

Brazil's Emerging Sectoral Framework for REDD and Avoided Deforestation in the Amazon's Xingu River Basin

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**Final Report
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Today's Topics

1. Project background and overview
2. The current state of REDD
3. Principal findings of the study



Part 1: EPRI Xingu Amazon Project

Creating Greenhouse Gas Emission Offsets from Avoided Deforestation in the Amazon's Xingu River Basin



Tropical forest deforestation is one of the leading sources of global greenhouse gas emissions. Avoided deforestation projects offer opportunities to generate carbon offset credits as a global climate change mitigation strategy.

- Advance our understanding of avoided deforestation based carbon “credits” in evolving global GHG cap and trade markets
- Unlock large-scale, low-cost GHG emissions offsets
- Gain early experience with carbon offset projects in advance of GHG emissions regulations
- Help to preserve and protect tropical rainforests and their biological resources, and provide sustainable development opportunities for indigenous peoples

Background and Overview

- Tropical deforestation is a leading source of global GHG emissions and is a key driver of global climate change.
- This EPRI project is focused on demonstrating the potential to achieve **large scale, cost-effective GHG emissions offsets** by implementing projects to reduce GHG emissions from deforestation and degradation (REDD).
- The project was developed in close cooperation with one of the world's foremost experts on indigenous rainforest peoples – **Steve Schwartzman Ph.D.**, International Program Director for the Environmental Defense Fund (EDF).
- **Dan Nepstad, Ph.D.** Senior Scientist of Woods Hole Research Center (WHRC), expert on REDD and Amazon conservation/deforestation, and is EPRI's R&D contractor for this project.

A window of opportunity



ENVIRONMENT

The End of Deforestation in the Brazilian Amazon

Daniel Nepstad,^{1,2‡} Britaldo S. Soares-Filho,^{3‡} Frank Merry,^{1,2*} André Lima,² Paulo Moutinho,^{1,2} John Carter,⁴ Maria Bowman,^{1,2†} Andrea Cattaneo,¹ Hermann Rodrigues,³ Stephan Schwartzman,⁵ David G. McGrath,^{1,2,6‡} Claudia M. Stickler,^{1,2,7} Ruben Lubowski,⁵ Pedro Piris-Cabezas,^{5,8} Sergio Rivero,⁶ Ane Alencar,^{2,7} Oriana Almeida,^{2,6} Osvaldo Stella²

Nepstad et al. 2009. Science

Xingu Project Summary: Original Concept

- **Goal:** To facilitate recognition and use of GHG emissions offsets derived from avoided tropical forest deforestation.
- **Why is this important?** Deforestation is one of the largest sources of global CO₂ emissions (17% of annual emissions (IPCC 2007)).
- **Partners:** Collaboration with Environmental Defense Fund (EDF), the Amazon Institute for Environmental Research (IPAM), and Woods Hole Research Center (WHRC).
- **Phases:** 1st phase of 3-phase project that starts with “capacity building” among tribal leaders leading to development of a pilot REDD project.
- **EPRI Leverage:** Builds upon previous work done by EPRI and its members on protection of forest lands (e.g., Noel Kempf project) and many years of work by EDF, WHRC and their Brazilian colleagues.
- **Initial project funding:** \$XXX,000

Participating EPRI Member Companies

- American Electric Power (AEP)
- Duke Energy (DUK)
- Entergy Corp. (ETR)
- Oglethorpe Power Corp. (OPC)
- PNM Resources (PNM)
- Southern Company (SO)
- TransCanada (TC)
- Tri-State G&T Association, Inc. (TRI)
- We Energies (WE)

Additional Topics Added to Project

- **REDD nesting framework:** The era of isolated forest carbon projects is ending. Increasingly, forest carbon projects will require linkages with state- and national-level REDD programs.
- **Financial mechanisms:** With the lack of regulatory clarity for REDD, public funding will be the main source of REDD finance. How could this funding be structured to create clear entry points for private investors? To reduce risk to private investors? To facilitate the provision of offsets?
- **Partners:** Collaboration with **Forest Trends**, and the Tropical Forest Group.
- **Additional project funding:** \$XXX,000

Current Project R&D Tasks

- Task 1: Design Sub-National REDD Program
- Task 2: Analyze carbon “registries”
- Task 3: Examine REDD Financing Mechanisms
- Task 4: Capacity building among indigenous leaders
- Task 5: Analyze carbon stock ownership
- Task 6: Prepare final deforestation “baseline” for Xingu
- Task 7: Prepare Project Design for Phase 2 Voluntary “Pilot” REDD project

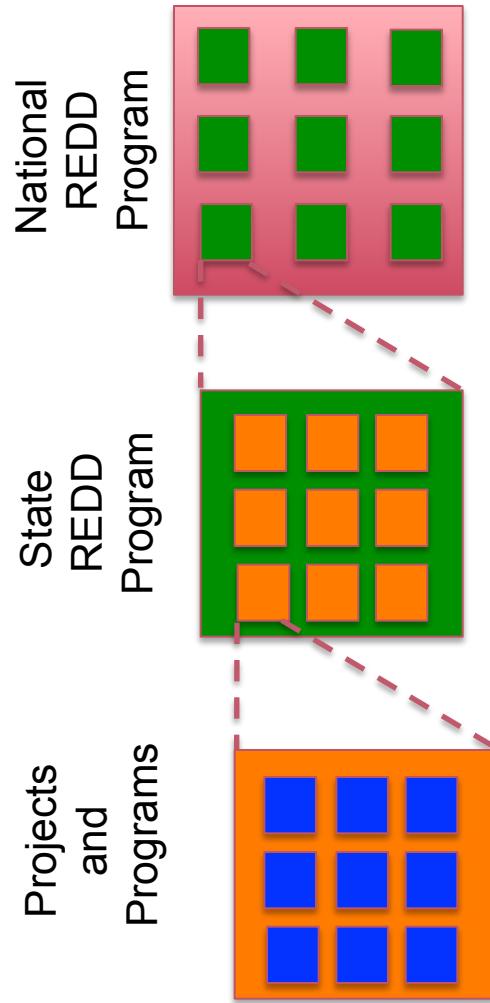
Part 2: The state of REDD

- International:
 - UNFCCC negotiations hobbling along; REDD+ is the most advanced piece of post-2012 framework.
 - Focus on **national** REDD+ programs, with recognition of sub-national programs
 - \$4B in “Interim REDD+ Finance” commitments; \$1B from Norway, \$1B from the US
 - Low expectations for Cancun

Part 2: The state of REDD

- US legislation:
 - US Cap-and-Trade legislation is the most likely source of large-scale demand for REDD offsets, but has stalled indefinitely
 - House: Waxman Markey bill approved; allows up to 5% of emissions through international offsets
 - Focus on national REDD programs, allows offsets from sub-national REDD for XX years
 - Senate: Kerry Lieberman. . .
- US interim finance:
 - \$1B Copenhagen commitment still alive, but reduced

Nesting



Part 2: The state of REDD

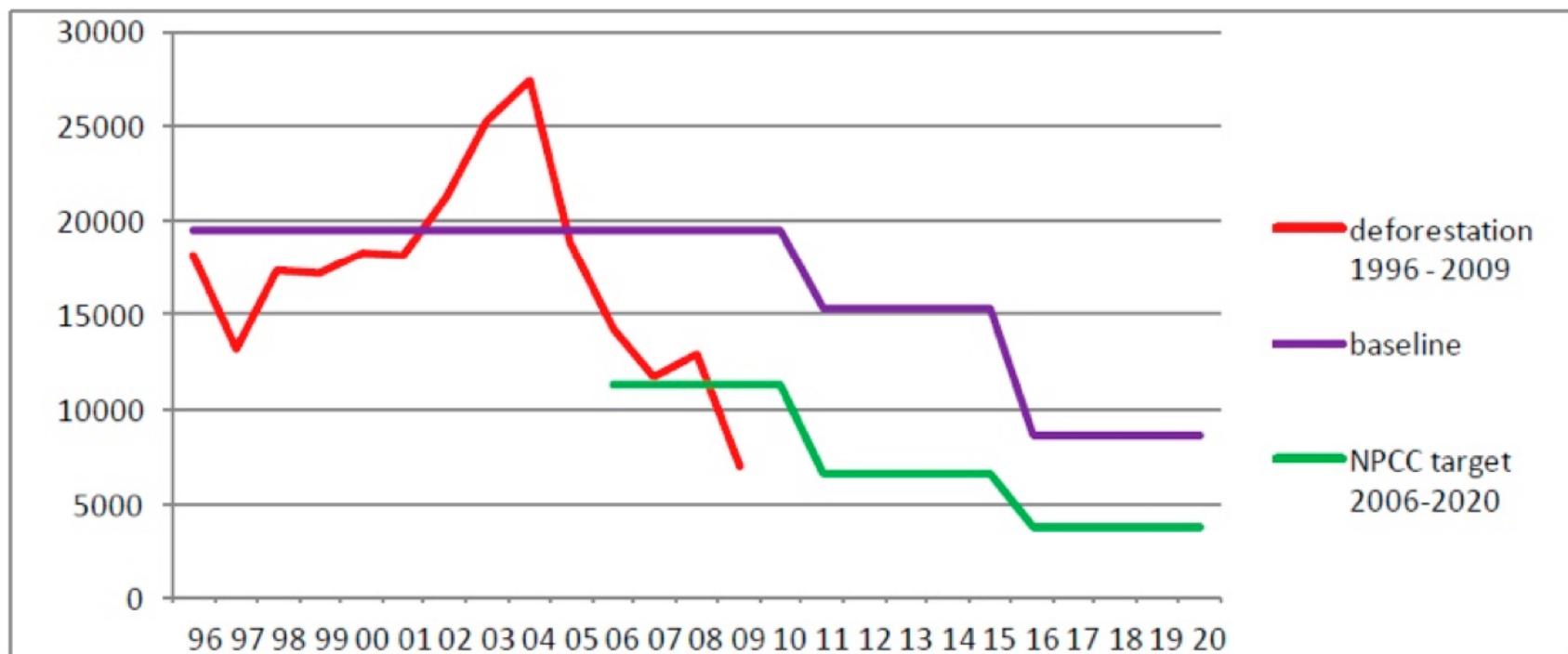
- Tropical nations:
 - 35 nations have formally expressed interest in developing REDD programs to the Forest Carbon Partnership Facility of the World Bank
- Brazil, Indonesia, Guyana, Tanzania with substantial funding
 - Indonesia received \$1B commitment from Norway, with a portion destined for province-level program

Brazil REDD

- National Climate Change Policy
 - 36-39% reduction in national emissions by 2020
 - Copenhagen Accord unclear if this “NAMA” disqualifies Brazil’s emissions reductions as international offsets
- Amazon and Cerrado targets

Brazil REDD (cont' d)

Deforestation in the Brazilian Amazon: historical rates, baseline, and target
(thousands of square kilometers)

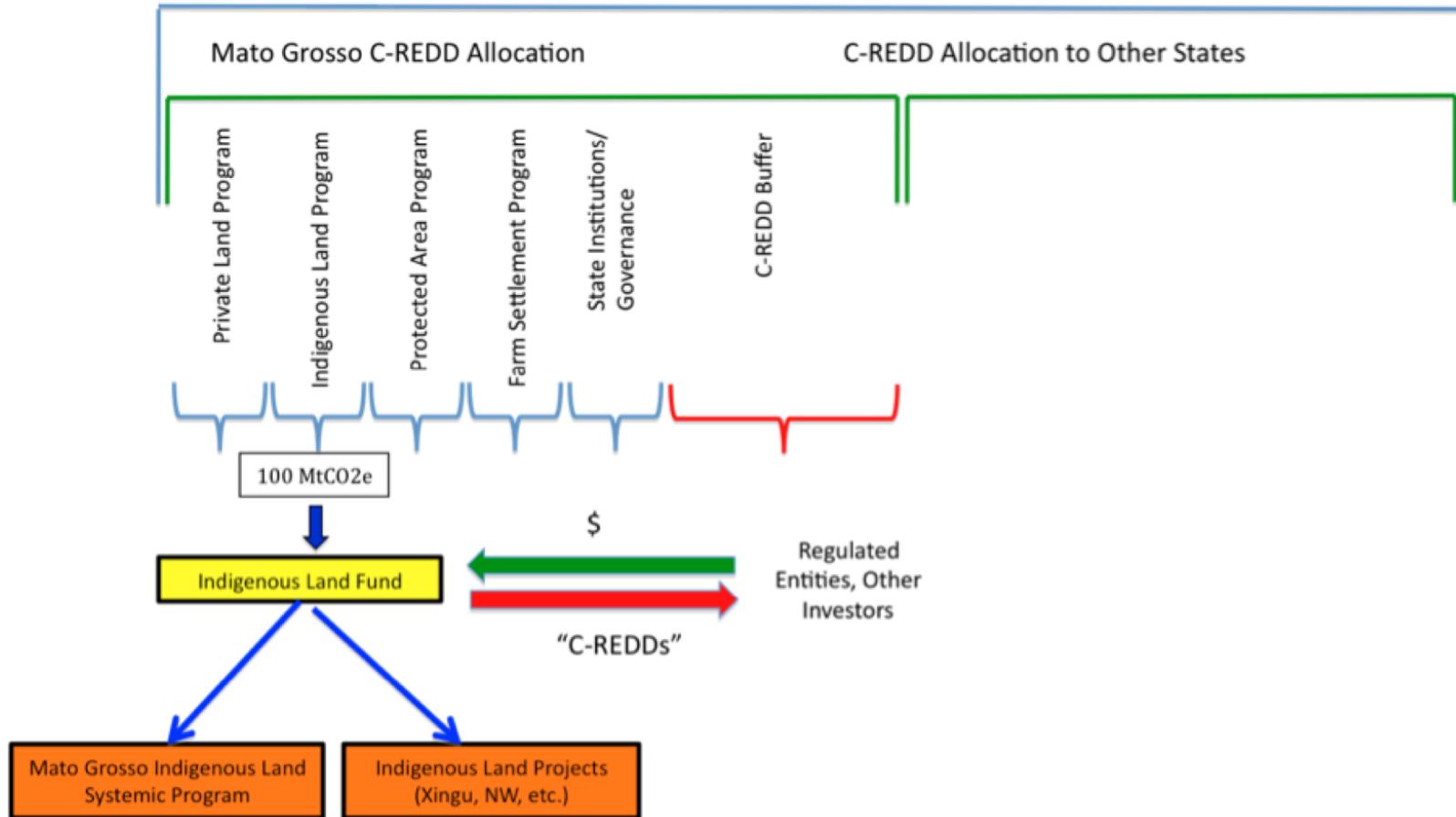


Part 2: The state of REDD

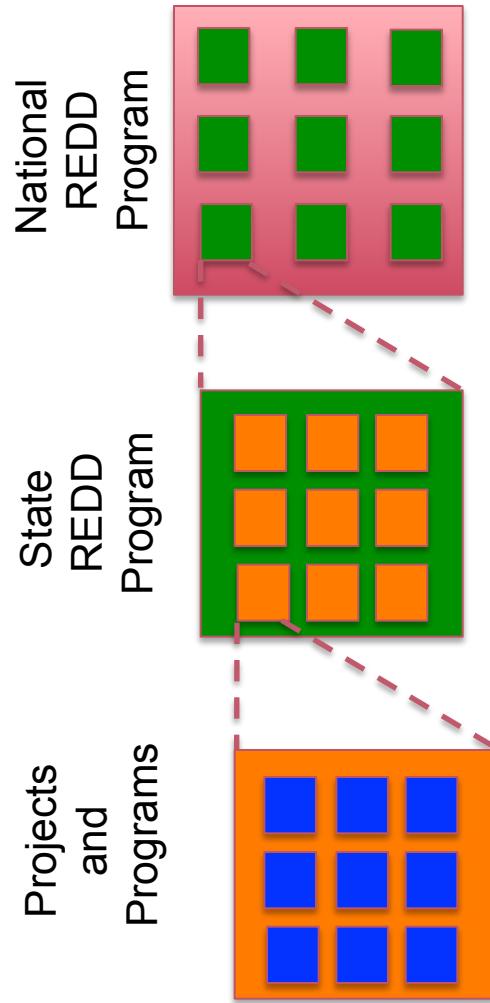
- Governor's Climate and Forest task force
 - 14 states: 3 in US (CA, WI, IL), 5 in Brazil, 4 in Indonesia, 1 in Nigeria, 1 in Mexico
- California's AB32 will finalize international offset rules early November
 - REDD is precarious

Mato Grosso REDD Architecture

C-REDDs Allocated to Amazon States



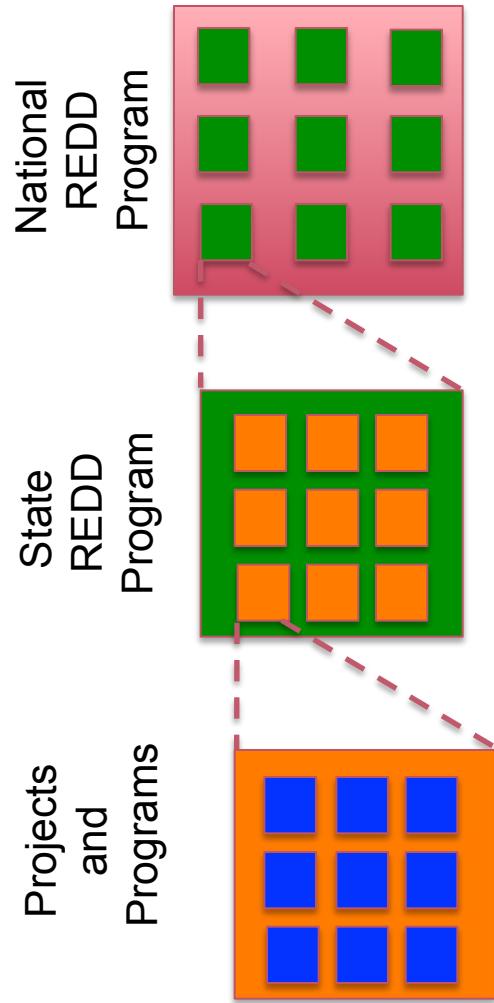
Part 3: Findings. *Nesting*



Main issues:

- Reference level (baseline) errors
- Do project-level credits depend upon national-level performance?
- Dependence on broad participation

Part 3: Findings. *Nesting*



Main Conclusions:

- Importance of periodically revisiting baselines, allocations, and policies at every scale
- Important of *ex ante* incentives for forest stakeholders
- Importance of buffering project-level crediting from failure at higher scales

Part 3: Findings. *Registries*

Carbon registries are needed to:

- Track creation, purchase, sale, and retirement of carbon offsets or allowances
- Prevent double counting
- Provide oversight through standards and auditing
- Insure against performance reversals

Several carbon registries exist.

- None developed for tracking offsets or allowances across scale.

Part 3: Findings. *Registries*

Existing registries have many important features of nested system:

- “Mata Viva” standard approved by Ministry of Environment, but operates at project level only
- TZ1 Markit registry now uses Mata Viva standard.
- State of Acre government has forged collaboration with TZ1 Markit

Part 3: Findings. *Registries*

To cross scales, registry could be part of spatial database that co-registers and monitors information relevant for REDD

- Forest carbon cover, land-use restrictions, certified private properties, REDD projects, opportunity costs of forest conservation

Part 3: Findings. *Financial structures*

Important financial challenges for REDD:

- Policies and funding to lower emissions to the crediting baseline
 - E.g. Brazil's ambitious private forest requirements could disqualify some emissions reductions for crediting
- Attracting/engaging private investors—who will be needed for REDD to achieve its potential—in the absence of regulatory clarity
- Lowering risk to private investors seeking exposure

Part 3: Findings. *Financial structures*

Entry points for private investors:

- Traditional projects (with geographical boundaries)
- Agricultural and forestry enterprises that could provide returns on investment and also exposure to REDD carbon market
- Purchase of REDD certificates or carbon bonds from governments

Part 3: Findings. *Financial structures*

Potential structures for reducing private investor risk:

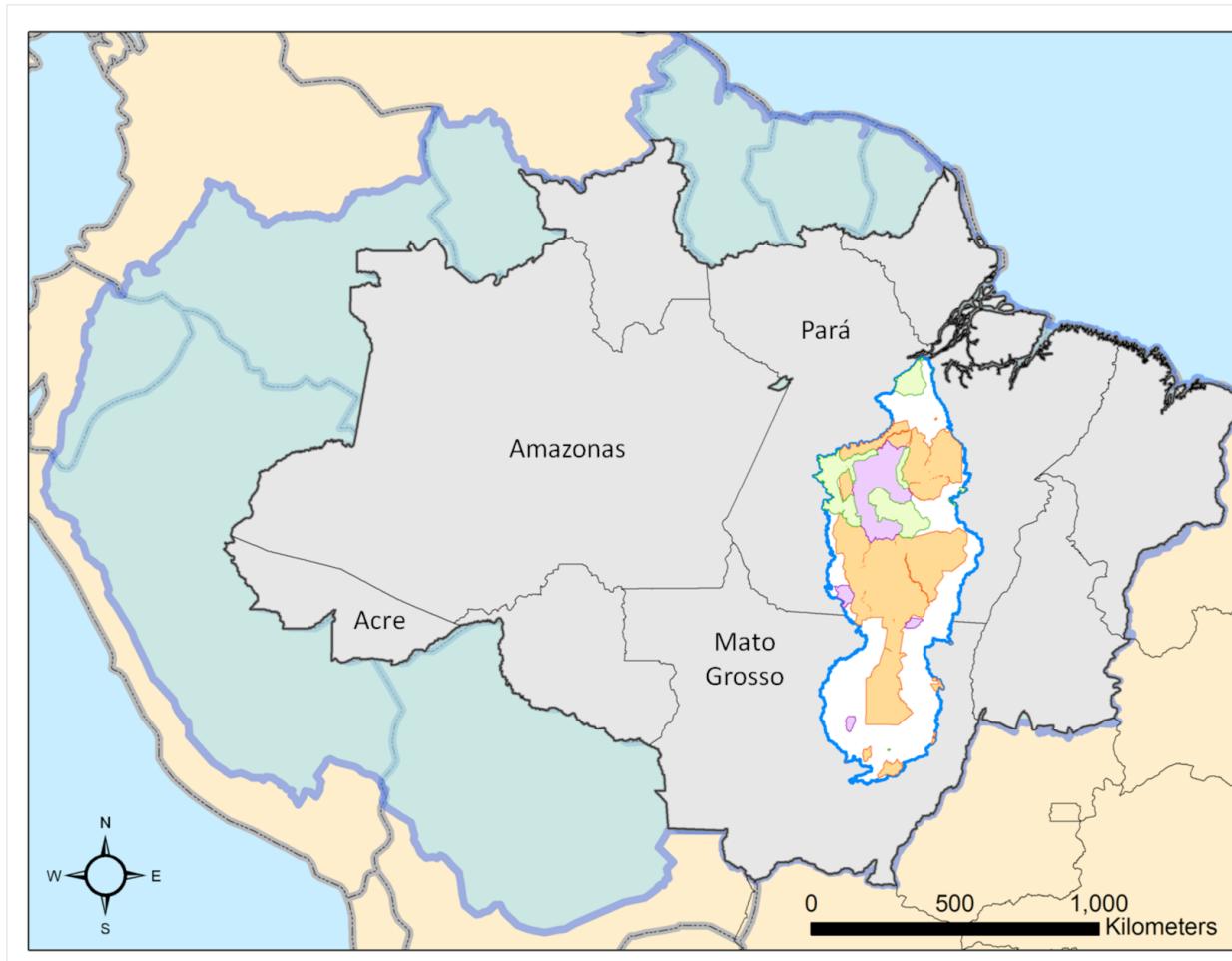
- Carbon revenue government bonds. Low-cost, medium-term (e.g. 10 year), exchangeable for REDD credits, or saleable.
 - Provides governments with up-front funding for REDD programs
- Carbon project-level debt
 - Upfront investments in REDD projects, secured by cash flow of agricultural/forestry activities.
- Performance-based feed-in tariffs
 - Government subsidies or price floors for verified REDD activities

Part 3: Findings. *Financial structures*

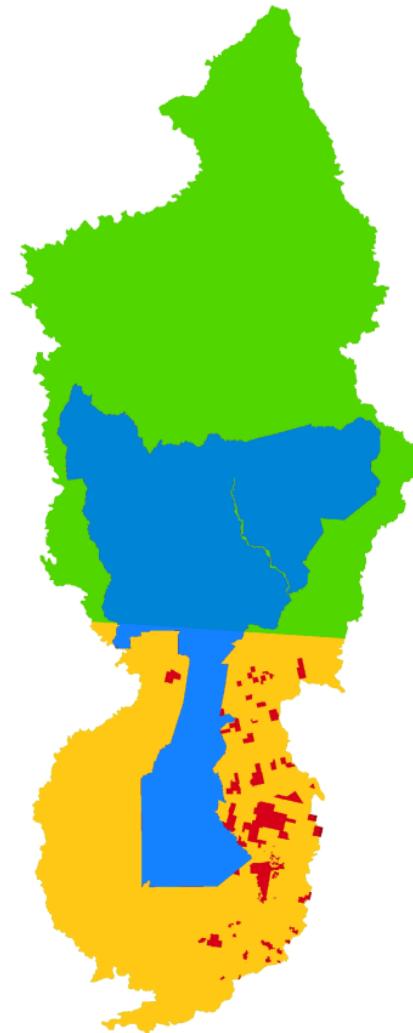
Potential structures for reducing private investor risk
(cont'd):

- Public-private partnerships
 - Public funding (e.g. interim REDD finance) along side private funding, with priority access to REDD credits given to private investors

Part 3: Findings. *Xingu avoided deforestation project*



The Xingu River Basin, Brazil



Map key:

Land Registry Lands
Headwaters--Mato Grosso
Xingu Basin--Para
Indigenous Lands

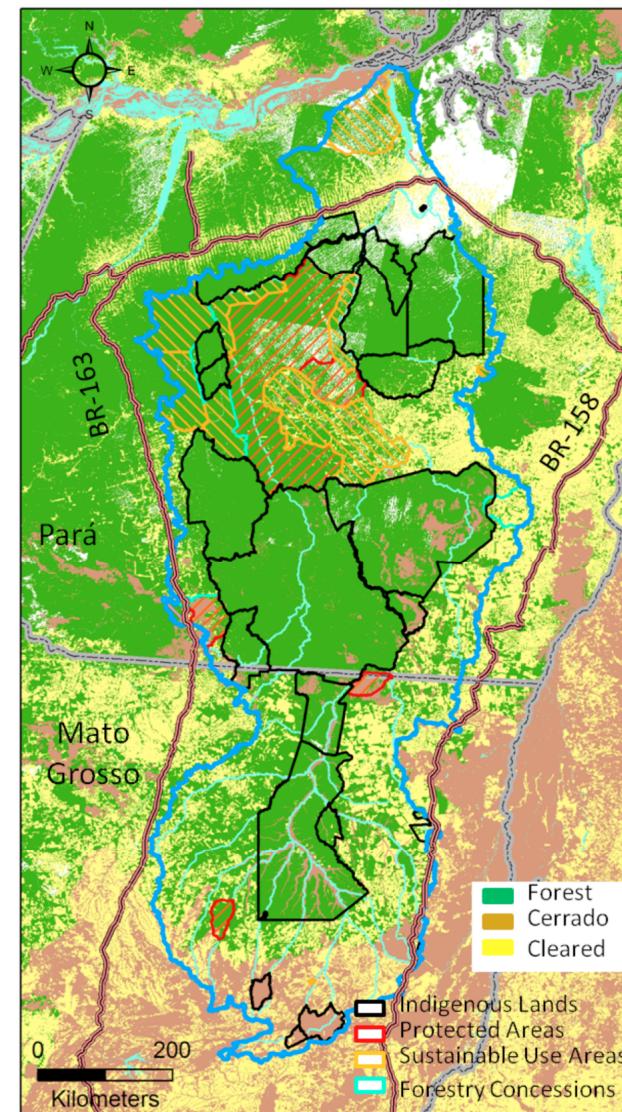
Key Facts:

Entire Basin = 51 MHa
Headwaters = 18 MHa
River Basin = 33 MHa
Indigenous = 13.1 MHa

Xingu Protected Areas Corridor (2 of 2)

- 26 million hectares (~ size of UK)
- Indigenous Lands
 - 14 million ha (20 million ha tota)
(34.6 million ac)
 - 18 indigenous peoples:
 - Kayapo, Tapayuna, Panara, Kaiabi, Yudja, Kisedje, Trumai, Ikpeng, Kamayura, Aweti, Yawalapiti, Mehinaku, Waura, Kalapalo, Kuikuro, Matipu, Nafukua, Narovuto
 - ~11,000 people

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Part 3: Findings. *Xingu Avoided Deforestation Project*



Photo: Steve Schwartzman, Environmental Defense Fund

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Capacity Building

- Consultation – 2 regional meetings (Kayapo and Xingu Indigenous Park) and 23 local (village-level) meetings in 2009
 - Themes: climate change, forests, payment for ecosystem services
- Positions of indigenous communities:
 - Interest in carbon project, but only with people/companies/nations who are reducing their own emissions
 - Two separate structures for administering forest carbon program (Kayapo and other tribes)
 - Projects, not cash payments.

Capacity Building

- Final decision on carbon project delayed by Belo Monte hydroelectric dam
 - Discussions will resume this Fall

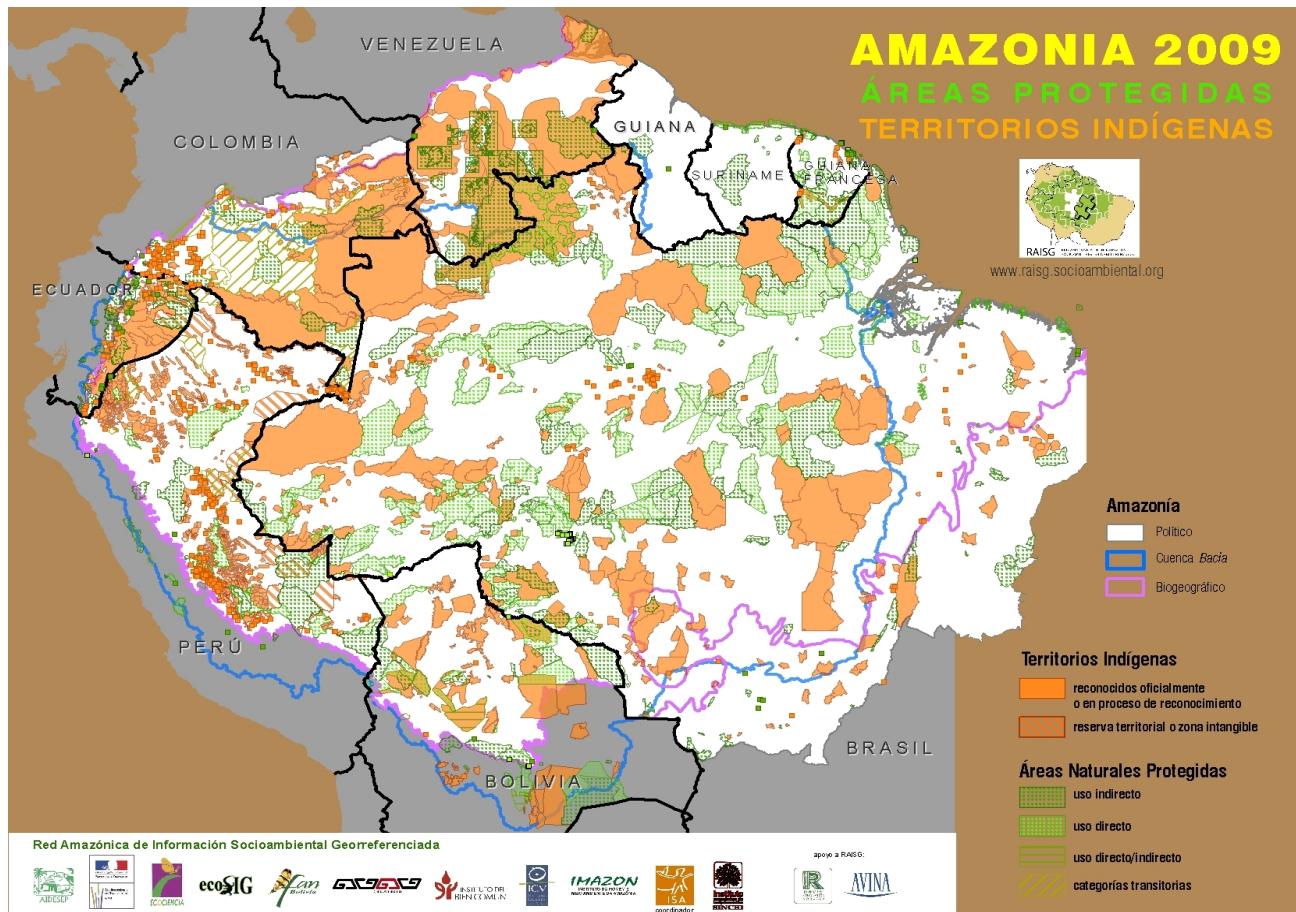
Consultation with Indigenous Tribes



Carbon Stock Ownership

Map of indigenous territories (ITs) and protected natural areas (PNAs) in the Amazon Basin

- Questions:
- Who owns indigenous land forest carbon?
- Can indigenous groups buy, sell, and trade their stored carbon to others?
- Would benefits from REDD program flow to indigenous inhabitants?



Carbon Stock Ownership

Three recent studies of carbon rights of Brazilian Amazon indigenous groups

Sales, Won, and Frederighi. 2008. "Legal Aspects of the Surui Community Project: Safeguarding the Biocultural Diversity of the Surui Land", Memo. Trench, Rossi, & Watanabe.

Garzón, Biviany Rojas 2008. REDD en Territorios Indígenas de la Cuenca Amazónica. ¿Serán los pueblos indígena los directos beneficiarios?: El Instituto Socioambiental..

do Valle, R.S.T. and Yamada, E.M. 2009. Brasil: Titularidade Indígena sobre Créditos de Carbono gerados por Atividades Florestais em Terras Indígenas. Instituto Socioambiental, www.socioambiental.org.br.

Carbon Stock Ownership

- There are no specific rules or laws in Brazil regarding forest carbon on indigenous peoples' lands
- Existing laws do provide broad protection of rights to natural resources that are now being formally recognized to extend to forest carbon
- 1988 Constitution and Indigenous Statute of 1973.
 - Gives indigenous peoples usufruct rights to lands traditionally occupied
 - Confers ownership of above-ground natural resources to indigenous inhabitants
 - Protects indigenous groups from contracts that could interfere with their traditional life

Carbon Stock Ownership

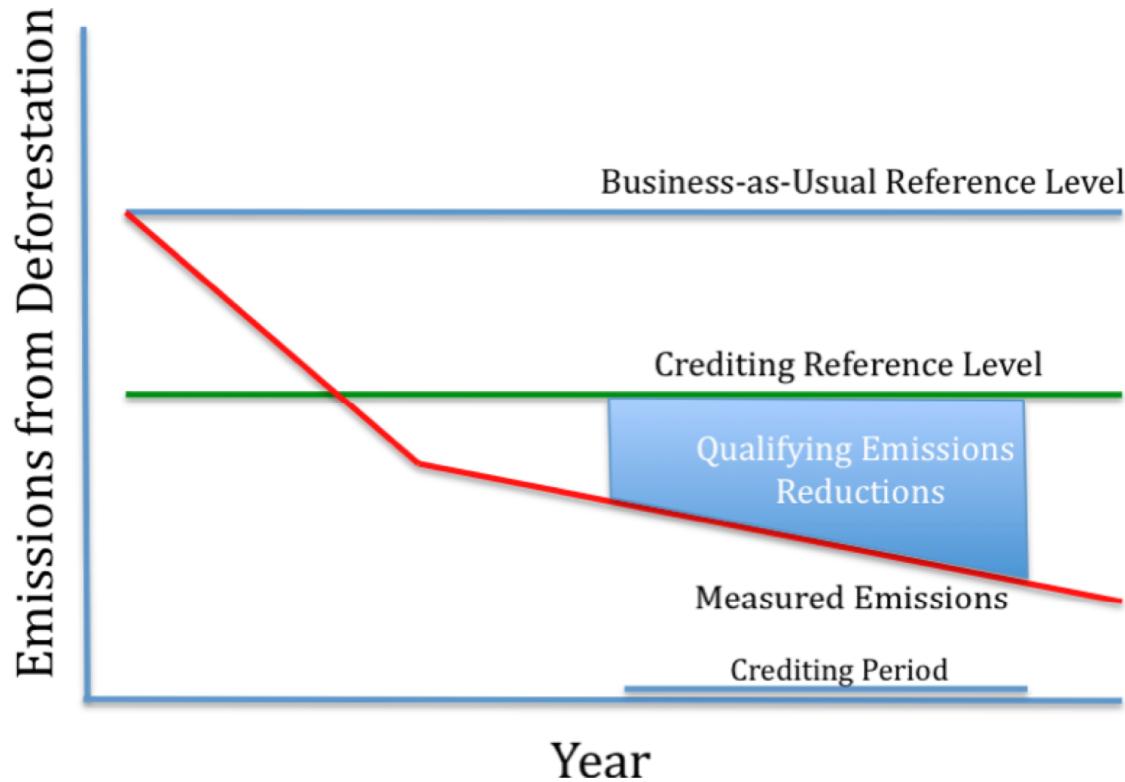
- Indigenous groups can enter into REDD forest carbon contracts, but only with approval of the federal government
- FUNAI, the government agency responsible for providing services to indigenous communities, holds the legal right to cancel contracts held by indigenous communities (if they break the law) and to receive a portion of contractual payments to communities.

Xingu baseline

- Context
 - Pressures on indigenous lands growing
 - New pressures from climate change, fire
- The dilemma
 - Xingu indigenous tribes' success in protecting their perimeters from illegal loggers and land grabbers underestimates the BAU potential for future emissions
- Approach
 - Traditional historical baseline analysis
 - Baseline through spatial simulation modeling

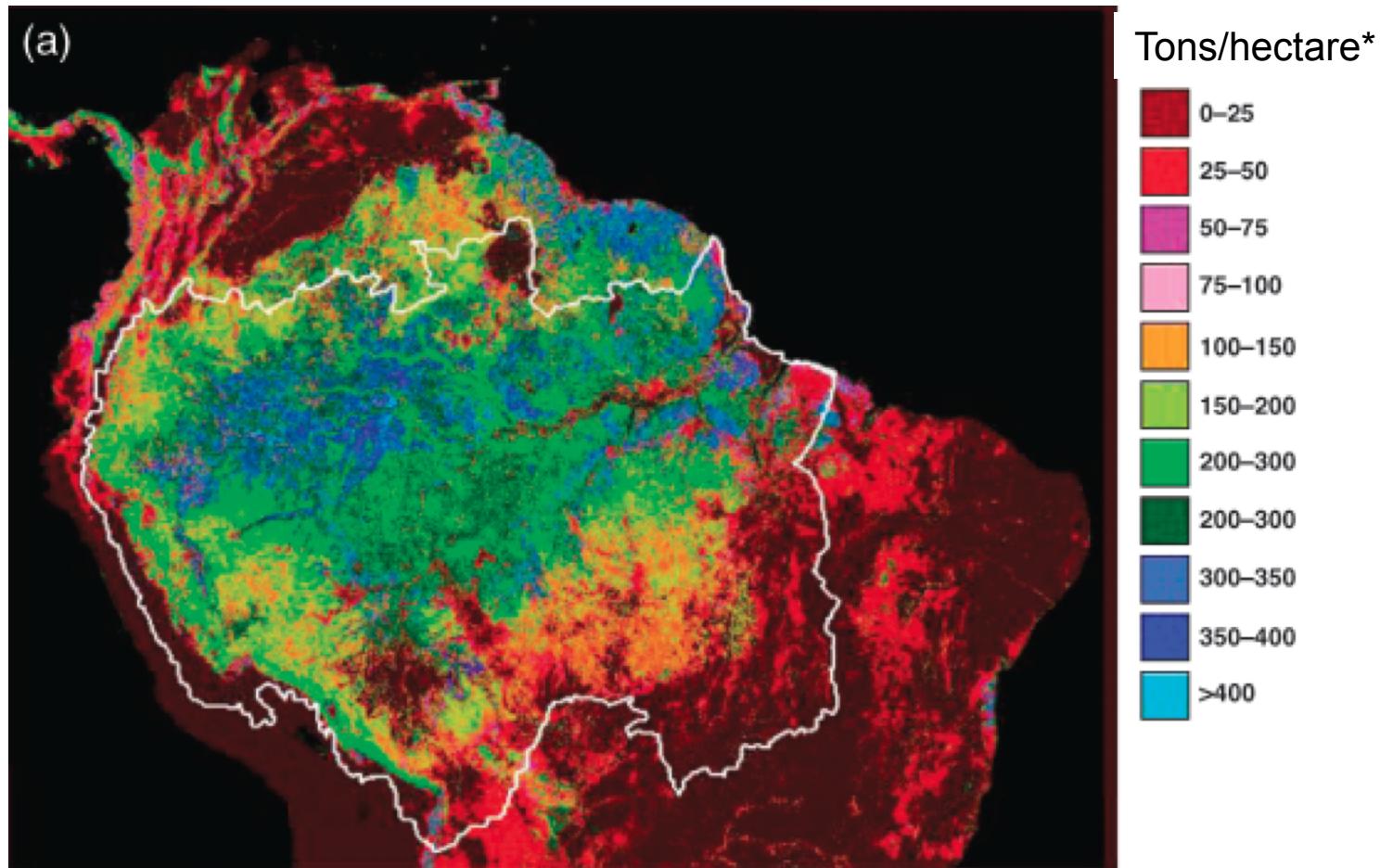
Xingu Baseline

Types of Baselines (“reference levels”)



Xingu baseline

Above-ground Biomass: satellite imagery and field plots



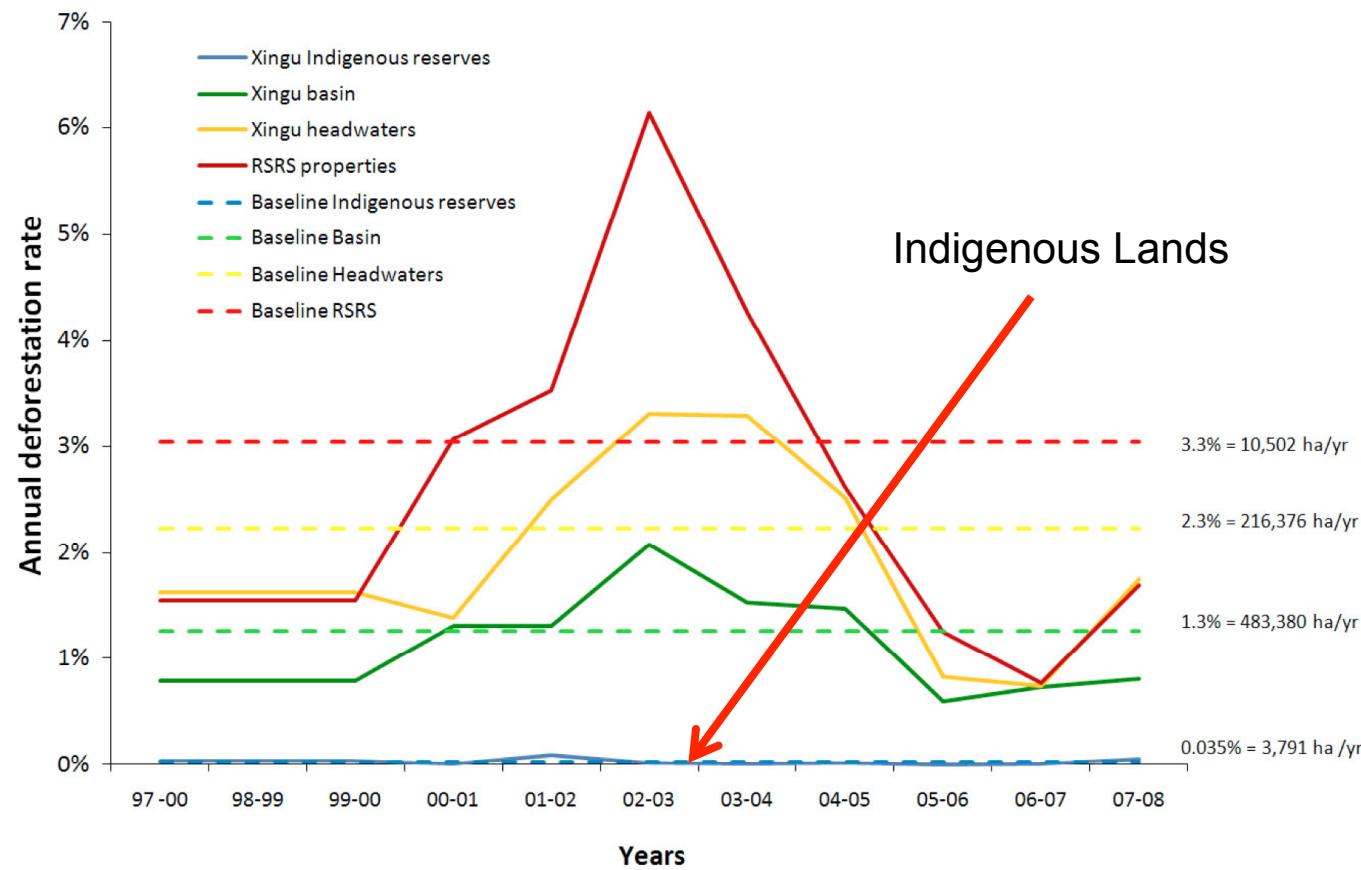
Xingu baseline

Carbon stocks

	Area ('000 ha)	Original Forest Area ('000 ha)	Forest Area, 2008 ('000 ha)	Percent Deforested	Carbon Stocks (million tC)	CO2eq (million tC)
Xingu River Basin	50,959	44,288	35,613	20%	4,693	17,223
Headwaters (Mato Grosso)	17,731	12,921	8,457	34%	1,071	3,931
Indigenous Lands	13,893	12,362	12,284	0,6%	1,322	4,852
Private Farms and Ranches in Land Registry	822	671	288	57%	39	143

Xingu baseline

“Traditional” historical baseline: annual deforestation close to zero



Xingu baseline

Modeling the baseline:

1. Using historical spatial relationships (deforestation vs. distance to roads, clearings, cities, slope, soil)
2. Different scenarios of Basin-wide deforestation rate
3. Different scenarios of compliance, forest code

Question: How would indigenous land deforestation change:

1. If perimeter control stopped
2. If deforestation rates varied
3. If 20% of indigenous land could be legally cleared

Xingu baseline

Modeling the baseline:

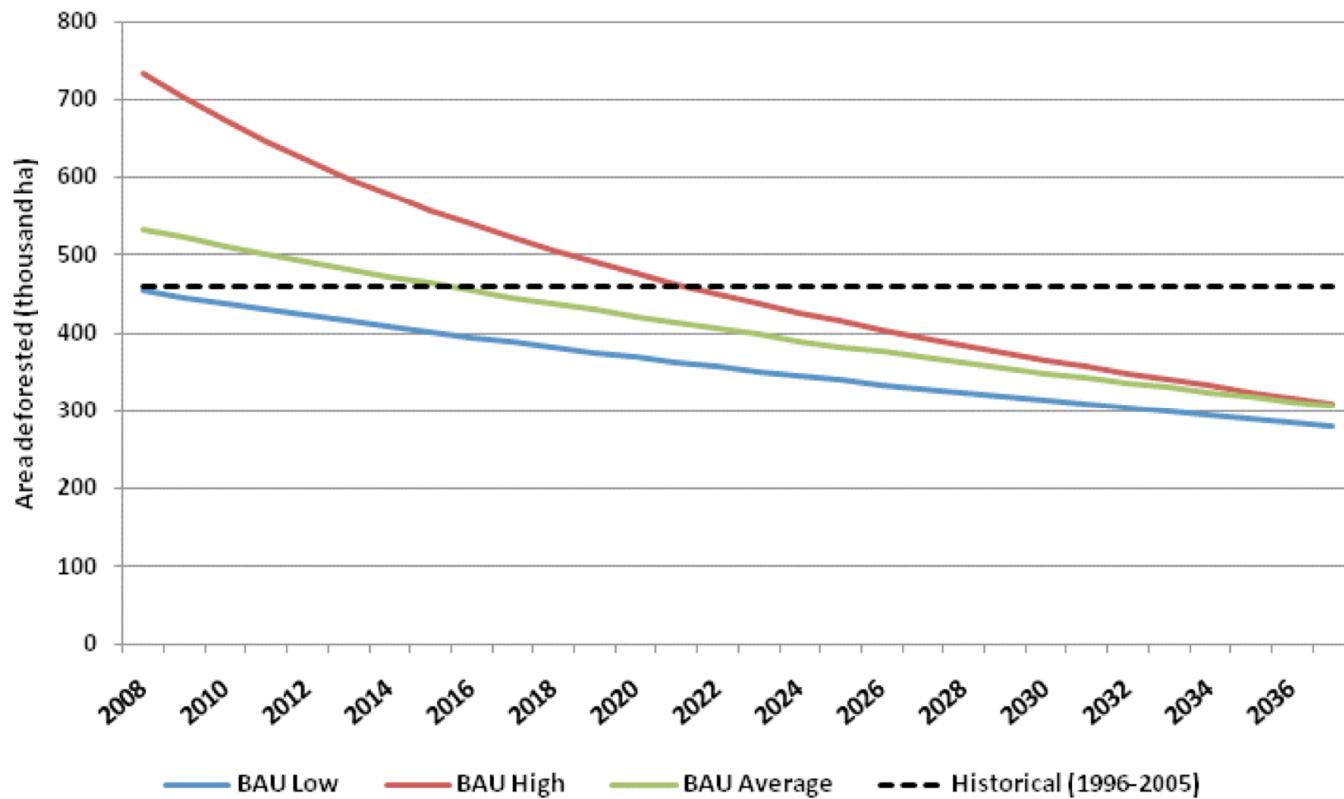
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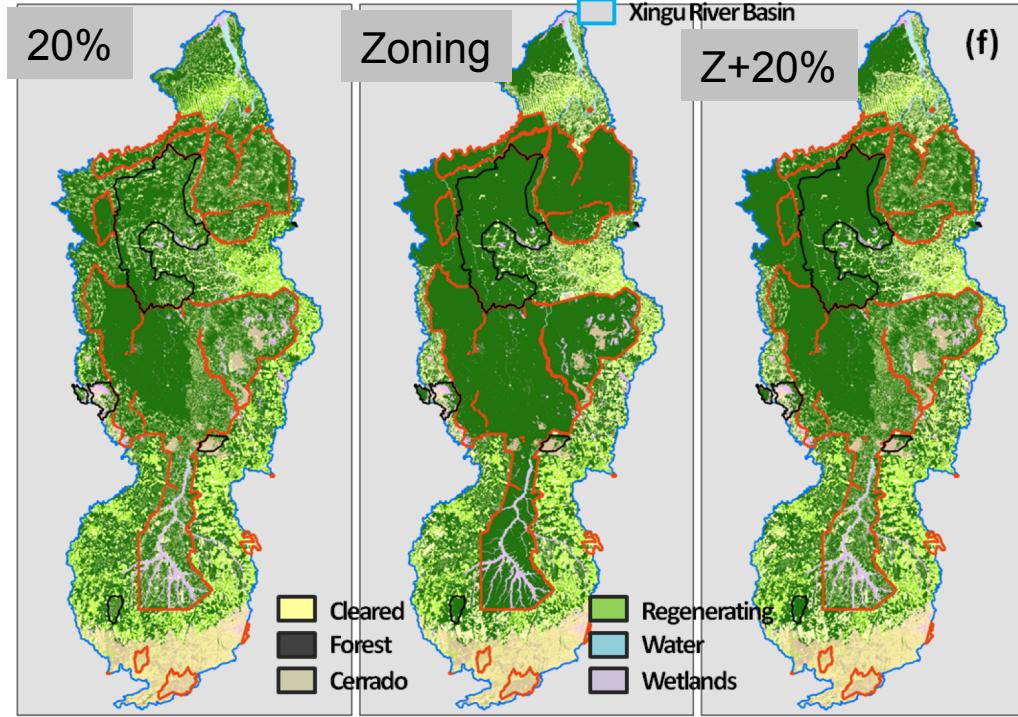
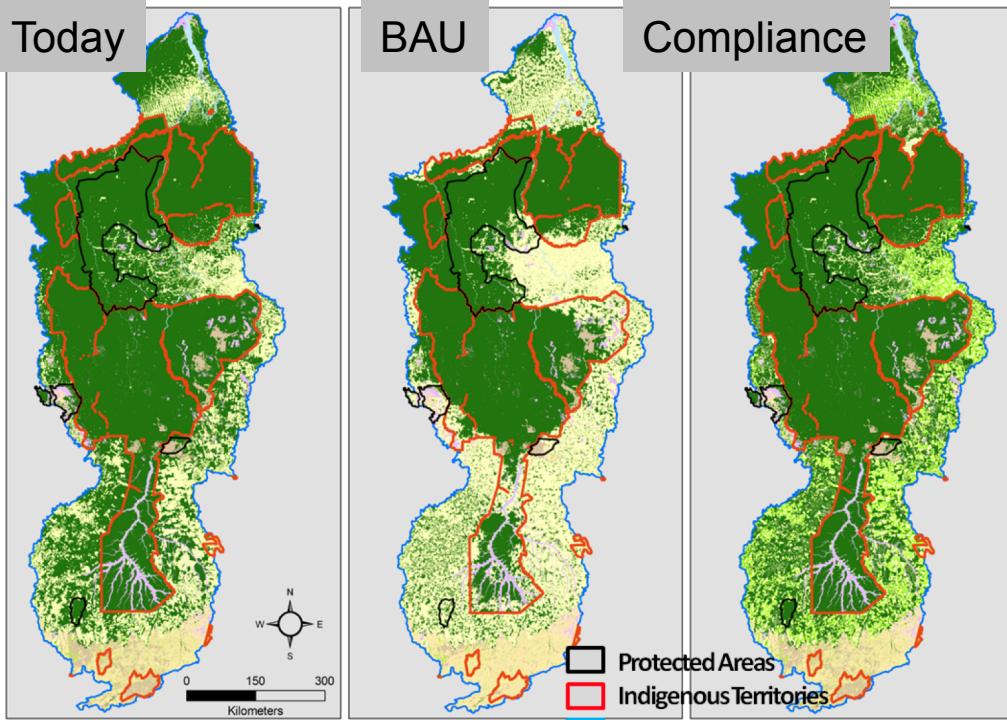
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Xingu baseline

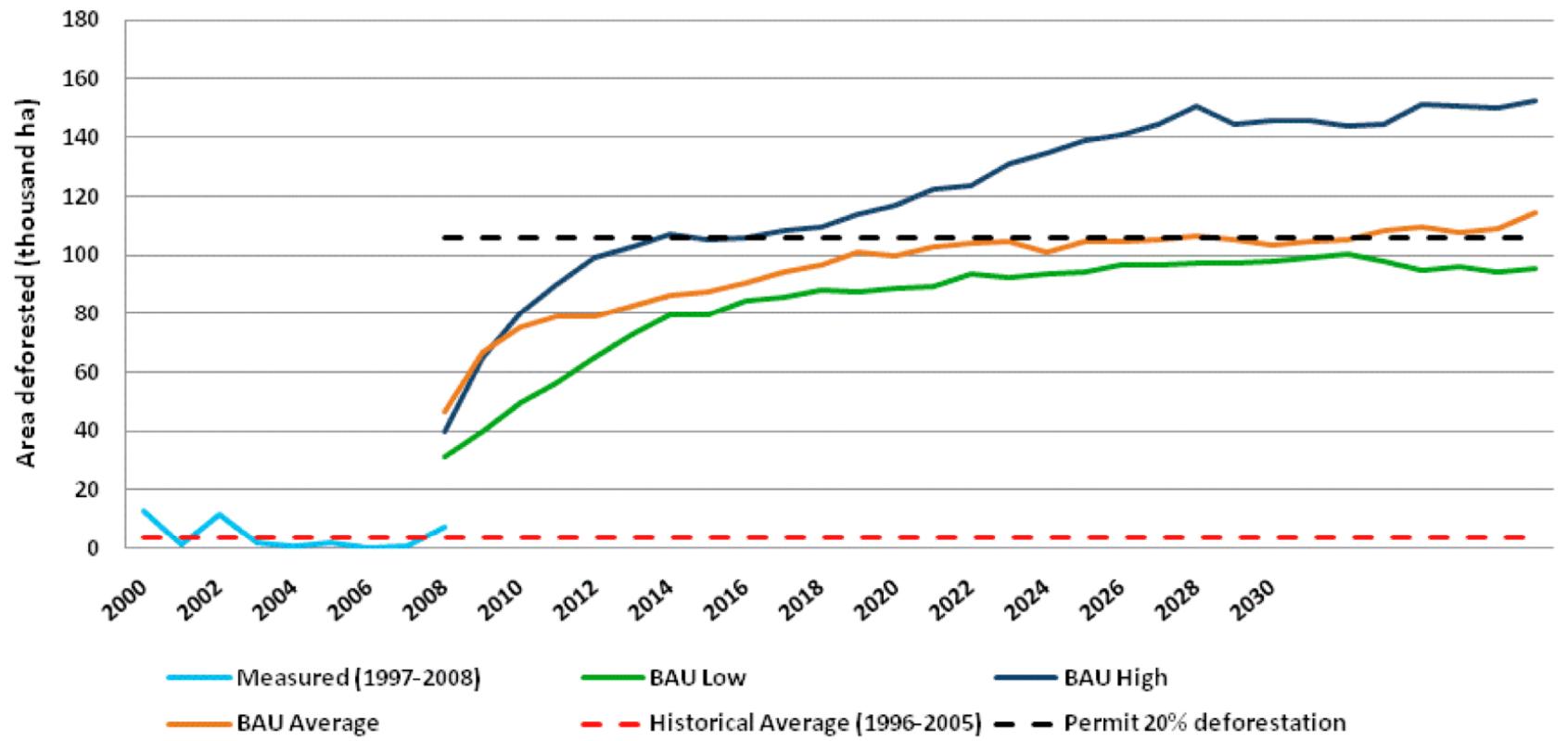
- Baseline as % of remaining forest





Xingu baseline

Comparison of modeled and measured baselines
Xingu River basin indigenous lands



Main Conclusions

Potential emissions reductions (offsets)

	<i>Historical</i>	<i>Modeled</i>
Additional forest clearing ('000 ha) (2030) BAU	85	1857 - 2618
Estimated emissions (MtCO ₂ e) (2030) BAU	30	1070 - 1539
Avoided emissions (MtCO ₂ e) (2008-2030) (zero deforestation)	30	1061 - 1530
Avoided emissions (MtCO ₂ e) (2030) (20% clearing)	1383	1146 - 1615

Main Conclusions

- Stand-alone forest carbon projects may not yield credits divorced from state- and national-level programs
- Nested REDD frameworks will require broad participation, *ex ante* incentives, attention to baselines
- Financial structures could facilitate private investment, lowering risk and providing access to future REDD credits through bond structures, public-private partnerships
- Brazilian law gives the right to indigenous tribes to enter into REDD contracts
- Xingu indigenous groups are interested in a REDD project
- The Xingu lands of the Xingu could provide 30 MtCO₂e using traditional baseline or >1 GtCO₂e using modeled baseline, through 2030