Table 1. Comparative characteristics, strategies, and expected co-benefits of sampled sub-national REDD+ pilot programs.

	ISA-CARBONO, ACRE	SÃO FELIX DO XINGU, PARÁ	NORTHWEST MATO GROSSO	JUMA, AMAZONAS
REDD+ PROGRAM CHARACTERISTICS				
Scale	Entire state; 8 initial priority areas	Entire municipality, including total area of indigenous lands and conservation units that exceeds municipal limits (within Pará); focal area under consultation with local actors	Entire municipality of Cotriguaçu	Juma Sustainable Development Reserve
Target actors	Extractivists, indigenous groups, small/medium/large agriculturalists, timber producers	Colonist settlers, indigenous groups, small/medium/large landholders, multi-level government agencies	Timber industry, medium/large cattle ranchers, colonist settlers, indigenous groups	Riverine populations
Main drivers of deforestation and degradation in project area	Road paving, illegal logging, cattle ranching, swidden agriculture, fire	Cattle ranching, illegal land-grabbing, illegal logging, lack production alternatives	Cattle ranching, illegal logging	Illegal logging, swidden agriculture, localized cattle expansion
REDD+ IMPACT PATHWAYS				
Land tenure regularization	Partner with National Institute of Agrarian Land Reform (INCRA) to develop the 'Legal Land' project in line with Ecological-Economic Zoning State Plan	Partner with state (ITERPA) and federal (INCRA) land agencies to develop more precise digital maps, and identify landholders' property limits through Rural Environmental Cadastre (CAR)	Zoning of medium and large landholdings through Rural Environmental Cadastre (CAR)	Not applicable (reserve established before project started)
Capacity-building	Technical trainings with government technicians in PES concepts and ISA-Carbono implementation	Trainings with all actors in REDD+ and CAR; additional training in MRV with government agencies, and improved land use practices with communities	Technical trainings for medium/large landholders in best cattle ranching practices and sustainable forest management; forest cover monitoring; community development	Environmental education; technical training in income diversification
REDD+ incentive Mechanisms	PES/rewards, public services, improve enforcment, support sustainable land use alternatives	PES, improve law enforcment (technical support), support sustainable land use alternatives	PES/rewards, improve enforcement, support sustainable land use alternatives	PES/rewards, public services, improve enforcment, support income diversification
EXPECTED CO-BENEFITS				
Ecological co-benefits	Priority areas selected considering biodiversity, soil, and water resources	Improved management of protected areas; landscape planning across land tenure mosaics to maximize biodiversity conservation	Conservation of biodiversity and water resources, soil conservation and restoration	Biodiversity conservation
Social co-benefits	Secure land tenure; promotion of rural livelihoods; health, education, transport services; community empowerment	Sustainable livelihood alternatives; stronger community organization; technical assistance	Access to credit and sustainable land use alternatives; stronger community organizations	Promotion of rural livelihoods; health, education, transport services; community empowerment
Monitoring of ecological and social indicators	Partnership with WWF/Sky for socio-ecological monitoring; test site of CCBA indicators; pursuit of FSC certification in forest management areas	Pursuit of CCBA/CARE social and environmental standards; pursuit of FSC certification in forest management areas	Pursuit of CCBA/CARE social and environmental standards	CCBA certified (2008)

3. Will early Brazilian REDD+ strategies live up to expectations?

It is still too early to make any conclusions about pilot REDD+ initiatives in the Brazilian Amazon, especially since national and global architectures are still under construction. That said, there is positive evidence that, despite challenges, these efforts could contribute to cost-effective and equitable climate change mitigation. Three particularly innovative elements distinguish the design of these REDD+ programs from conventional conservation initiatives:

a. Clear commitment to performance assessment: All reviewed pilot REDD+ schemes have invested in the establishment of reference levels and MRV systems. Scale and focus of project actions focus on the relevant drivers of deforestation and degradation, and in most, leakage control provisions have been contemplated.

b. Direct compensation payments: Intervention strategies go beyond traditional ICDP approaches and generally include direct and conditional compensation mechanisms and attempts to promote equity and social and ecological co-benefits. Diverse intervention strategies may, however, raise REDD+ implementation costs beyond predictions.

c. Synergies through partnerships between sub-national governments and NGOs/private foundations: The partnerships in these programs demonstrate required synergies between government agencies with mandates for tenure regularization and law enforcement, yet sometimes low institutional capacity, and NGOs and private foundations that may be more efficient, but lack legitimate means to provide basic REDD-readiness conditions.

No single Brazilian REDD+ pilot can claim to have introduced sufficient safeguards against all potential stumbling blocks in the way of cost-effective and equitable forest-based emission reduction. Early REDD+ funding has, nonetheless, resulted in a new generation of conservation initiatives with potential to be cost-effective, and both socially and ecologically acceptable.

Graphic design: Maria Eugenia Ismardi

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Grounding the REDD+ debate: Preliminary evidence from pilot initiatives in the Brazilian Amazon


Photo of Juma River: © FAS

An international mechanism to reduce emissions from deforestation and forest degradation and increased carbon stocks through improved forest management (REDD+) is likely to become part of a post-2012 international convention on climate change. Meanwhile, the academic and public debate on the role of forest conservation in climate change mitigation has become increasingly polarized. Many of these conflicting positions are based on conceptual models or assumptions about how REDD+ will be put into practice; linking the debate to the large number of pilot REDD+ initiatives currently underway is thus an important step forward. We discuss three hypotheses related to the opportunities and limitations of REDD+ and link them to strategies being pursued by four incipient REDD+ programs in the Brazilian Amazon.

Hypotheses in the REDD+ debate

1. REDD+ is a cost-effective climate change mitigation strategy

Point: Empirical research supports potential cost-effectiveness of REDD+

Greenhouse gas abatement cost studies suggest REDD+ is relatively cost-effective in comparison to other mitigation options (1, 2). Farm-level opportunity costs were shown to be low on large tracts of threatened forest lands, and transaction costs are modest in countries, such as Brazil, with substantial institutional capacity and ongoing policy change for avoided deforestation (3, 4).

Counter-point: REDD+ could turn out to be ineffective and expensive

REDD+ could be ineffective if it focuses on areas of low additionality, or fails to address extrasectoral drivers of deforestation, poor governance, and leakage risks. Also, along with economic multiplier effects, REDD+ could become very expensive, since it requires large preparatory investments in land zoning, capacity building, implementation of Monitoring, Reporting, and Verification (MRV) systems, and law enforcement.

2. REDD+ will have positive social effects

Point: REDD+ conditionality offers a chance for improved governance and community well-being

Through large-scale and performance-based funding, REDD+ offers a unique opportunity to provide social co-benefits, such as improved local governance and enhanced community well-being, which are also pre-conditions for REDD+ effectiveness (5). REDD+ standards that include social criteria, such as the Climate, Community, and Biodiversity Alliance (CCBA)

voluntary standards for forest carbon programs, and the Brazilian Social and Environmental Principles and Criteria for REDD+ (www.reddsocioambiental.org), provide safeguards to assure recognition of local rights.

Counter-point: Weak governance in REDD+ could lead to high social costs

REDD+ may disproportionately favor large and well-off farmers, whereas local and indigenous communities that lack a voice in the design of REDD+ strategies may disproportionately bear the costs. People with unclear or unrecognized land use rights may easily be excluded from REDD+ incentives or deprived of customary rights (6).

3. REDD+ will provide ecological benefits

Point: A host of ecological co-benefits will naturally flow from REDD+

There are many potential ecological co-benefits of REDD+, because it focuses on the conservation of carbon in standing natural forests, which tend to provide many other environmental services, including maintenance and restoration of hydrological functions and water quality, soil resources, and terrestrial and aquatic biodiversity (7). A comprehensive ecologically-focused MRV system could be developed through enhanced remote sensing technologies combined with field studies (7, 8), along with the CCBA standards that focus on biodiversity.

Counter-point: Ecological costs may arise from the narrow carbon focus of REDD+

The carbon focus of REDD+ has led to legitimate concerns about its potential ecological effects. Two important ecological costs of REDD+ could be the displacement of destruction from high-biomass forests to low-biomass ecosystems, and the replacement of native ecosystems with monoculture tree plantations (7) in situations where plantation forests qualify for REDD+ funding. Additionally, in REDD+ projects that involve forest management, silvicultural interventions to increase carbon stocks could have negative implications for biodiversity through severe modification of forest structure and composition (9).

Incipient REDD+ programs in the Brazilian Amazon

Through its Global Comparative Study (GCS) on REDD+, the Center for International Forestry Research (CIFOR) is partnering with four pilot REDD+ programs in the Brazilian Amazon (Box 1, Figure 1) to understand short-term processes and impacts in terms of effectiveness, efficiency, equity, and co-benefits (http://www.forestsclimatechange.org/The-Global-Comparative-Study-of-REDD+.html).

Box 1. Basic facts of four Brazilian REDD+ programs researched in collaboration with CIFOR's GCS-REDD.

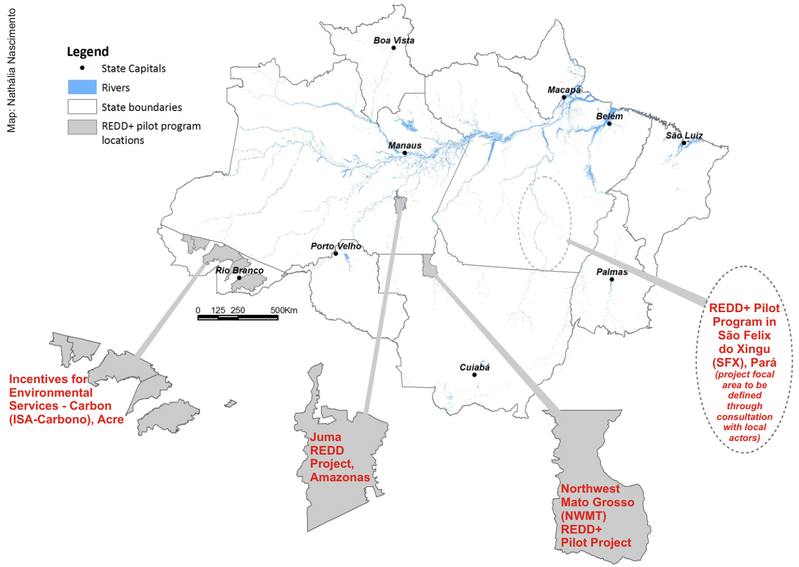
1) Incentives for Environmental Services - Carbon (ISA-Carbono), Acre
- State-wide REDD+ program led by Acre's State Government (based on 12-year history of state forest-based development)
- Goal to promote progressive, consistent, and long-term reduction in greenhouse gas emissions, through intensified production, increased value of standing forest, sustainable forest management, and forest protection
- Support from Amazon Fund, KfW, and Sky TV
- State Government recently passed "SISA" law (Lei 2308, 22 Oct 2010) to back program through institutionalized system of incentives for environmental services

2) REDD+ Pilot Program in São Felix do Xingu (SFX), Pará
- Partnership between The Nature Conservancy (TNC), State Environmental Secretariat of Pará (SEMA/PA), and municipal government of São Felix do Xingu
- Goals include land zoning, improved law enforcement, indigenous and protected area management, sustainable production alternatives, restoration of degraded lands, enrichment planting, and participation of vulnerable groups in REDD+ decision-making

3) Northwest Mato Grosso (NWMT) REDD+ Pilot Project
- Partnership between *Instituto Centro de Vida* (ICV), State Environmental Secretariat of Mato Grosso (SEMA/MT), TNC, *L'Office National des Forêts International* (ONF-I), and municipal government of Cotriguaçu
- Goals include land zoning, restoration of "Legal Reserve" and "Areas of Permanent Protection," recuperation of degraded lands, sustainable production (cattle ranching and forest management), and protected area management
- Support from Amazon Fund and Packard Foundation

4) Juma REDD Project, Amazonas
- First CCBA certified REDD project in Brazil in 2008 (10)
- Implemented by private foundation *Fundação Amazonas Sustentável* (FAS) in partnership with State Environmental and Sustainable Development Secretariat (SDS/AM)
- Incorporates Bolsa Floresta (BF) Program goals of conservation and improved livelihoods through supporting sustainable production alternatives, providing public services, strengthening institutions, and conditionally subsidizing household income, which are applied in 15 sustainable-use protected areas in Amazonas
- Support from Marriott Hotel (Juma), endowment fund managed by FAS (BF household subsidies), and Amazon Fund and Bradesco (3 other BF components)

Figure 1. Map of 5 pilot REDD+ pilot program sites in the Brazilian Amazon



These programs, led by government agencies, non-governmental organizations (NGOs), and a private foundation in four states of the Brazilian Amazon, are diverse in terms of scale and action (Table 1). That said, they are not entirely representative of the REDD+ landscape in Brazil, which includes private sector projects and those that target only indigenous groups.

Key elements of REDD+ pilot program design

Sub-national REDD+ programs in the Brazilian Amazon cannot be separated from the context in which they are embedded (11). The programs discussed here benefit from national policies for reduced deforestation, an engaged civil society, and high MRV capacity. They also face the challenges of dealing with land tenure insecurity and poor forest law enforcement, and meeting the equity expectations of highly mobilized social movements that represent forest peoples' rights.

1. Program scale and scope as they relate to cost-effectiveness

These four REDD+ programs work at different scales and target distinct actors, and all demonstrate leadership by or partnership with sub-national government agencies.

The effectiveness of these programs will depend on their strategies to deal with conditions of additionality and leakage control. According to the Soares-Filho et al. model of predicted deforestation in the Brazilian Amazon (12), all programs could justify additionality, because at least in part they target areas that are projected to be threatened by deforestation until 2050, even in places where historical deforestation rates are low (Acre's ISA-Carbono priority areas and Juma). That said, the model projections depend substantially on infrastructure expansion, and in certain areas it remains to be seen to what extent such development will occur.

Programs can address leakage by identifying potential leakage channels and by designing interventions to deal with the risks accordingly or, alternatively, by discounting credits for estimated leakage (13). Acre has determined that a percentage of the carbon credits will be kept in security to deduct for possible leakage, and formed an agreement with the neighboring state government of Madre de Dios, Peru to enhance shared territorial management instruments to prevent international leakage. In SFX and NWMT, leakage is being addressed through 'neutralization' strategies to discourage clearing of new areas (e.g. promoting intensified cattle ranching and agriculture, and economic alternatives). These programs also plan to delineate leakage zones and discount for estimated leakage.

Program cost-efficiency will depend on chosen intervention strategies. Despite differences in scale and target populations, these four programs are adopting direct compensation mechanisms in combination with improved enforcement and public services, and support for sustainable land use alternatives. In most programs, land zoning is being undertaken as a fundamental REDD-readiness activity. Reference levels and MRV systems are being defined and implemented through partnerships with experts in universities, research organizations, or NGOs to take advantage of existing capacity and to reduce costs. Programs are investing heavily in institutional and individual capacity-building (Table 1). Such a diversity of activities in REDD+ implementation comes with financial costs, but is likely necessary for program effectiveness.

2. Program strategies to promote positive social and ecological outcomes

Benefit-sharing and promotion of social co-benefits

Based on a previous analysis (4)[1], returns to land uses in the various project sites are in the low to middle range of opportunity cost estimates for the Brazilian Amazon, even for São Felix do Xingu (US$ 3.3/Mg CO_2) and NWMT (US$ 2.4/Mg CO_2) that target large landholders. Per-unit compensation requirements for emission reductions are particularly low in project sites with high forest biomass, such as Juma (US$ 0.4/Mg CO_2). If producers do not have to make huge economic sacrifices to be able to produce carbon credits, they would thus be more likely to derive net benefits. All programs have or plan to elaborate benefit-sharing documents through consultation with local stakeholders.

[1] Detailed methods for calculation of opportunity costs in Börner *et al.* 2010.

Social co-benefits are primarily being addressed through program efforts to clarify land tenure, improve local livelihoods, and engage local communities in program decision-making. While REDD+ has clearly incentivized land zoning in program areas, there are no guarantees that customary rights are recognized in these processes, especially where rights are contested. That said, all are pursuing CCBA certification (already attained by Juma) through which such rights issues could be monitored. All programs include Integrated Conservation and Development Project (ICDP) approaches to promote rural livelihoods, which are primarily focused on sustainable agriculture and forestry, as well as community empowerment. Juma, in particular, has demonstrated purposeful inclusion of marginal groups, and household income benefits go directly to women.

Promotion of ecological co-benefits

All program proponents incorporate conservation of biodiversity, soils, and water resources in their REDD+ interventions. Conservation strategies include creation of protected areas, improved management of existing protected areas, and promotion of sustainable forest management and improved agricultural practices. The pursuit of CCBA and Forest Stewardship Council (FSC) certification (in forest management areas of select programs) could simultaneously address biodiversity monitoring and minimize ecological risks. Additionally, MRV systems for carbon could be used to demonstrate positive hydrological outcomes associated with stream buffer restoration (SFX, NWMT) and maintenance of soil quality through decreased use of fire by smallholders (Acre). Leakage control from high biomass to low biomass areas would need to be incorporated into a national REDD+ strategy, as it would be difficult for programs to control.

Photo: Haroldo Palo Jr.

Aerial view of the deforestation frontier in São Félix do Xingu, in the state of Pará, Brazil.