, OECD/FAO, 2010.

Mato Grosso's main institutional mechanism for developing its REDD+ program is the "Fórum Estadual de Mudanças Climáticas do Mato Grosso" (Mato Grosso State Forum on Climate Change, referred to here as the "Forum"). This multi-stakeholder group was formed in May 2010, and has drafted a proposed state REDD+ law. The public consultation process for the draft REDD+ law recently was completed, and included input from many sectors (e.g., indigenous, farmers, forestry producers, smallholders). Currently, revisions are being incorporated into the draft legislation. There are many challenges related to finalizing this legislative process, including: (i) the low level of involvement of government agencies outside of the Secretary of Environment (SEMA); (ii) the low level of engagement by the private sector; (iii) opposition to approval of the proposed legislation by some of the state's legislative representatives; and, (iv) the limited development of sector-specific plans for REDD+.

Background

The State of Mato Grosso has a total area of 903,357 km² and a population of 3,035,122 inhabitants.¹¹⁴ The population density is 3.36 people/km². Agriculture is the dominant economic activity in the state, and its fluctuation drives fluctuations in other economic sectors, as shown in Figure 3-8. Roughly one fifth of state GDP is generated by exports, with 88% of exports being accounted for by soy meal, oil, and beans according to the Mato Grosso Secretary of Planning (SEPLAN – MT).

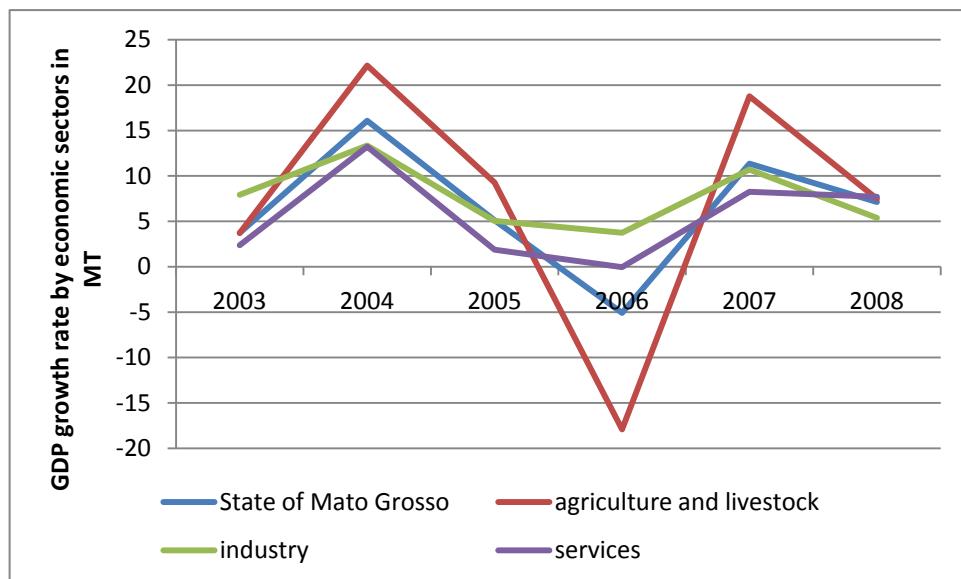


Figure 3-8
GDP Growth Rate by Economic Sectors in Mato Grosso, Brazil

¹¹⁴ Censo Demográfico 2010,, IBGE, 2011. Table 3145 - População residente por sexo, situação do domicílio e cor ou raça - Resultados Preliminares do Universo
<http://www.sidra.ibge.gov.br/bda/tabela/protabl.asp?c=3145&z=t&o=25&i=P> (last visited May 17, 2012).

Mato Grosso is highly urbanized with 82% of the population living in urban centers. The indigenous population is approximately 42,500, and is divided among 42 ethnic groups.¹¹⁵ Approximately 200,000 people are engaged in smallholder/family agriculture in the state.¹¹⁶

Agriculture and cattle ranching account for approximately 27% of the state's economy. The state had a GDP of \$35 billion in 2009, and has an average annual per capita income of \$11,000.¹¹⁷ The main agricultural products are soybeans, cotton, corn (maize), sugar cane, manioc (cassava), rice, beans and bananas.¹¹⁸

Mato Grosso's native ecosystems fall into three main categories: (i) closed-canopy tropical forest (53%); (ii) savanna/woodland (the "Cerrado") (40%); and, (iii) swamp regions (i.e., the Pantanal) (7%). Roughly 39% of the state's forest and savanna areas were deforested by 2010. Ten percent of the state's territory is made up of demarcated indigenous territories in the forest areas, and another five percent is made up of indigenous territories in the Cerrado. Land areas set aside for conservation purposes represent 4.2% of the state's total area, with 60% of these located within the forest biome.¹¹⁹

Deforestation typically involves a sequence of activities, beginning with selective logging, followed by forest clearing for cattle pasture and swidden agriculture. Early in frontier expansion, the formation of cattle pastures often is used to demonstrate "productive use" of the land, protecting the land claim against disappropriation for agrarian reform. In the last 10 years, the expansion of soy, cotton, and corn into the forest regions of Mato Grosso has added another layer of complexity. Where pasturelands are flat, well drained, and close to soy storage and processing infrastructure, they are often converted to soybean plantations. As such, soy has an indirect impact in the process of deforestation.^{120,121,122}

Scope

Mato Grosso has yet to establish an official scope for REDD. However, the state's draft REDD+ law would establish a scope that includes actions for "reducing emissions from deforestation and

¹¹⁵ Preliminary data from IBGE's 2010 census available at http://www.funai.gov.br/etnias/etnia/etn_mt.htm (last visited May 17, 2012).

¹¹⁶ Censo Agropecuário, IBGE, 2006. Tabela 3.25.5 - Pessoal Ocupado Nos Estabelecimentos em 31.12, Por Sexo, Segundo a Agricultura Familiar - Mato Grosso – 2006.

¹¹⁷ Contas Regionais do Brasil (Mato Grosso), IBGE, 2011, available at <http://www.ibge.gov.br/estadosat/temas.php?sigla=mt&tema=contasregionais2009>, (last visited May 17, 2012) Exchange rate = R\$1.7 per one U.S. dollar. (\$US1).

¹¹⁸ *Id.*

¹¹⁹ These calculations were made by IPAM's geoprocessing laboratory. Biome data extracted from IBGE. Deforestation data: Prodes and IBAMA.

¹²⁰ Sergio Margulis, *Causes of Deforestation in the Brazilian Amazon*, World Bank, 2004.

¹²¹ Daniel C. Nepstad, Claudia M. Stickler and Oriana T. Almeida, *Globalization of the Amazon Soy and Beef Industries: Opportunities for Conservation*, Conservation Biology 20 (2006) pp. 1595-1603.

¹²² http://www.sema.mt.gov.br/index.php?option=com_content&view=article&id=106&Itemid=195

forest degradation, conservation, sustainable forest management and the increase of forest carbon stocks.”¹²³ The draft law also would define the scope of each term as follows:

1. *Deforestation*: Total removal of native vegetation from an area with the intention of converting it permanently to an alternative use of the land;
2. *Forest degradation*: Partial destruction of native vegetation in a given area due to human activities or natural agents;
3. *Conservation*: Management of human interaction with nature, including preservation, maintenance and sustainable use of the environment and natural resources in a particular area of native vegetation that may or may not be under threat of deforestation and forest degradation;
4. *Sustainable Forestry*: Forest management to achieve economic, social and environmental benefits while respecting sustainable mechanisms of the ecosystem under management. It must also consider cumulatively or alternatively the use of multiple timber and non-timber products and sub-products, and the use of other forest goods and services;
5. *Forest Carbon Stock*: The amount of carbon stored in vegetation, which exists in the following: living biomass above ground including trunks, branches and leaves; underground living biomass such as roots; woody debris including fallen trunks and broken branches; and ground litter including leaves and other debris from dead vegetation; and
6. *Increase in Forest Carbon Stocks*: Actions to recover, restore, and enhance native vegetation in a given area, resulting in the increase of forest carbon stocks.

Reference Level and Target

Most of the Amazon states in Brazil have established their own plans to reduce deforestation and fires that complement the national plan for reducing deforestation in the Amazon (i.e., the “Plano de Ação para Prevenção e Controle do Desmatamento na Amazônia Legal”), and the National Climate Change Plan (NCCP). The Mato Grosso Plan for the Prevention and Control of Deforestation and Fires (referred to here as the PPCDQ-MT) established a reference level that is compatible with the national reference level established for the Amazon region, and defined a voluntary target for reducing emissions from deforestation by 89% by 2020. This state-level target was formalized through a state decree (# 2943/2010) signed in October 2010. Former Governor Blairo Maggi initiated this process during his administration as part of the state’s involvement in the GCF. The state’s commitment to achieve its deforestation target depends upon implementation of the NCCP plan as well as a REDD+ mechanism for compensating lowering emissions.

¹²³ Mato Grosso draft law for REDD, article 2, § I. Available at: http://www.sema.mt.gov.br/index.php?option=com_content&view=article&id=727%3Aminuta-de-anteprojeto-d (Last visited, May 29, 2012).

The original reference level is based on a historical average deforestation rate from 1996 to 2005 within the state. Total deforestation during that period was 75,600 km², or an average of 7,600 km² per year, and corresponded to 2.8 GtCO₂e of emissions (PPCDQ-MT, 2009). The PPCDQ-MT states that the reference level will be revised every five years, and will consider the average of the last ten years, as shown in Table 3-5.

Table 3-5
Baselines and Targets to Reduce Deforestation in the State of Mato Grosso

First period (2006 – 2010)		Second period (2011 – 2015)		Third period (2016 – 2020)	
Baseline	Target	Baseline	Target	Baseline	Target
Average deforestation rate from 1996 to 2005	64% reduction based on the baseline	Average deforestation rate from the last 10 years- 2001 to 2010	75% reduction based on the baseline	Average deforestation rate from the last 10 years - 2006 to 2015	80% reduction based on the baseline

The total reduction in deforestation shown in Figure 3-9 (Scenario 1) would avoid clearing 46,850 km² of forest and associated emissions of 2.3 GtCO₂e from 2006 to 2020.. If the state achieves its target reduction, it could still legally deforest 9,077 km² between 2011 and 2020, retaining a forest stock of nearly 300,000 km². From 2006 to 2010, Mato Grosso has avoided the deforestation of 26,097 km² corresponding to 1.3 GtCO₂e emissions. Under Scenario 2 (using the same reference level until 2020) the state's emission reduction would be 4 GtCO₂e below the 1995-2006 average historic baseline.

Even though PPCDQ-MT stipulates baselines and target reductions for deforestation, the draft of the REDD+ law does not state that these reference levels will be maintained.

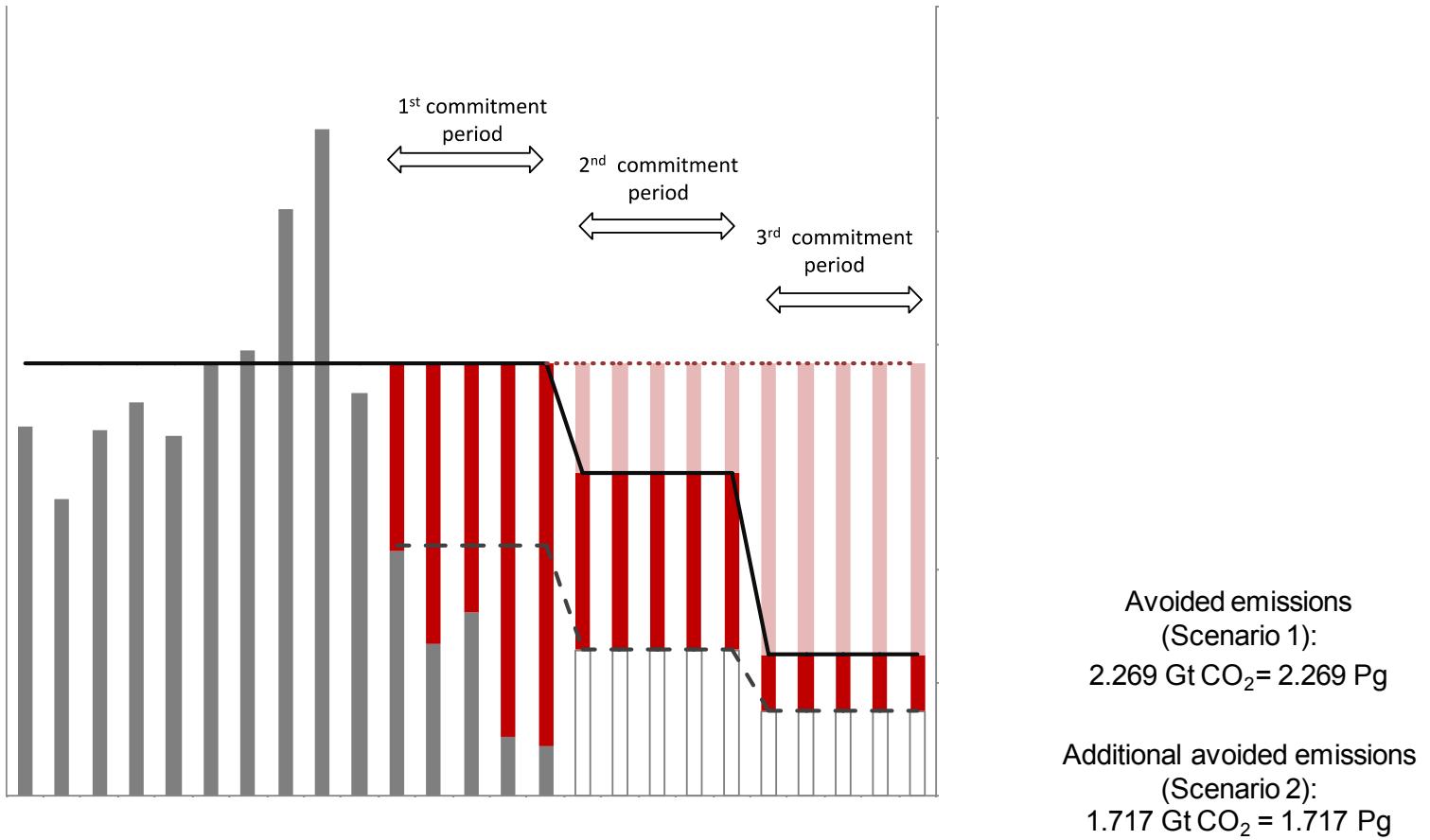


Figure 3-9
Mato Grosso, Brazil - Reference and Target Levels of Deforestation for Three Commitment Periods 2006-2020

Nesting

Mato Grosso does not have an official mechanism to nest REDD+ projects or to align its program under a potential national program, as the state is still developing its REDD+ policies. However, the state's proposed REDD+ policy envisions establishing a state-wide baseline with sectoral programs organized thematically (e.g., smallholders, ranching, protected areas, indigenous lands, etc...), and/or by geographic region. Also, as envisioned by the draft REDD+ law, REDD+ projects that do not fall within a specific sectoral program would be expected to receive temporary credits until they are linked to a REDD+ program. The distribution of REDD+ credits among the different sectoral programs is yet to be established. The definitions of programs, projects, and preparatory actions as defined in the draft REDD+ law are summarized in Table 3-6. The definitions shown illustrate the nested approach being proposed in Mato Grosso.

Table 3-6
Definitions Used in Mato Grosso's Draft REDD+ Policy

Definition of REDD+ Programs, Projects, and Preparatory Actions Defined in Mato Grosso's Draft REDD+ law
<ul style="list-style-type: none">• <i>REDD+ Programs</i>: A number of measures (e.g., rules and incentives) addressed to specific sectors, themes or regions within the state;• <i>REDD+ Projects</i>: Activities developed by public or private agents that result in measurable, reportable and verifiable reduction in CO₂e emissions. These activities have the potential to generate REDD+ trade bonds;• <i>Readiness for REDD+</i>: Activities developed by public and private agents that are necessary for the implementation of REDD+, but that do not have measurable results in terms of emission reductions. These activities will be financed using public funds and will not be eligible for CREDD+ or trade bonds.

To date, there are three REDD+ pilot projects being developed in Mato Grosso that are registered in the GCF database. Each of these projects is described briefly below.

Pilot Project REDD+ Cotriguaçu¹²⁴

This project began in 2008, and is located in Cotriguaçu, in the Northwestern region of the state. It covers an area of 9,400 km² (7,600 km² of intact forest) that is composed of private properties, indigenous territories, protected areas and smallholder settlements. This pilot project has a proposed lifespan of 30 years. Total estimated avoided emissions between 2006 and 2020 are estimated to be approximately 26 MtCO₂e. The proposed baseline method uses historical deforestation rates (i.e., using the Amazon Fund methodology based on a carbon density of 100 ton C/ha). No MRV regime has been proposed. This project is in the developmental phase.

¹²⁴ Mato Grosso, Brazil, GCF Database. Expected to be available online in 2012 at www.gcftaskforce.org. See Section One for more information about the GCF Database.

Surui Carbon Project¹²⁵

This project is located in the Indigenous Territory of 7 de Setembro (7th of September). It covers the municipalities of Rondolandia (Mato Grosso state), Cacoal and Espigão d'Oeste (Rondônia state). The project includes approximately 240,000 ha. Avoided emissions through the life of the program have been estimated to be approximately 2 MtCO₂e through 2045 (865,000 tCO₂e for the three year period 2010-2012). The project is based on a combination of historical baseline plus the projected future baseline based on SIMAMAZÔNIA simulation model adapted for this project. To determine the projected future deforestation baseline, the simulation model takes into account “infrastructure pressures” within the region. The project was certified recently under CCB and VCS standards, and the sale of carbon credits is being negotiated.

Xingu Project¹²⁶

This project is located in the Xingu River watershed, and is focused on indigenous territories covering more than 13 million ha in the states of Mato Grosso and Para, and the cattle ranches and soy farms that lie outside of the indigenous lands. Following extensive consultation with the indigenous groups that live within the basin, the project has been postponed because of concerns raised by these groups about engagement with forest carbon investors, and decisions by some indigenous groups (e.g. the Kayapo of Gorotire) not to participate in the project. This project illustrates the complexities of implementing project-level REDD+ activities and, in particular, the level of investment that is needed for indigenous people to understand and freely engage in a REDD+ project. This project was described in a previous EPRI report.¹²⁷

Offset Issuance and Tracking

A system for issuing REDD+ offsets in Mato Grosso has not yet been developed. Under the draft legislation, REDD+ *tradable bonds*, corresponding to one ton of CO₂e emissions reductions would be created. REDD+ tradable bonds would be recognized and validated by the state government, and available to be sold or traded.

To date, development of the REDD+ system in Mato Grosso has made progress, but Mato Grosso has not yet completed the development of the following instruments related to offset issuance:

- **REDD+ units:** REDD+ emission reduction units would be generated by REDD+ projects or state programs. A portion of the units would be converted into credits that could be tradable in compliance markets;
- **REDD+ registry:** An official registry to track all issued and traded carbon credits associated with REDD+ projects and activities;
- **Securing REDD+ credits against performance reversals:** A mechanism to set aside a portion of issued offset credits as insurance against reversals. This insurance will serve as security in the case of increased deforestation and forest degradation rates.

¹²⁵ *Id.* and FUNBIO Presentation about the Surui Project, Katoomba Group, http://www.katoombagroup.org/%7Eforesttr/publication_details.php?publicationID=2599 (last visited May 17, 2012).

¹²⁶ *Id.*

¹²⁷ EPRI 2010. *See* supra note 9.

Mato Grosso's draft law for REDD+ mandates creation of a state registry to account for emission reductions from deforestation and forest degradation. This state registry would be responsible for validating, verifying and certifying emission reductions. The registry also would account for issued tradable credits, and track their trade, while providing traceability and ensuring against double counting.

Emissions Monitoring, Reporting, and Verification

Deforestation Monitoring

Currently, Mato Grosso uses both the deforestation monitoring system of the national government, PRODES,¹²⁸ and its own deforestation monitoring system. PRODES is based on LANDSAT imagery and has been the official source for data on the deforestation of the Brazilian Amazon since 1988. Mato Grosso's state methodology is based on LANDSAT and SPOT 5 satellite images. Its use of high-resolution SPOT images (e.g., 10 meters resolution) that makes it possible to monitor deforestation in areas smaller than the minimum 6.25 ha area monitored by PRODES. Furthermore, the state's system covers all three biomes: forest, Cerrado, and Pantanal. PRODES monitoring only is conducted for closed canopy forests, or the "forest" biome.

One limitation of the state's system is its frequency. PRODES provides annual estimates of deforestation, while the state's system generally produces estimates every two years. According to SEMA, the latest deforestation assessment to be delivered in 2012 will provide estimates of deforestation for the period of mid-2009 to mid-2010.

Degradation and Fire Monitoring

Mato Grosso has not conducted systematic evaluations of forest degradation.¹²⁹ Currently, degradation is monitored partially through DEGRAD, INPE's methodology based on satellite images from LANDSAT and the China-Brazil Earth Resources Satellite (CBERS). In addition, wall-to-wall, high-resolution maps of forest degradation by selective logging have been developed,¹³⁰ but these maps have not been assimilated by the state. Mato Grosso intends to establish its own degradation monitoring system, but it has not yet taken formal steps to do so.¹³¹

Mato Grosso uses the national system of active fire monitoring (INPE/SIGMA),¹³² but does not have a specific system to monitor forest fires. Active forest fires are difficult to detect and

¹²⁸ The Brazilian Institute of Spatial Research (INPE) monitors deforestation and degradation in the Amazon through the Project for Monitoring Deforestation in the Legal Amazon (PRODES), which analyses images of Landsat, Cbers and DMC to determine occurrence of deforestation. More information is available at <http://www.obt.inpe.br/prodes/>

¹²⁹ GCF Database, *supra* note 124.

¹³⁰ Gregory P. Asner, Selective Logging in the Brazilian Amazon, *Science* 310 (2005) pp. 480-482.

¹³¹ GCF Database, *supra* note 124.

¹³² More information is available at <http://sigma.cptec.inpe.br/queimadas/perguntas.html>

monitor using the thermal threshold method developed to do so, because of interference created by the forest canopy.^{133, 134}

The state currently does not monitor forest carbon enhancement through forest regeneration, tree plantations, or forest recovery following disturbance. There is a plan to develop a system to monitor enhancement of forest carbon that was included in a proposal submitted to the Amazon Fund.

Forest Carbon Stock

Forest carbon stocks in Mato Grosso have been mapped using a combination of remote sensing (both optical and satellite-borne LIDAR) and field surveys.^{135, 136} However, the state government has not yet tested or validated these maps, or incorporated them into the evolving state-wide REDD+ program.

According to SEMA officials, the carbon stocks in the state need to be quantified to develop a statewide REDD+ program. Therefore, comprehensive studies focused on quantifying the carbon stocks need to be performed for the state's different biomes, including savannah areas and wetlands.

Social and Environmental Safeguards

Mato Grosso's draft REDD+ legislation includes several elements that could help the program to establish and fulfill social and environmental safeguards. The principles embodied in the draft law include fairness and equity in the sharing of REDD+ benefits, and respect for the rights of traditional people. It also includes a commitment to the free, prior and informed consent (FPIC) of stakeholders with regards to the development of the REDD+ program, and a commitment to transparency and full disclosure of the REDD+ program. Furthermore, the draft law states that REDD+ actions should contribute to environmental protection and restoration, poverty alleviation, promotion of sustainable economic alternatives, social inclusion, and improvement of living standards for people who inhabit the areas where REDD+ projects or programs are implemented. It also would prohibit the use of REDD+ resources for uses other than the objectives described above. The Mato Grosso Forum of Climate Change, as proposed in the draft law, would institutionalize participation of civil society and the private sector in the state's REDD+ program.

Legal and Institutional Framework

Mato Grosso's development of REDD+ legislation is moving slowly, but has made important progress since 2009, when the program was first launched. The state REDD+ multi-stakeholder working group (described below) evaluated the draft state draft law through a public consultation

¹³³ Ane Alencar, Daniel C. Nepstad and Maria del Carmen Vera Diaz, *Forest Understory Fire in the Brazilian Amazon in ENSO and non-ENSO Years: Area Burned and Committed Carbon Emissions*, Earth Interactions 10 (2006).

¹³⁴ Ane Alencar, et al., *Temporal Variability of Forest Fires in Eastern Amazonia*, Ecological Applications 21 (2011) pp. 2397-2412.

¹³⁵ Sassan Saatchi et al., *Distribution of Aboveground Live Biomass in the Amazon Basin*, Global Change Biology 13 (2007) pp. 816-837.

¹³⁶ Baccini et al. *See* supra note 26.

process, and an assessment workshop that included REDD+ experts. Nine sectoral workshops were held to present the draft REDD+ law and to engage stakeholders.

Implementation of the proposed legislation would require restructuring of some governmental bodies, such as the SEMA. In the current institutional framework, there appears to be substantial operational responsibilities for the REDD+ program assigned to the Management Council, a voluntary body that may not have sufficient time or capacity to execute such activities. Some observers have pointed out that it may be more efficient if the operational decisions can be left to government officers with technical expertise. The proposed REDD+ draft law would create the structure described below, and shown in Table 3-7.¹³⁷

Table 3-7
Organization and Functions of the Proposed REDD+ system in Mato Grosso, Brazil

Role	Governmental Body	Responsibility
Decision-making	Management Council	Defines the criteria and technical norms, analyzes and monitors the functionality of the system.
Scientific/technical support	Scientific Committee	Proposes methods, parameters and technical criteria.
Executive	SEMA	Manages REDD+ activities, including the registry system and issuance of CREDD+.
Financial Management	State Climate Change Fund	Manages the public and private financing.
Civil Society Participation	Mato Grosso Forum on Climate Change	Mobilizes and promotes the participation of civil society and private sector stakeholders.

The State Climate Change Fund would receive and manage the resources of the state's REDD+ system. It is not necessary that all REDD+ funds flow through the state fund, although all funds would be required to be registered and accounted for in some manner.

Mato Grosso's draft REDD+ legislation would create a public-private partnership entity for the purpose of attracting private investment and public funds into the REDD+ program (see Acre case study, *supra* for more information about how such a partnership could be structured).

In 2009, Mato Grosso created the State Forum of Climate Change.¹³⁸ The Forum is an important organization that fosters participation by civil society and the private sector to address climate change in the state. The Forum is responsible for proposing climate change policies for the state, and it is officially connected to SEMA.

¹³⁷ This information was obtained by the authors through participation in the GT REDD-MT meetings and discussions of the REDD+ draft law.

¹³⁸ State Law 9.111 of April 15th 2009 (State of Mato Grosso, Brazil).

Mato Grosso's existing policies to halt deforestation appear to be in alignment with the existing directives of the federal government. Additionally, the state recognizes the need to align its laws with the national REDD+ policy and strategy as soon as these are defined and approved.

Finally, the state also has a REDD+ Working Group (GT-REDD+). The GT-REDD+ drafted the proposed Mato Grosso REDD+ law. Many members of the GT-REDD+ also participate in the Forum.

REDD+ Planning

It is important to highlight several key features associated with the evolving REDD+ plan for Mato Grosso. These include:

- The state is viewed as having well-structured forest policies with legal and institutional bodies in place. However, to be implemented in practice, these policies would require strengthening areas such as monitoring and enforcement;
- The draft REDD+ law is still a work in progress; and,
- The lack of a well-defined national REDD+ strategy in Brazil has hindered the elaboration and implementation of Mato Grosso's REDD+ law and program.

The four main Mato Grosso state policies related to forest policy and REDD+ are:

1. Rural property environmental licensing system (Sistema de Licenciamento Ambiental de Propriedades Rurais -SLAPR): This system was created in 1999, and is designed to monitor and promote compliance with the Forest Code on private properties. It uses remote sensing and geographic information systems (GIS) to identify properties and deforestation occurring on them. This system covers about 30% of the private properties within the state.^{139, 140} In the future, the system may be able to account for carbon stocks on private lands. The system currently faces several operational challenges, including the lack of synergy with the state's existing land tenure database and the need to support existing demand for services related to delivering environmental licenses.
2. Legal Mato Grosso (Mato Grosso Legal – MT Legal) (Complementary law# 327/2008): This program creates special conditions for landowners to come into compliance with environmental legislation. Agricultural producers who joined MT Legal before a cut-off date are exempt from previous fines imposed by SEMA. MT Legal is considered to be a successful program, and it currently includes 15,474 registered properties.¹⁴¹
3. Plan for Controlling Deforestation and Fires (Plano de Controle de Desmatamento e Queimadas [PPCDQ- MT]): As mentioned previously, this plan was developed in 2009, and establishes targets for deforestation reduction. It is made up of four elements:

¹³⁹ Andrea A. Azevedo. *Legitimização da Insustentabilidade? Análise do Sistema de Licenciamento Ambiental de Propriedades Rurais – Mato Grosso*, SLAPR University of Brasilia, (2009).

¹⁴⁰ Boletim Transparência Florestal, Instituto Centro de Vida (ICV), (2010).

¹⁴¹ This information was obtained during a telephone call with Elaine Corsini, Superintendent of Monitoring and Environmental Indicators, at SEMA, on December 19, 2011.

(i) controlling and monitoring, (ii) zoning and land tenure, (iii) promotion of sustainable activities; and, (iv) governance. The committee that manages the plan started work in 2011. Because the plan was developed by a previous state government, there is now a need to engage the new administration to complete it. REDD+ actions are included in the plan, and the plan is one of the policy tools included in the REDD+ draft law.

4. Socio-Economic and Ecological Zoning (Zoneamento Socio Econômico e Ecológico [ZSEE]): This law classifies zones of land-use within the state. Zoning of Mato Grosso began more than 20 years ago, but only became legally required in 2011. There is strong public objection to the zoning that was approved by the state's legislative assembly. Currently the zoning is being analyzed by the National Environmental Council (Conselho Nacional de Meio Ambiente-Conama), which must approve the ZSEE before it can be fully enforced. There are two main issues that still need to be resolved: (i) potential changes in land categories without any technical criteria/justification; and (ii) potentially allowing legalization of deforested areas located in legally mandated private forest reserves, with a cut-off date of April 2011. Resolution of this latter issue could facilitate the compliance of a large number of farms and ranches, exempting these properties from the requirement to re-establish the legal forest reserve.

Also, a Low Carbon Agriculture Program is being developed in Mato Grosso led by the federal Ministry of Agriculture as part of the development of national climate change mitigation sectoral plans. In 2011, three events were held to involve stakeholders in the process of formulating a plan. In late 2011 the plan was sent to the state governor for approval. The program aims to promote GHG mitigation in the agriculture and cattle sectors in Mato Grosso. Although the program is growing in popularity, it lacks sufficient political support to become law.

One of the challenges of developing a state-wide REDD+ policy is to develop approaches to reconcile existing forest carbon projects to the state policy framework.

According to the GT REDD+, the next steps for the development of the Mato Grosso REDD+ plan should be:

- Present the draft legislation for discussion at the state legislative assembly;
- Pass the legislation;
- Develop the GHG inventory and emissions reference scenario for deforestation and forest degradation;
- Improve the monitoring system for the Cerrado (savannah/woodland) biome;
- Design and implement an emissions registry to track and monitor REDD+ activities; and
- Develop REDD+ sectoral programs.

Financing

Currently there are no financial resources allocated to assist in the elaboration of the state's REDD+ policy, nor budget allocated to prepare for implementation of REDD+ (e.g., training). The activities being undertaken now are being done within SEMA-MT's regular and planned

budget. In October 2011, SEMA submitted a proposal to the Amazon Fund¹⁴² to cover many of the state's environmental conservation activities, including preparing a state inventory of GHG emissions and mapping of forest carbon biomass in different ecosystems.

In the draft REDD+ legislation, the only financial mechanism that appears is the State Climate Change Fund. The Fund would receive and invest capital to implement and maintain the state's REDD+ system. This fund would rely on the state budget, donations and grants, investments, partnerships and other sources of finance to operate. Financing that goes into the Fund would only be allowed to be used to develop and implement REDD+ activities and to maintain the necessary programmatic infrastructure.

Additionally, the state is concerned about funding activities that are crucial to REDD+ program development, but that do not in and of themselves directly contribute to emissions reduction. Currently, it is assumed that some portion of REDD+ tradable credits issued by the state, or revenues from the sale of REDD+ credits, will be used to fund governmental activities, such as deforestation monitoring.

As a result of ongoing public consultations, some observers expect the draft REDD+ policy to be revised to include more appealing financial mechanisms designed to attract investors and donors, including tighter fiscal controls, tracking of funds, and a more robust carbon trading system.

¹⁴² The Amazon Fund was created by the Brazilian Government to receive international donations to support actions to prevent deforestation and forest degradation, including REDD.

4

LESSONS AND INSIGHTS

Global climate policy stands at a crossroads. The traditional, top-down approach embodied in the UNFCCC has faltered in recent years, giving way to a much more plural, fragmented (and messy) architecture marked by a series of loosely linked emerging and existing GHG compliance systems and a host of other efforts proceeding at multiple levels of governance.¹⁴³ Although REDD+ continues to gain traction in the UNFCCC process, it seems unlikely that the international community will be able to create a fully functioning REDD+ mechanism in the absence of a larger climate treaty – a prospect that now appears will take at least until 2020 to materialize.¹⁴⁴ In the meantime, the basic idea of REDD+ as it was first articulated in the UNFCCC process needs to be revised and adapted to the new realities of climate policy and the basic facts of a fragmented carbon market. As described in this report, this is already happening in several key respects.

States and Provinces Take a Leadership Role

Rather than wait for an international climate treaty or a new REDD+ mechanism to be adopted through international negotiations, states and provinces throughout the tropics are moving ahead with efforts to build high-quality REDD+ programs and link them with emerging GHG compliance systems, such as the GHG cap-and-trade program being implemented in California. If successful, these efforts could provide critical proof-of-concept opportunities for efforts to operationalize REDD+. Furthermore, these efforts also could provide the “DNA” of rules and system designs that could be transferred to, and adopted by, other emerging GHG compliance systems and other sources of performance-based finance (such as the Norwegian commitments to Brazil and Indonesia) in which flows of financial support are conditioned upon actual policy changes and verified emissions reductions achieved at the subnational or national level. As this report documents, the GCF has led the way in pushing this new approach, through the unique subnational collaboration between early mover states and provinces in tropical forest countries and the only jurisdiction in the world today (i.e., California) that currently is considering ways to include REDD+ within its own compliance GHG cap-and-trade program.

Transition Away from REDD+ Projects to Jurisdictional REDD

A critical feature of the approach being advanced by California and its GCF partners is the transition away from isolated REDD+ projects to jurisdiction-wide REDD+ programs. Similar in some respects to the proposals to create sectoral approaches for offsets that have been advanced in the context of CDM reform and in other venues, the jurisdictional approach to REDD+ represents a much more ambitious and potentially viable approach to achieve emissions reductions from REDD+ at large scale and deliver a portion of these reductions into emerging GHG compliance systems. Although REDD+ projects are likely to continue to provide important

¹⁴³ See Boyd, *supra* note 8 and accompanying text.

¹⁴⁴ http://unfccc.int/files/meetings/durban_nov_2011/decisions/application/pdf/cop17_durbanplatform.pdf

sources of innovation and learning, it is unlikely that they will be able to achieve large-scale emissions reductions. The premise (and the promise) of jurisdictional REDD+ is that through policy choices (i.e., decisions about infrastructure, land-use zoning, and sources and uses of revenue) and policy alignment across key economic sectors, state and provincial governments will be able to deliver substantially more emissions reductions than any single project or group of projects is likely to deliver, and they will be able to do so at significantly reduced transactions costs. A jurisdictional approach to REDD+ also potentially can help to alleviate concerns about emissions leakage associated with individual REDD projects.

Conceived and implemented in this manner, subnational REDD+ program development also can provide a critically important pathway to development of viable national level REDD+ programs. While most countries assign national governments responsibility to manage some categories of forest types (e.g., national forests and parks, indigenous lands, and in some cases private forest lands), state and provincial governments often retain primary authority for spatial land-use zoning, forest monitoring, enforcement of land-use laws, and application of social and environmental safeguards. Under any scenario related to the development of effective national approaches to achieve REDD+, states and provinces likely will need to play a critical role.

REDD+ Program Design Must be Flexible

Building subnational jurisdictional REDD+ programs is much more challenging than designing and implementing individual projects, and this report recognizes that different circumstances and conditions across the GCF states and provinces inevitably will result in states and provinces taking different pathways to develop and implement such programs. There is no one right way to do this, but the authors believe there are minimum conditions that any viable jurisdictional REDD+ program will need to meet to succeed.

Some states and provinces likely will start with existing REDD+ projects in their jurisdictions and work to “nest” them within state-level accounting and emerging jurisdictional REDD+ programs. Others may start with a more comprehensive jurisdictional approach, and then decide whether and how to include specific projects within such a program (Figure 1-2).

Notwithstanding the initial barriers and start-up costs associated with building a jurisdictional REDD+ program, this approach may be more viable over the longer term than the nested pathway, given the multiple layers of accounting and MRV that must be reconciled in a nested approach. Comprehensive jurisdictional approaches have the important advantage of focusing from the outset on the policy reforms, institutional innovations, law enforcement, and cross-sector alignment that are likely to be necessary to achieve large-scale, lasting changes in GHG emissions from land use.

One of the key challenges to implementing jurisdictional REDD+ is that many states and provinces already host existing REDD+ projects. These jurisdictions tend to see REDD+ through the eyes of project developers and investors who typically are more comfortable with the project-level approach. It is also true that some states and provinces simply lack the political commitment and/or the institutional capacity to design and implement a jurisdictional approach to REDD+. And, perhaps most importantly, it is still unclear whether sufficient REDD+ finance (public or private) will materialize, and provide meaningful incentives for governments and other actors to build these programs in a way that depends upon substantial flows of performance-based REDD+ revenues.

Perhaps as a consequence of this focus on project-level activities, most GCF states and provinces have devoted little attention to designing programs that could reduce emissions from the major industries and land-use activities that are the principal drivers of deforestation and forest degradation. To achieve long-term, large-scale, sustainable reductions in emissions across entire jurisdictions it may be necessary to implement a combination of policies that influence the economic logic of these industries and agents, and those that create and enforce restrictions on the types of activities permitted within different geographical zones of a state or province. Large-scale emissions reductions may be achieved more efficiently and at lower cost through the refinement or creation of both command-and-control land-use regulations and their enforcement and economic instruments such as agricultural tax structures and agricultural loan programs. States and provinces could attract private sector investment into programs that are facilitating the transition of agricultural sectors to non-deforesting, low-emission production systems through the development of financial instruments that manage risk and through the innovative use of the state's or province's emissions reductions.

Lack of Funding may Hamper Further Development of REDD

An important threat to the ongoing development of REDD+ programs within the GCF is that none of them have yet succeeded in attracting sufficient funding. During the years leading up to COP15 in Copenhagen (2009), expectations were created that large flows of funding would be provided to governments that engaged in REDD+; but these expectations largely have gone unmet. Most of the public, "fast-track" REDD+ finance has been slow to move and, in any event, is being dispensed to national governments or through competitive grant-making processes, making it largely unavailable to state- and province-level governments. As a result, several subnational governments are now questioning the political viability of continuing to invest in their REDD+ programs.

This report represents the first effort to develop a comprehensive assessment of the state of REDD+ program development across the GCF states and provinces, and evaluate the prospects for these programs to generate compliance-grade emissions reductions from REDD+ activities capable of being recognized by, and sold into emerging GHG cap-and-trade systems such as the one being developed in California.

Minimum Conditions for State-based REDD+ Program Development

Based on the assessment and analysis of the minimum conditions for REDD+ program development discussed in Section Two, and the assessments of individual states and provinces provided in Section Four and in the appendices, it is clear that none of the GCF states and provinces are able to issue compliance-grade REDD+ offsets today, although some are making rapid progress in that direction. The following provides a brief summary of overall progress on the key elements of REDD+ program development within the GCF member governments:

- **Scope:** Decisions regarding the scope of REDD+ have not been made in many GCF states and provinces. Resolution of this issue will depend in part on discussions between states and provinces and their respective national governments, as well as the rules and regulations adopted in emerging compliance markets, such as in California. Most states likely will start with REDD programs that focus on reductions in emissions from

deforestation, and then move to expand their programs to include reducing degradation and enhancing forest carbon as MRV capabilities and administrative capacity increase.

- **Reference levels and targets:** None of the GCF states and provinces has adopted an official reference level for REDD+, although several have proposed reference levels. There is a division among GCF states and provinces regarding the appropriate methodology to use to establish reference levels, with some proposing historical emissions, and others seeking to develop reference levels based on BAU projections of future deforestation. These issues will take time to resolve, and resolution will depend in part on coordinating efforts to develop national reference levels, and on decisions to be made within emerging compliance markets regarding methodologies to establish reference levels. Careful attention will need to be directed at efforts to adjust reference levels, as the scope of REDD+ programs is broadened to include forest degradation and forest carbon enhancement. Integrated approaches to develop reference level that include emissions reductions from deforestation, forest degradation, and forest carbon enhancement are technically feasible, and could potentially simplify and improve the accuracy of emissions reduction estimates.
- **Nesting:** The development of project nesting architectures and approaches to reconcile accounting for REDD+ projects and subnational REDD+ programs with national programs are still being developed in GCF states and provinces, and this activity has not been identified as a priority by all of the evolving programs. The problem of “stranded” projects varies across the GFC states and provinces. Where regional reference levels have been developed and widely accepted, such as in the Brazilian Amazon region, most states have informally adopted the data and approach taken by the federal government to establish their own jurisdiction-wide reference levels. The greatest progress in establishing state-level reference levels and REDD+ targets that are consistent with the national reference level has been made in the Brazilian Amazon region. Discussions among Amazon state governments prior to COP15 in 2009 led to a proposal to allocate region-wide reference levels among states through a combination of accounting for forest carbon stocks and historical emissions from deforestation (“flows”), called the “stock-flow” approach.¹⁴⁵ The resulting state-level reference levels gained the political support of the state governments, and together added up to the region-wide reference level defined by the national government. Some of these state-level reference levels have been recognized in new laws or governmental decrees. A similar negotiated allocation of regional emissions reductions could take place among the states of Mexico, or the provinces of Indonesia.
- **Offset issuance and tracking:** Some of the Brazilian GCF states have adopted laws that provide a basis for the definition of REDD+ assets; some have also initiated discussions with registry providers to develop a system to register and track REDD+ credits. Currently, there are no existing carbon registry systems suitable to operate at the scale of a state or province that can support a jurisdictional REDD+ program. As noted above, some jurisdictional registry systems now are being developed (e.g., Acre).

¹⁴⁵ Paulo Moutinho et al., *The emerging REDD+ regime of Brazil*, Carbon Management 2 (2011) pp. 587-602.

- **Emissions monitoring, reporting, and verification:** All GCF states and provinces are making progress in their efforts to establish systems to monitor, report and verify jurisdiction-wide emissions from deforestation, degradation, and forest carbon enhancement, but none have completed and implemented these systems. Once again, the states of the Brazilian Amazon have the opportunity to adopt results provided by the federal government's deforestation monitoring system, which has provided annual estimates of the area of deforestation since 1988 and the location of deforestation since 2000. These estimates are based upon high-resolution satellite imagery (LANDSAT), and are reported annually through the Brazilian National Space Research Institute's (INPE) website. However, INPE estimates of deforestation are not verified systematically.
- **Social and environmental safeguards:** Development and adoption of environmental and social safeguards varies significantly across GCF states and provinces. Some jurisdictions have created robust multi-stakeholder processes as integral parts of their REDD+ program development, and have proposed specific programs to distribute or share revenues among key constituents. Others have largely relegated safeguards to project-level activities.
- **Legal and institutional framework:** Several Brazilian states have adopted laws directed at mitigating climate change and creating REDD+, and most have established, or are in the process of establishing, institutional capacity to manage REDD+ programs. Other GCF states and provinces are contemplating legislation and regulations associated with REDD+ and most have dedicated some administrative resources to REDD+.
- **REDD+ planning:** All GCF states and provinces have engaged in some degree of REDD+ planning. Most states have initiated at least one REDD+ project through which they are gaining experience in carbon accounting, project design, MRV, and project finance. Several states and provinces have developed "command-and-control" approaches to restrict deforestation and degradation caused by the agricultural and timber sectors, and are analyzing these drivers of deforestation. However, the process of aligning policies and creating incentives to redirect the expansion of agriculture, ranching, or selective logging on a more sustainable basis is at a very early stage. There has been a related lack of progress related to fostering inter-agency dialogue that likely will be necessary to embed REDD+ into future strategies and pathways for low emissions rural development.
- **Financing:** Most GCF states and provinces are relying on existing state budgets and donations from philanthropic organizations and multi-lateral institutions to fund near-term development of their REDD+ programs. However, these sources of funds are very limited and lack of financial resources has slowed development of REDD+ across the GCF member states and provinces. Acre is in the process of creating a new public-private institution designed to engage the private sector at the level of the state/provincial REDD+ program. Creation of a similar institutional structure is contemplated in Mato Grosso's draft REDD+ legislation. Most GCF states and provinces have begun to develop more formal approaches to deal more effectively with REDD+ project developers. Questions regarding the liability for reversals, and the risks inherent in nested architectures are only now beginning to be addressed.

In sum, GCF states and provinces have significant work to do if they want to build REDD+ programs capable of generating compliance-grade offsets in the next five years. As noted, the success of these efforts will depend in part on whether or not GCF governors and their constituents see enough potential future benefits coming from REDD+ that they are willing to make the necessary investments and policy choices to build REDD+ programs. This is not something that will be cheap, easy, or quick to implement.

Significant Progress has been Made in GCF States on REDD+ Implementation

Notwithstanding the challenges facing REDD+, and the significant effort that will be needed to build compliance-grade REDD+ programs at jurisdictional scale, it is important to recognize the significant progress that has been made to date in many GCF states and provinces and the lessons to be learned from this experience. Below are some key insights based on the analysis conducted for this report:

1. Measurable Progress has been Achieved

States and provinces are mobilizing around the issues of forests and agriculture in unprecedented ways. In the contexts of the GCF and REDD+, most states and provinces are engaging in forest stakeholder dialogues, developing forest monitoring capacity, and analyzing the drivers of deforestation. Many state leaders have made commitments to lower deforestation or impose moratoria on logging, and several are developing REDD+ legal frameworks. This mobilization around forest and agricultural sectors has been strongest in jurisdictions where it has been part of a broader agenda focused on economic growth, job creation, and food security goals combined with low-carbon development strategies.

2. A Persistent Focus on Projects

Most states continue to view REDD+ as a collection of individual projects, and are following the “project-based” pathway to REDD+ (Figure 1-2). These states may not be aware of the potential advantages of jurisdiction-wide frameworks for REDD+, and have not yet made the shift from project-based approaches to jurisdictional approaches. Of particular concern is the lack of progress in developing policy and enforcement strategies for transitioning the agricultural and livestock sectors that are often the primary drivers of deforestation to low-deforestation pathways for increasing yields over time. At this time, most states and provinces have not established reference levels, or initiated development of REDD+ legal frameworks. In some cases, the persistent focus on projects likely can be attributed to institutional capacity constraints. In all but a handful of subnational governments, creating REDD+ programs is bumping up against the limitations of existing government institutions that are understaffed, underfunded, and which lack political power.

3. Large Potential Volume of Emissions Reductions and Offsets

The scale of emissions reductions that could be achieved by the GCF states is large. If the GCF states of the Brazilian Amazon alone achieved their deforestation reduction targets through 2020, total emissions reductions from 2006 to 2020 below the historical reference level (average emissions for the period 1996-2005) would be approximately 7 GtCO₂e as shown in Table 4-1. A large portion of these emissions reductions likely will not qualify to be used as offsets in California’s cap-and-trade program or other climate mitigation programs for several reasons. First, a portion of these emissions reductions will be counted as reducing emissions from the

reference level to a crediting baseline that accounts for subnational governments' "own" contribution to REDD+. In addition, some of these emissions reductions are likely to be allocated to the federal government and insurance buffers. A key factor that will influence the potential supply of offsets that might be available from Brazilian states is the incremental decline in the reference level that is now part of Brazilian REDD+ policy, and uncertainty related to the federal government's claims on REDD+ offsets. The potential supply of REDD+ offsets also is very difficult to estimate with accuracy because of uncertainty regarding the implementation of Nationally Appropriate Mitigation Actions (NAMA's) within the UNFCCC. Emissions reductions achieved as part of NAMA commitments and programs may be disqualified as international offsets. A similar quantity of emissions reductions potentially could be achieved by Indonesian and Mexican states through 2020, although these programs are likely to take more time to mature. Other states and provinces also could develop REDD+ programs that may increase the potential supply of REDD+ offsets.

Table 4-1
Emissions Reductions for Four Brazilian Amazon States Reviewed in this Report

Reference Level	REDD Emissions Reductions (millions tons CO ₂ e)		
	Historical (1996-2005)	Adjusted Downward	Historical (1996-2005)
Period	2006-2010	2011-2020	2011-2020
State			
Acre	85	116	214
Amazonas	65	117	309
Mato Grosso	1,264	1,717	2,722
Para	311	732	2,224
TOTAL	1,725	2,682	5,469

Table 4-1 shows 1.7 GtCO₂e of emissions reductions that already have been achieved by reducing deforestation from 2006 to 2010 in the four Brazilian states that are reviewed in this report. Emissions reductions that may be achieved from 2011-2020 based on a reference level that is adjusted downward every five years are estimated to be 2.7 GtCO₂e, and based on a flat reference level are estimated to be 5.5 GtCO₂e. Total emissions reductions for the 2006-2020 period are estimated to be 7.2 GtCO₂e (1.725+5.469 GtCO₂e) below the historical reference level (1996-2005). This estimate is based on an average aboveground forest biomass of 132 tC per ha.

4. Realizing the GCF's Potential to Supply Offsets Depends on Near-term Increases in the Flow of Financial and Technical Support and Benefits

There is a chronic shortage of financial and other support for GCF states and provinces that are developing REDD+ programs. This lack of support is undermining political commitment. Most REDD+ fast track finance is destined to be provided to national governments. Virtually all private-sector investment in REDD+ is flowing directly to individual projects that do not include significant governmental participation. There is an urgent need to provide performance-based, early-action funding, and technical support to design jurisdiction-wide REDD+ programs to secure and expand political commitment in the GCF states and provinces and to speed up the development of jurisdictional REDD+ programs,

5. REDD+ as the First Step to Achieving Low-emission Rural Development

The realization of the potential for REDD+ to alter existing patterns of rural development also is likely to depend upon a shift in focus. Most states continue to view REDD+ as a potential source of funding combined with minor reputational benefits, rather than the first step down the road towards implementing a new paradigm of low-emission rural development. Acre is an important exception, and is demonstrating that jurisdiction-wide REDD+ can be an integral component of a low-emission rural development strategy.

6. Policy and Institutional Alignment are Important

To achieve the potential benefits associated with REDD+, development and implementation of REDD+ programs must involve a broader array of government agencies and institutions than just the environment and/or forestry-related ministries where REDD+ programs now typically reside. Broadening governmental involvement can help to better inform policy design, enforcement, and the alignment of legislation and programs across the relevant sectors (e.g., agriculture, forestry, mining, infrastructure). This integration across government ministries is happening now in Acre and other states and provinces, albeit at a slow pace.

7. Financial Sustainability is Elusive

Existing and emerging compliance markets alone are not likely to be sufficient to sustain GCF REDD+ programs in the near term. Additional sources of funding to support development of GCF REDD+ programs are needed.

Currently, the EU ETS prohibits use of REDD+ offsets for compliance with its cap-and-trade program, and it is not envisioned to change this prohibition in the near term.

The further development and evolution of the GHG cap-and-trade market in California may create demand for some “sectoral” REDD-based offsets between now and 2020, but this overall demand is expected to be relatively small (~50 MtCO₂e cumulative) and is expected to take several years to develop fully.

Given the expected limited demand for compliance-quality REDD+ offsets in the near term in evolving carbon markets that exist today or are now being implemented, new sources of near-term investment and financial benefits are needed to sustain GCF REDD+ programs now being developed.

8. It may be Possible to Harness Agricultural Investments to Favor Low-Emission Production Systems

As private agricultural investments in the GCF states increase (driven by high commodity prices and associated flows of investment into agriculture and forestry), new opportunities may arise to harness these capital flows to support farm sector transitions to low-emission production systems that achieve increases in yield through intensification rather than horizontal expansion into forests. Agricultural investments that already hold the potential to provide modest returns to investors could become more attractive through finance mechanisms that provide exposure to the state’s emissions reductions that this investment helps to achieve. There is considerable scope for policy and institutional innovation that lowers risk and increases potential returns for private investors in GCF states and provinces.

9. Approaches to Safeguards are not yet ready to Support Jurisdictional REDD+

To date, environmental and social safeguards have been incorporated into REDD+ projects, but establishing these kinds of safeguards may represent a potential Achilles' heel for development of jurisdictional REDD+, as states attempt to implement dozens of performance criteria across entire jurisdictions. States and provinces are now reaching out to forest communities to explain the benefits, risks and responsibilities associated with REDD, which is complicated by the fact that substantial REDD+ finance has not yet materialized for any GCF states and provinces.

10. Relationship with National Regimes can be Tense

The relationship between subnational and national governments can be tense. This dynamic, tense relationship appears to exist in Brazil, Mexico, and Indonesia, where states and provinces are demanding greater autonomy and the ability to sell emissions reductions into offset markets. Recently, Brazil has retrenched from its earlier support of international offset mechanisms, and could decide to keep REDD+ emissions reductions for use within Brazil, thereby closing the door to the sale of REDD+ offsets to other parties in the international carbon markets. Two key issues to be resolved as part of the ongoing relationship between national and regional governments related to REDD+ are the establishment of appropriate reference levels, and the allocation of future REDD+ revenues between national and state-level governments.

A

AMAPÁ STATE SUMMARY

Overview

Amapá is located in the northern region of Brazil, bordering French Guiana, Suriname and the Brazilian state of Pará, as shown in Figure A-1. The average annual deforestation in Amapá from 1996 to 2005 was approximately 19.5 km², rising to 54.4 km² from 2005 to 2009. There are no studies evaluating the main drivers of deforestation in Amapá, although, satellite imagery shows most deforestation has occurred within 10 km of roads.¹⁴⁶



Figure A-1
Map of Location of Amapá, Brazil

Amapá is at a very early stage in developing and implementing legislation related to environmental services and a REDD+ program. The new government of Amapá that took office in January 2011 is seeking advice on how to develop its statewide REDD+ strategy, and how to

¹⁴⁶ Amapá, Brazil. GCF Database, GCF Task Force. Expected to be available online in 2012 at www.gcftaskforce.org. See Section One for more information about the GCF Database.

access funds to develop state readiness for REDD. Although Amapá has experienced low deforestation rates historically, current trends show increasing deforestation in the state.

Background

Amapá occupies an area of 143,453 km², and according to the state government, forested areas correspond to 115,479 km² of the territory. The estimated population of Amapá is 587,311 inhabitants (IBGE, 2007), and the vast majority (90%) of the population lives in urban areas. The GDP of the state is US\$ 3 billion.¹⁴⁷ The main sources of income in Amapá are mining (manganese and gold), forest products (Brazil nuts, timber), silviculture (timber), and açaí fruit harvesting. The average per capita income is US\$5,600.¹⁴⁸

Scope

This is not applicable to Amapá at this time, since the state does not have a REDD+ program.

Reference Levels and Targets

Amapá has not yet established reference levels for deforestation or degradation. The recently elected state government is analyzing the steps needed to implement a climate change policy.

According to INPE, historical average deforestation rates (km²/year) were:

- 1995-1999: 19
- 2000-2004: 20
- 2005-2009: 54

According to INPE, historical average degradation rates (km²/year) were:

- 2007: 50
- 2008: 63

The data probably underestimates deforestation because of persistent cloud cover that impedes forest mapping with optical satellites.

Nesting

This is not applicable to Amapá, since the state does not yet have a REDD+ plan. Furthermore, there is still a lot of uncertainty related to the federal government's directive on REDD, and it is unknown if states will be allowed to generate REDD-based offset credits as part of their efforts to achieve the Federal commitments to reduce deforestation, or if credits only will be available for actions that reduce deforestation and degradation below what is required to achieve the federal commitments. The latter approach could significantly reduce the quantity of offset credits that states may be able to generate by implementing policies and activities to achieve REDD. However, there is a commitment among the Brazilian Amazon states to work together to address their common concerns related to the implementation of the Federal government's REDD

¹⁴⁷ IBGE. Conversion using an exchange rate of R\$ 1.80 per US\$1.

¹⁴⁸ GCF Database. See *supra* note 146.

commitments, and the states intend to collaborate on their efforts to work with the Federal government to develop necessary regulations to implement the federal REDD program.

Offset Issuance and Tracking

Amapá does not have official methodologies or standards for issuing REDD+ offsets. Amapá also does not have a carbon registry.

Emissions Monitoring, Reporting, and Verification

Due to the difficulty of finding satellite imagery without clouds, Amapá is seeking funds to implement a geo-processing laboratory that will enable the state to increase the precision of its monitoring of deforestation and degradation.

National monitoring (INPE/PRODES) of deforestation in Amapá is inadequate because of cloud cover. The State Environment Secretary (SEMA) now provides estimates of deforestation and forest degradation every two years.

Additionally, the estimated carbon stock for the state of Amapá above and below ground is 179.94 ± 7.6 tons CO₂e/ha. The Amapá Carbon Project, a partnership between the National Research Institute for the Amazon (INPA) and the State Forest Institute (IEF), made this determination. The methodology used in the field to develop this estimate consisted of collecting data relating to above and below ground portions of trees (e.g., leaves, branches, trunks, and roots) within four 100m² plots. Samples were sent to a laboratory to determine organic carbon volumes.¹⁴⁹

Social and Environmental Safeguards

A formal process to develop and adopt social and environmental safeguards has not yet started. However, in its preliminary discussions about REDD, Amapá officials have expressed their intention to address the interests of indigenous groups and the population that relies on the forest for subsistence.

Legal and Institutional Framework

The state of Amapá has yet to develop a legal or institutional framework for REDD+.

REDD+ Planning

Amapá does not have a REDD+ plan. The previous government administration, which ended its tenure in December 2010, had intended to focus its REDD+ program on the state's existing protected areas. However, the new government appears to be interested in implementing a statewide REDD+ program, and it is engaging experts to help the state to define appropriate REDD+ accounting methodologies and policies.

¹⁴⁹ Information submitted by state officials to the GCF Database. See supra note 146.

Financing

Currently, officials from Amapá are consulting with REDD+ experts to better understand and explore available funding mechanisms that can be used to develop REDD+ readiness.

B

AMAZONAS STATE SUMMARY

Overview

The State of Amazonas occupies 29% of the Amazon forest, and shares borders with Bolivia, Peru, Colombia and Venezuela, and the Brazilian states of Mato Grosso, Acre and Pará. Figure B-1 shows the location of Amazonas within Brazil. It is the largest Brazilian state covering 1.5 million km². The average annual deforestation in Amazonas from 1996 to 2005 was approximately 1004 km², falling to 609 km² from 2005 to 2010. The main drivers of deforestation in Amazonas are conversion of forestland to cattle pasture and farmland, especially in zones adjacent to roads.¹⁵⁰



Figure B-1
Map of Location of Amazonas, Brazil

Beginning in 2003, the government of Amazonas has worked continuously to advance environmental policies to avoid deforestation. It adopted a sustainable Macro Ecologic-

¹⁵⁰ Amazonas, Brazil. GCF Database, GCF Task Force. Expected to be available online in 2012 at www.gcftaskforce.org. See Section One for more information about the GCF Database.

Economic land-use Zoning plan (MZEE-AM) to coordinate the use of the state's territory.¹⁵¹ Amazonas implemented a Green Free Zone Program that provides tax exemptions for non-timber extractive products, and a state Plan to Prevent and Control Deforestation (PPCD-AM). Amazonas also hosted the first REDD+ project in Brazil (the Juma Sustainable Development Reserve, also known as the Juma REDD+ project), and has had a Climate Change Forum composed of members of civil society since 2007. The forum has proposed a Payment for Environmental Services draft law to create a program for payments for environmental services (referred to as PES-AM),¹⁵² which now is being discussed by the state's legislative assembly. If approved, the PES-AM would create the basis for developing and implementing Amazonas' statewide REDD+ program.

Background

Amazonas hosts some of the richest biodiversity in the world. Approximately 98% of the state remains covered by native forests. Approximately 55% of the state is protected under state and federal laws, with 15% in federal conservation units, 12% in state conservation units, and 28% as indigenous territories.¹⁵³

Amazonas has a population of 3.5 million inhabitants and 66 indigenous ethnic groups.¹⁵⁴ Half the total population lives in the capital, Manaus, where a large number of industries are located. The estimated 2010 GDP of Amazonas was US\$ 32 billion, with a per capita income for the same period of US\$ 9,300.¹⁵⁵

Scope

According to the proposed draft PES-AM law, the scope of REDD+ in Amazonas would encompass reducing GHG emissions by reducing deforestation and degradation, while promoting conservation, sustainable forest management, maintenance, and enhancement of measured forest carbon stocks.¹⁵⁶

¹⁵¹ State Law 3 no. 417 of July 31, 2009. (State of Amazonas, Brazil). Additionally, Amazonas began to implement regional ZEEs. For example, in 2011, the state enacted the "ZEE for the Purus Region" through the State Law no. 3.645, of 8/8/2011. The ZEE for the Purus Region is currently awaiting final approval by the National Environment Council – CONAMA.

¹⁵² Amazonas Draft Law for Payment for Environmental Services, [hereinafter PES-AM], http://www.gcftaskforce.org/documents/Amazonas_Proposed_Law_on_Environmental_Services_and_Forest_Conse rvation_Unofficial_English_Translation.pdf

¹⁵³ GCF Database. *See supra* note 150

¹⁵⁴ Censo 2010, IBGE, Government of Amazonas, http://www.ibge.gov.br/home/presidencia/noticias/noticia_visualiza.php?id_noticia=1766&id_pagina=1 (last visited May 18, 2012).

¹⁵⁵ *Id.*

¹⁵⁶ Amazonas PES draft law. *See supra* note 152 at art. 13, I.

Reference Levels and Targets

According to INPE, the historical rates of deforestation and degradation in the state of Amazonas were:

Average deforestation rate (km²/year):

- 1995-1999: 1,023.2
- 2000-2004: 984.2
- 2005-2010: 609.3

Average degradation rate (km²/year):

- 2007: 180
- 2008: 65

The state does not have an official reference level or targets for REDD-related emission reductions. An overview of deforestation rates and reference-level scenarios for Amazonas is shown in Figure B-2. This figure shows historical average rates of deforestation in Amazonas, and a 42% reduction in the target deforestation rate every five years projected from 2010 to 2020. Additionally, the state's PES-AM draft law would require future regulations to establish a voluntary carbon emission reduction target specifically for REDD.¹⁵⁷

Nesting

Currently, there is no mechanism to nest REDD+ projects in Amazonas. The PES-AM draft law does not say if the state will “nest” REDD+ projects, but it does recognize early REDD+ actions (prior to the law’s enactment) under the state’s accounting system, which is a form of nesting. A nesting design is likely to be defined in the state’s REDD+ program.¹⁵⁸

Offset Issuance and Tracking

Currently, there are no official methodologies or standards for issuing REDD+ credits in the state. According to the PES-AM draft law, methodologies to create REDD-based offsets will be established by specific regulations. A committee formed by scientific experts would be created to advise the government during the development of the REDD+ program.

The PES-AM draft law directs the creation of a Center for Regulation, Control and Registry.¹⁵⁹ It would be responsible for requesting and controlling data, maintaining a registry of environmental services and products, and the inventory of each environmental program.¹⁶⁰

¹⁵⁷ Amazonas Draft Law for Payment for Environmental Services. *See* supra note 152 at arts. 12 and 14.

¹⁵⁸ *Id.* art. 15.

¹⁵⁹ Amazonas Draft Law for Payment for Environmental Services, art. X.

¹⁶⁰ *Id.*

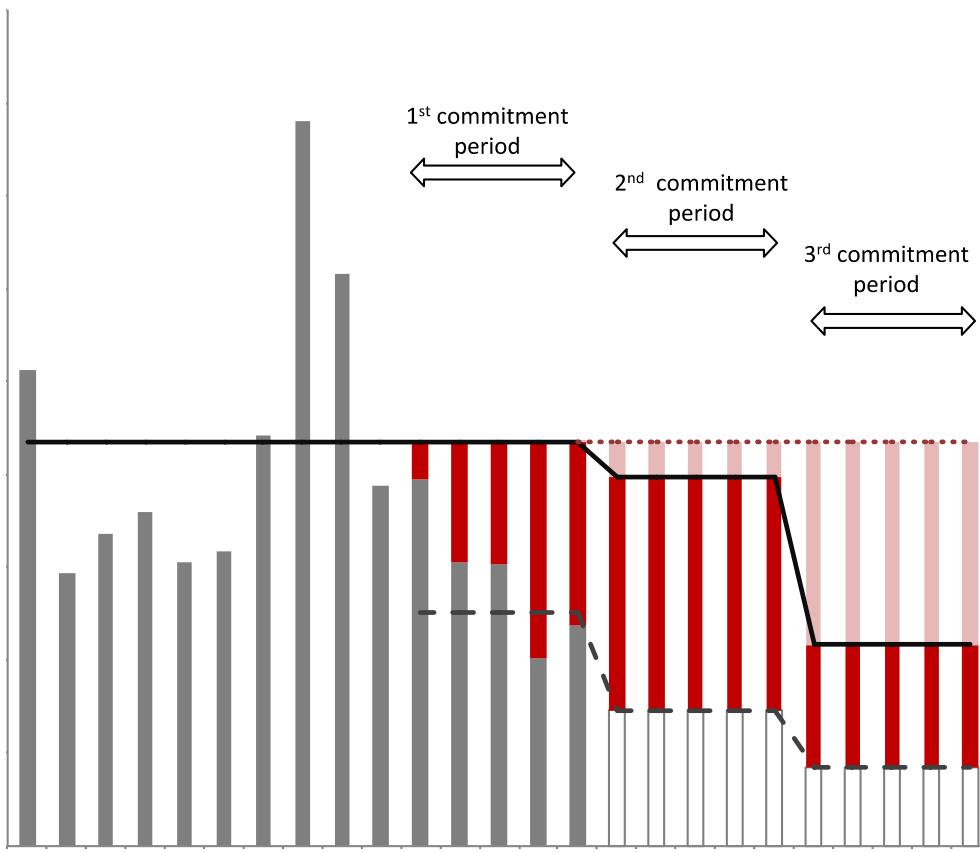


Figure B-2
Reference Levels and Emissions for Amazonas State, Brazil

Emissions Monitoring, Reporting and Verification

The Institute for Environmental Protection of Amazonas (IPAAM) is the entity responsible for monitoring deforestation and forest degradation in the state.

IPAAM is responsible for the enforcement of environmental legislation, and has established a geo-processing laboratory to monitor and identify illegal deforestation and fires. IPAAM's database is composed of spatial information including indigenous lands and protected areas (at the state and federal level), socio-economic factors, as well as biophysical and LANDSAT satellite imagery.¹⁶¹ IPAAM, however, works closely with INPE to obtain imagery and data from PRODES,¹⁶² DETER,¹⁶³ and DEGRAD monitoring systems.

The state has approximately 24 billion tons of carbon stocks including 18.48 billion tons above ground and 5.2 billion tons underground.¹⁶⁴ The methods used to determine the carbon stocks have uncertainty levels of less than 10 percent (IPCC indicates below 20 percent). However, the state will require frequent monitoring of forest inventory if it is to better understand the carbon dynamics in relation to carbon sequestration over time.

Social and Environmental Safeguards

The state of Amazonas has worked with different stakeholders to develop its REDD+ program. The existing REDD+ working group within the Forum for Climate Change drafted the PES-AM draft law. This proposed legislation also would create an Evaluation and Monitoring Committee. Half of the committee members would be composed of members of civil society and the other half would be government officials. The committee would ensure transparency and effectiveness of the payment for environmental services programs, including REDD.

Safeguards to protect Amazonas' environmental resources can be found in the state's MZEE land-use planning,¹⁶⁵ the Green Free Zone program, the PPCD-AM, and the PES-AM draft law.

Legal and Institutional Framework

Amazonas has steadily developed its REDD+ legal framework over the past few years. In 2007 and 2008, the state passed a law creating the State Conservation Units System (SEUC), it enacted the state Climate Change Policy, and implemented the Forest Incentive Program (Bolsa Floresta). In 2009, it passed the MZEE law and presented the PPCD-AM to the federal government, as proof of the state's commitment to reduce deforestation. In 2011, Amazonas passed a law requiring owners and occupants of rural lands to register under the Environmental

¹⁶¹ More information is available at http://www.ipaam.am.gov.br/pagina_interna.php?cod=47 (last visited May 18, 2012).

¹⁶² See supra note 128 and accompanying text.

¹⁶³ INPE also developed the system for Detection of Deforestation in Real Time (DETER), allowing the government to act faster and more efficiently against deforestation. More information is available at <http://www.obt.inpe.br/deter/index.html> (last visited May 18, 2012).

¹⁶⁴ GCF Database. See supra note 150.

¹⁶⁵ See supra note 142, art. 3, and accompanying text.

Registry of Rural Lands (CAR). Starting in 2010, a draft version of the PES-AM was open for public consultation, and the PPCD-AM began to be implemented. Currently, the state government is finalizing the PES-draft law to address comments received, and plans to submit the draft law to the state's legislative assembly. If approved, the PES law will establish the basis for a statewide REDD+ program. Table B-1 describes the organization of the current state government, and the proposed REDD+ framework.

Table B-1
Key Institutions involved in Developing and Implementing REDD+ in Amazonas

Name of the organization	Branches/Responsibilities
Secretariat of Environment and Sustainable Development (SDS)	<ul style="list-style-type: none"> • State Center for Climate Change (CECLIMA) – coordinates REDD+ program • Center for Regulation, Control, Registry, and Management of Environmental Services • State Center of Conservation Units (CEUC) – operates projects in state conservation units; • Institute for Environmental Protection of Amazonas (IPAAM) – conducts monitoring, reporting, and verification activities • Agency of Sustainable Development (ADS) – responsible for promoting activities that generate sustainable income on specific projects
Amazonas Land Institute (ITEAM)	Formalizes land rights
Institute for Agribusiness Development and Sustainable Forestry (IDAM)	Provides technical support for agriculture and sustainable forest management
Amazonas Sustainable Foundation (FAS)	Coordinates REDD+ programs related to Forest Allowances (Bolsa Floresta)
National Institute of Amazon Research (INPA) –	Federal agency responsible for verifying carbon stocks. It directly supports the state of Amazonas
National Institute of Spatial Research (INPE)	Federal agency responsible for monitoring deforestation and forest degradation. It directly supports the state of Amazonas.
Climate Change Forum	<ul style="list-style-type: none"> • Proposes climate change policies • Monitor and Evaluation Committee: (proposed by the PES-AM to monitor and evaluate the PES system).

The draft law includes a package of economic measures (e.g., tax incentives and subsidies), called Models of Environmental Services Incentives¹⁶⁶ that are designed to encourage natural resource conservation, and to improve environmental services to generate economic wealth and

¹⁶⁶ *Id.* at art. 22, IV.

eradicate poverty. Finally, the draft law includes provisions to create trading platforms to be used to commercialize credits generated by environmental services.¹⁶⁷

At the state level, the PES-AM draft law directs the statewide REDD+ program to be developed in accordance with existing national legislation related to REDD and Brazil's international commitments.¹⁶⁸

REDD+ Planning

Amazonas initiated its REDD+ strategy before it became a hot topic of international discussion. First, the state established the Amazonas Sustainable Foundation (FAS), a private-public partnership that supported the implementation of the Juma REDD+ pilot project. The state also developed the Forest Incentive Program (FIP) to compensate traditional populations and indigenous people for their roles in conserving the environment. Today, 35,000 people living across 10 million ha benefit from the program.¹⁶⁹ However, Amazonas is moving from a project focused REDD+ policy to a broader statewide REDD+ program. The FIP is being combined with policies such as the MZEE planning, the PPCD-AM, and CAR to reduce deforestation. Table B-1 also identifies some of the key institutions involved in developing and implementing REDD+ in Amazonas.

Financing

According to the PES-AM draft law, the resources to maintain the state REDD+ program would be obtained from: (i) public national funds, such as the Climate Change National Fund; (ii) contracts and agreements with federal, state and municipal governments; (iii) donations from national and international, public or private entities; (iv) state budget; (v) trading schemes related to environmental services and products; (vi) private investments; and, (vii) loans from national and international financial institutions.

If approved, the PES-AM draft law would create the funding institutions and instruments to implement and manage REDD+ projects and environmental services activities. First, the law would create the Promotion Fund to encourage conservation practices and support to environmental services.¹⁷⁰ Second, the law would create the Pro-Tech Environmental Services Fund to finance technological innovation and develop tools to measure and increase the value of environmental services.¹⁷¹ Third, the law would create an Investment Fund to be used to pay for conservation activities and provide payments for environmental services and products.¹⁷²

¹⁶⁷ *Id.* at art. 26, III.

¹⁶⁸ *See id.* at art. 3.

¹⁶⁹ <http://www.fas-amazonas.org/pt/secao/programa-bolsa-floresta>

¹⁷⁰ *See* PES-AM, *supra* note 152 at art. 22, I.

¹⁷¹ *Id.*

¹⁷² *Id.* at art 22, III.

C

CAMPECHE STATE SUMMARY

Overview

Campeche is located in southern Mexico on the Yucatan Peninsula near Cancun, as shown in Figure C-1. From 1993 to 2002 the gross annual deforestation in Campeche was approximately 391 km^2 , decreasing to 310.6 km^2 from 2002 to 2007. The main drivers of deforestation in Campeche are conversion of forests to pasture land and some conversion to agricultural land. The lack of government incentives to engage in sustainable forestry related activities also contribute to deforestation.



Figure C-1
Map of Location of Campeche, Mexico

Background

Campeche has a total area of $56,859 \text{ km}^2$. In 2005, it had a population of 754,730 inhabitants, and 26% of the population inhabited rural areas. The state's ethnic composition is 77% Maya, 10% Chol, 2% Tzeltal, 1.8% Kanjobal, 1.1% Mame, and 7% who are not specified. The 2006

GDP for was US\$ 9.5 billion.¹⁷³ The original forested area was 4.7 million ha. Approximately 45% (2.3 million ha) of the territory is now managed as protected forests.¹⁷⁴

Scope

Campeche has not yet developed an official scope of actions that will qualify as REDD+.

Reference Level and Target

A state-level GHG emissions inventory for the Agriculture, Forest and Other Land Use (AFOLU) sector is being developed to provide a basis to set reference levels. Data on deforestation, forest degradation, and carbon stock densities are all expected to be part of the inventory. As of yet, no emissions reduction targets have been established for Campeche and there are no estimates of potential future emissions reductions.

Average deforestation rates in Campeche (km^2/year) have been estimated to be:

- 1995-1999: 434
- 2000-2004: 404
- 2005-2009: 373

Nesting

This is not applicable to Campeche, since the state still does not have a REDD+ plan.

Offset Issuance and Tracking

Campeche does not have official methodologies or standards for issuing REDD+ offsets or a carbon registry.

Emissions Monitoring, Reporting and Verification

Deforestation rates in Campeche are based on available land use maps, produced by INEGI at a scale of 1:250,000. Deforestation estimates based on these maps are uncertain because the minimum resolution is 50 ha, and deforestation in Mexico generally occurs on a smaller scale.

Monitoring of forest degradation in Campeche is based on the same land use maps used to estimate deforestation. These maps were produced by INEGI in 1993, 2002, and 2007. Between 1993 and 2002, degradation averaged $255 \text{ km}^2/\text{yr}$. This average decreased to $39 \text{ km}^2/\text{yr}$ between 2002-2007. Degradation in Campeche is due mainly to agricultural practices, hurricane impacts, and unsustainable forest management. As with deforestation, degradation monitoring could be improved using a combination of satellite and ground-based monitoring.

Campeche has not yet quantified its forests' carbon stock. However, the state has classified its forest into 18 different types, with evergreen forests making up the majority of above ground

¹⁷³ Campeche, Mexico. GCF Database, GCF Task Force. Expected to be available online in 2012 at www.gcftaskforce.org. See Section One for more information about the GCF Database.

¹⁷⁴ *Id.*

carbon stocks. Between 2004 and 2007, about 1,000 permanent inventory plots were established in Campeche. Carbon stocks in woody vegetation are derived from the national forest inventory data. As part of updating the national forest inventory all permanent plots are being re-measured. As of 2009, all carbon pools had been measured or estimated, although the data continues to be analyzed.

Social and Environmental Safeguards

Social and environmental safeguards are undefined, although Campeche's REDD+ Technical Advisory Committee (CTC-REDD+) is considering them.¹⁷⁵ Additionally, the federal government is carrying out the Development of Forestry Practices in Communities of Southern Mexico project (DECOFOS) in Campeche.¹⁷⁶ More specifically, this project includes 74 municipalities in the states of Chiapas, Campeche, and Oaxaca. These municipalities were chosen to be part of this project because they have high densities of indigenous people, marginalization, and poverty. DECOFOS' goal is to improve the livelihood of these people by strengthening their social organization, building capacity to manage forest resources, and encouraging the creation of sustainable businesses and agricultural practices.

Legal and Institutional Framework

The state of Campeche does not have a legal framework to handle REDD+ yet. As for institutional framework, the state has created the CTC-REDD+, which is responsible for proposing REDD+ policies for the state.

Campeche has been working closely with the federal government authorities to create a REDD+ program integrated with the national strategy. However, there is not yet a plan detailing how state REDD+ programs will be legally integrated with Mexico's national commitments, or the volume of carbon credits that states will be allowed to generate.

REDD+ Planning

The three states of the Yucatan Peninsula are promoting a regional level initiative to address climate change that includes development of a REDD+ program in coordination with Mexico's CONAFOR. Campeche has not developed any independent REDD+ program for the state.

Financing

Campeche has not yet identified any funding sources to support development or implementation of a state REDD+ plan.

¹⁷⁵ Minutes of CTC-REDD+ meeting held in Nov. 18, 2011. *See also* Campeche REDD+ Strategy, Presentation in Sept., 2011 available at http://www.gcftaskforce.org/meeting/documents/Campeche_Annual_Meeting_2011.pdf (last visited May 29, 2012).

¹⁷⁶ The project also has financial support from the International Fund of Agrarian Development (FIA).

D

CENTRAL KALIMANTAN PROVINCE SUMMARY

Overview

Central Kalimantan is a province of Indonesia, one of four in Kalimantan - the Indonesian part of the island of Borneo, as shown in Figure D-1. The Indonesian province of Central Kalimantan has suffered serious and widespread environmental degradation, especially from 1996 to 1999. This was primarily due to the so-called *mega rice project* implemented in the province. The project involved clearing about one million hectares of peat swamp forests and construction of 4000 km of canals. Today, only 865,000 ha of swamp forest remain in the province, and only 1.4 million ha of secondary forest and 1.1 million ha of degraded shrub-land remain.



Figure D-1
Map of Location of Central Kalimantan Province, Indonesia

Background

The province of Central Kalimantan occupies 153,564 km², and has a population of 2.2 million people. The provincial capital is Palangkaraya. About 67% of the population lives in rural areas,

and the largest ethnic group is the indigenous Dayak people.¹⁷⁷ Figure D-1 shows the location of Central Kalimantan in Indonesia.

Scope

Central Kalimantan has not defined the scope of its REDD+ program, but is expected to cover the same actions and activities as Indonesia's national REDD+ efforts.

Reference Level and Target

Central Kalimantan does not have an official reference level or target for reducing deforestation and GHG emissions.

Nesting

Central Kalimantan does not have a mechanism to nest REDD+ projects.

Offset Issuance and Tracking

Central Kalimantan does not have approved methodologies and standards for issuing offsets or a carbon registry. At this time, it appears that all provinces in Indonesia will operate within a national registry to be developed in the future.

Emissions Monitoring, Reporting and Verification

Central Kalimantan has not yet developed a system to monitor, report or verify emissions from deforestation and forest degradation.

Social and Environmental Safeguards

Central Kalimantan was the province in Indonesia to host the Social and Environmental Standards (SES) assessments,¹⁷⁸ which are underway.

Additionally, benefit sharing is being legally addressed as part of a new draft regulation being considered by the national government.¹⁷⁹ This regulation would mandate that the local community receive at least 20% of the proceeds generated from carbon-related projects. However, many observers believe this benefit sharing mechanism could benefit from more comprehensive stakeholder participation, and the draft regulation is currently being reviewed.

Legal and Institutional Framework

Central Kalimantan does not currently have a legal or institutional framework for REDD+.

¹⁷⁷ Central Kalimantan, Indonesia. GCF Database, GCF TASK FORCE. Expected to be available online in 2012 at www.gcftaskforce.org. See Section One for more information about the GCF Database.

¹⁷⁸ More information is available at <http://www.redd-standards.org/indonesia-assessment> (last visited May 18, 2012).

¹⁷⁹ Ministry of Forestry Republic of Indonesia Decree Number P.36/Menhet-II/2009: Regarding Procedures for Licensing of Commercial Utilization of Carbon Sequestration and/or Storage in Production and Protected Forests [hereinafter "Indonesia Decree P.36/Menhet II/2009"].

However, national laws related to REDD+ exists in Indonesia, including:

- The Agrarian Law of 1960 that defines Indonesian forestry jurisdiction and natural resources management. This law provides guidance for recognizing and awarding land rights; and
- The Forestry Law of 1999, which outlines forest functions, and empowers the Department of Forestry to determine and manage Indonesia's *Kawasan Hutan* (Forest Zone).

Also, there are several Ministry of Forestry Orders specifically related to REDD:

- Permenhut No. 68/2008 describes the permission and approval procedures for REDD+ demonstration activities;
- Permenhut No. 30/2009 regulates procedures related to the implementation of REDD+ activities, including requirements to be fulfilled by developers, verification and certifications, and terms and conditions of REDD-related implementing bodies; and
- Permenhut No 36/2009 regulates the permission and procedures for REDD+ projects that sequester and store carbon. It details the project application process, as well as revenue collection, utilization and sharing. This order reportedly is still being reviewed.

REDD+ Planning

Starting in 2005, Central Kalimantan established a “green” policy framework. By 2010 this had evolved into a vision of Central Kalimantan as a “Green and Clean Province.”

The province is the site for the Australia-Indonesia Forest Carbon Partnership REDD+ Demonstration Project, which aims to reduce emissions on 135,000 hectares of degraded peat lands. It is also a participant in the Heart of Borneo trans-boundary conservation project. Finally, in 2010 Central Kalimantan became Indonesia’s fifth full member of the Governors’ Climate Task Force (GCF).

Central Kalimantan has been pursuing a low-carbon development strategy in line with national policies. In 2010, the province was chosen to be a pilot province for REDD+. This occurred as a consequence of the signing of the LOI between Norway and Indonesia, which imposes a moratorium on deforestation in Indonesia in exchange for grants to protect and restore forests and peat lands.

The restoration of damaged peat ecosystems is a high priority for both the provincial and national government, and has been identified as a high priority based on instructions from the president.

Financing

Central Kalimantan is receiving financial support from the national government, through the Indonesia-Norway partnership to implement REDD+ pilot projects and develop REDD+ policies. It has also attracted a number of private investments that support REDD+ projects.

E

CROSS RIVER STATE SUMMARY

Overview

The state of Cross River is part of the Federal Republic of Nigeria, as shown in Figure E-1. The average deforestation rate in Cross River between 2000 and 2008 was 163.2 km²/year. During this period, the total forest cover in the state declined 18%. The main drivers of deforestation in Cross River are unsustainable agricultural practices, commercial logging, forest fires, and cattle grazing.¹⁸⁰

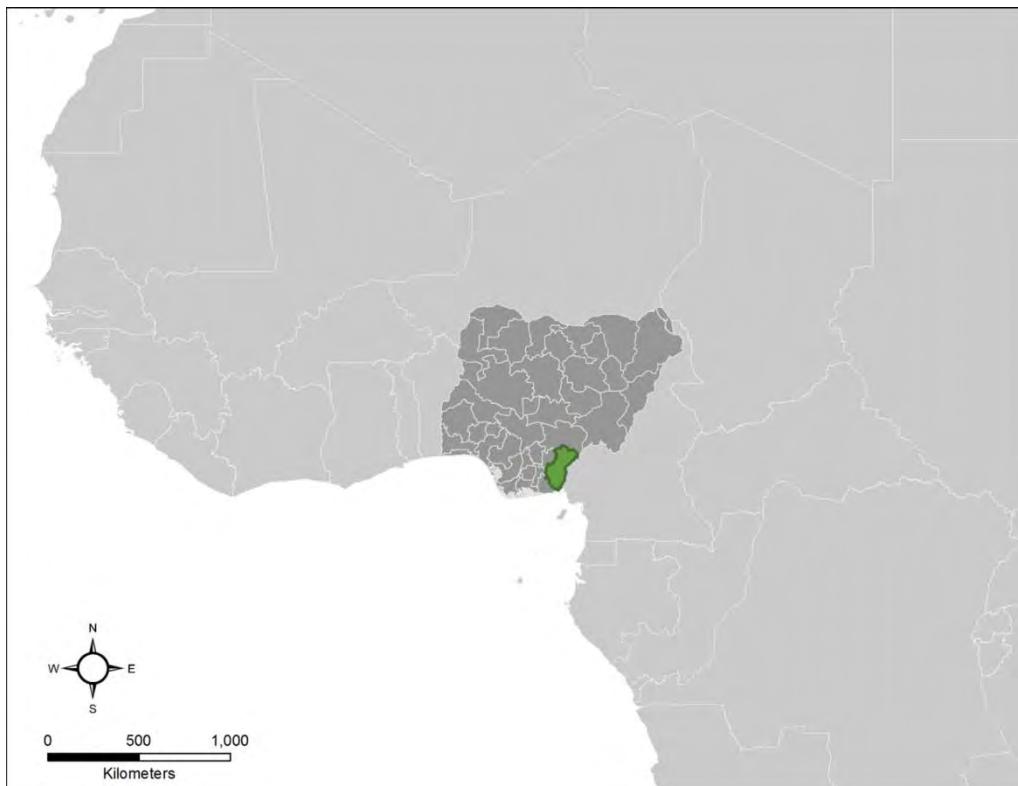


Figure E-1
Map of Location of Cross River State, Federal Republic of Nigeria

¹⁸⁰ Cross River State, Nigeria, GCF Database, GCF TASK FORCE. Expected to be available online in 2012 at www.gcftaskforce.org. See Section One for more information about the GCF Database.

Background

The state of Cross River encompasses 22,342 km² of land, and had a population of 2.8 million as of 2005. Approximately 1.8 million people live in rural areas. The state is ethnically diverse and is made up of approximately 29% Efik, 12% Bete, 16% Ejagham, 16% Ekoi, 14% Bako, 8% Boki, and 7% Mbembe. The GDP of Cross River was approximately US\$ 9.3 billion in 2007, and the per capita GDP was U\$3,150.¹⁸¹

Cross River has approximately 730,000 ha of forest area. The federal government manages 40% of this as part of the Cross River National Park. The state of Cross River manages 38% as forest reserves, and local communities manage the remaining 22%.¹⁸²

Scope

The state of Cross River has not defined the scope of its REDD+ program.

Reference-Level and Target

The state of Cross River does not have a defined reference level or target for reducing deforestation and GHG emissions.

Nesting

The state of Cross River does not have a nesting design for its REDD+ program.

Offset Issuance and Tracking

The state of Cross River has not developed any standards and methodologies for issuing carbon credits for REDD+ projects. Cross River also does not have a carbon registry for REDD+ projects.

Emissions Monitoring, Reporting and Verification

Currently, there is no institutional system to monitor deforestation in Cross River. However, monitoring has occurred on an *ad hoc* basis since the 1990s. In 1999, the United Kingdom's Department for International Development (DFID) launched the Three-year Cross River Community Forestry Project (CRSCFP). This project involved more than 33 communities in the state of Cross River, and led to completion of numerous studies, including a rapid inventory of the state's forest resources. In August 2002, Flasse Consulting performed an assessment of the tropical high forest cover and timber volume, as well as an appraisal of forest quality using remote sensing.

Forest degradation is not officially monitored in Cross River. Most drivers of degradation are the same as for deforestation. The Flasse Consulting assessment completed in 2002 re-visited several 1994 forest plots and found high levels of degradation.

¹⁸¹ *Id.*

¹⁸² *Id.*

As for carbon stocks, a study done by the TFG in 2008 examined four adjacent plots, and estimated the average above-ground carbon stocks to be 193 tC/ha ($\pm 50\%$).¹⁸³ Underground carbon stocks are unknown. The relatively low level of accuracy of the TFG study is a consequence of the study being comprised of only four 20m x 20m plots. To increase the accuracy of the estimates of the carbon density in Cross River's forests, a statistically robust survey would need to be done that addresses different forest classes in a manner consistent with remote sensing data.

Social and Environmental Safeguards

The UN-REDD program that is expected to be launched in Nigeria requires a stakeholder engagement plan for the state of Cross River. The resulting plan could become a model to be used throughout the country in the future. Benefit sharing mechanisms still need to be developed, but it appears that the state government is interested in achieving a wide range of co-benefits from REDD+ activities, including generating sustainable income from non-timber forest products. Finally, this UN-financed REDD program requires the grantees (i.e., Nigeria and Cross River) to pay attention to the UN-REDD Social and Environmental Principles, as they implement this project in Cross River.

Legal and Institutional Framework

The state of Cross River does not have a legal or institutional framework related to REDD+. However, the state is working closely with the federal government to develop its REDD+ program and capacity building.^{184, 185} Recognition of land tenure, and development of uniform policies among different branches of the government are two of the many issues Cross River will need to address as it develops a REDD+ program.

REDD+ Planning

As mentioned above, Cross River's government is engaged directly with the federal government of Nigeria and the international community to become ready to implement REDD+. The state appears to be eager to protect its forests and improve the livelihood of the forest dwellers. However, a REDD+ plan of substance remains to be developed and formalized. For example, Cross River does not have: (i) a reliable system to monitor, report, or verify emission reductions from REDD+ activities; (ii) a long-term forest management plan; or, (iii) strong institutional capacity to manage forestry resources sustainably and enforce laws.¹⁸⁶

¹⁸³ *Id.*

¹⁸⁴ More information is available at Cross River's official website:
http://www.crossriverstate.gov.ng/index.php?option=com_content&view=article&id=1061:nigeria-signs-un-redd&catid=209:quick-news (last visited May 18, 2012).

¹⁸⁵ Details for Nigeria National REDD Plus Readiness-October 2011,
http://www.unredd.net/index.php?option=com_docman&task=doc_details&Itemid=&gid=6110 (last visited May 18, 2012).

¹⁸⁶ GCF Database, *See* supra note 180.

Financing

The State of Cross River has sought financial assistance from the UN-REDD Programme, the World Bank FCPF, and the US Forest Service to implement its statewide REDD+ program. In October 2011 Nigeria was awarded US\$4 million by the UN-REDD Programme to help the nation and states to implement many early-stage REDD+ components. About US\$2.5 million of this grant will be invested in Cross River.¹⁸⁷ Additionally, the government of Cross River has spent more than \$500,000 related to development of REDD+ programs. The state funds have been used primarily to develop a new forest management law and to enforce an anti-logging moratorium.¹⁸⁸

¹⁸⁷ Presentation of Nigeria REDD+ Readiness Programme at the UN-REDD 7Th Board Meeting. Berlin, October 13-14, 2011.

¹⁸⁸ *Id.*

F

EAST KALIMANTAN PROVINCE SUMMARY

Overview

East Kalimantan is a province of Indonesia, one of four in Kalimantan - the Indonesian part of the island of Borneo, as shown in Figure F-1. The average annual deforestation in East Kalimantan from 2000 to 2005 was approximately 361 km², rising to 1,464 km² from 2003 to 2006. The main drivers of deforestation related emissions in East Kalimantan are cattle ranching, large-scale agriculture, and logging.



Figure F-1
Map of Location of East Kalimantan Province, Indonesia

The East Kalimantan government appears to be committed to developing a functional REDD+ program. However, to reach this goal, a variety of actions would be needed. This includes capacity building for all government agencies, communities and NGOs, and the establishment of effective communications between government agencies and stakeholders

Background

East Kalimantan is the second largest Indonesian province with a total land area of 198,441 km². The province's population is approximately 3.1 million people. The GDP of the province is approximately US\$ 33.1 billion, including US\$ 1.6 billion associated with the agricultural sector. Per capita income was US\$ 4,120 in 2010.¹⁸⁹

East Kalimantan originally had 171,292 km² covered by forests. Currently, 18.8% of existing forests are protected, 14.8% of forests are conserved (managed for conservation and comprising the International Union of Conservation of Nature [IUCN] categories 1-4), and 66% are forestlands used for commercial production.¹⁹⁰

Although deforestation has increased across the province, stricter government control of illegal logging since 2004 has helped slow this trend. However, deforestation rates have increased because land classifications have been changed, and some planned deforestation has continued as part of an economic development plan.

Scope

East Kalimantan has not established a formal scope for its REDD+ program. However, it is expected to include the same scope as the national government. In 2008, Indonesia signed a LOI with Norway to undertake REDD+ actions in exchange for financial support.

Reference Level and Target

East Kalimantan has not established a formal jurisdiction-wide reference level.

In 2010, emissions were estimated to be 250 MtCO₂e annually, and the province has set an emission reduction target of 26% by 2030, aiming for yearly emissions of approximately 184 MtCO₂e. A more thorough GHG emissions inventory is currently being developed.

Nesting

East Kalimantan does not have a project nesting design for REDD+.

Offset Issuance and Tracking

East Kalimantan has not developed methodologies or standards to issue REDD+ offsets, although the province is currently working with the national government on developing related MRV standards.

East Kalimantan does not have a carbon registry. At this time, it appears that all provinces in Indonesia will operate as part of a national carbon registry to be developed in the future.

¹⁸⁹ East Kalimantan, Indonesia, GCF Database, GCF Task Force. Expected to be available online in 2012 at www.gcftaskforce.org. See Section One for more information about the GCF Database.

¹⁹⁰ *Id.*

Emissions Monitoring, Reporting and Verification

Estimates of forest cover for the period of 2000 through 2006 are based on a combination of MODIS and LANDSAT satellite data. The results derived from combined analysis of these two datasets were compared to field sampling, and provide estimates of deforestation and with an order of error of approximately 15%.¹⁹¹

Average historic deforestation rates in East Kalimantan (km²/year) have been estimated to be:¹⁹²

- 2000-2005: 36
- 2003-2006: 146

The rate of forest degradation is unknown. The major factors driving degradation of primary forests are logging and forests fires. However, methods to accurately monitor forest degradation still need to be developed.

Social and Environmental Safeguards

The current legal framework needs to be analyzed further to determine to what extent it may address the rights of local and indigenous communities. Mechanisms and pathways still need to be created that lead to community involvement in the early stages of project actions. The East Kalimantan REDD+ task force is working with a range of organizations to ensure appropriate levels of consultation and participation. However, currently there is no action plan or formal institutional framework to ensure the FPIC of local communities.

Benefit sharing is addressed by a draft regulation being considered by the national government.¹⁹³ This regulation would mandate that local communities receive at least 20% of the proceeds generated from carbon-related projects. However, many observers believe this benefit sharing mechanism could be improved with more comprehensive stakeholder participation, and currently the regulation is being reviewed.

Legal and Institutional Framework

East Kalimantan does not have a legal and institutional framework in place to deal with REDD.

However, national laws related to REDD+ exists in Indonesia, including:

- The Agrarian Law of 1960 that defines Indonesian forestry jurisdiction and natural resources management. This law provides guidance for recognizing and awarding land rights; and

¹⁹¹ The relationship between MODIS estimates and LANDSAT estimates is linear and statistically robust with r² of 0.87 and a residual standard error 7.15%. The deviation between estimated and actual forest cover based on BAPLAN field sampling is about 15% and this value has been adopted as the order of error to apply to forest area loss.

¹⁹² GCF Database. *See supra* note 189.

¹⁹³ Indonesia Decree P.36/Menhet II/2009. *See supra* note 179.

- The Forestry Law of 1999, which outlines forest functions, and empowers the Department of Forestry to determine and manage Indonesia's *Kawasan Hutan* (Forest Zone).

Also, there are several Ministry of Forestry Orders specifically related to REDD:

- Permenhut No. 68/2008 describes the permission and approval procedures for REDD+ demonstration activities;
- Permenhut No. 30/2009 regulates procedures related to the implementation of REDD+ activities, including requirements to be fulfilled by developers, verification and certifications, and terms and conditions of REDD-related implementing bodies; and
- Permenhut No 36/2009 regulates the permission and procedures for REDD+ projects that sequester and store carbon. It details the project application process, as well as revenue collection, utilization and sharing. This order reportedly is still being reviewed.

As for institutional framework, the province of East Kalimantan is creating a Climate Change Council that would operate as an “arm” of the existing national council of climate change.

REDD+ Planning

East Kalimantan began its first REDD+ project in 2008 in the Berau Forest. Pemerintah Kabupaten Berau operates this project, and plans to continue to do so for five years. Over this five-year period, the project seeks to avoid an estimated 10 MtCO₂e of emissions.¹⁹⁴ In addition, there are three types of pilot projects being implemented as part of the East Kalimantan Green Low Carbon Development Strategy: (i) Reduced Impact Logging, (ii) use of degraded land for oil palm development; and, (iii) rehabilitation and conservation of peat swamp forests.

Furthermore, there are three core elements to the province’s REDD+ implementation strategy. First, a “Carbon Development Strategy” that aims to identify major emission sources, emission reduction opportunities, and the economic costs of reducing emissions, while promoting sustainable livelihoods. Second, the “Implementation of General Readiness” is an effort to design the Governor’s Green Delivery Unit. The Unit may identify and develop mechanisms to implement REDD+ and seek funding sources. Third, a Pilot Project for Low Carbon Development is expected to be launched once sufficient funding is secured.

The government of East Kalimantan has begun to develop an MRV strategy in conjunction with other government bodies, community groups, and NGO's. The approach to conducting MRV in the province is likely to be based on a national standard to be developed and maintained by national government agencies and implemented by the province. The government of East Kalimantan is actively coordinating its REDD+ activities with the National Climate Change Board and relevant national government agencies.¹⁹⁵

¹⁹⁴<http://redd-database.iges.or.jp/redd/download/project?id=15> (last visited May 18, 2012).

¹⁹⁵ GCF database. See supra note 189.

Financing

Current REDD+ implementation is funded primarily by provincial budgets and donor funding. Provincial authorities hope additional funding can be allocated from the national government. To finance REDD+ implementation, the province seeks to: (i) develop and strengthen its national and international networking; and (ii) involve the private sector by gaining access to funds designed for corporate social responsibility actions.

G

PAPUA PROVINCE SUMMARY

Overview

Papua comprises most of the western half of the island of New Guinea¹⁹⁶ and nearby islands, as shown in Figure G-1. Its capital is Jayapura. It's the largest and easternmost province of Indonesia, covering 317,062 km² on the island of New Guinea.

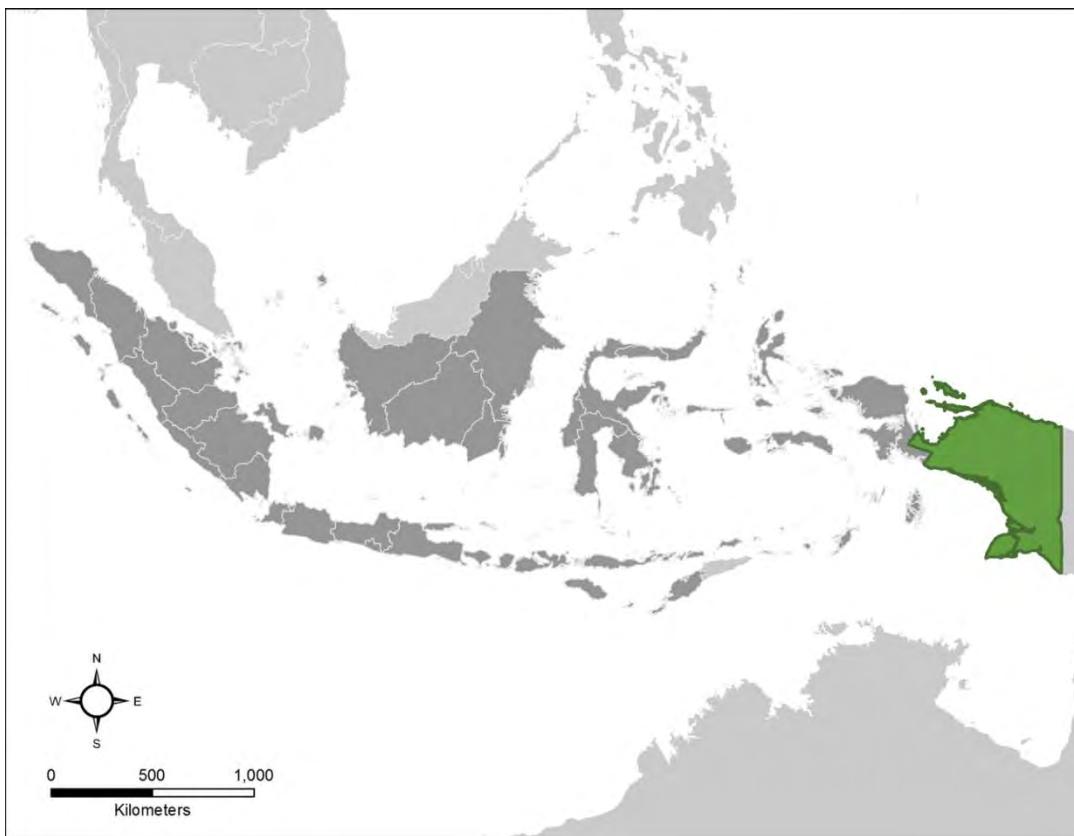


Figure G-1
Map of Location of Papua, on the island of New Guinea, Indonesia

Average annual deforestation in Papua from 2000 to 2005 was 217 km²/year, falling to 195 km²/year from 2003 to 2006. The main drivers of deforestation in Papua are logging and conversion of land to agriculture. Logging and fires are the main drivers of degradation to primary and secondary forests.

¹⁹⁶ The province originally covered the entire western half of New Guinea. It was first called Irian Jaya. In 2001 it was renamed to Papua. In 2003, the Indonesian government divided the province into two, the western part was named West Papua, while the easternmost retained the name of Papua. .

Papua has been constructing a low-carbon emissions economic strategy that seeks to manage the largest portion of the province as intact tropical forest. Utilizing REDD+ mechanisms would enable the province to maintain low GHG emissions, and minimize carbon losses through land conversion.

Background

Indonesia's West Papua province also is located on New Guinea. Papua's current population is approximately 2.1 million people. The province is composed of isolated rural communities with indigenous Papuans accounting for 75% of the inhabitants. Papua hosts extremely high biological and cultural diversity due to its bio-geographical position within the tropical Asian Pacific region. More than 300 languages are spoken in this province.¹⁹⁷

Papua contains 31.4 million km² of forestland, most of which are closed tropical humid forests. Approximately 24% of Papua's forested land is protected, 22.5% is managed for natural conservation, 32.5% is used for commercial production, 20.6% has been zoned for conversion to non-forest use, and .001% exists on private land. An estimated 85% of Papua's forested areas are primary forest with low levels of human disturbance.¹⁹⁸

Papua is one of the most resource rich provinces in the country. In 2008, Papua had the fourth highest GDP in Indonesia at US\$6.9 billion. The province's main industries are mining, forestry, agriculture, estate crops (e.g., palm oil), and fishing. Despite its relatively high GDP, it has the highest rate of illiteracy (74%) and official poverty (40%) among Indonesian provinces.¹⁹⁹

Scope

Papua has yet to define the scope of its REDD+ program.

Reference Level and Target

Papua has yet to define a reference level of deforestation or degradation. Given the low rates of historical deforestation, the national government has acknowledged the value of developing a projected baseline that takes into account broad economic development objectives. The government of Indonesia is committed to reduce its GHG emissions by 15% unilaterally by 2015, and by 41% with international support by 2020.

Nesting

Papua does not have a project nesting design yet.

Offset Issuance and Tracking

Papua does not have approved methodologies and standards for issuing carbon offsets.

¹⁹⁷ Papua New Guinea GCF Database, GCF TASK FORCE. Expected to be available online in 2012 at www.gcftaskforce.org. See Section One for more information about the GCF Database.

¹⁹⁸ *Id.*

¹⁹⁹ *Id.*

Papua is still in the early phases of becoming prepared to develop and implement REDD+, and does not have a carbon registry. At this time, it is expected that all provinces in Indonesia will operate their programs using a national carbon registry that is expected to be developed in the future.

Emissions Monitoring, Reporting and Verification

The Ministry of Forestry is responsible for collecting deforestation data in Papua. As of 2004, significant reductions in deforestation had been achieved by increased control of illegal logging. Additionally, Papua plans to implement a satellite system to monitor deforestation, degradation and changes in land use.

Forest cover monitoring for 2000-2005 was performed using both LANDSAT and MODIS techniques. LANDSAT provides better resolution, but is not as complete as MODIS. Results from analysis combining these two techniques were compared to field sampling and provide estimates with an error factor of approximately 15%.²⁰⁰

Forest Cover monitoring for the period of 2003-2006 was based on 1:250,000 scale interpretation of LANDSAT 7 ETM+ overlays for 2002/2003 and 2005/2006. Data from the province was analyzed by the Provincial Offices of the Ministry (BKLH), and compiled and reported by the national government. Deforestation data is used for spatial planning at the province and district²⁰¹ levels of government.

Less information is available on forest degradation, although the total forest degradation from 2003 to 2006 was estimated at 5,946 km².²⁰² Both logging and forest fires have contributed to degradation of primary forest. Papua plans to begin using satellite imagery in 2012 to monitor ongoing forest degradation.

There is little data available to quantify forest carbon stocks in Papua.

Social and Environmental Safeguards

Papua does not have a social and environmental safeguard policy for its REDD+ program. Like the rest of Indonesia, Papua continues to grapple with the legacy of a historically strong central government. One consequence of this legacy is a continuing struggle to resolve land tenure issues. As these issues are resolved, investor interest in forest carbon projects in Papua may increase.

The current legal framework that addresses land and natural resource rights needs to be analyzed further, especially with regards to the rights of local and indigenous communities. Additional work needs to be done to ensure that communities can become involved at the early stages of

²⁰⁰ The relationship between MODIS estimates and LANDSAT estimates is linear and statistically robust with r^2 of 0.87 and a residual standard error 7.15%. The deviation between estimated and actual forest cover based on BAPLAN field sampling is about 15% and this value has been adopted as the order of error to apply to forest area loss. See GCF Database.

²⁰¹ In Indonesia districts within the provinces are known as “Kabupaten.”

²⁰² Data from GCF Database. See supra note 197.

REDD+ projects and activities. In addition, procedures are likely to be needed to ensure acknowledgement of indigenous and community rights, such as participatory mapping supported by legal mechanisms.

Benefit sharing is addressed by a draft regulation being considered by the national government.²⁰³ This regulation would mandate that local communities receive at least 20% of the proceeds generated from carbon-related projects. However, many observers believe this benefit sharing mechanism could be improved with more comprehensive stakeholder participation, and currently the regulation is being reviewed.

Legal and institutional Framework

Papua has yet to define its legal and institutional framework to deal with REDD. Papua was granted special autonomy status in 2001 in recognition of its unique ethnic composition and the dependency of indigenous Papuans on traditional forest ownership. Through this arrangement, the province receives additional funding from the national government, and has greater local influence over forest management. However, the specific ways that the province's REDD+ program may be integrated with the national program have not yet been determined

The national laws related to REDD+ in Indonesia, include:

- The Agrarian Law of 1960 that defines Indonesian forestry jurisdiction and natural resources management. This law provides guidance for recognizing and awarding land rights; and
- The Forestry Law of 1999, which outlines forest functions, and empowers the Department of Forestry to determine and manage Indonesia's *Kawasan Hutan* (Forest Zone).

Also, there are several Ministry of Forestry Orders specifically related to REDD:

- Permenhut No. 68/2008 describes the permission and approval procedures for REDD+ demonstration activities;
- Permenhut No. 30/2009 regulates procedures related to the implementation of REDD+ activities, including requirements to be fulfilled by developers, verification and certifications, and terms and conditions of REDD-related implementing bodies; and
- Permenhut No 36/2009 regulates the permission and procedures for REDD+ projects that sequester and store carbon. It details the project application process, as well as revenue collection, utilization and sharing. This order reportedly is still being reviewed.

REDD+ Planning

Papua's current REDD+ Program is part of the province's overall Low Carbon Development Strategy Plan first developed by its governor following COP-13 held in Bali, Indonesia. The plan calls for Papua to maintain at least 50% of its forests, to stop clearing primary forest for the

²⁰³ Indonesia Decree P.36/Menhut II/2009. See supra note 179.

cultivation of palm oil, and to ensure that large-scale agricultural developments use industry best practices standards. It also calls for economic diversification through the development of clean energy and/or small-scale forestry enterprises. Overall, current development objectives are being tied to a low-carbon economic strategy.

Financing

Currently, REDD+ implementation is being funded primarily by provincial budgets and international donor funding. Provincial authorities hope the central government may allocate additional funding in the future. The Papua Low Carbon Development Task Force now is seeking additional interim funding from the Climate Land Use Alliance (CLUA), the United Kingdom Climate Change Unit (UKCCU) and the European Union (EU) for the period of 2012-2014. The CLUA and CCU have provided interim funding through December 2011.

H

PARÁ STATE SUMMARY

Overview

Pará is the second largest state in Brazil. Pará is located in Northeastern Brazil as shown in Figure H-1. The average annual deforestation in Pará from 1996 to 2005 was approximately 6,449.5 km², falling to 5,043 km² from 2005 to 2010. The main drivers of deforestation in Pará are cattle ranching, large-scale agriculture, and logging.²⁰⁴



Figure H-1
Map of Location of Pará, Brazil

Pará is the Amazon region's second largest GHG emitter (historical average of 300 MtCO₂e/yr). However, it has taken important policy steps towards the development of a jurisdictional REDD+ program. Pará created an ecological-economic land-use zoning plan (ZEE) that is now approved for part of the state. It also developed a Plan for Prevention, Control, and Alternatives to Deforestation (PPCAD-PA). The state is resolving land tenure issues, upgrading forest monitoring systems, and gaining experience as it hosts a variety of REDD+ projects. However,

²⁰⁴ Pará, Brazil, GCF Database, GCF Task Force. Expected to be available online in 2012 at www.gcftaskforce.org. See Section One for more information about the GCF Database.

the state has not yet developed a REDD+ legal framework or plan, nor has it developed strategies to finance the development and implementation of a statewide REDD+ program.

Background

Pará covers an area of approximately 1.25 million km² with roughly 870,000 km² still covered by tropical forests.^{205, 206} It is the most populous state in the Amazon region with more than seven million inhabitants, and accounts for approximately 33% of all deforestation in the Brazilian Amazon basin.²⁰⁷ Recent federal enforcement in the region has contributed to a decline in deforestation. The creation of new indigenous lands (covering 25% of the state) and protected areas also has successfully slowed deforestation.²⁰⁸ However, these conservation efforts are under pressure as agricultural frontiers expand into the state.

Scope

The State of Pará does not have a REDD+ program, and Pará has yet to develop an official scope of actions that will qualify for REDD. However, as part of draft legislation proposed in 2009, REDD+ actions were envisioned to be a set of measures taken that would result in compensation for reductions in carbon emissions from the destruction of natural areas, provided that such reductions were measurable, verifiable, quantifiable and demonstrable.²⁰⁹

Reference Level and Target

Pará has created a jurisdiction-wide reference level and emission reduction target defined by law.²¹⁰ The goal of the state is to reduce emissions from deforestation by 80% by 2020, compared to historic deforestation rates over the period 1996-2005. This goal is similar to the federal target, and progress will be measured in three periods:

1. 2006 to 2010: Reduction of 42% from the baseline;
2. 2011 to 2015: Reduction of 66% from the baseline (or 42% from 2006-2010); and,
3. 2016 to 2020: Reduction of 80% from the baseline (or 42% from 2011-2015).

Average deforestation rate (km²/year):

- 1995-1999: 5,812
- 2000-2004: 7,087
- 2005-2009: 5,394

²⁰⁵ Pará has 1,247,689.15 km². Brazilian Institute of Geography and Statistics (IBGE).

²⁰⁶ Pará is just behind Amazonas in territorial extent. *Id.*

²⁰⁷ GCF Database. *See supra* note 204.

²⁰⁸ Soares-Filho et al. *See supra* note 15.

²⁰⁹ Climate Change Law Proposal, Sept. 2009, §§ II, XIII.

²¹⁰ State Decree n. 1.697, of June 5, 2009.

Average degradation rate (km²/year):

- 2007: 3,899
- 2008: 8,264

Figure H-2 depicts the deforestation rates and reference levels for Pará State, Brazil. This figure shows historical average rates of deforestation in Pará, and shows a 42% reduction in deforestation every five years.

Nesting

Pará reference level is consistent with the federally defined reference level for the Brazilian Amazon region and targets to be achieved from 2006-2020. If Pará achieves its jurisdictional targets, it will be responsible for 30% of the total emission reductions under the federal plan.

As shown in Figure H-2, Pará potentially could achieve 1.8 GtCO₂e of emissions reductions by 2020, based on Scenario 1 that accounts for emissions reductions below a reference level that declines every five years. If the reference level is assumed to be based on historic levels of deforestation (1996-2005), Pará potentially could achieve an additional 732 MtCO₂e of emissions reductions. In total, based on an historical reference level, Pará potentially could achieve 2.532 GtCO₂e of emissions reductions.

The state has not developed a strategy or approach to nest REDD+ projects hosted in the state into its jurisdictional-based REDD+ program. Currently, five REDD+ projects are in the planning phase in the state.

Offset Issuance and Tracking

Pará has not developed any methodologies or system to issue REDD-based offsets, and does not have a carbon registry and tracking system for offsets.

Emissions Monitoring, Reporting and Verification

The State Environment Secretary (SEMA) is responsible for collecting data on deforestation and degradation in the state.

Currently, there are three different methodologies used to monitor deforestation in Pará: PRODES²¹¹ and DETER²¹² from INPE and SAD from IMAZON.²¹³ However, Pará wants to increase its own capacity to monitor deforestation, and install an advanced geo-processing laboratory in the state. Forest degradation is monitored using INPE's DEGRAD system.²¹⁴

²¹¹ See supra note 128.

²¹² See supra note 163.

²¹³ The Institute of Man and Environment of the Amazon (IMAZON) developed its own method to monitor deforestation, called the System of Deforestation Alert (SAD). More information is available at <http://www.imazongeo.org.br/imazongeo.php#> (last visited May 18, 2012).

²¹⁴ INPE developed the DEGRAD system to monitor degradation. More information is available at <http://www.obt.inpe.br/degrad/> (last visited May 18, 2012).

Carbon stocks have not been quantified in Pará, although carbon stock estimates have been made as part of specific REDD+ projects in the state. For example, a REDD+ project being developed in the Calha Norte region located in three state-owned forests showed carbon stocks ranging from 161-193 tons CO₂e/ha based on the RADAM (Amazon Radar Project)²¹⁵ database and geo-statistical analysis.²¹⁶

Social and Environmental Safeguards

A formal process to develop and adopt social and environmental safeguards has not yet started in Pará. Safeguards are expected to be addressed when Pará develops its REDD+ program. Nonetheless, the state's draft Climate Change Law²¹⁷ recognizes the "protector-receiver" principle, which means that those who act to protect the forests must be rewarded. It also recognizes the need to protect natural ecosystems and to conserve biodiversity.

Legal and Institutional Framework

Pará does not have a legal or institutional framework for REDD. However, a draft Climate Change Law is under consideration.²¹⁸ If the proposed legislation is approved without any changes, it will encourage the payment for ecosystem services, including REDD+ projects. The state also would create guidelines and criteria for approving REDD+ projects²¹⁹, which may be hosted on private and/or public lands. A Climate Change and Payment for Ecosystem Services Fund also would be created to assume responsibility for managing and distributing funds to support payment for ecosystem projects.

Pará's existing policies to halt deforestation appear to be in alignment with the federal government's directive to reduce deforestation.

REDD+ Planning

Pará does not have a REDD+ plan, although several elements of a plan already are being developed and implemented. The state adopted in law a sustainable macro ecologic-economic land-use zoning plan (ZEE) that covers the western half of the state, and intends to soon extend this plan to the entire territory.²²⁰ The ZEE divides the state into four different zones: (i) consolidation zones (28% of the territory), (ii) expansion zones (4%), (iii) restoration zones (3%); and, (iv) conservation zones (65%).²²¹ In 2008, the state required owners and occupants of rural lands to register under the Environmental Registry of Rural Lands (CAR).²²² In 2009, Pará

²¹⁵ RADAM was a federal project developed to identify the vegetation, soil, mineral and hydric resources of the Amazon Region in Brazil. Its technology was based on sensorial radars.

²¹⁶ GCF Database. *See supra* note 204.

²¹⁷ Climate Change Law Proposal available for Public Consultation, Sept. 2009.

²¹⁸ *Id.*

²¹⁹ Proposed Climate Change Law for Pará, Title IV, §§ VII and X.

²²⁰ *See* Environmental Policy Law-Pará, art. 71.

²²¹ State Law 6.745, May 6, 2005, at art. 4. (State of Pará, Brazil).

²²² State Decree n. 1.148, July 7, 2008. (State of Pará, Brazil).

developed the PPCAD-PA, as described above. The PPCAD-PA seeks to reduce deforestation by supporting sustainable agriculture, regularizing land-tenure, and through other actions. Additionally, the PPCAD-PA set pre-established goals and progressive timeframes to achieve reductions in deforestation.

The state is now hosting five REDD+ projects, and SEMA is participating in these projects to gain experience as the state moves forward to further develop its REDD+ policies.

Financing

Because Pará has not yet developed a statewide REDD+ program, the state has not yet been actively seeking funds to pay for REDD+ actions. However, the state government is seeking grants from the Amazon Fund²²³ to implement actions and programs that can help the state to become ready to implement programs for REDD. For example, SEMA received R\$15.9 million²²⁴ to implement the CAR property registry. Also, as previously mentioned, Pará currently hosts five REDD+ pilot projects on its territories. These projects have different financing sources ranging from private organizations, NGOs, government agencies, charitable donations, and a combination of these sources.

²²³ The Amazon Fund was created by the Brazilian Government to receive international donations to support actions to prevent deforestation and forest degradation, including REDD.

²²⁴ R\$ = Brazilian Reais.

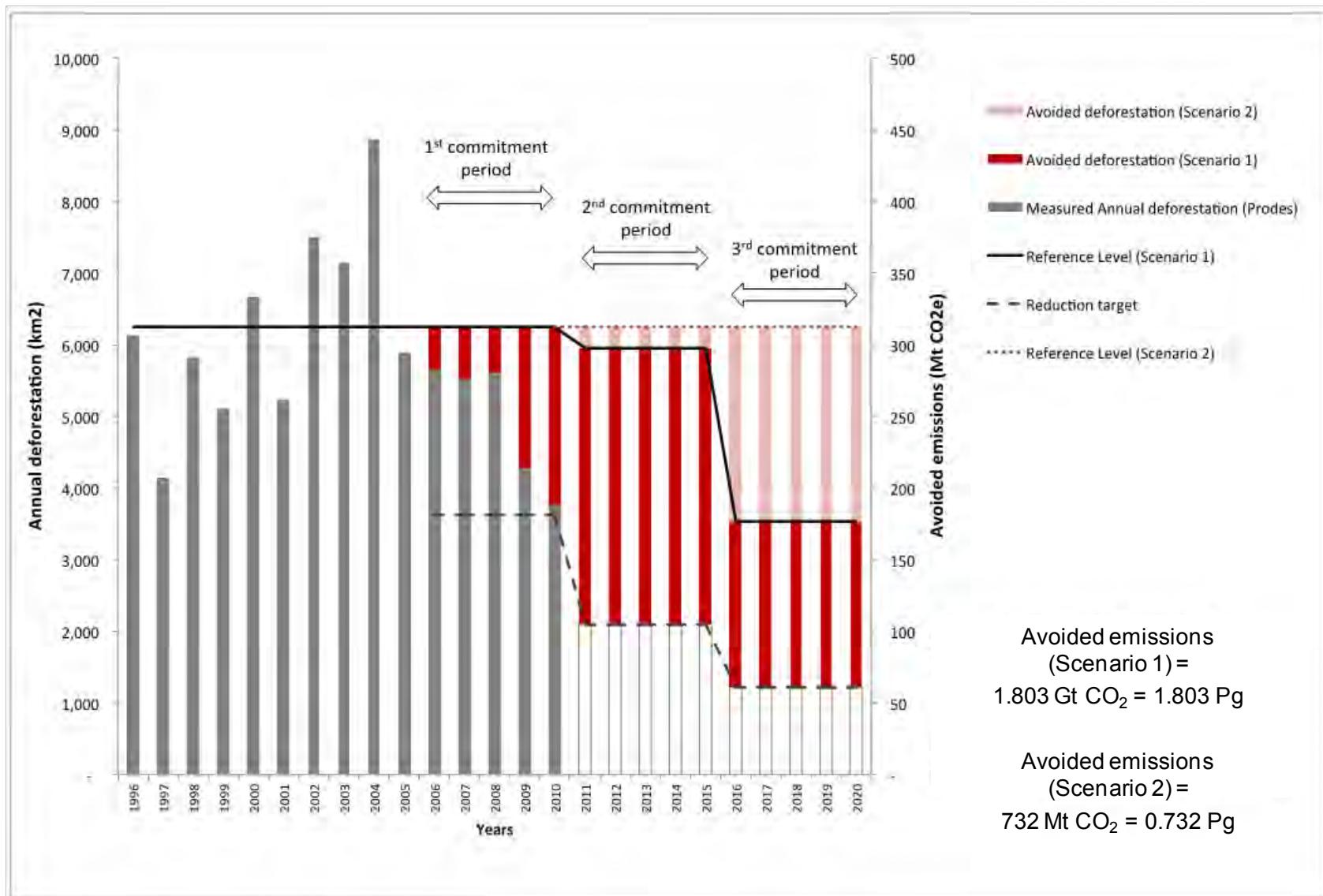


Figure H-2
Reference Levels and Emissions for Pará State, Brazil

WEST KALIMANTAN PROVINCE SUMMARY

Overview

West Kalimantan is a province of Indonesia, one of four in Kalimantan - the Indonesian part of the island of Borneo, as shown in Figure I-1.



Figure I-1
Map of Location of West Kalimantan Province, Indonesia

The average annual deforestation in West Kalimantan from 2000 to 2005 was approximately 273 km², falling to 60 km² from 2003 to 2006.²²⁵ However, deforestation in 2009 was estimated to be 1304 km² based on satellite imagery.²²⁶ This deforestation was estimated to account for approximately 18 MtCO₂e²²⁷ of emissions.²²⁸ The main drivers of deforestation related

²²⁵ Overview of REDD in West Kalimantan Province, Presentation by GCF West Kalimantan Team, available at [http://www.gcftaskforce.org/documents/May_Aceh/Day_1_2/West%20Kalimantan%20Presentation%20\(May%208%202010\).pdf](http://www.gcftaskforce.org/documents/May_Aceh/Day_1_2/West%20Kalimantan%20Presentation%20(May%208%202010).pdf) (last visited May 29, 2012).

²²⁶ *Id.*

²²⁷ *Id.*

²²⁸ *Id.*

emissions in West Kalimantan are commercial logging and conversion of land to agriculture and mining operations (coal and gold).²²⁹

The Indonesian province of West Kalimantan appears to be committed to developing a strong REDD+ program. It has been a member of the GCF since its creation in 2008. The province has convened a REDD+ Working Group under the authority of the governor. In addition, West Kalimantan hosts several REDD+ projects with participants that include international governments and non-profit organizations.

Background

West Kalimantan covers an area of 146,807 km² of land. The province has a total population of 4.25 million people, comprising 1.8% of Indonesia's national population. Approximately 83% of the population live in rural areas. The province's ethnic composition is 35% indigenous Dayak, 13% Melayu, 12% Sambas, 9% Tioghoa, 9% Jawa, and 8% Kendayan. The GDP in 2008 was US\$ 1.26 billion, of which the agriculture sector accounted for 27%, the commercial and services sectors accounted for 23%, and gas and electricity account for 19%.²³⁰

Forests cover 60,166 km² of West Kalimantan.²³¹ Currently, 25.6% of these forests are protected, 16.2% of forests are conserved (managed for conservation and comprising the IUCN categories 1-4), 52.4% are engaged in commercial production of forest products, and 5.7% are convertible forests (i.e., forests zoned for conversion to non-forest uses including for settlement and estate crops).²³²

Scope

West Kalimantan has not defined the scope of its REDD+ program. However, it is expected to include the same scope as the national government.

Reference Level and Target

Reference levels and emissions reduction targets have not been defined yet for West Kalimantan, but are expected to be developed in the context of the national commitment to REDD+ and the implementation of the Indonesia-Norway LOI. The president of Indonesia has committed to Indonesia reducing its national emission by 15% by 2015 unilaterally, and by 41% with international support by 2020. However, it has not been determined yet what percentage of the nation-wide emission reductions West Kalimantan will be required to achieve.

Nesting

The province of Kalimantan does not have a project nesting design for REDD.

²²⁹ *Id.*

²³⁰ West Kalimantan, Indonesia, GCF Database, GCF Task Force. Expected to be available online in 2012 at www.gcftaskforce.org. See Section One for more information about the GCF Database.

²³¹ Information presented by the West Kalimantan REDD+ Team at the GCF Meeting 2011. These deforestation estimates are significantly higher than those from previous years. Additional analysis of these numbers is necessary to confirm their validity.

²³² *Id.*

Offset Issuance and Tracking

West Kalimantan has not developed any methodologies or system for issuing offsets. The province of West Kalimantan also does not have a carbon registry. At this time, it appears that all provinces in Indonesia will operate as part of a national carbon registry to be developed in the future.

Emissions Monitoring, Reporting and Verification

Estimates of forest cover for the period of 2000 through 2005 are based on a combination of MODIS and LANDSAT satellite data. The results derived from combined analysis of these two datasets were compared to field sampling, and provide estimates of deforestation with an estimated level of uncertainty of approximately 15%.²³³

Average deforestation rate (km²/year):²³⁴

- 2000-2005: 136
- 2003-2006: 24

The Indonesian Ministry of Forestry is responsible for forest monitoring in West Kalimantan. In 2007, they began to develop a database called the Forest Resource Inventory System (FRIS). This project is supported partially by the Indonesia-Australia Forest Carbon Partnership (IAFCP). Additional improvements to the province's MRV framework are being driven by requirements contained in the Indonesia-Norway LOI. These project components are being developed in conjunction with national policy.

The rate of forest degradation in West Kalimantan is unknown. The major factors driving degradation of primary forests are logging and forests fires. However, methods to accurately monitor forest degradation still need to be developed.

More detailed data is needed to measure carbon stocks in West Kalimantan to account for the range of forest structural types. Nationally, the biomass carbon stocks of forests range between 50 -300 tC/ha for dryland forest and between 75-275 tC/ha for peat swamp forests. This data is based on an interpretation of a countrywide map and is highly uncertain. It is not likely to be a sufficient basis upon which to develop a robust REDD+ program. This problem highlights the need for an extended National Forest Inventory (NFI) to be conducted throughout Indonesia.

Social and Environmental Safeguards

Recognition of communities and indigenous peoples' rights are considered to be a top priority by those involved in developing the province's REDD+ program. It is hoped that by developing better mechanisms to obtain FPIC from indigenous people living in the province that social safeguards will be strengthened. West Kalimantan is taking steps to improve the data made

²³³ The relationship between MODIS estimates and LANDSAT estimates is linear and statistically robust with r^2 of 0.87 and a residual standard error 7.15%. The deviation between estimated and actual forest cover based on BAPLAN field sampling is about 15% and this value has been adopted as the order of error to apply to forest area loss

²³⁴ GCF database. See supra note 230.

available to stakeholders. It has been developing institutional capacity within its Forestry Information Center to support greater data accountability and transparency, especially as the data relates to ensuring that MRV can be accomplished effectively. The Information Center also will be used to disseminate scientific mapping produced using remote sensing technology.

Benefit sharing is addressed by a new draft regulations being considered by the national government.²³⁵ This regulation would mandate that local communities receive at least 20% of the proceeds generated from carbon-related projects. However, many observers believe this benefit sharing mechanism could be improved with more comprehensive stakeholder participation, and currently the regulation is being reviewed.

Legal and institutional Framework

The province of West Kalimantan has not enacted any specific legislation to facilitate REDD+ or other climate change programs. Hence, it is not known how its REDD+ program will be integrated with the national government's REDD+ programs and actions. However, the province's REDD+ program is expected to be consistent with all relevant national commitments and directives.

However, national laws related to REDD+ exists in Indonesia, including:

- The Agrarian Law of 1960 that defines Indonesian forestry jurisdiction and natural resources management. This law provides guidance for recognizing and awarding land rights; and
- The Forestry Law of 1999, which outlines forest functions, and empowers the Department of Forestry to determine and manage Indonesia's *Kawasan Hutan* (Forest Zone).

Also, there are several Ministry of Forestry Orders specifically related to REDD:

- Permenhut No. 68/2008 describes the permission and approval procedures for REDD+ demonstration activities;
- Permenhut No. 30/2009 regulates procedures related to the implementation of REDD+ activities, including requirements to be fulfilled by developers, verification and certifications, and terms and conditions of REDD-related implementing bodies; and
- Permenhut No 36/2009 regulates the permission and procedures for REDD+ projects that sequester and store carbon. It details the project application process, as well as revenue collection, utilization and sharing. This order reportedly is still being reviewed.

REDD+ Planning

West Kalimantan is planning to develop a REDD+ program based on good governance and designed to supporting sustainable forest management. The provincial government has adopted three principle strategies to develop and implement its REDD+ program.

²³⁵ Indonesia Decree P.36/Permenhut II/2009, See supra note 179.

First, the province is focused on reducing deforestation by continuously improving local government policies and institutions including enforcement and management of Technical Implementation Units (UPTs). Currently, there are seven UPTs covering different key elements designed to prevent deforestation: (i) Forest Inventory and Mapping; (ii) Land and Forest Fire Control; (iii) National Parks; (iv) Institute for Watershed Management; (v) Forest Resources Conservation Center; (vi) Institute for Monitoring of Forest Production; and, (vii) Forestry Information Center.

Second, the government plans to create incentives to better manage forest resources and remove incentives that encourage deforestation by private parties exploiting natural resources that are owned by the public. These incentives include establishing a Green Investment Award to be given to companies in the fields of forestry, plantations, agriculture, and mining that implement Zero Burning and Reduced Impact Logging (RIL) policies. There are also plans to create a mechanism to conduct environmental assessments using an integrated team of NGOs, universities, and government agencies.

Finally, the government intends to oversee payments and incentives for REDD+ to prevent corruption, and to support mechanisms that are transparent, accountable, and free from political influence. This process is envisioned to involve stakeholders and community organizations like the Council of Traditional Malay Culture (MABM), the Council of Indigenous Dayak (DAD), and the alliance of other indigenous communities at both district and city/village levels.

Financing

The majority of current funding for REDD+ implementation in the province comes from provincial budgets and private, charitable donors. Initial REDD+ projects being developed in the province include: (i) ecosystem restoration of more than 90,000 ha in the Putri River and Lake Siawan Belidak regions funded by a collaboration with FFI; (ii) a REDD+ project funded by FFI and Macquarie Bank; (iii) a demonstration activity supported by the German government (KFW-FORCLIM);²³⁶ and (iv) recent USAID activities funded through the International Fund for Agricultural Development (IFAD). The province also hopes to receive additional funding from the national government in the near future.

²³⁶ Kreditanstalt für Wiederaufbau (Reconstruction Credit Institute) – Forests and Climate Change Program.

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