OCCASIONAL PAPER

The context of REDD+ in Brazil

Drivers, agents and institutions

Peter H. May
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CIFOR

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CIFOR
Jl. CIFOR, Situ Gede
Bogor Barat 16115
Indonesia

T +62 (251) 8622-622
F +62 (251) 8622-100
E cifor@cgiar.org

www.cifor.cgiar.org

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Abbreviations

AdT	Amigos da Terra—Amazônia Brasileira
ALAP	Área de limitação administrative provisória (areas of provisional administrative limitations)
ALFA	Iniciativa de Aplicación de la Legislación Florestal en la Amazonia (Initiative for Application of Forestry Legislation in Amazonia)
APA	Área de Proteção Ambiental (environmental protection area)
APP	Área de Preservação Permanente (area of permanent preservation)
BAU	business as usual
BNDES`	Banco Nacional de Desenvolvimento Social e Econômico (National Bank for Social and Economic Development)
CBD	United Nations Convention on Biological Diversity
CDM	Clean Development Mechanism
CGFLOP	Commission for Public Forest Management (Comissão de Gestão de Florestas Públicas)
CITES	Convention on International Trade in Endangered Species
CNS	Conselho Nacional de Seringueiros (National Council of Rubber Tappers)
COFA	Comitê Orientadora do Fundo Amazônia (Amazon Fund Steering Committee)
COIAB	Coordenação de Organizações Indiígenas da Amazônia Brasileira (Coordination of the Indigenous Organizations of the Brazilian Amazon)
CONAFLOR	Comissão Coordenadora do Programa Nacional de Florestas (Coordinating Commission for the National Forestry Program)
CONAMA	Conselho Nacional do Meio Ambiente (National Environmental Council)
COP	Conference of the Parties
DETER	Sistema de Detecção do Desmatamento em Tempo Real (System for Detection of Deforested Areas in Real Time)
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária (Brazilian Enterprise for Agricultural and Livestock Research)
FAS	Fundação Amazonas Sustentável (Sustainable Amazonas Foundation)
FBMC	Forum Brasileiro de Mudanças Climáticas (Brazilian Forum on Climate Change)
FBOMS	Forum Brasileiro de ONGs e Movimentos Sociais (Brazilian Forum of NGOs and Social Movements)
FLEGT	Forest Law Enforcement Governance and Trade
FNO	Fundo Constitucional do Norte (Constitutional Fund for the North)
GCF	Governors' Climate and Forests Task Force

GHG	greenhouse gas
GTA	Grupo de Trabalho Amazônico (Amazon Working Group)
GTI—PPCDAM	Grupo de Trabalho Interministerial do Plano de Ação para Prevenção e Controle do Desmatamento na Amazônia Legal (Interministerial Working Group—Action Plan for Prevention and Control of Deforestation in the Legal Amazon)
IBAMA	Instituto Brasileiro do Meio Ambiente e Recursos Naturais Renováveis (Brazilian Institute of Environment and Renewable Natural Resources)
IBGE	Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistics)
Idesam	Instituto de Conservação e Desenvolvimento Sustentável de Amazonas (Institute for Conservation and Sustainable Development of Amazonas)
Imaflora	Instituto de Manejo e Certificação Florestal e Agropecuária Institute for Forestry and Agricultural Management and Certification
Imazon	Instituto do Homem e Meio Ambiente da Amazônia (Amazon Institute of People and the Environment)
INCRA	Instituto Nacional de Colonização e Reforma Agrária (National Institute for Colonization and Agrarian Reform)
INPE	Instituto Nacional de Pesquisas Espaciais (National Institute for Space Research)
IPAM	Instituto de Pesquisa Ambiental da Amazônia (Amazon Environmental Research Institute)
ISA	Instituto Socioambiental (Socioenvironmental Institute)
ITTO	International Timber Trade Organization
MCT	Ministério da Ciência e Tecnologia (Ministry of Science and Technology)
MMA	Ministério de Meio Ambiente (Ministry of the Environment)
MoU	memorandum of understanding
MRV	monitoring, reporting and verification
NAMA	Nationally Appropriate Mitigation Action
NGO	nongovernmental organisation
OTCA	Organização do Tratado de Cooperação Amazônica Amazon Cooperation Treaty Organization
PAC	Programa de Aceleração do Crescimento (Accelerated Growth Programme)
PAS	Plano Amazônia Sustentável (Sustainable Amazon Plan)
PES	payments for environmental services
PNF	Programa Nacional de Florestas (National Forestry Program)
PNGATI	National Program for Environmental Management in Indigenous Lands (Programa Nacional de Gestão Ambiental em Terras Indígenas)
PNMC	Plano Nacional sobre Mudança do Clima (National Climate Change Plan)
PNMFC	National Program for Community Forestry Management (Programa Nacional de Manejo Florestal Comunitário)
POLONOROESTE	Northwest Brazil Integrated Regional Development Program
PPCDAM	Plano de Ação para Prevenção e Controle do Desmatamento na Amazônia Legal (Action Plan for Prevention and Control of Deforestation in the Legal Amazon)
PRODES	Programa de Cálculo do Desmatamento na Amazônia (Program for Calculation of Deforestation in the Amazon)
PVEA	Plano de Valorização Econômica da Amazônia (Plan for Economic Valorization of the Amazon)

RAMSAR	International Agreement on Wetlands
RDS	Reserva de Desenvolvimento Sustentável (sustainable development reserve)
REDD	reduced emissions from deforestation and degradation
RESEX	Reserva Extrativista (extractive reserve)
SBSTTA	Subsidiary Body for Scientific, Technical and Technological Advice
SFB	Serviço Florestal Brasileiro (Brazilian Forest Service)
SIPAM	Sistema de Proteção da Amazônia (System for Protection of the Amazon)
SNUC	Sistema Nacional de Unidades de Conservação da Natureza (National System of Protected Areas)
SPVEA	Superintendência do Plano de Valorização Econômica da Amazônia (Superintendency for the Plan for Economic Valorization of the Amazon)
SUDAM	Superintendência de Desenvolvimento da Amazônia (Superintendency for Development of the Amazon)
TNC	The Nature Conservancy
UNDRIP	UN Declaration on the Rights of Indigenous People
UNFCCC	UN Framework Convention on Climate Change
WWF	World Wide Fund for Nature

Executive summary

Deforestation and degradation in the Brazilian Amazon have various causes, related to economic, political and social factors. Since the 1960s, successive military and civilian governments have encouraged settlement through large-scale cattle ranching, logging and soybean cultivation, as well as occupation by small farmers in the Amazon. Historically, producers in the Amazon have been actively encouraged to clear the rainforest as proof of 'productive' activity under land-titling laws and for the acquisition of credit. From the mid 1970s, development paradigms were increasingly centred on the promotion of private enterprises through generous credit and fiscal incentives, with particular attention on the ranching, timber and mining sectors—which increased pressure on forests In the current setting, deforestation and degradation in the Brazilian Amazon increasingly reflect market demands and private sector profitability, combined with a policy arena that, although averse to continued forest clearing, actively promotes activities that are among its principal driving forces.

Despite the drive towards Amazon settlement and agroindustrial expansion, a number of measures have been undertaken to reduce deforestation, culminating in the adoption of quantitative targets for reduction in deforestation from a 10-year historical baseline in the Amazon by 80% and in the cerrado by 40% by 2020. Policy implementation experience suggests that a substantial foundation for achieving the proposed emissions reductions exists. However, such progress continues to be undermined by contradictory policies, particularly within the infrastructure, agribusiness and mining sectors, which would constrain the achievement of deforestation reduction targets. Constraints associated with the effectiveness of law enforcement capacities to address illegal deforestation and the political will to address land conflicts in areas of high tenure insecurity, as well as continued corruption in the timber industry, combine to seriously undermine REDD+ prospects in the Brazilian Amazon.

During the past 2 decades, government efforts to contain the negative effects of widespread forest clearance have often centred on an attempt to decentralise licensing and enforcement responsibility to the Amazon states. In most cases, little corresponding capacity development has occurred. However, this situation varies among Amazon states; some progress has been made on forest information systems or monitoring. In 2003, during the Lula administration, a major interministerial programme for Amazon deforestation reduction (PPCDAM) was initiated; however, it has been hampered by a centralised structure. Furthermore, there has been little real coordination of such efforts with continuing sectoral support of expanded agribusiness, mining, transportation and energy infrastructure.

Despite the absence of adequate intersectoral policy coordination, the Brazilian government has made the PPCDAM the centrepiece of its commitment announced at COP 15 in Copenhagen. This policy framework has also been extended to the 9 states in the region, 7 of which have already prepared plans to reduce deforestation on their own as part of the newly decentralised federalist structure for regional environmental governance.

Brazil's capacity to monitor and assess the status of forestland conversion to other uses is advanced,

but its enforcement capacity is considerably less so. Higher resolution annual PRODES data have been complemented by real-time monitoring with the lower resolution DETER, available for download by state and civil society organisations. The police and army have been mobilised to carry out control operations in municipalities throughout the 'Arc of Deforestation'. The absence of land titles and widespread illegal occupation of public lands makes it difficult to identify the individuals responsible for deforestation. At the same time, this land tenure situation also makes it difficult for landholders to enter into long-term contracts to commit themselves to reduce deforestation and access potential REDD+ benefits. Furthermore, insecure land tenure is allied with uncertain carbon tenure, so that although indigenous groups represent a principal bulwark against illegal deforestation in much of the Amazon, indigenous territories lie on lands under the control of the Union, from which the marketing of environmental services remains uncertain in terms of remuneration. The same is true of untitled land reform beneficiaries and forest dwellers in sustainable use protected areas such as extractive reserves. Tenure insecurity may therefore translate in these cases into inequities in potential REDD+ benefit-sharing arrangements. Nevertheless, a number of voluntary carbon projects have been promoted in such areas by forest peoples and non-governmental organisations (NGOs) acting on their behalf.

Significant mobilisation of forest peoples, through protest and some efforts to promote alternative land use patterns and livelihood initiatives, has emerged to counter governmental inertia. In recent years, such efforts have increasingly centred on REDD+ strategies and responses. The subnational REDD+ projects that have proliferated over the past few years largely focus on those areas that are of interest for reasons of equity rather than scale of deforestation reduction. REDD+ implementation at a pilot scale in Brazil has thus been perceived more as a poverty-reduction instrument than necessarily as an effective means to meet UNFCCC voluntary commitments. To achieve REDD+ targets in Brazil, a 'nested strategy' has been proposed. In practice, this would imply that voluntary remuneration for environmental services in subnational schemes could contribute towards accounting of national reduction achievements, chiefly considered to be a response to command-and-control mechanisms under federal administration.

The current report provides an overview of the contextual conditions that affect the REDD+ policy environment in the Brazilian Amazon. Based on reviews of existing literature, national and international data, legal opinions and selected expert interviews, it provides the background and the preliminary analysis of the context in which national REDD+ strategies are being developed. This document is organised into 5 main sections. First, it reviews the main forest and land use trends, investigating the main country-specific drivers of deforestation and degradation. The second section reviews major institutional factors linked to governance and rights, with particular emphasis on access rights to forestland and forest resources, as well as on decentralisation of governance, which has a crucial role in Brazil's REDD+ strategy. The third section encompasses political-economic factors, depicting the broader context in which drivers of deforestation and degradation operate. The fourth section moves more specifically to the development of national REDD+ policy strategies. The final section then draws on the implications of the preceding sections for prospective REDD+ outcomes by conducting an assessment of the efficiency, efficacy and equity (3Es) of execution of REDD+ strategies.

Resumo executivo

O desmatamento e a degradação de florestas na Amazônia brasileira têm suas origens a partir de várias causas, sempre relacionadas a fatores econômicos, políticos e sociais. Desde os anos 60, sucessivos governos militares e civis têm incentivado a ocupação humana através da pecuária bovina em larga escala, extração de madeira e, posteriormente, o cultivo da soja, bem como o assentamento de pequenos produtores rurais na Amazônia. Historicamente, os produtores da Amazônia foram ativamente incentivados a derrubar a floresta como demonstração de atividade 'produtiva' sob as leis fundiárias e para a aquisição de crédito. Desde a a década de 1970, os paradigmas de desenvolvimento são centrados cada vez mais na promoção de empreendimentos privados através do crédito e incentivos fiscais generosos, com especial atenção para a pecuária, madeira e mineração, que aumentaram a pressão sobre a Amazônia. A configuração atual do desmatamento e degradação florestal na Amazônia brasileira reflete cada vez mais as exigências do mercado e da conseqüente rentabilidade do setor privado, combinado com uma arena de políticas publicas que, embora se declare oposta ao desmatamento contínuo da floresta, promove atividades que estão entre suas principais forças motrizes.

Apesar da movimentação em direção à colonização e expansão agroindustrial na Amazônia, uma série de medidas foram adotadas para conter a onda associada ao desmatamento, o que culminou com a adoção de metas quantitativas de redução do desmatamento, a partir de uma base histórica de 10 anos, de 80% na Amazônia e de 40% no cerrado até 2020. A experiência brasileira na implementação de políticas públicas sugere que existe um alicerce substancial que permitirá atingir tais almejadas reduções de emissões. Contudo, tal progresso continua sendo prejudicado por políticas contraditórias, especialmente nos setores do agronegócio, infraestrutura e mineração que limitam a realização de metas de redução de desmatamento. Além disso, as restrições associadas à eficácia da capacidade de controle do desmatamento ilegal, a falta de vontade política para resolver os conflitos fundiários em áreas de alta insegurança da posse, assim como a corrupção continuam na indústria madeireira e no seu aparato regulatório, que conjuntamente prejudicam as perspectivas para REDD+ na Amazônia brasileira.

Durante as últimas duas décadas, os esforços do governo para conter os efeitos negativos da extensiva destruição da floresta, muitas vezes têm sido centrados na tentativa de descentralizar as responsabilidades de licenciamento e de controle aos governos estaduais da Amazônia Legal. Na maioria dos casos, nota-se que ocorreu pouco desenvolvimento de capacidades correspondentes. No entanto, esta situação varia entre os estados da Amazônia; alguns progressos foram alcançados em sistemas de informações florestais ou de monitoramento. Em 2003, durante o governo Lula, um grande programa inter-ministerial para redução do desmatamento da Amazônia (PPCDAM) foi iniciado , mas ficou estagnado devido a uma estrutura de gestão demasiadamente complexa. Além disso, há pouca coordenação de tais esforços,

em contraposição ao apoio setorial esmagador em prol da expansão do agronegócio, mineração, transportes e infra-estrutura energética.

Apesar da ausência de adequada coordenação política intersetorial, o governo brasileiro fez com que o PPCDAM virasse a peça central de seu compromisso anunciado na COP15, em Copenhague. Este quadro político também foi estendido aos nove estados da região, sete dos quais já têm preparado os seus próprios planos de contenção de desmatamento como parte da estrutura federalista recentemente descentralizada para a governança ambiental regional.

A capacidade do Brasil para acompanhar e avaliar o processo de conversão florestal para outros usos é considerado impar, mas a sua capacidade de controle é consideravelmente inferior. Os dados anuais de alta resolução do PRODES foram complementados com monitoramento em tempo real através do DETER, de menor resolução, cujas imagens encontram-se também disponíveis para download por organizações da sociedade civil e estaduais. A polícia e tropas do exército foram mobilizados para realizar operações de controle nos municípios do Arco do Desmatamento. Mas, devido à inexistência de cadastros completos de propriedade da terra e ocupações ilegais desenfreadas em terras públicas, é difícil associar o desmatamento aos indivíduos responsáveis.

Ao mesmo tempo, esta situação fundiária torna impossível aos proprietários celebrar contratos de longo prazo mediante os quais se comprometam a reduzir o desmatamento e acessar potenciais benefícios da REDD+. Além disso, a posse insegura da terra é aliada à incerteza do direito de propriedade sobre o carbono, de modo que, embora os grupos indígenas representem um baluarte principal contra o desmatamento ilegal na maior parte da Amazônia, os territórios indígenas se encontram em terras sob o controle da União, nos quais a comercialização de serviços ambientais é ainda incerta de ser remunerada as tribos que os protegem. O mesmo vale para beneficiários em terras ainda não titulados da reforma agrária e os moradores da floresta em áreas protegidas para uso sustentável, como reservas extrativistas. A insegurança da posse pode, portanto, traduzir-se, nestes casos, em desigualdades na partilha dos benefícios potenciais de REDD+. No entanto, uma série de projetos voluntários de carbono florestal têm sido promovidos em tais áreas pelos povos da floresta e organizações não-governamentais (ONGs) que atuam em seu nome.

Além disso, uma mobilização significativa dos povos da floresta surgiu para combater a inércia governamental através de protesto e alguns esforços para promover padrões alternativos de uso da terra e iniciativas locais de sobrevivência. Tais esforços têm se centrado cada vez mais em estratégias e respostas de REDD+. Em grande medida, os múltiplos projetos subnacionais de REDD+, que têm proliferado nos últimos anos, têm como foco as áreas que são de interesse por razões de equidade e não pela escala de redução de desmatamento. A implementação de projetos pilotos de REDD+ no Brasil tem sido, assim entendida, mais como um instrumento de redução da pobreza do que necessariamente como um meio eficaz para cumprir os compromissos voluntários da UNFCCC. Para atingir este fim, uma 'estratégia integrada' (nested strategy), foi proposta, incluindo o pagamento voluntário de serviços ambientais em sistemas sub-nacionais que contribuam para conquistas nacionais de redução provenientes primordialmente de mecanismos de comando e controle.

O presente relatório fornece uma visão geral das condições contextuais que afetam o ambiente político de REDD+ na Amazônia brasileira. É baseado em revisões de literatura, nacional e internacional, pareceres jurídicos, bem como entrevistas com especialistas selecionados e apresenta o histórico e a análise preliminar do contexto no qual as estratégias nacionais de REDD+ estão sendo desenvolvidas. O documento está organizado em cinco seções. Primeiro, analisa-se a as tendências principais no uso da floresta e da

terra, investigando as causas (drivers) principais (específicas ao país) do desmatamento e degradação florestal. A segunda seção revisa os principais fatores institucionais ligados à governança e direitos, com particular ênfase sobre os direitos de acesso aos recursos florestais e às terras na floresta, e também à descentralização governamental, que tem um papel crucial na estratégia de REDD+ no Brasil. A terceira seção compreende os fatores político-econômicos, retratando o contexto no qual as causas de desmatamento e degradação operam, incluindo breves comentários sobre o debate em torno do Código Florestal. A quarta seção se dirige, mais especificamente, para o desenvolvimento de estratégias nacionais de políticas para REDD+. Finalmente, a última seção traça algumas conclusões sobre as implicações das seções anteriores para os resultados potenciais de REDD+ através de uma avaliação preliminar e prospectiva da eficácia, eficiência e eqüidade (3Es) da execução de estratégias de REDD+ no país.

Introduction

This report is a contribution to CIFOR's multiyear Global Comparative Study on REDD+,[1] which aims to provide policy makers, practitioners and donors with strategic information on reducing emissions from deforestation and forest degradation, and enhancement of forest carbon stocks in developing countries.[2]

This country profile for Brazil focuses on the Brazilian Legal Amazon region, which is made up of all or part of 9 states[3] (Acre, Amapá, Amazonas, Maranhão, Mato Grosso, Pará, Rondônia, Roraima and Tocantins), and in particular on the Amazon rainforest biome (consisting primarily of dense and open broadleaf tropical rainforest). Some reference is made to areas in the *cerrado* biome, which are pertinent because of pressures of expansion in non-forest land uses, and because of persistent confusion regarding transition zones between the 2 biomes.

In this country profile we elected not to examine other biomes in Brazil, such as the Atlantic Forest or the semi-arid *caatinga*, because of their distinct history of settlement, policy evolution, current land use pressures and responses to deforestation. As the Brazilian Amazon is itself of continental scale and relative importance in global rates of tropical deforestation (having accounted for 42% of all forest area decline in 2000—2005; FAO 2005), this focus is strategic to global concerns for curtailing emissions.

This study—notably a work in progress due to the evolving policy framework for REDD+ both in Brazil and at the global level—was the combined effort of a steadily growing contingent of co-authors, collaborators and reviewers. The principal authors owe a particular debt of gratitude to Maria Fernanda Gebara, who made substantive additions and revisions to the entire study, as well as to complementary indicators. Maria Brockhaus played an essential coordinating role for contextualising the work within the global comparative study on REDD+ policies and strategies. The study was also reviewed by Sheila Wertz-Kanounnikoff, Sven Wunder, Jan Börner, Andrew Wardell, Alice Thault and Anthony Hall. Zhang Shaozeng identified key actors and institutions for policy network analysis. Bruno Calixto, who reviewed evolving media coverage on REDD+ in principal Brazilian newspapers from 2005 to 2009, identified the public figures and events that stimulated the emergence of a REDD+ strategy at the national and subnational levels. We also appreciate the assistance of Hugo Rosa and Luciana Figueiredo, respectively, with the latter 2 analyses. We also thank Imogen Badgery-Parker, Efrian Muharrom, Gun gun Rakayana, Gideon Suharyanto and Catur Wahyu for editing, design and layout of this publication.

This country profile is based on the GCS Component 1 methodological framework and the country profile guidelines prepared by Maria Brockhaus, Monica Di Gregorio, and Sheila Wertz-Kanounnikoff (unpublished project document).

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1 Forests, land use trends and drivers of deforestation and degradation

1.1. Current forest cover and historical overview of forest cover change

The Amazon biome spans 9 countries and a total area of 6.4 million km^2, of which nearly two-thirds (63%) is located within Brazil's national boundaries.[4] The Amazon River basin—with headwaters and tributaries located in the Andes *cordillera*, Guiana Shield and Brazilian savannahs (*cerrado*)—covers approximately 7 million km^2, equivalent to 25% of the land surface of South America. With more than 1000 rivers and tributaries, the Amazon is the world's largest hydrographic basin and the source of 15% of all fresh water on the planet.[5]

Figure 1.1. The Amazon forest biome and the Legal Amazon of Brazil

Source: Imazon (2005)

Figure 1.2. States of the Legal Amazon of Brazil
Source: Imazon (2005)

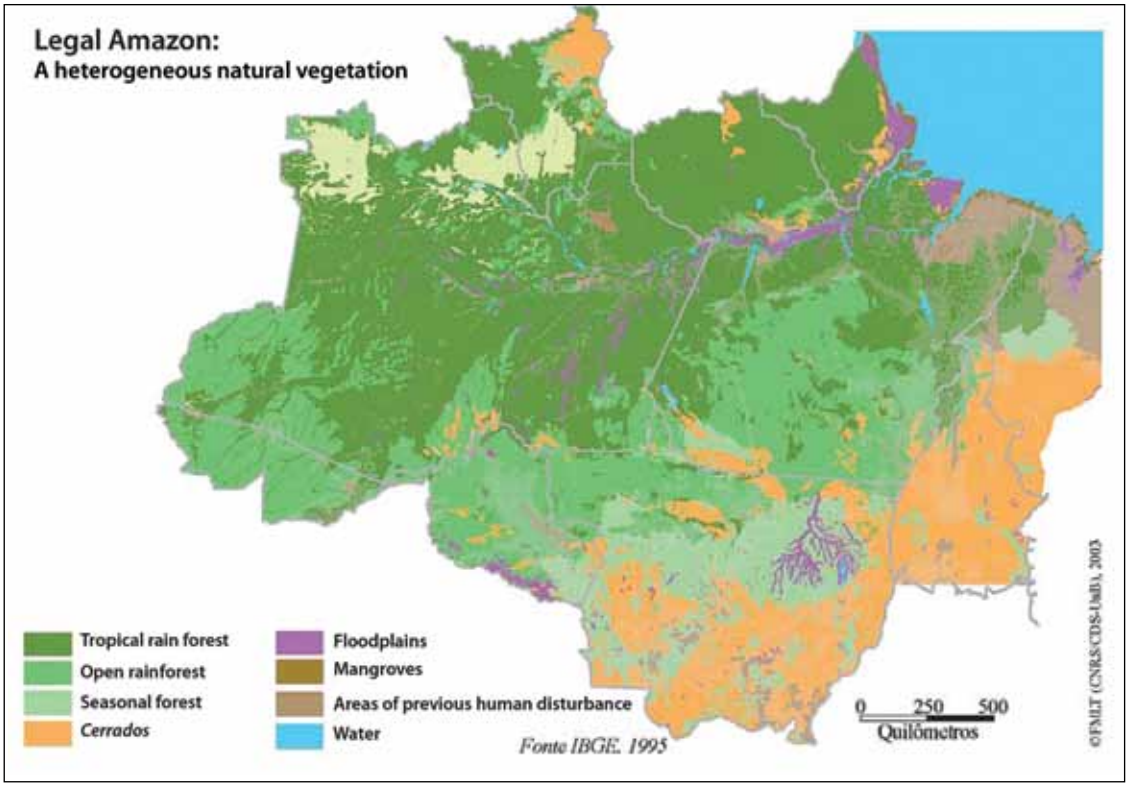

Figure 1.3. Major categories of natural vegetation in the Legal Amazon

Source: Pasquis *et al.* (2003)

Figure 1.4. Major biomes in Brazil

Source: IBAMA[7]

The Brazilian Amazon, covering 4.1 million km^2, accounts for one-third of the world's remaining tropical forests. When referring to the Brazilian Amazon, it is useful to distinguish between this portion of the biome located within the country's boundaries (48% of the country's surface area) and the 'Legal Amazon' (*Amazônia Legal*) a geopolitical region created for administrative purposes that encompasses more than 5.2 million km^2, or 61% of the country's total area, including all or part of 10 Brazilian states (Figures 1.1 and 1.2).[6]

Various types of tropical forests originally covered an estimated 73% of the Legal Amazon region. Non-forest forms of natural vegetation, such as savannahs, natural grasslands and *campirana*, also occur in the region (Figure 1.3). The portions of the Legal Amazon located outside the Amazon biome proper are covered mainly by savannah vegetation and transitional forests, principally within the *cerrado* biome (Figure 1.4).

According to analyses of remote sensing data by Brazil's National Institute of Space Research (INPE), annual deforestation rates in the Brazilian Amazon (Figure 5) peaked at approximately 29 000 km^2 in 1995 (about 0.8% of the remaining forestland of approximately 3.7 million km^2), followed by a reduction to roughly 16 500 km^2 (about 0.5%) a year in the second half of the 1990s. Subsequent average rates of annual clearing increased substantially to 21 500 km^2 during 2000—2004, peaking at 27 772 km^2 in 2004 (0.78%).[8] Deforestation rates subsequently dropped by 59%, declining rapidly from 19 100 km^2 in 2005 to around 12 000 km^2 in both 2007 and 2008 (<0.4%) followed by a substantial decline to an estimated 7008 km^2 (0.2%) in 2009.[9] The most recent decline is the basis for the government's argument that deforestation is under control and will tend to zero as its command-and-control policies are maintained, fundamental to its original position on reduced emissions from deforestation in the UNFCCC.

Approximately 15% (0.75 million km^2) of the total area of Brazil's Legal Amazon has already been transformed for agricultural and ranching activities. The predominant land use within deforested areas is cattle pasture, reaching an

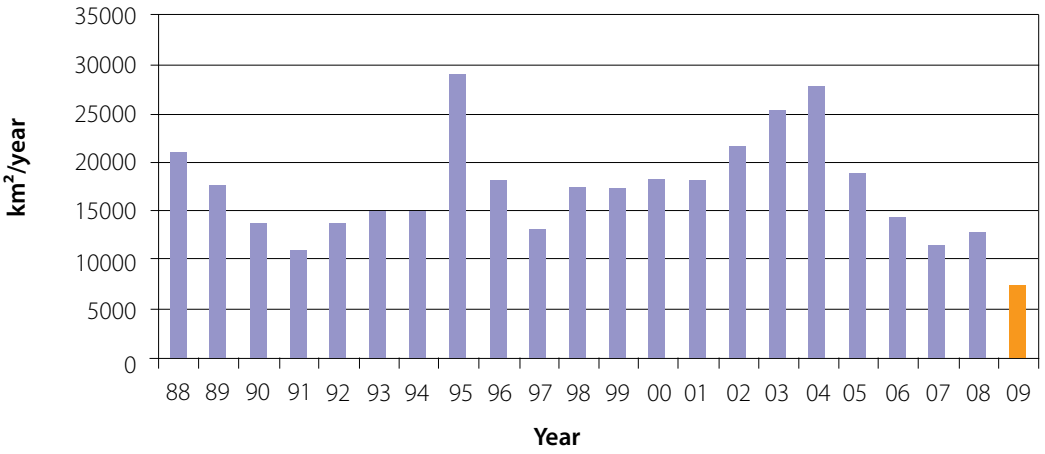

Figure 1.5. Annual deforestation rates in the Legal Amazon of Brazil (1988—2009)

Source: PRODES/INPE[10]

estimated 82.3% (0.62 million km^2) by 2007. The remaining cleared areas are devoted to annual crops (mostly rice, bean, maize, soybeans and cotton) and perennials (such as coffee, cacao and black pepper). In contrast to recent trends at the national level, the area devoted to artificial cattle pastures in the Legal Amazon has expanded rapidly in recent years, demonstrating a 44.2% increase between 1985 and 2006 (Smeraldi and May 2009).[11] The cattle herd in the states of the Legal Amazon reached an estimated 70 million head in 2007 (IBGE/PPM 2007). According to researchers at the Brazilian Corporation for Agricultural and Livestock Research (EMBRAPA) (Dias Filho and de Andrade 2006), approximately 61.5% of pastures in the western Amazon are characterised by some degree of degradation, as measured by the incidence of weed growth (secondary forest regeneration). Most cattle are managed on extensive range, with little use of fertiliser, sanitary measures, pasture legumes or forages. However, significant advances have been made in recent years in pasture management techniques, including rehabilitation of degraded lands, although such improvements remain restricted as a proportion of total pasture land. Around half of all Brazilian CO_2 emissions arise from cattle ranching, predominantly due to deforestation and burning (Bustamante *et al.* 2010, Imazon cited in Valor Econômico[12]).

In addition to deforested areas, a much larger area of the Brazilian Amazon has been subjected to different forms of human intervention. A recent study by the Instituto do Homem e Meio Ambiente da Amazônia (Barreto *et al.* 2005) estimates that by 2002, 47% of the Brazilian Amazon was under some type of human pressure, including forest clearing, selective logging, fire and mining activities. Although the total area of selectively logged forests in the Brazilian Amazon is unknown, estimates indicate that this activity may affect 10 000—20 000 km^2 of forest per year. Between 2007 and 2008, for example, the area of degraded forest detected by satellite imagery nearly doubled (INPE 2009). Some of these forests are subsequently converted to agricultural and pasture lands following timber extraction, while others remain as logged forest (Imazon 2006).[13]

1.2. Review of the main drivers of forest cover change

1.2.1. Historical background

From the colonial period through to the 1950s, the economy of the Brazilian Amazon was characterised by intermittent exploratory activities and the boom and bust cycles of extractive commodities. Although the dominant

economic activities did not lead to widespread deforestation or depletion of timber resources, they were often marked by unsustainable uses of natural resources, the concentration of wealth, exploitative labour conditions and devastating impacts on indigenous populations (Oliveira 1983, Weinstein 1983). Nevertheless, this period saw the occupation of many areas of forest at low density by forest extractivists from other regions of Brazil, particularly the dry northeast, chiefly drawn to the rubber trade as so-called *soldados da borracha* ('rubber soldiers'), who were promised (but never received) compensation for their contributions to the war effort. The great northeast drought of 1942 was said to have pushed nearly 50 000 northeasterners to the Amazon to extract rubber (Dean 1987).

During the 1950s, initial steps were taken by the Brazilian government to promote the 'integration' of the Amazon region into the national economy and society, including creation of a regional development plan (PVEA) and a special federal agency for its implementation (SPVEA), along with construction of the Belém—Brasília (BR-153) highway. In the early 1960s, the BR-364 (Cuiabá—Porto Velho) was also opened as a penetration highway, linking the centre-south region to the western Amazon (Figure 6). During this period, the opening of federal highways in the Amazon was viewed as a means to decentralise population and economic development towards the country's interior, facilitate access to raw materials and expand markets for consumer goods industries based in the centre-south.

Following the military coup of 1964, Brazil's ruling junta dramatically increased the level of state intervention in the Amazon, as exemplified by the creation in 1966 of a new regional development agency, SUDAM. Planning doctrines were increasingly influenced by geopolitical concerns

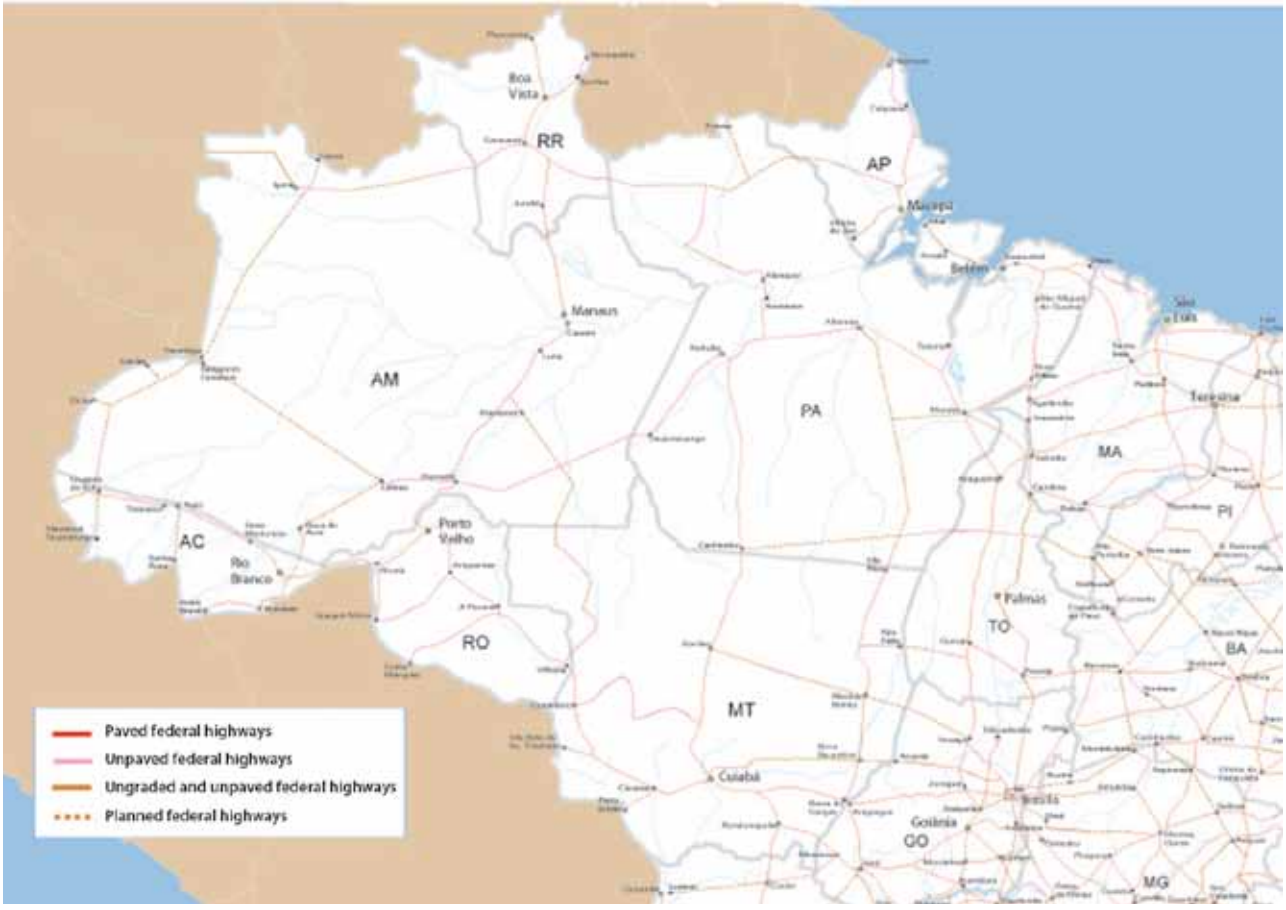

Figure 1.6. Federal highways in the Brazilian Amazon

Source: DNIT/MT

for 'national integration' and 'national security' in the Amazon (following the slogan 'integrate it to avoid losing it' (*integrar para não entregar*); Becker 1990). The region was characterised as a demographic void, where urgent measures should be taken to allocate 'lands without men to men without lands' (*terra sem homens para homens sem terra)*. This view ignored the presence of pre-existing populations, such as indigenous peoples, extractivists and river-dwellers (Hall 1997). During the early 1970s, government policies prioritised the construction of the east—west Transamazon highway (BR-230), along which an ambitious small-farmer colonisation scheme, under the responsibility of a new federal land agency (INCRA), would purportedly settle 100 000 migrant families—three-quarters of them impoverished northeasterners—in so-called *agrovilas* (Moran 1981, Bunker 1985).

By the mid 1970s, the federal government had essentially abandoned its ambitious plans for small-farmer colonisation along the Transamazon highway, leaving migrant families to their fate. Although purportedly due to technical difficulties and the alleged shortcomings of migrant farmers, this change of course was traceable to pressure exerted by powerful lobbies, based largely in the centre-south region, which were interested in new economic opportunities (especially large-scale cattle ranching) associated with the opening of roads and other infrastructure in the Amazon (Schmink and Wood 1979, Hecht 1985). From the mid 1970s, development paradigms were increasingly centred on promotion of private enterprises through generous credit and fiscal incentives, with particular attention to the ranching, timber and mining sectors (Gasques and Yokomizo 1985). However, impoverished migrant settlers continued to be attracted to the region, especially along the BR-364 highway in Rondônia and the BR-163 (Cuiabá—Santarém) highway in western Pará.

Processes of occupation of public lands in the Brazilian Amazon have been historically induced by incentives to clear forests as proof of 'productive' activity for purposes of concession of private title and access to public credit programmes. Within this context, social conflicts over access rights to land and other natural resources, involving a variety of newcomers (ranchers, speculators, migrant farmers) and existing populations, intensified during the 1970s and 1980s (Branford and Glock 1985, Hecht and Cockburn 1989, Millikan 1992).

During the 1980s, conventional models of Amazonian 'development' were increasingly challenged by social movements, human rights advocates, environmentalists, academics and other concerned citizens. By the late 1980s, the rubber-tapper (*seringueiro*) and indigenous peoples' movements, in conjunction with environmentalists, were successful not only in raising public awareness of the negative social and environmental impacts of mainstream development schemes (such as the World Bank-funded POLONOROESTE programme) but also in their positive contributions towards the conservation of forests (Schwartzman and Allegretti 1987, Hall 1997). Following the brutal murder of rubber-tapper leader Chico Mendes in December 1988, some positive steps were taken in the Amazon, such as the creation in March 1990 of the first 4 extractive reserves (RESEX), conceived by the rubber-tapper movement as a means to combine community-based development with forest conservation (Allegretti 1990). This period also witnessed creation of the national environmental agency IBAMA, whose primary roles have included licensing of economic activities with significant environment impacts (e.g. deforestation, infrastructure projects), creation and management of protected areas and promotion of forest management. Regular annual measurement by INPE of deforestation in the Amazon forest biome also began in 1988 (see Section 1.2.3)

Throughout the late 1980s and 1990s, however, conventional development paradigms predominated in the region, as exemplified by the creation of a series of export-oriented multimodal transportation corridors within the *Brasil em Ação* (Brazil in Action) and *Avança Brasil* (Advance Brazil) infrastructure investment programmes of the Cardoso administration (1994—2002). As described in the following section, corridor-based development policies were largely maintained by the Lula administration (2003—2010), especially

within the context of its Accelerated Growth Program (PAC).

1.2.2. Recent trends and drivers of deforestation and degradation

In recent decades, deforestation in the Brazilian Amazon has been spatially concentrated along an 'Arc of Deforestation' comprising the eastern and southern flanks of forests from southeast Maranhão across the states of Tocantins, Pará, Mato Grosso and Rondônia, extending to southeast Acre (Figure 1.8). Along this arc, the vast majority of clearing has occurred along the axes of major roads, such as the Cuiabá—Porto Velho highway (BR-364) in Mato Grosso and Rondônia states, the Transamazon highway (BR-230) in the state of Pará, the north—south Belém—Brasília highway (BR-153) and BR-163 near Santarém (Pará).

These corridors established new forms of access to land and other natural resources, powerfully influencing the structuring of new patterns of human occupation in the region. Clearly, the construction and paving of highways constitute major direct drivers of deforestation in the Amazon. As previously observed, highway corridors have been a primary focus of land titling and small-farmer settlements, recognisable in remote sensing images for their 'herringbone' configuration of feeder roads and gradual expansion of forest clearing, typically associated with the expansion of cattle pasture as a predominant land use and means to create tenure concentration (Figures 1.7 and 1.8; Millikan 1992).

In recent years, forest clearing has often expanded to new frontiers that extend beyond the traditional 'Arc of Deforestation', such as southern Amazonas state and the axis of the BR-163 highway in southwestern Pará. The latter has occurred following plans to pave BR-163 to create a new corridor from Cuiabá in southern Mato Grosso to the main shipping channel of the Amazon in Santarém, where a new soybean crushing hub has developed. In areas of recent frontier expansion, deforestation is often practised within the context of land grabbing (*grilagem*), whereby access rights to land are based on fraudulent land titles and, typically, the use of violence against landless farmers and traditional populations who hesitate to abandon their properties. In such areas, deforestation patterns also correlate with the opening of clandestine roads by illegal loggers, particularly in areas that are yet to be designated public lands or protected areas (including indigenous lands). Illegal logging often plays a key role in the initial stages of occupation of public lands, facilitating subsequent access by squatters and other actors. Frequently, ranchers and speculators use proceeds from illegal high-grading of forests to finance subsequent clearcutting for other land uses.

Figure 1.7. Aerial photo of settlement project along the axis of the BR-364 highway in Rondônia state (2006)

Source: Brent Millikan

Figure 1.8. Remote sensing image of forest clearing in central Rondônia (July 2003)

Source: Google Earth

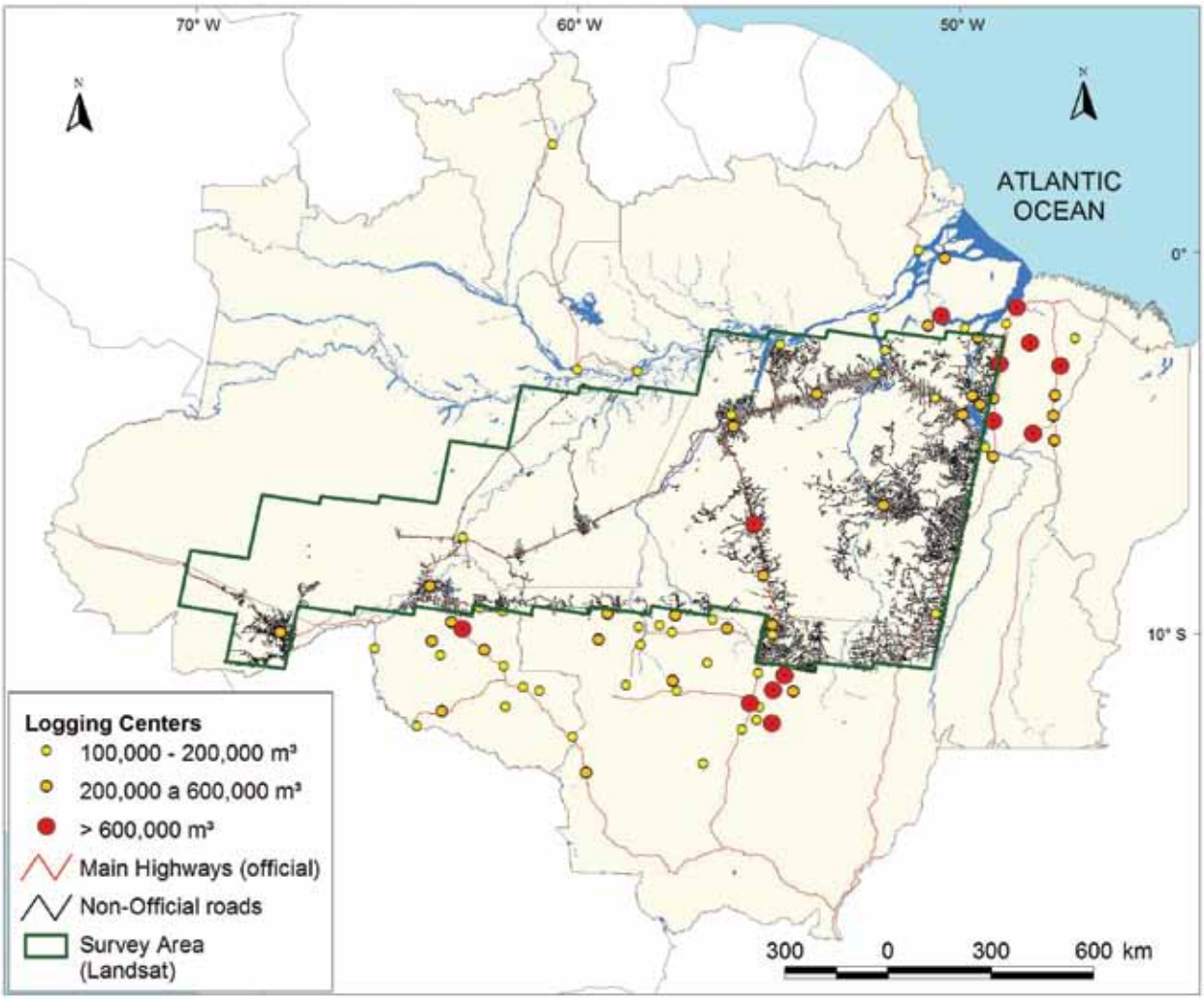

Figure 1.9. Map of clandestine roads in the Brazilian Amazon

Source: Imazon (2005)

One of the salient characteristics of logging in the Amazon has been its spatial mobility. As more valuable timber species have been depleted, frequently accompanied by the advance of deforestation, logging activities have migrated to new frontiers. For example, between 1998 and 2004, timber production migrated from eastern to western Pará and from north-central to northwest Mato Grosso (Lentini *et al.* 2005). However, most logging in the region has been characterised by unsustainable practices, associated with boom and bust tendencies and consequent spatial mobility (Rodrigues *et al.* 2009). Clandestine roads opened by illegal loggers typically facilitate occupation by land grabbers, ranchers and squatters, and may eventually lead to clearcutting once these spontaneous transport corridors permit market access (Figure 1.10).

Much of the total volume of roundwood extracted annually in the Brazilian Amazon originates from illegal sources, including protected areas and indigenous lands (Lawson and MacFaul 2010). However, much of the 'legal' timber is derived from deforestation of smallholder properties (permitted up to 3 ha/year) and government-authorised clearing for agribusiness development (a process which requires environmental licensing).

It is now possible to detect conversion of sites degraded by logging to clearcut areas (see Section 1.2.3). For example, of formerly degraded sites in 2007, nearly 2000 km^2 had been converted to clearcut areas by 2008, while another 3600 km^2 remained as degraded stock from the previous period. However,

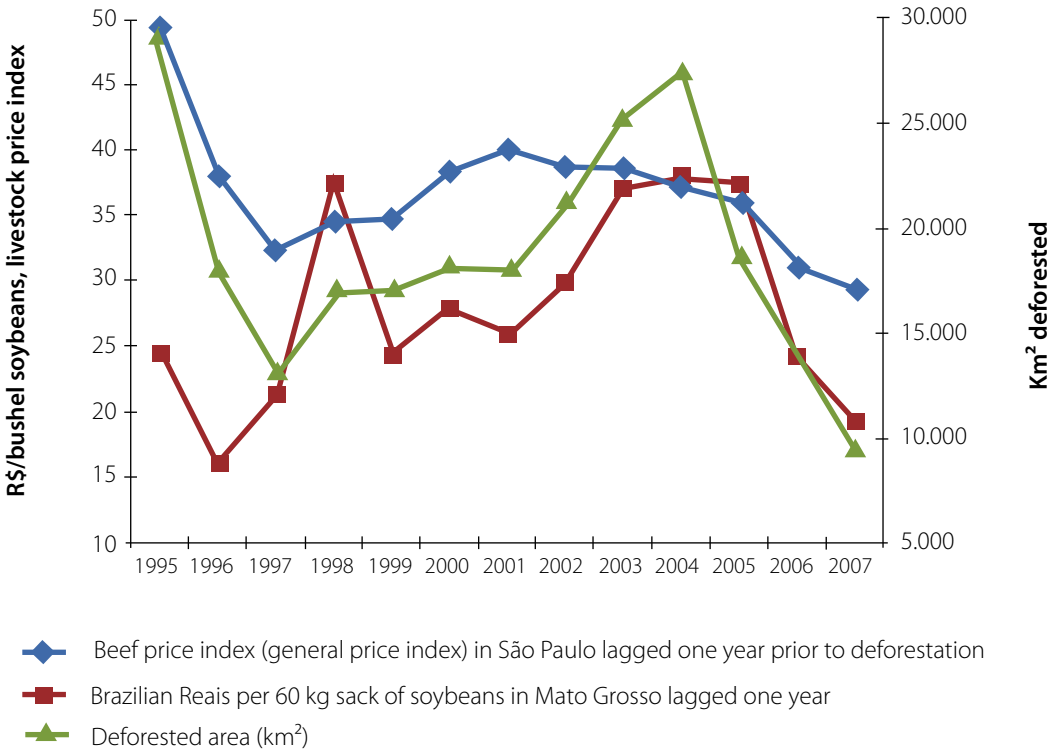

Figure 1.10. Variations in prices of beef and soybeans between 1994 and 2006, and rates of deforestation in subsequent years (1995—2007)

Source: Barreto *et al.* (2009)

the total stock of degraded forests increased from 15 000 km² to 28 000 km², indicating opening of new timber extraction areas on a significant scale, in a year when deforestation was declining (INPE 2008).

Increasingly, deforestation trends in the Brazilian Amazon have been linked to globalised markets for beef, hides,[14] timber, soybeans, biofuels and other commodities. Clearly, recent movements in deforestation rates are linked to fluctuations in commodity markets, especially for beef and soybeans (see Figure 1.10) as well as climatic factors. However, it may be argued that efforts undertaken by the Brazilian government, especially related to the creation of protected areas in regions such as along the BR-163 corridor and improved enforcement activities, have, at least temporarily, yielded positive results (Barreto *et al.* 2009).

The predominance of cattle pasture in the Brazilian Amazon reflects a series of contributing factors, including: (1) the use of pasture as a means to establish and maintain land claims, both legitimate and fraudulent; (2) the profitability of extensive ranching, especially when linked to subsidised access to public land, timber resources and cheap labour; (3) the importance of cattle, especially for dairy farming, among family-based producers as a guarantee against financial duress, and a source of household nutrition; (4) the ease of transport and sale of cattle for which markets and infrastructure are well developed even in very remote forest areas and (5) tendencies towards land concentration, including within rural settlement projects characterised by high rates of attrition (Millikan 1992, Arima *et al.* 2005, Barreto *et al.* 2008, Smeraldi and May 2008, 2009).

Root causes and agents of deforestation with regard to soy are related to a recent shift of soy supply from

the north to the southern hemisphere, which has significantly increased the pressure in the Amazon. Between 1980 and 2007, while the soy plantations in the United States remained constant at around 0.26—0.27 million km^2 , the area of plantations in Brazil increased from under 0.1 million km^2 to just over 0.36 million km^2. Such trends reflect, to a significant extent, the fact that Brazil has more land available for the expansion of agricultural land use. Perverse national incentives through tax credits and land ownership recognition have actually encouraged expansion of soybean cultivation in previously forested areas. Meanwhile, in the United States, federal subsidies for biofuel production made corn (maize) a more attractive commercial proposition than planting soy. As a result, major soy traders sought out new high-volume sources and accelerated the expansion of the industry in Latin America. Although soy production is not currently as technically viable in most parts of the Amazon basin as in the drier *cerrado*, its expansion—along with that of sugarcane in response to greater demand for ethanol—has had the indirect effect of pushing pastures further into the forest frontier (Searchinger *et al.* 2008). Moreover, BSE outbreaks in Europe in the mid 1990s discouraged animal-sourced protein in livestock feed, leading to a switch in demand across the region for soy protein sources. Furthermore, in 2007, demand from several developing nations led to growth rates in the high teens. China, for example, now accounts for 45% of all soybean imports from Brazil (Campbell *et al.* 2010).

Despite progress in policies related to forest conservation in the Amazon (Section 1.3), recent government initiatives often emit contradictory signals, which clearly affect the drivers of deforestation, with important implications for the potential and limitations of REDD+. Particularly relevant examples include the following.

Persistence of rural credit programmes that stimulate deforestation, especially for cattle ranching. Between 1989 and 2007, a single credit programme (Fundo Constitucional do Norte; FNO) invested US $3.5 billion in cattle ranching in the Brazilian Amazon. The Brazilian National Bank for Economic and Social Development (BNDES) has recently been strongly criticised for its major role as a source of capital for expansion of huge beef-processing facilities in the Amazon, without installing due safeguards to avoid the purchase of cattle from areas of deforestation (including indigenous lands) (Smeraldi and May 2009, Greenpeace 2009). Rural credit programmes have tended to prioritise herd augmentation, with little priority given to improving productivity and management of pastures on already-cleared lands. Technology for such improvement has existed for some time, using techniques developed by EMBRAPA and other research institutes, but several barriers to the uptake of such technologies have limited their adoption. Although Resolution 3545 of the National Monetary Council established requirements for proof of legitimacy of land claims and compliance with environmental legislation as a prerequisite for access to rural credit for agricultural and ranching activities in the Amazon biome, its effectiveness has suffered from a lack of effective monitoring.[15]

Large-scale infrastructure projects. The Programa de Aceleração do Crescimento (PAC; Accelerated Growth Program), launched in February 2007, involves an ambitious portfolio of large-scale infrastructure projects, such as large hydroelectric dams on the Madeira, Xingu and Tapajós Rivers, and the paving of the BR-319 highway (Manaus—Porto Velho). The PAC has been marked by a reversion to conventional paradigms of economic growth, lobbying interests of powerful economic groups (such as construction conglomerates), patronage relations with regional political elites and the 'politicisation' of environmental licensing procedures. As a result, planning processes involving strategic analyses of socio-environmental impacts, economic efficiency and alternatives, involving multi-stakeholder dialogue and conflict resolution, have been progressively marginalised (AdT 2007, INESC 2007, International Rivers 2008).

Attempts to undermine the Brazilian Forest code and other environmental legislation. Conservative politicians in the Brazilian Congress have recently undertaken a major offensive to weaken the Brazilian Forest code and related environmental legislation, particularly with regard to forest conservation on private landholdings (see for example Proposed Laws PL 5020/2009 and PL 1207/2007). The Lula government failed to adopt a clear position on this issue, which has pitted the Ministry of Environment against the influential Ministry of Agriculture and agribusiness lobby.

Another highly controversial initiative involved signing into law an initiative (*Medida Provisória* (Provisional Executive Order) 458/2009) by President Lula in February 2009 (subsequently converted into federal law, Law 11 952/2009, in June the same year). This law has the stated objective of regularising the land claims of small to medium squatters who occupied public lands in the Amazon region in 'good faith', with benefits that would ostensibly include improved compliance with forest and environmental legislation.[16] However, critics have argued that loopholes in the legislation have favoured land speculators, contributing to increased deforestation, social conflicts and land concentration (Imazon 2010).[17]

Processes of land occupation and natural resource use in frontier areas of the Brazilian Amazon have been typically characterised by boom and bust patterns. In the short term, rapid growth in both income and employment has occurred, fuelled by the decimation of natural capital embodied in high-grade timbers, whose often illegal sale helps to kick-start the process. However, social and environmental costs are typically high, as evidenced by high levels of violence, impoverishment (the Amazon remains the region of Brazil with lowest per capita income), degradation of forest resources and deforestation. In the long term, a pronounced reduction and even collapse of economic and social indicators has occurred in some areas, associated with exhaustion of forests and other natural resources, land concentration and extensive patterns of land use, particularly cattle pasture (Celentano and Verissimo 2007). While there has been some wealth accumulation arising from conversion of natural to material capital, to the extent that such capital remains in the Amazon, it has typically not been ploughed back into sustainable resource-based production, but rather into real estate and *maquiladora*-type electronics industries such as are prominent in the Manaus free trade zone.[18]

Urbanisation patterns in the Amazon represent another aspect associated with land use change. While Manaus and Belém continue to attract substantial rural—urban flows, the overall exodus of rural dwellers from failed settlements has tended to swell the urban ranks of small and medium-sized cities as well. The 2000 census registered a 70% rate of urbanisation in the Legal Amazon (compared with 85% in Brazil as a whole). Many former rural inhabitants maintain market and social ties to their rural roots. Debate continues as to whether such dynamics represent a release from pressure on forest resources, or whether the cash influx from urban employment and growth in markets for forest products may represent an added source of resource pressure (Padoch *et al.* 2008).

Variations in the spatial dynamics of deforestation in the Brazilian Amazon have generally reflected significant differences between influencing factors, such as land tenure policies, economic incentives, infrastructure, access to markets and migration from other regions of Brazil, as well as environmental characteristics (soils, topography, timber and mining resources, climate).

In summary, despite significant progress in some areas (see Section 1.3), mainstream development policies for the Brazilian Amazon still tend to be characterised by top-down decision-making, institutional fragmentation and dichotomies of 'development vs. environment', particularly in the electrical energy, transportation and agribusiness sectors. To a large extent, the view of the Amazon as an endless source of open access resources persists as a dominant paradigm among decision-makers (Hall 2008).[19]

Table 1. Institutions with capacity to monitor forest cover change in Brazil

Institution	Programme/System	Method	Coverage areas
INPE	PRODES (Program for Calculation of Deforestation in the Amazon), created in the late 1980s	Annual interpretation of Landsat images and geoprocessing techniques to measure 'gross deforestation'.[a]	Legal Amazon
	DETER (System for Detection of Deforested Areas in Real Time),[b] created in 2004	Every 15 days, georeferenced information is generated on alterations in the region's forest cover, allowing for timely implementation of enforcement activities related to illegal deforestation.	Legal Amazon
	DEGRAD, created in 2009	Monitoring processes of forest degradation and implementation of management schemes in forest concessions administered by the Brazilian Forest Service (SFB).[c] The DEGRAD system enables monitoring of roads, deposits for stockpiling logs and the removal of trees through 'selective cutting'.	Any forest disturbance in the Amazon (Figures 1.11 and 1.12)
IBAMA	CEMAM (Center for Environmental Monitoring), created in 2004.	Upon receipt of remote sensing imagery from DETER/ INPE, the centre prepares and distributes georeferenced digital maps on critical areas for on-the-ground enforcement activities in the Amazon.	All Brazilian biomes

a The term 'gross deforestation' indicates that previously cleared areas in processes of secondary succession or forest regeneration were not included in calculations of the extent and rate of annual forest clearing.
b Unrestricted access to and downloads of DETER images are available online from INPE (www.obt.inpe.br/deter).
c For further discussion of forest concessions, see Section 2.

1.2.3. Capacity for monitoring deforestation and degradation

Brazil is one of the most advanced countries in the world in terms of capacity to monitor its forest resources using remote sensing and GIS technologies. Since the creation of the National Institute for Space Research (INPE) in the mid 1970s, the federal government has invested in developing institutional capacity to monitor forests, especially in the Amazon region, based on remote sensing. The main institutions and their respective activities in monitoring forest cover change at the national and subnational levels in Brazil are set out in Table 1.

At the government level, recent developments in forest monitoring in the Brazilian Amazon also include: (1) structuring of the sophisticated radar-based System for Protection of the Amazon (Sistema de Proteção da Amazônia; SIPAM) and (2) partnerships between the Ministry of Environment

and state governments in decentralising capacities for remote sensing and GIS-based monitoring of forest cover at the state level in the Amazon region.

In the past few years, the time required for annual data analysis of deforestation has been reduced from 8 months to approximately 5 months, allowing for data (both in aggregate form and at state and municipal levels) to be distributed throughout the country with greater ease. Moreover, significant progress has been made in terms of:

- dissemination of images, including interpretations and analyses of data on the Internet, allowing for transparency in estimates of annual rates for gross deforestation in the Brazilian Amazon;
- improved cartographic quality of analyses; and
- diversification in remote sensors used to generate estimates of annual rates of gross deforestation, minimising the total area of forests affected by cloud cover, thus improving accuracy and coverage.

Significant contributions to remote sensing techniques for monitoring forests in the Brazilian Amazon have been made by specialised NGOs such as Imazon and scientists such as Britaldo Soares at the Federal University of Minas Gerais. Figure 1.13 provides an example of how researchers at Imazon have employed high-resolution Iconos satellite imagery to monitor forest degradation in Paragominas, Pará.

As described in Section 2, the most important challenges for forest monitoring in the Brazilian Amazon are related to the effective use of remote sensing and geoprocessing data in licensing and enforcement activities, addressing such critical issues as opening of penetration roads by illegal loggers and forest clearing on public lands as practised by *grileiros*.

1.3. Mitigation potential

In recent years, important progress has been made in Brazil regarding promotion of forest conservation and addressing the drivers of deforestation and degradation in the Amazon region, including the following.

a. Remote-sensing-based monitoring of deforestation in the Amazon is underway under the leadership of the INPE and its application in forest law enforcement and other policies.
b. Action Plan for the Prevention and Control of Deforestation in the Amazon Region (PPCDAM), prepared by an interministerial working group in consultation with civil society organisations in 2004 (Alencar *et al*. 2004), recently renewed for 3 years. As part of the PPCDAM, strategic lines of action were defined to address land tenure problems and territorial planning; monitoring, licensing and enforcement; sustainable management of forests and improved use of already-cleared lands; and sustainable infrastructure in the transportation and energy sectors.
c. During 2003—2008, the creation of new federal protected areas across more than 19 million ha in the Brazilian Amazon, frequently in areas under intense pressure from illegal deforestation and predatory logging, such as along the Cuiabá—Santarém highway (BR-163) in Pará state. Moreover, significant advances were made in the official recognition of indigenous lands, including the 17 000 km^2 Raposa Serra do Sol reserve in the state of Roraima.
d. In 2005, approval of an amendment (Law 11 132) to a federal law regarding the national system of protected areas (SNUC; Law 9.985/2000). This amendment allowed the federal government to establish special 'areas of provisional administrative limitations (ALAP)' as a means to restrict activities that may pose severe environmental risks in locales where studies are being conducted for the creation of new protected areas.
e. In March 2006, approval of the Public Forest Management Law (Law 11 284/2006). This law provides for long-term competitive concession of public forestlands predominantly destined for commercial timber extraction, as well as community-managed forests and creation of the Brazilian Forest Service (SFB). The law also provides for independent certification of management, in recognition of the advances in forest area certified in the Amazon.

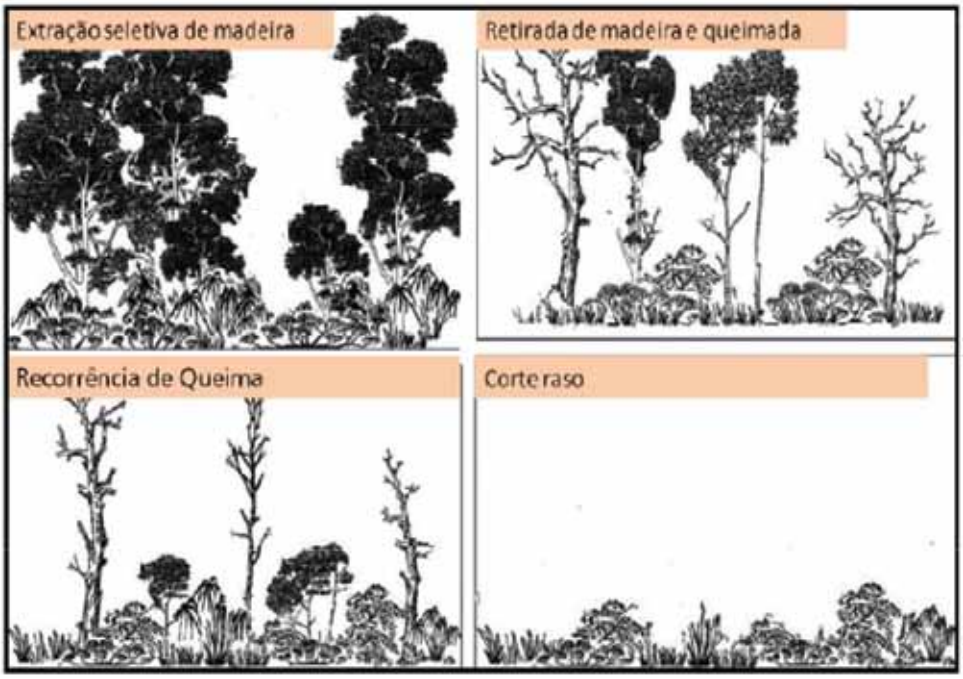

Figure 1.11. Progressive degradation of forests

From left to right: selective timber extraction; timber removal and burning; recurrent burning; clearcutting.

Source: INPE (2008:13), based on Barlow and Peres (2008)

f. In June 2006, launch of a pioneer initiative to integrate a highway infrastructure project into a comprehensive sustainable regional development strategy (Plano BR-163 Sustentável), based on active participation of NGOs and social movements in the region.
g. In July 2006, after Greenpeace (2006) published the report 'Eating up the Amazon', the Soy Working Group announced a 2-year moratorium on the purchase of soybeans grown on newly deforested land in Brazil. The moratorium was later extended beyond July 2010 and is holding up well, despite pressures from rising soy prices and from producers pushing for new soy plantations.
h. In October 2009, Environment Minister Carlos Minc presented the National Pact to Value the Standing Forest and Reduce Deforestation, proposed by 9 NGOs to reduce net deforestation to zero, to Congress. The pact was expected to be approved by the president by the end of 2009. Although it has not been approved, the adoption of a quantitative target for deforestation-related emissions reductions of 80% by 2020 may be construed as de facto approval.
i. In December 2007, signing of Presidential Decree 6321/2007. This decree established specific procedures to intensify efforts in combating deforestation in municipalities identified as 'hotspots' of forest clearing, including a revision of private land titles (to identify fraudulent documents and illegal occupations) and restrictions on access to credit among rural properties lacking minimal proof of legitimate claims.
j. State of Amazonas Climate Change Law (3135/2007) authorising REDD projects, creating more than 30 protected areas and establishing mechanisms for payment for environmental services (PES) in the state.
k. In February 2008, approval of Resolution 3545 of the National Monetary Council, linked to the Central Bank of Brazil. This established requirements for proof of legitimacy of land claims and compliance with environmental legislation as a prerequisite for access to rural credit for

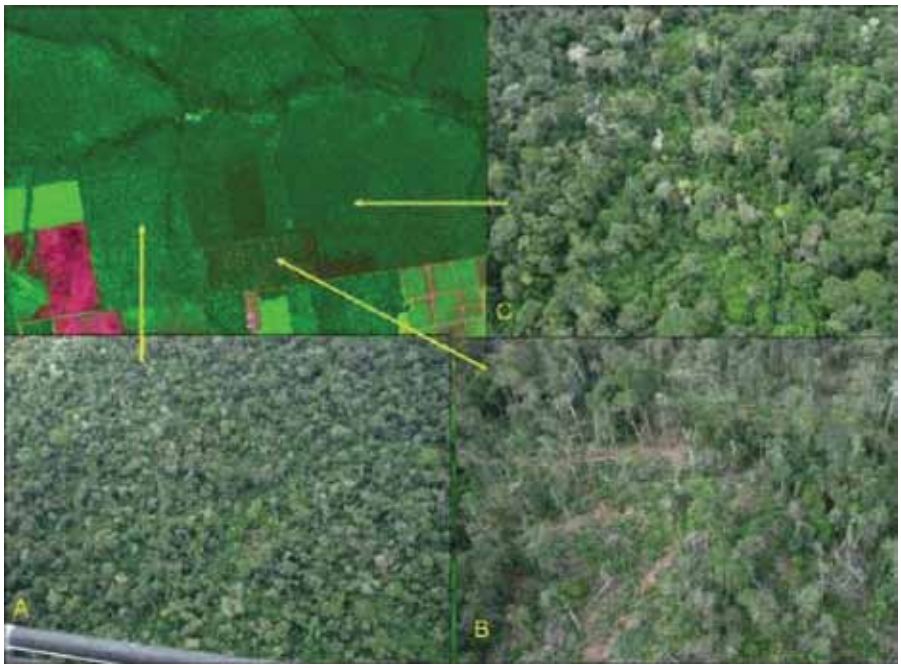

Figure 1.12. Stages of forest degradation linked to timber extraction in enhanced satellite imagery

(A) Degradation of moderate intensity, in an area undergoing regeneration after timber extraction, patios still in evidence. (B) High-intensity degradation, active timber extraction in progress, with a large portion of the soil exposed. (C) Low-intensity degradation, with evidence of access roads having been opened up.

Source: INPE (2008: 37)

agricultural and ranching activities in the Amazon biome. This was followed by creation of an industry Working Group on Sustainable Ranching in June 2009, in response to publication by Greenpeace (2009) of studies showing the origin of beef from illegal land uses, followed by commitments from beef packers to purchase only sustainably sourced cattle.

l. In May 2008, preparations for state action plans for prevention of deforestation under the aegis of the PPCDAM began in the states of Acre, Mato Grosso, Tocantins and Pará. As of mid 2010, 7 states in the Amazon had concluded their PPCDAM plans; Maranhão and Roraima were still in the process of developing their plans.[20]
m. The National Climate Change Plan approved in October 2008. The plan provides for reduction in deforestation-related emissions as well as measures to improve forest management and curb pasture expansion. Congress subsequently passed a National Climate Change Law (Law 12 187/2009), signed by the president on 29 December 2009, establishing a national climate change policy, adopting the reduction in greenhouse gas (GHG) emissions by up to 38.9% by 2020 (including through reduced deforestation) and creating a national council on climate change and a climate change fund.[21]
n. At COP 15 in Copenhagen (December 2009), Brazil committed to the achievement of nationally appropriate mitigation actions (NAMAs), registering activities related to the plan in the international registry for NAMAs.

This conjunction of public policy actions and civil society engagement suggests the existence of a substantial foundation for achieving the proposed emissions reductions. However, progress continues to be undermined by contradictory policies,

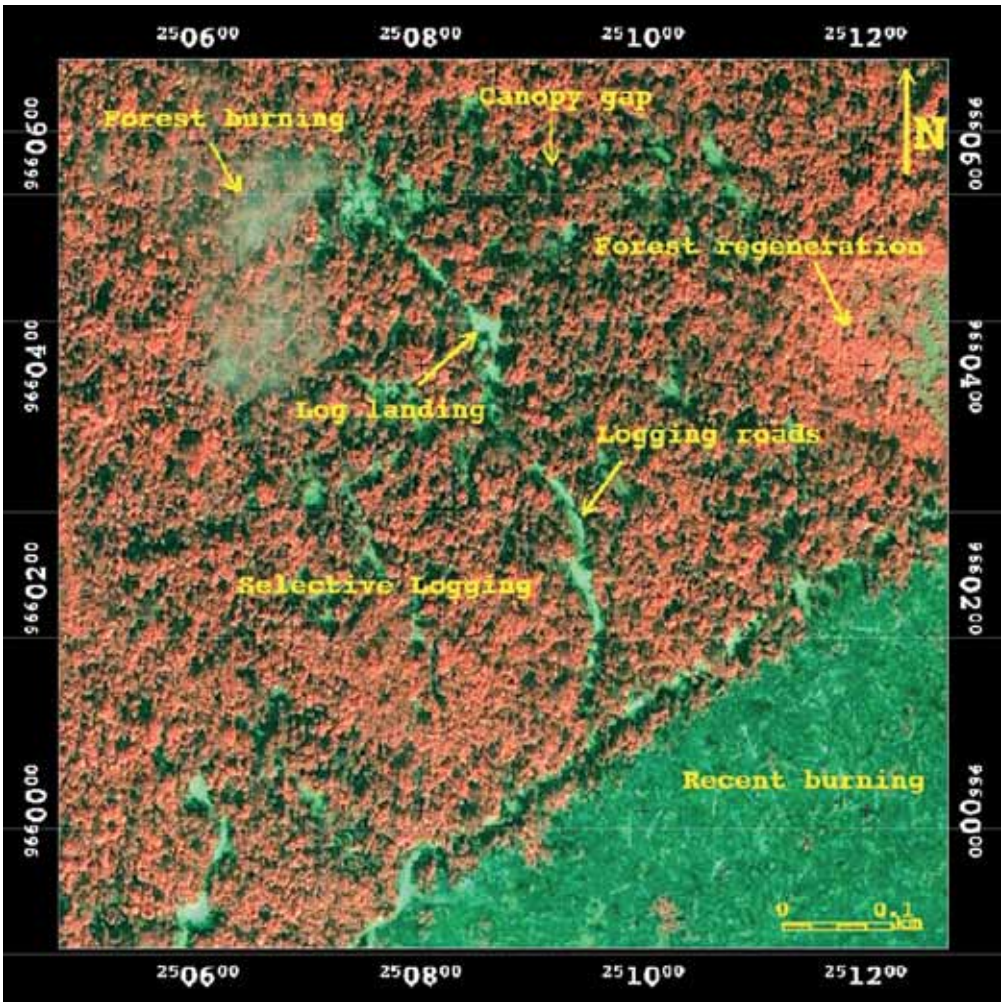

Figure 1.13. Monitoring of forest degradation in Paragominas, Pará in 1999

Source: Souza and Barreto (2000)

particularly within the infrastructure, agribusiness and mining sectors, that constrain achievement of deforestation reduction targets. Furthermore, constraints associated with the effectiveness of enforcement capacity to address illegal deforestation and political will to address land conflict in areas of high tenure insecurity, as well as continued corruption in the timber industry and its regulatory apparatus, combine to seriously undermine REDD+ prospects in the Brazilian Amazon.

2 Institutional environment and distributional aspects

2.1. Governance in the forest margins

2.1.1. Global governance and international agreements

The Brazilian government has adopted the following positions with regard to international agreements related to the forestry sector:

- UN Convention on Biological Diversity (CBD): ratified in 1994
- UN Framework Convention on Climate Change (UNFCCC): signed in 1992
- International Timber Trade Organization (ITTO) (1994 agreement): ratified in 1997
- Convention on International Trade in Endangered Species (CITES): ratified in 1975
- RAMSAR Agreement on Wetlands: ratified in 1992
- Forest Law Enforcement Governance and Trade (FLEGT): not signed
- UN Forum on Forests: member state
- UN Declaration on the Rights of Indigenous People (UNDRIP): ratified in 2008

To date, the Brazilian government has been resistant to adhering to FLEGT, apparently due to concerns over 'non-tariff trade barriers' on its growing timber exports, mainly from the Amazon region. The government has favoured voluntary regional agreements, such as Iniciativa de Aplicación de la Legislación Florestal en la Amazonia (ALFA), initiated in 2006 by the country members of the Amazon Cooperation Treaty Organization (OTCA) with the objective of constructing and implementing a regional agenda that aims to increase sustainable development and enforcement of federal legislation in the Amazon Region.

In addition, Brazil signed an agreement on deforestation with the United States in March 2010. Under the Memorandum of Understanding (MoU), the governments of Brazil and the USA will establish a Climate Change Policy Dialogue[22] that will meet at least once a year to work towards developing and implementing pragmatic solutions and policies for reducing emissions, including carbon markets, research initiatives and technology transfer. This may mark a breakthrough on Brazil's previous refusal to engage in offset markets with the United States and other major emitting nations.

Brazil has also been actively participating in the Governors' Climate and Forests Task Force (GCF), initiated by California Governor Arnold Schwarzenegger.[23]

Finally, Brazil has been a key actor in the Interim REDD+ Partnership, created in March 2010 and formalised in Oslo 2 months later.[24] At one of the most recent meeting of the partnership, held in Brasília, Brazilian representatives played a key role in establishing the next steps for reaching these objectives.[25]

2.1.2. Governance conditions in areas under high threat of deforestation and degradation

The illegal extraction of timber on public lands in the Amazon, including in protected areas and indigenous lands, typically involves the opening of clandestine access roads that facilitate occupation by land grabbers (*grileiros*), ranchers and squatters. In many cases, illegal timber extraction is used as a source of capital for subsequent clearcutting of forests (GTA 2008, Barreto *et al.* 2009).

The lack of coherent policies and institutional presence with regard to enforcement of environmental and forest legislation has contributed considerably to illegal deforestation and logging in the Brazilian Amazon. Over the years, the vast majority of fines for illegal deforestation, when issued (especially when these involve powerful economic agents), have simply not been paid, due to legal loopholes or to court overload and complex review processes.[26] Similar loopholes have restricted the confiscation of some equipment used in illegal logging operations. Chronic problems of understaffing, lack of sustained funding and corruption within federal and state agencies have been major contributors to the persistence of illegal deforestation and logging in the region. In many cases, enforcement problems are compounded by the fact that political patronage groups with close ties to the timber industry are responsible for nominating local officials within federal and state environmental agencies, seriously compromising their level of autonomy. A very small proportion of environmental fines are actually collected.

Despite the enormity of these problems, the following points illustrate recent progress in enforcement instruments related to illegal deforestation and logging in the Brazilian Amazon.

- IBAMA and state environmental agencies have increasingly employed remote-sensing-based monitoring to support planning of enforcement and control operations with positive results. In addition, these agencies have developed new and much more effective strategies for enforcement operations, by concentrating on the more substantial deforestation sites, focusing on the more significant drivers of deforestation (such as 'pirate' cattle operations in protected areas), strengthening media coverage and conducting crackdown operations to repress illegal activity in the Arc of Deforestation.
- Significant advances have been made in strengthening IBAMA's institutional presence in the Amazon, including decentralised databases and increased staffing, together with efforts to increase transparency and stem corruption.
- Institutional partnerships for enforcement operations have been strengthened as part of a series of measures announced by the Environment Minister in 2008 to reduce illegal deforestation, involving IBAMA, federal and state police, state environmental agencies and, in more complex operations, the Brazilian Army.
- IBAMA has increasingly operated in conjunction with other government agencies responsible for repression of related criminal acts of land grabbing (*grilagem*), invasions of indigenous lands, drug trafficking and use of slave labour.
- In 2005, the maximum value of fines for illegal deforestation was increased from approximately US $500 to US $2500 per ha.

Nonetheless, major challenges remain for the enforcement of legislation regarding forest protection and management in the Brazilian Amazon. For example, despite recent increases in the value of fines for illegal deforestation, institutional weaknesses in terms of sustainable funding and staffing continue to be major obstacles, as is the lack of transparency in the application and collection of fines for environmental crimes (in addition to the above-mentioned non-payment of fines levied by IBAMA).[27] Moreover, non-enforcement of forest legislation is also clearly linked to inconsistencies in other public policies, in such areas as land tenure and economic incentives.

Illegal deforestation in the Brazilian Amazon also reflects difficulties in implementation of legislation regarding forest management and maintenance of forests on private landholdings, associated with bottlenecks in licensing and a historical lack of incentives for valuing forests for sustainable management and ecosystem services (Brito *et al.*

2005, ICV 2008). A frequent observation is that it is much easier to approve an authorisation for forest clearing than a sustainable forest management plan (PMFS), which is much more complex. Without an approved management plan, extractivists are not permitted to transport and market products from sustainably managed forests. In particular, there is a need to simplify procedures for approval of community forest management and non-timber forest management (Miccolis 2008, Sabogal *et al.* 2008).

Major obstacles for forest governance in the Brazilian Amazon, especially in recent frontier areas, include elite capture of government institutions in a manner that inhibits their capacity to perform in the public interest, lack of transparency and weak civil society organisation. In general, decision-making processes that involve multi-stakeholder dialogue and transparency are either fragile or non-existent. However, recent initiatives[28] by civil society organisations could serve as the nucleus for further multi-stakeholder dialogues on REDD+ in the Amazon.

2.1.3. Institutional spaces for policy dialogue and forest governance

In recent years, important steps have been taken in Brazil to create participatory councils and other institutional spaces for policy dialogue between governments and stakeholders on issues that involve the forestry sector in the Amazon region. Such initiatives have been described as 'channels of participation that articulate representatives of the population and members of the public sector in practices related to management of public goods … agents of innovation and spaces for the negotiation of conflicts' (Gohn 2003:7).[29]

At the federal level, relevant institutions for policy dialogue regarding the forestry sector in the Brazilian Amazon include:

a. Coordinating Commission for the National Forestry Program (Comissão Coordenadora do Programa Nacional de Florestas, CONAFLOR)
b. Commission for Public Forest Management (Comissão de Gestão de Florestas Públicas, CGFLOP)
c. National Environmental Council (Conselho Nacional do Meio Ambiente, CONAMA)
d. Interministerial Working Group—Action Plan for Prevention and Control of Deforestation in the Legal Amazon (Grupo de Trabalho Interministerial do Plano de Ação para Prevenção e Controle do Desmatamento na Amazônia Legal, GTI—PPCDAM)
e. National Program for Environmental Management in Indigenous Lands (Programa Nacional de Gestão Ambiental em Terras Indígenas, PNGATI)
f. National Program for Community Forestry Management (Programa Nacional de Manejo Florestal Comunitário, PNMFC)

Coordinating Commission for the National Forestry Program (CONAFLOR)

CONAFLOR was formally established in April 2000, along with the creation of the programme itself. The National Forestry Program (Programa Nacional de Florestas; PNF) has broad objectives that include promotion of the sustainable use of forests, support for economic activities of forest peoples, control of illegal deforestation and predatory logging, fire prevention and control and incentives for reforestation in degraded areas.[30]

CONAFLOR is formally charged with such responsibilities as: (1) proposing and evaluating measures to implement principles and guidelines for the forestry sector within the National Environmental Policy; (2) providing recommendations for the planning of actions within the PNF; (3) proposing measures to increase integration between programmes, projects and other activities, as well as integration with other sectoral policies, based on the objectives of the PNF and (4) contributing to monitoring of implementation of the PNF.

The current membership of CONAFLOR includes 12 federal agencies, 5 civil society organisations (representing forestry students, industry and construction workers, agricultural workers, indigenous peoples, extractive communities, and professional foresters), 5 representatives of subsectors within forest industries (timber and

non-timber products), 4 members appointed by the Brazilian Forum of NGOs and Social Movements (FBOMS), 5 representatives of state environmental agencies and 3 representatives of educational and scientific institutions.

Despite its broad membership and mandate, the functioning of CONAFLOR is subject to major limitations. Moreover, the PNF (coordinated by the Secretariat for Biodiversity and Forests of the Environment Ministry) is essentially a project funded by the World Bank, with significant limitations in terms of financial resources, technical capacity and political leverage over public policies relevant to the forestry sector. In addition, CONAFLOR is formally a consultative (as opposed to deliberative) institutional forum, with consequent limitations on its decision-making responsibilities.

Nevertheless, CONAFLOR has contributed to important debates on such topics as legal norms on the consumption of forest products, reforestation, decentralisation of forest policies and enabling legislation for the Public Forest Management Law (Law 11 284/2006).

Commission for Public Forest Management (CGFLOP)

CGFLOP was created within the context of the Public Forest Management Law (Law 11 284/2006). As mentioned in Section 2, key elements of this recent legislation include: (1) establishment of procedures for concession of forest resources on public lands (without transfer of ownership rights) and (2) creation of the Brazilian Forest Service (Serviço Florestal Brasileiro; SFB). Law 11 284/2006 also created the National Fund for Forest Development (Fundo Nacional de Desenvolvimento Florestal) to finance 'sustainable activities' and 'technological innovation' in the forestry sector of Brazil.

CGFLOP functions as a consultative body for the SFB within the structure of the Ministry of the Environment. Formally, it is charged with providing advice, evaluations and proposals regarding guidelines for public forest management at the federal level, as well as opinions on annual plans for public forest concessions.[31] The composition of CGFLOP, established by Decree 5765 of 5 June 2006, is similar to that of CONAFLOR, including representatives of state and federal agencies, workers, scientific community, social movements and NGOs.[32]

To date, CGFLOP's activities have focused largely on: (1) discussing elements of enabling legislation for the Public Forest Management Law (issued as Presidential Decree 6063 of 20 March 2007), particularly with regard to the establishment of a national cadastre of public forests and procurement norms for forest concessions and (2) analysis of an annual report prepared by the SFB on activities related to public forest concessions.

Despite its limited mandate and consultative (as opposed to deliberative) status, CGFLOP has functioned as an effective arena for stakeholder dialogue on some relevant issues for forest governance. On a few occasions, CGFLOP met jointly with CONAFLOR to discuss new regulations on community forest management, for which NGOs and social movements were able to provide input that influenced the outcome of draft legislation. However, the commission has not yet addressed such key issues as the need to effectively integrate public forest management strategies with other sectoral policies regarding access and ownership rights to public lands (see Section 2), as well as other key policy instruments for promoting socially equitable forest management in the Brazilian Amazon (e.g. applied research, economic instruments, extension services).

National Environmental Council (CONAMA)

CONAMA is another important institutional space for policy dialogue on forest policies in Brazil. The council was established in 1981 as part of Brazil's first overarching national environmental policy legislation (Law 6938/1981). The composition of CONAMA includes broad representation from federal, state and municipal governments, as well as representatives from the private sector, social movements and NGOs.[33]

In contrast to CONAFLOR and CGFLOP, CONAMA was established as both a consultative

and a deliberative body with authority to approve resolutions that are legally binding. Although acting sporadically in relation to the forestry sector, CONAMA has served as an important arena for debates and negotiations on such issues as revisions to the Brazilian Forest code, licensing of forest management projects, public access to information on the forestry sector, decentralisation of forest management permissions and environmental licensing of rural settlements and infrastructure projects with huge potential impacts on forests in the Amazon region (Thault 2006).

Recently, several Brazilian NGOs have proposed a restructuring of CONAMA, arguing that the council suffers from problems of unbalanced representation and other shortcomings in its role as a forum for democratic decision-making on environmental issues.[34]

Interministerial Working Group—Action Plan for Prevention and Control of Deforestation in the Legal Amazon

A major recent initiative of the Brazilian government was the launch of the PPCDAM. Preparations for the action plan began in mid 2003, during the first year of the administration of former President Lula, largely at the insistence of then Environment Minister Marina Silva.

An initial phase of preparation in May—June 2003 involved significant participation of Brazilian NGOs, whose expertise and suggestions contributed considerably to the basic framework of the action plan, which was officially launched in March 2004. Based on a solid analysis of deforestation dynamics, the plan's strategy called for actions in such relevant areas as land tenure (including creation and implementation of protected areas), revision of economic incentives with regard to sustainable agriculture and forest management, and guidelines for ensuring the environmental sustainability of infrastructure projects in the transport and energy sectors.

By July 2003, a Presidential Decree had created an Interministerial Working Group composed of 12 federal agencies headed by the President's Office (Casa Civil—Presidência da República) to coordinate implementation of the PPCDAM.[35] In addition to leadership within the central power structure of the federal government, a novel feature of the working group was that, for the first time, deforestation and illegal logging in the Amazon were cast not as an exclusive 'problem' of the Ministry of Environment, but rather as the responsibility of the federal government as a whole, including ministries responsible for agrarian reform, agribusiness, justice and physical infrastructure (mining and energy, transportation). Although formal membership in the working group was limited to federal agencies, its coordinator pledged to maintain close collaboration with NGOs, state governments and other stakeholders.

The implementation of the PPCDAM has yielded mixed results, demonstrating both the potential for the federal government to more effectively address deforestation dynamics and enormous problems with regard to institutional coordination and conflicting agendas among government agencies. A major deficiency has been the working group's failure to establish an ongoing dialogue with civil society organisations and other stakeholders (state governments, social movements, private sector, etc.) as an integral part of planning, monitoring and evaluation of the action plan. Such problems, combined with a lack of public access to information to independently monitor implementation, have posed major obstacles for effective governance of the PPCDAM. This context has exacerbated conflicts within the federal government, in which conventional 'developmentalist' interests have increasingly undermined the action plan's implementation. In the meantime, expanding commodity markets for beef, soy and timber have contributed to renewed pressures on forests in the Brazilian Amazon.[36]

National Program for Environmental Management in Indigenous Lands (PNGATI)

In 2008, the Ministry of Justice and the Ministry of Environment created an Interministerial Working Group (Grupo de Trabalho Interministerial) with the objective of elaborating a national policy for environmental management on indigenous lands. The aim of the programme is to construct strategies to secure protection and support for indigenous people and their lands focusing on concerns for

sustainable development, land tenure, indigenous culture and well-being.

National Program for Community Forestry Management (PNMFC)

The objectives of the National Program for Community and Family Forestry Management, established by Decree 6874/2009, include organising and supporting actions for sustainable forest management by local communities, including small farmers, settlers and traditional communities. It is coordinated jointly by the Ministry of Environment and the Ministry of Agrarian Development.

State-level institutional spaces

Many states have created forums to discuss subnational policies, programmes and approaches for REDD+ and climate change responses. Examples include Tocantins State Forum for Climate Change and Biodiversity (Forum Estadual de Mudancas Climaticas e Biodiversidade do Tocantins) and Amazonas State Forum for Climate Change, Biodiversity, Environmental Services and Energy (Forum Amazonense para Mudanças Climáticas, Biodiversidade, Serviços Ambiantais e Energia). In addition, the state of Pará is creating a Working Group on REDD to discuss its implementation and consistency with public policies in the state. Such spaces for dialogue between stakeholders and the public sector are playing a key role in the formulation of strategies for climate change and REDD at the subnational level, favouring decentralisation.

Other relevant institutional spaces

In Brazil, there are other relevant institutional spaces responsible for sectoral policies at the federal level that influence, directly or indirectly, the prospects for socially equitable forest management in the Amazon region. These include councils and commissions responsible for such wide-ranging topics as ecological-economic zoning, biodiversity, rural development, indigenous peoples and other traditional populations and infrastructure development (energy and transportation infrastructure). An example is the National Council for the Legal Amazon (Conselho Nacional da Amazonia Legal; CONAMAZ), composed of the president, representatives of all relevant ministries and governors of the Legal Amazon states.

It is important to note that institutional spaces responsible for national development policies typically lack participation by civil society organisations, despite their wide-reaching implications. Two key examples are the National Council on Integrated Transport Policy (established by Law 10223/2001) and the National Council on Energy Policy (created by Law 9478/1997). As described elsewhere in the report, transportation and energy policies have significant implications for illegal deforestation and predatory logging in the Brazilian Amazon.

Brazil also has different institutional spaces organised by civil society organisations involved in forest decisions, which have become vocal with respect to REDD+. These institutions have been particularly active and effective in influencing decision-making processes since the late 1980s, when the assassination of Chico Mendes sparked a grassroots mobilisation of global significance. Through meetings, publications and protests, they have increasingly ensured recognition of their roles in policy development and implementation. One example is the Coordination of the Indigenous Organizations of the Brazilian Amazon (COIAB), which now has a permanent seat on the executive committee of the Amazon Fund with significant influence over the fund's decisions. Other examples include the Amazon Working Group (Grupo de Trabalho da Amazônia; GTA), a confederation of more than 300 grassroots organisations in the region, which has been developing principles for REDD+ policies and projects (see Section 2.3.3) and the National Council of Rubber Tappers (CNS), which participated in national and international conferences on REDD, thus influencing the debate.

2.1.4. Implications for REDD+

Clearly, weak governance in the Brazilian Amazon—in terms of institutional capacities, elite capture, lack of transparency and incipient levels of civil society mobilisation and organisation—has major implications for the success of REDD+, particularly in areas of recent frontier expansion. It should be noted that neither CONAFLOR nor

CGFLOP has been formally designated with responsibility for deliberating over national REDD+ policies. The SFB has assumed some such responsibility, at least to the extent of attempting to track subnational initiatives underway (SFB 2009) and in a second phase, beginning in October 2010, the Climate Change and Environmental Quality Secretariat (Ministry of Environment) will support SFB actions in managing policies and actions on REDD+ as well as articulating civil society engagement with public policy formulation in this sphere.[37] The role of the PPCDAM is seen as central to the effectiveness of national REDD+ policy, but the weaknesses in that process will likely be perpetuated in the context of REDD+ initiatives.

2.2. Decentralisation and benefit sharing

2.2.1. Decentralisation in Brazilian environmental governance

In Brazil and other developing countries, decentralisation of natural resource policies has been viewed as a means of achieving a variety of goals, including improved management efficiency, better adaptation of public policies to local realities, increased transparency and accountability among government agencies, institutionalisation of democratic participation and stakeholder dialogue, with empowerment of local communities and, ultimately, progress in achieving socially equitable sustainable development (Ribot 2002).

The Brazilian Federal Constitution of 1988 establishes common responsibilities of federal, state and municipal governments to ensure protection of the environment (Article 23), as well as granting authority to all 3 levels of government to legislate concurrently on environmental issues, including on forests (Article 24, III), as long as principles of hierarchy are respected (e.g. state and municipal governments cannot issue norms that conflict with federal environmental legislation).

Trends during the past decade towards decentralisation of forest and environmental policies in the Amazon pose new challenges for strengthening forest governance at the state and local level. Within this context, state and municipal councils responsible for environment and forestry issues may assume key roles for the success of decentralisation, especially in ensuring transparency and accountability among local government agencies that have assumed new responsibilities.

An important aspect of policy decentralisation in the Brazilian Amazon has been the emergence of state-level institutional forums responsible for environmental policies that typically often involve issues of forest management and protection. Currently, all 9 states in the Legal Amazon have state environmental councils, and similar initiatives have emerged among many municipalities. In addition, subnational initiatives on licensing facilities operation, law enforcement and regularisation of land tenure have demonstrated that states have taken the lead on forest conservation strategies. This phenomenon is part of a larger process of decentralisation of environment and natural resource policies in the Amazon states, supported by the federal government and international agencies such as the World Bank.[38]

During 2005—2006, IBAMA signed a series of cooperation agreements (*acordos de cooperação*) with state environmental agencies in the Legal Amazon, delegating responsibilities to the state level for authorising forest clearing and approval of sustainable forest management operations. The legal foundations for such initiatives were reinforced through Article 83 of the Public Forest Management Law (Law 11 284/2006,) and Resolution 378/2006 of the National Environmental Council (CONAMA). However, most of these agreements were characterised by a lack of consistent criteria regarding institutional capacities, operational procedures and transparency. This lack of 'responsible decentralisation' has contributed to problems of illegal deforestation and logging, especially in states such as Rondônia, where elite capture of state environmental agencies is particularly evident (GTA 2008).

Since the approval of the Bali Road Map and the provision for a REDD mechanism, Amazon state governments have initiated actions that aim to implement REDD+ policies and programmes.

Amazonas was the first state to create a climate change law that authorises REDD+ projects and compensates people for avoiding deforestation. Following this example, the state of Acre recently launched the Policy Program for Valuing Forest Assets. In the case of Amazonas, however, concern has been raised regarding the degree to which democratic process was adhered to through public hearings on development of the law creating the state's REDD+ programme, which is characterised as having been pursued with little or no participation from civil society (Queiroz 2009).

Brazil has incipient initiatives underway to share benefits from forest services, also primarily in Acre and Amazonas states to date, as well as several benefit-sharing schemes associated with voluntary forest carbon projects in the Atlantic Forest (May 2010). The main categories of benefits being shared and implemented in these states involve incentives for maintaining conservationist practices (e.g. social and economic benefits) and compensation to cover REDD implementation costs at the property or community level (e.g. payments for environmental services). However, analyses of these mechanisms have demonstrated the need for greater local participation in their design and allocations, fewer funding bottlenecks (affecting transactions costs), more implementation capacity and less political bias in planning (see Hall 2008, Gebara, in press; see Section 4.5.5. for further details on these schemes and Table 3 for a list of initiatives in progress).

2.2.2. Implications for REDD+

The recent rush to decentralise forest policy from the federal to state governments in the Brazilian Amazon, without due attention to problems of weak governance in the region, has important implications that may undermine the success of REDD+. Weak governance is reflected in inadequacy of institutional capacities for enforcement of environmental norms, as well as in elite capture of benefits and lack of transparency regarding the results of such programmes. Nevertheless, in some instances, decentralisation has permitted greater local social control over forest governance, such as access to forest management plans and environmental licenses, than had been the case under IBAMA.

Despite continued problems of weak governance, it should be noted that several Amazon states have taken the lead in promoting a change in Brazil's position on forests in the climate convention, arguing that their need for resources to assume the roles established by decentralisation could be answered in part by access to REDD+ resources. A task force of Amazon governors, created in a joint letter to the president on 26 June 2009, later presented a unified position on global climate negotiations, which established a preference for a 'nested approach' to REDD+ financing. This approach favours the realisation of subnational programmes in those states which had prepared action plans to combat deforestation under the PPCDAM, as well as state climate policies. Such strategies have been developed in several states to date, with the aim of engaging stakeholders at state and local levels as a means to secure greater participation and transparency in the adoption of REDD+ strategies.

2.3. Tenure issues

2.3.1. Indigenous rights to carbon, land and trees

The Federal Constitution of 1988 includes a specific chapter (VIII) on indigenous peoples and their lands. This chapter recognises the 'original rights' (*direitos originários*) of indigenous peoples to 'traditionally occupied' lands, defined as territories 'inhabited on permanent basis, utilized for productive activities, indispensable for the preservation of environmental resources necessary for the well-being, physical and cultural reproduction of indigenous peoples, according to their uses, customs and traditions'. Moreover, the Brazilian Constitution establishes that it is incumbent upon the Union to demarcate and protect indigenous lands. The Federal Constitution also determines that the use of water resources, including hydroelectric purposes, as well as the exploitation of mineral resources, may only be conducted with authorisation from the Brazilian Congress. Such authorisation requires previous

consultations with indigenous peoples and their participation in the benefits of any mining activities that are authorised.

According to data collected by the Instituto Socioambiental (ISA) until mid 2007, approximately 170 indigenous groups currently reside in 387 indigenous lands (*terras indígenas*) in Brazil's Legal Amazon, covering a total of 1.07 million km^2, equivalent to 21.5% of the region. At least 77% of indigenous lands have completed a formal process of recognition (identification, demarcation, homologation, registration in local title registries (*Cartórios de Registro de Imóveis* and/or *Secretaria de Patrimônio da União*).

In addition to their fundamental importance for the well-being of native peoples, indigenous lands in the Brazilian Amazon perform key functions in the maintenance of biodiversity and other environmental services provided by forest ecosystems, including regulation of climate and hydrographic regimes.

Despite recent progress in the legal recognition of indigenous lands, many of these areas are subject to pressures from ranchers, placer miners (*garimpeiros*), loggers, commercial fishermen and hunters, resulting in social conflicts that compromise the exclusive use rights to natural resources that Brazilian law guarantees to indigenous peoples. In areas such as the Xingu Indigenous Park (Parque Indígena do Xingú) in northeastern Mato Grosso, environmental degradation in surrounding areas—clearing of riparian forests along tributaries of the Xingu River, water pollution through indiscriminate use of agrochemicals in soybean farms and disruption of hydrological regimes and fish migration through hydroelectric projects—have all had negative impacts on indigenous communities.[39] Despite such pressures, however, it is remarkable that the borders of indigenous lands in most cases have been respected (Nepstad *et al.* 2006). In most cases, this is due to indigenous peoples' own efforts to monitor their perimeters and to enlist legal support, with the assistance of indigenist organisations, to protect these areas. Another current threat involves attempts within the Brazilian Congress to facilitate exploitation of mineral resources, implementation of hydroelectric projects and transportation corridors and performance of military operations within indigenous lands. As indigenous peoples' ability to protect themselves in the face of these forces is weak, alliances are essential.

Brazil is a signatory of ILO Convention no. 169 (adopted in June 1989 and in force since September 1989) and the UN Declaration on the Rights of Indigenous Peoples, adopted in September 2007. However, these international agreements have not been observed in the Brazilian Amazon, especially with respect to the planning of major infrastructure projects (such as hydroelectric dams) that directly and indirectly affect indigenous peoples and their territories.

Grassroots mobilisation among indigenous groups in the Brazilian Amazon varies tremendously, but is in general quite incipient. Creating collaboration between isolated indigenous groups over national policies that affect their territories is a major challenge.

With respect to rights over carbon, there is currently disagreement as to whether the provision of environmental services could be subject to commercial agreements on the part of indigenous groups. Because the lands on which indigenous territories are demarcated are, under the Constitution, the property of the Union, this right is dubious.[40] The same doubt applies to lands in agrarian reform settlements, which—until released and titled—are also the property of the Union, so that land reform beneficiaries could not in principle benefit from avoiding deforestation on their lots.

2.3.2. National tenure context

Data on land tenure in the Brazilian Amazon have long been characterised by severe information gaps and a high degree of uncertainty, including overlapping claims with varying degrees of legitimacy. Ongoing ambiguity in terms of access and ownership rights to land and forest resources has contributed significantly to social conflicts in the region, in which landless migrants, as well as indigenous peoples and other traditional populations (extractivists, *ribeirinhos*, etc.), have been the primary losers. The lack of clarity

regarding land tenure rights has contributed to other problems, including obstacles to legalisation of forest protection and management on both private and public lands (Serôa da Motta 1997, Börner *et al.* 2010).

The federal land agency INCRA (National Institute for Colonization and Agrarian Reform) has attempted over the past decade to carry out revisions of land cadastres (*recadastramento*) with the intent of clarifying legitimate claims, while reducing social conflicts and fraudulent appropriation of public lands (*grilagem*). An initial *recadastramento* of large properties (>10 000 ha) was initiated in 1999. A second *recadastramento* was initiated in 2001, focusing on land claims between 5000 and 10 000 ha. A third *recadastramento* was launched in 2004 within selected municipalities of the region. In all cases, interested parties were required to provide georeferenced maps and documentation to prove the legitimacy of their claims.

A recent analysis by Imazon (2008) of *recadastramento* undertaken by INCRA between 1999 and 2004 identified the following general characteristics of the land tenure situation in the Legal Amazon.

- In October 2003. INCRA's land cadastre identified 1.78 million km^2 (35% of the region) as occupied by private properties or by squatters on public lands.
- Within this area, 1.33 million km^2 was occupied by 242 000 private landholdings with some sort of title registered in a local land registry office *(cartório de registro de imóveis*). Approximately 0.2 million km^2 (4% of the territory) was occupied by large private landholdings (>5000 ha) with titles that had been validated by INCRA. However, doubts remained concerning the legitimacy of documents for many of the remaining claims. For example, 0.21 million km^2 was occupied by large landholdings with titles granted by state governments that had not yet been verified by INCRA, while the documentation of an additional 0.56 million km^2 occupied by large landholdings was still being analysed.
- Land reform settlements, also administered by INCRA, comprise a substantial area in the Legal Amazon (210 000 km^2, or 4% of the region's total area), where the vast majority of national territory dedicated to official settlement is located. While settlers face problems common to other migrants to the Amazon, their lots are at least nominally secure, although these lots remain under public control until they are released by the public authority.
- In 2003, INCRA's land cadastre included approximately 302 000 cases of squatters occupying public lands within a total area of 420 000 km^2 (23.7% of all land claims registered by INCRA). As further described below, the legitimacy of claims by different types of 'squatters' (from poor migrants to large speculators and ranchers) has been the subject of considerable confusion in Brazil, with changes in norms and contrasting interpretations of legislation over time.
- Four thousand landholdings covering 32 000 km^2 were registered simultaneously as titled lands and areas with squatter's rights on public lands (*posses*).
- In 2007, 43% of the region was identified as destined for protected areas (both conservation units and indigenous territories). Some protected areas, such as extractive reserves (RESEX), are intended to promote sustainable use of forest resources among traditional populations. However, squatters (e.g. ranchers) occupy considerable portions of legally protected areas, especially in recently created protected areas. This is in part explained by the fact that many protected areas in Brazil have been created on paper, but rarely are occupants compensated for their loss of property rights, creating substantial conflict. Furthermore, occupants are rarely ejected forcibly from protected areas. Finally, many areas (RESEX; sustainable development reserves (RDS); environmental protection areas (APAs), etc.) are created with the explicit aim of sustainable use rather than integral and exclusive biodiversity protection, and imply making production practices compatible with their protection objectives. Such aims have not in most cases been matched by the financial resources, staffing

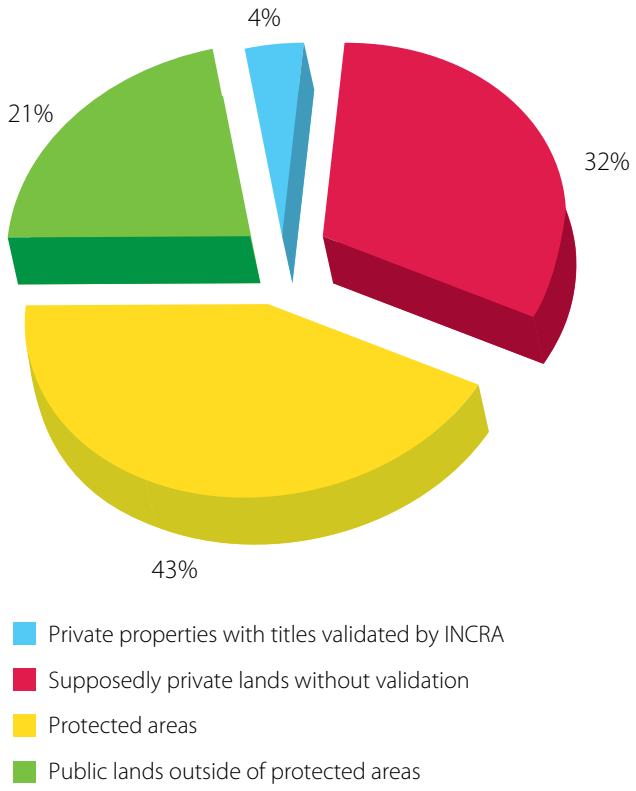

Figure 2.1. Land tenure in the Brazilian Amazon

Source: Barreto *et al.* (2008)

and technical support necessary to achieve them.

- In addition to the above categories, it was estimated in 2003 that approximately 1.04 million km² of public lands (21% of the Legal Amazon) had not received any formal designation. Such areas include uninhabited lands, as well as areas occupied by populations with legitimate claims that have not yet been recognised (e.g. indigenous peoples, riverine populations) and others whose occupations may be characterised as illegal.

In summary, the land tenure situation in the Brazilian Amazon, notwithstanding recent progress, is still characterised by a high degree of uncertainty regarding access and ownership rights. One-third of the Legal Amazon (32% or 1.6 million km²) is composed of private land claims that remain to be fully verified by INCRA. According to Imazon (2008), there are more than 300 000 cases of squatter occupations (*posses*) throughout the Brazilian Amazon. Another striking characteristic is the high degree of land concentration. For example, in the North region, more than 82% of all property area registered in the 2006 Agricultural and Livestock Census (IBGE 2009) is in properties larger than 100 ha. Although smallholder land use patterns have resulted in considerable forest conversion, smallholders are by no means the principal actors driving deforestation rates in the Amazon region.[41]

Following are some of the major contributing factors to these characteristics of the land tenure situation in the Brazilian Amazon.

- From the colonial period through to the rubber booms of the late 19th and early 20th centuries, extractive economies involved concessions of access rights (emphyteusis) to huge tracts of forestlands with imprecise boundaries in which highly exploitative labour conditions prevailed. In many cases, documents associated with such concessions to forest resources (often produced through fraudulent means) have been successfully transformed into private land titles. A case in point is the 'Brazil nut Polygon' in southern Pará state, where such concessions were ceded to one family which still monopolises much of the Brazil nut trade in the Amazon, although much of the concession area was deforested by the same group for other purposes.
- Since the 1960s and 1970s, large infrastructure projects (especially construction of a network of federal highways), credit and fiscal incentives, land titling and settlement projects have all contributed to migratory flows from other regions of the country, speculation and land concentration in the Amazon. There are, however, pockets of smallholder beneficiaries of land reform or colonisation projects that were associated with such infrastructure projects. The entire state of Rondônia, for example, was settled primarily through public land distribution associated with the development of the BR-364 highway. Remaining smallholder communities along the Trans-Amazon Highway in Pará were also settled in this fashion despite the failure of the *agrovilas*. Such areas generally exhibit lower land concentration indices than the region as a whole.

- Major limitations in the planning and implementation of rural settlement projects have been associated with displacement of traditional populations and high rates of colonist attrition and (re)concentration of lands, giving way to cattle ranches, which typically benefit from economies of scale. In principle, however, such settlements were undertaken with the purpose of smallholder production and resale of lots was (in theory) prohibited.
- There have been major inconsistencies in legislation and interpretations by judges regarding the rights of squatters on public lands to receive titles, or compensation for 'improvements' to land when such areas are reverted to public control.
- Historically, government agencies have adopted a *laissez faire* attitude towards illegal occupations by squatters on public lands at the frontier, especially when powerful political and economic interests are involved. In several cases, land tenure regulations have been subsequently altered to legitimise such occupations.
- INCRA, the federal land agency, and state governments have recognised forest clearing associated with the introduction of planted cattle pastures as an 'improvement' (*benfeitoria*) on public lands, for purposes of granting private titles. Such policies have not only encouraged forest clearing (in contradiction to environmental legislation) but also contributed to the expulsion of traditional populations and landless migrants by speculators and ranchers.
- Until recently, policies regarding the creation of protected areas in the Brazilian Amazon did not recognise the contributions of traditional populations (e.g. rubber-tappers (*seringueiros*), Brazil nut gatherers (*castanheiros*), riverine populations (*ribeirinhos*)) to the maintenance of a system of protected areas. This perspective has since changed with the creation of an array of sustainable use reserve typologies (RESEX, RDS, APAs, etc.). However, some constraints to these initiatives remain, such as financial resources to conservation and divergence among approaches and definitions for constituting and implementing community forest management.
- INCRA and other government institutions responsible for addressing land tenure problems and related social conflicts in the Brazilian Amazon—including responsibility to ensure the rights of indigenous peoples and other traditional populations—have been perennially underfunded and understaffed; they also lack transparency and are susceptible to corruption.

Approximately 43% of the Brazilian Amazon is currently included within various protected areas for both total conservation and sustainable use, including indigenous reserves. More than 60% of areas protected in this way involve the direct participation of resource-user populations in managing these units. Their rights are tantamount to permanent and hereditary usufruct over the forests they manage. However, they cannot sell these rights. A range of projects and programmes both within and outside of these protected areas have been developed to directly benefit local groups such as extractivists, small farmers, fishing communities and indigenous groups, as well as producers of various kinds whose livelihoods depend upon the non-destructive use of natural resources but which also contribute to local economic development.

2.3.3. Implications for REDD+

It is evident that the principal difficulty in implementing REDD+ strategies in the Brazilian Amazon in areas removed from the forest margins stems from the insecurity of tenure of many occupants of land, whether or not they possess legitimate claims. As deforestation frequently occurs in areas that lack definitive title, the effectiveness of policies such as credit restrictions that seek to motivate landowners to protect remaining forests is severely restricted. Negotiation of contracts among REDD+ project proponents cannot prosper without definitive rights over land and forests, a status which holds for many small farmers as well as for ranchers and other large-scale claimants (Börner *et al.* 2010).

Precarious tenure conditions also severely limit the effectiveness of principal REDD+ implementation measures on the ground, such as law enforcement (when responsibility for illegally cleared forest patches cannot be assigned to a specific individual) and payments for environmental services (when

landholders cannot guarantee service provision due to insecure land claims, or when single legitimate land stewards cannot be unambiguously identified).

However, it is clear that actors involved in representing indigenous and traditional peoples in the Amazon are aware of the relevance of tenure security in obtaining access to benefits associated with REDD+. A series of hearings carried out in 2010, organised by the Committee on Socio-Environmental Principles and Criteria for REDD+ coordinated by the GTA, and IPAM (Amazon Environmental Research Institute) and facilitated by Imaflora (Institute for Forestry and Agricultural Management and Certification), had as its primary focus the definition of criteria for effective PES strategies to be used as a cornerstone in negotiating appropriate REDD+ project-level approaches. Such criteria include distributive policies on the use of REDD+ resources, vis-à-vis scale of properties, legitimacy of land claims, local participation and transparency.[42]

3 The political economy of deforestation and degradation

3.1. Political-economic context of drivers of deforestation and degradation

Following are some examples of key national public policies that have facilitated deforestation and degradation in the Brazilian Amazon.

Large-scale infrastructure projects: The Programa de Aceleração do Crescimento (PAC), launched in February 2007, involves an ambitious portfolio of large-scale infrastructure projects, many targeting the Legal Amazon, such as the Rio Madeira hydroelectric dams and the paving of the BR-319 highway (Manaus—Porto Velho). The PAC has been marked by a reversion to conventional paradigms of economic growth, lobbying interests of powerful economic groups (such as construction conglomerates), patronage relations with regional political elites and the 'politicisation' of environmental licensing procedures, as well as the perpetuation of corrupt bidding procedures despite accounting safeguards. As a result, more advanced planning processes involving strategic analyses of socio-environmental impacts, economic efficiency and alternatives, involving multi-stakeholder dialogue and conflict resolution, although nominally urged by law and regulation, have been marginalised in practice (AdT 2007, INESC 2007, International Rivers 2008).

It is opportune to recall that the most rapid rates of deforestation in the Amazon have always been highly correlated with the presence of major infrastructure projects, as described in Section 1. These projects respond to a political context in which physical development initiatives to increase the economic value of the region are considered a desirable means to gain political capital, despite their eventual long-term costs to regional and/or global society and nature.[43] One infamous example is the World Bank-funded (US $411 million) POLONOROESTE programme (Northwestern Brazil Integrated Development Program), which aimed to contribute to national integration, promote demographic occupation and increase production in parts of the Amazon through massive road-building and colonisation projects. This project radically altered the socio-environmental dynamics of the areas affected (Rondônia and Mato Grosso) in a period of less than 10 years. During the programme's implementation, the areas involved attained the highest rates of deforestation in the history of the Brazilian Amazon (Millikan 1992). Such dynamics persist in projects such as the paving of the Cuiabá—Santarém and Porto Velho—Manaus highways along with major hydroelectric projects in the Madeira and Xingu River basins currently among the largest budget items of the PAC.

Persistence of rural credit programmes that prioritise extensive cattle ranching: Between 1989 and 2007, a single credit programme (FNO) invested US $3.5 billion in cattle ranching in the Brazilian Amazon, with more than 90% of the funds going towards herd expansion rather than towards any efforts to improve technical indices of productivity and hence reduce deforestation pressures (Smeraldi

and May 2009). BNDES has recently been strongly criticised for its role as the principal source of capital for expansion of large-scale beef processing facilities in the Amazon (see Section 1.2.2).

Land tenure policies: As described above, government agencies have historically adopted a *laissez faire* attitude towards illegal occupation by squatters on public lands, especially when powerful political and economic interests are involved. Passage into law of an executive order permitting property title regularisation in the Amazon has sparked considerable controversy (see Section 1.2.2).

Development policies: Despite recent progress, mainstream development policies in the Amazon still tend to be characterised by top-down decision-making, institutional fragmentation and dichotomies of 'development vs. environment', particularly in the electrical energy, transportation and agribusiness sectors. To a large extent, the view of the Amazon as an endless source of open access resources persists as a dominant paradigm among decision-makers (Hall 2008).[44]

Commodity markets: As described in Section 1, recent deforestation trends in the Brazilian Amazon (both increases and declines) demonstrate a growing linkage to globalised markets for minerals, beef, timber, hides, soybeans, biofuels and other commodities. Many of these commodities are consumed primarily at the national level, but international demand also plays a key role. Although Brazil is now the world's largest producer and exporter of beef, its domestic consumption is still in the order of 80% of all beef produced (Smeraldi and May 2009), which makes it difficult to improve production practices by invoking importer pressures. Furthermore, beef demand comes in large part from China, Russia and Egypt, among other emergent economies; these regions are concerned more with purchasing low-cost beef than with ensuring traceability to forest-friendly cattle ranches. For example, Brazil is the world's biggest producer and exporter of cattle hides, most of which are used for footwear, furniture, cars and garments. As much of the exported hide trade moves via a second party for processing, tracing its origins is complex; for example, Chinese-produced leather garments, accessories and footwear carry the label 'Made in China', rather than show the provenance of the hides from which the leather was processed (Campbell *et al.* 2010). In addition, according to Imazon (2010), 79% of timber production in 2009 that originated from the Legal Amazon was consumed on the domestic market, mainly in São Paulo and the country's northeast. Considering trends in the recent past (Marquesini and Montalto 2008),[45] such data indicate a temporary retraction in timber exports, related to the global economic meltdown.

Markets for biofuels, both domestic and international, contribute indirectly to these pressures for land use change. As mentioned above, rapid expansion in maize production for ethanol in the United States may have indirectly stimulated Amazon deforestation due to compensatory growth in soybean production in former pasturelands in the *cerrado* (Searchinger *et al.* 2008). More direct pressures may be felt as proposals for development of biodiesel based on African oil palm plantations within the Amazon region come to fruition. The Agropalma enterprise in Pará attracted capital for a significant expansion for this purpose, but low prices forced it to abandon its biodiesel operation. However, as oil palm will in most cases occupy previously degraded lands, it represents a minor threat for Amazon deforestation as a form of biofuels expansion (Lapola *et al.* 2010).

Divergence between ministries: The Brazilian Ministry of Agriculture forecasts that in the next decade livestock production will increase by 52% and that beef exports will increase 93%. At the same time, the Ministry of Environment has stated that about half of Brazil's proposed near-40% reduction from anticipated growth in carbon emissions by 2020 will come from reducing deforestation. One of the biggest challenges for Brazil will be in reconciling this increase in livestock production with its deforestation target (Campbell *et al.* 2010).

Enforcement: A major contributing factor to illegal deforestation and logging in the Brazilian Amazon has been the lack of coherent policies and institutional presence with regard to enforcement of environmental and forest legislation. Over the years, the vast majority of fines for illegal deforestation, when issued, have simply not been paid, due to legal loopholes, despite recent increases in the value of those fines.[46] As described earlier (see Section 2.1.2),

Box 1. The Brazilian Forest code

The Brazilian Forest code (Federal Law 4771/1965) establishes a percentage of rural properties to be maintained as a permanent forest reserve (*Reserva Legal*). The Forest code also prohibits the clearing of primary vegetation on steep slopes and along the margins of rivers and streams, all of which are classified as 'areas of permanent protection' (*Áreas de Preservação Permanente*; APPs). A *legal reserve* is defined as 'an area located in the interior of a private property or land claim, except in areas of permanent preservation (APP), necessary for the sustainable use of natural resources, the conservation and restoration of ecological processes, the conservation of biodiversity and the sheltering and protection of native flora and fauna' (Article 1, III). An *area of permanent protection* (APP) is defined as a 'protected area covered or not with native vegetation, with the environmental functions of preserving water resources, landscapes, geological stability, biodiversity, and genetic fluxes of flora and fauna, as well as protection of the soil and securing the well-being of human populations' (Article 1, II). These norms are linked to such legal statutes as: (1) the concept that forests are essential to the 'common interests to all inhabitants of the country' (Article 1 of the Brazilian Forest code), and (2) the determination that the 'social function' of rural landholdings (*imóveis rurais*) requires, *inter alia*, 'the adequate use of available natural resources and environmental preservation' (Article 186, Federal Constitution of 1988).

The Forest code originally stipulated that at least 50% of private properties in the country's northern region should be maintained as legal reserves. Following a major increase in forest clearing rates in the mid 1990s, a provisional executive order was signed by President Fernando Henrique Cardoso in July 1996 (*Medida Provisória* 1.511/1996) that prohibited deforestation on 80% of private landholdings in the Legal Amazon characterised by forest cover.* Due to controversy surrounding this measure, its current version (*Medida Provisória* 2166—67/2001) has not yet been made into law by the Brazilian Congress. In fact, there are several bills currently in Congressional committee that aim to reduce the Amazon biome legal reserve back to 50% (see, for example, PL 1207/2007). In 2010, a special subcommittee of Congress passed a draft bill to roll back provisions of the Forest code, suspending fines and alleviating liabilities by those who had converted forests in excess of the Code's provisions. Efforts to restore legal reserves and require compliance with environmental licensing have been stymied while debate on this legislation continues.

* By contrast, the Forest code (Article 16) determines that only 35% of savannah (cerrado) vegetation on private landholdings in the Legal Amazon be maintained as legal reserves.

a number of institutional factors have limited the effectiveness of enforcement.

In addition to illicit practices where forest clearing cannot be authorised, such tendencies reflect difficulties in implementation of the Brazilian Forest code (see Box 1), associated with bottlenecks in licensing, non-enforcement of legislation and a historical lack of incentives for valuing forests for sustainable management and ecosystem services (Brito *et al.* 2005, ICV 2008).

Governance and elite capture: A chronic problem in the Amazon is elite capture of public institutions with regulatory responsibilities for access to and use of forest resources, for private economic and political interests, associated with land speculation, illegal logging, cattle ranching, tax evasion, drug trafficking, patron—client relationships and electoral campaigns.

A strategic initiative in the Brazilian Amazon for balancing needs to constrain deforestation and forest degradation with legitimate development objectives should, in principle, be the Plano Amazônia Sustentável (PAS; Sustainable Amazon Plan), launched in mid 2003 at the beginning of the first term of the Lula administration. However, within a context of growing prevalence of conventional developmentalist paradigms and alliances with traditional political and economic elites, the Lula government effectively abandoned the PAS and related initiatives along the Cuiabá—Porto Velho highway, such as the Plano BR-163 Sustentável. The increasingly marginal role of the Ministry of Environment in relation to mainstream development policies has become increasingly apparent, as exemplified by the resignation of Minister Marina Silva in May 2008, and the rubber stamping of environmental licenses conceded for such mega projects as the Belo Monte hydroelectric facility in 2010.

4 The REDD+ policy environment: Actors, policy events and policy process

4.1. Broader climate change policy context

The Brazilian government has more than 20 public policies intended to have positive impacts (direct and indirect) on climate change. Most of them are related to energy initiatives. The country's main challenge, however, is the problem of deforestation, responsible for up to 75% of Brazil's CO_2 emissions (MCT 2009).

Currently, there are 2 macro policies for climate change in Brazil: the National Plan for Climate Change, approved in November 2008 and presented at COP 14 in Poznań, and the National Policy for Climate Change, which was approved by the National Congress and signed into law by former President Lula in late December 2009. The former presents the status of initiatives in different sectors and possible mitigation and adaptation actions for them. It also addresses the issue of impacts and vulnerabilities associated with adaptation to climate change and outlines plans on research and development, education and instruments to implement actions. The National Policy provides specific actions to implement what is in the plan, including the creation of a national climate change commission and fund; it also reiterates deforestation reduction commitments by 2020 made at COP 15 in Copenhagen.

The plan recognises the role of the Clean Development Mechanism (CDM) in mitigating climate change as the only measure in effect for mitigation actions consistent with the UNFCCC. Despite Brazil's favourable experience with the CDM to date, the plan recognises that other economic, technical, institutional and policy instruments will be needed to attain the objectives of the UNFCCC. This can be seen as a positive sign for REDD+, as one of the plan's goals is to reduce net deforestation to zero. CDM activities in Brazil have been limited primarily to landfills and energy projects, and no afforestation or reforestation projects have yet been registered (although 2 have been approved by the National Authority, both outside the Amazon). This highlights the country's lack of experience in developing forest projects for reducing emissions, despite the many forest-based voluntary carbon market experiences in progress throughout the country (May 2010).

Another initiative that has important impacts for the REDD+ context in Brazil is the Amazon Fund, which has already received a donation of US $110 million from the Norwegian government; it is hoped it will receive additional support from another 12 countries. The fund aims to implement actions for reducing deforestation on a voluntary basis. Of more than 45 projects submitted, only 5 projects have been approved by the fund; all these are administered by NGOs or parastatal funds such as Sustainable Amazonas Foundation (FAS) and FUNBIO. Further detail on the creation and structuring of the fund is provided below (also see Box 2).

4.2. REDD+ policy actors, events and policy processes

The following timeline summarises the evolution of Brazilian positions and initiatives on REDD+, especially within the context of UNFCCC.

1997. Brazilian federal government demonstrates opposition to inclusion of instruments to promote conservation of tropical forests and avoidance of deforestation in the Kyoto Protocol.

2003. Brazilian environmentalists propose the creation of a mechanism, initially called 'compensated reduction', linked to international carbon markets that would reward verifiable reductions in CO_2 emissions from deforestation achieved by Brazil and other developing countries, given their contributions to addressing the global climate crisis. Based on satellite monitoring of deforestation, the proposed mechanism would involve the establishment of reduction targets and compensation for 'avoided deforestation' contingent upon verified reductions in annual clearing rates, compared with a periodically adjusted historical baseline (IPAM 2005, Santilli *et al.* 2005).

November 2006. Shortly before COP 12 in Nairobi, the Brazilian government proposes the creation of 'positive incentives for the net reduction of emissions from deforestation in developing countries that voluntarily reduce their greenhouse gas emissions from deforestation in relation to a reference emission rate'. Under the proposal, voluntary efforts to reduce emissions from deforestation should not involve a 'mandatory regime' that includes 'future obligations, goals, targets or timeframes'. Moreover, it is stated that 'Brazil does not envisage any mechanism that could be used by Annex I countries to meet their quantified greenhouse gas emission limitation and reduction commitments under the Kyoto Protocol. In this context, emission reductions achieved are to be considered additional to emission reduction by Annex I countries' (Brazil 2006).

May 2007. At a meeting of the UNFCCC Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), the Brazilian government submits a document with additional methodological considerations with regard to its proposal for 'policy approaches and positive incentives to reduce emissions from deforestation in developing countries'.

October 2007. A group of 9 NGOs[47] launches the 'Zero Deforestation Pact' in the Brazilian Congress, proposing a national commitment to reduce deforestation rates in the Amazon from 14 000 km^2 in 2005—2006 to zero in 2015, based on annual targets and a series of actions to strengthen forest governance in conjunction with state governments (with particular attention to improving licensing systems of rural landholdings), economic incentives directed towards reduction of deforestation and conservation of forests, creation and consolidation of protected areas, implementation of alternative settlement projects appropriate to the Amazon, and support for indigenous peoples. Based on the findings of an initial study (Young *et al.* 2007), the signatory organisations estimated that R$ 1 billion (approximately US $588 million) would be needed each year to finance implementation of the pact, and called for the creation of a special 'Amazon Fund' to be created within BNDES.[48]

August 2008. President Lula signs Decree 6.527, creating the Amazon Fund (Fundo Amazônia) within BNDES.[49] The Amazon Fund is conceived as a mechanism for receiving donations aimed at:

> (actions in prevention, monitoring and control of deforestation and promotion of conservation and sustainable use of the Amazon biome in the following areas: i) management of public forests and protected areas, ii) environmental monitoring, control and enforcement, iii) sustainable forest management, iv) (other) economic activities based on the sustainable use of forests, v) ecological-economic zoning, territorial management and land tenure regularisation, vi) conservation and sustainable use of biodiversity, and vii) rehabilitation of degraded lands).

Similarly to the proposal at COP 12, it is proposed that donations to the Amazon Fund be linked to verifiable emissions reductions from Amazonian deforestation, such as the 59% reduction estimated by INPE to have occurred between 2004 and 2007.

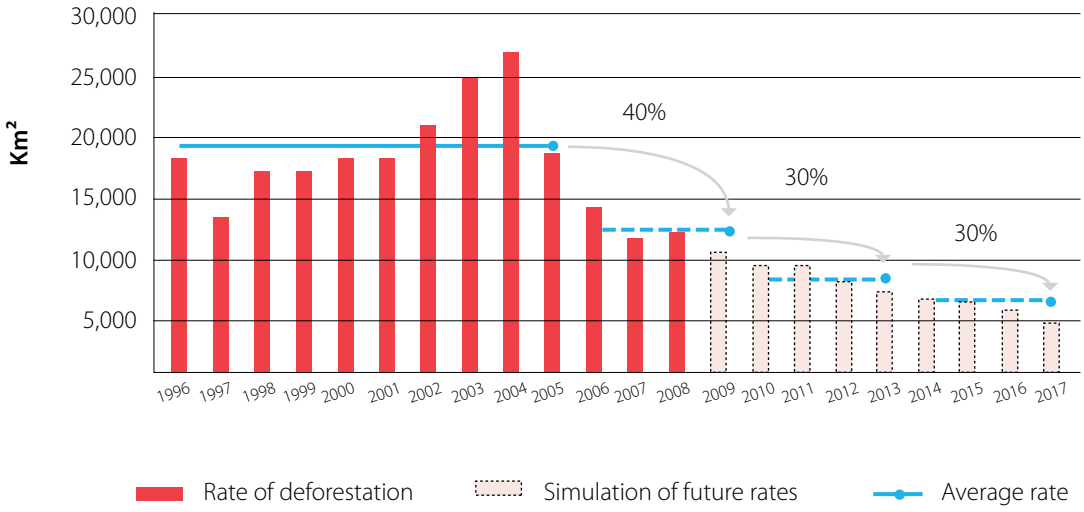

Figure 4.3. Deforestation rates, projected targets and a moving baseline for Amazonian deforestation within Brazil's National Plan for Climate Change

Source: PNMC (2008).

Environment Minister Carlos Minc estimates the total funding requirements at US $21 billion. The Norwegian government announces an initial donation of US $110 million to the Amazon Fund, with the intention of contributing up to US $1 billion over 10 years. The presidential decree also established a steering committee (Comitê Orientadora do Fundo Amazônia; COFA) for the Amazon Fund, composed of representatives from the federal government, Amazon state governments, industry, academia and civil society organisations.[50]

November 2008. The governors of Mato Grosso, Amazonas, Pará and Amapá participate in the Governors' Global Climate Summit in Los Angeles, where they sign MoUs with the US states of California, Illinois and Wisconsin. The MoUs pledge cooperation on climate change and commitments to developing regulations for reductions of deforestation to be used in US state compliance markets. During the event, the GCF is established to move forward in defining criteria for implementation of 'compliance-grade REDD' (EDF 2009).

December 2008. The Brazilian government launches the National Climate Change Plan (PNMC) on the eve of COP 14 in Poznań.[51] In general terms, the plan calls for a 'sustained reduction in deforestation rates ... in all Brazilian biomes' with the overall goal of reaching 'zero illegal deforestation', albeit at an underdetermined moment in the future. In particular, the PNMC establishes a goal of reducing Amazonian deforestation by 72% by 2017, in relation to a baseline of annual deforestation in the 1996—2006 period, resulting in a reduction of 4.8 billion tons of CO_2. As shown in Figure 4.2, an initial reduction of 40% would be achieved during the 2006—2009 period in relation to the 10-year 1996—2005 average. Additional reductions of 30% would be achieved in 2 subsequent periods, using an adjustable baseline. To achieve this goal, the PNMC calls for implementation of the PPCDAM to be strengthened, especially within its 'sustainable productive activities' component.[52] The plan also calls for the implementation of similar action plans in other Brazilian biomes, with improvements in capacities for monitoring deforestation and land use change.

June 2009. At a meeting of the Forum of Amazonian Governors in Palmas, Tocantins, the governors of the 9 Amazon states sign a letter to President Lula, stating support for zero

deforestation in the region and calling on the Brazilian government to support the creation of market-based REDD mechanisms. The letter proposes the creation of a task force with the support of the Federal Government, composed of specialists nominated by the Amazonian states, with the objective of proposing, within 30 days, recommendations to the president in relation to positions to be adopted at COP 15 in Copenhagen. Finally, the letter proposes: (1) the creation of a special institution within the president's office to coordinate preparation and implementation of a 'national system for reduction of emissions', involving federal, state and municipal governments, private sector and civil society organisations and (2) organisation of a mission of governors from the Amazon states to Copenhagen, led by President Lula, to 'present the vision of the Brazilian Amazon regarding priority guidelines for a new international regime on climate change'.

October 2009. The Interagency Task Force on REDD and Climate Change, created by President Lula in response to the Amazon governors' proposal, presents its first report, recommending that the Brazilian government adopt 'innovations' in its positions within the negotiating process of UNFCCC through support for 3 mechanisms of REDD financing: (1) governmental financing, (2) market mechanisms without compensation (carbon offsets) and (3) market mechanisms for REDD with compensations for emissions from Annex 1 countries.[53] The task force recommends that a compensatory mechanism for REDD be linked to 'incentives for Annex 1 countries to adopt targets and additional financial commitments, in the direction of a target of reductions of 40% by 2020'. The report also calls for precautions to ensure that 'efforts in the negotiation of a compensatory mechanism for REDD don't negatively affect non-market compensatory mechanisms and nationally-appropriate mitigation actions (NAMAs)'. These proposals received support from the Amazon governors at a meeting in Macapá, Amapá, on 16 October 2009. [54]

October 2009. At an interministerial meeting with President Lula to discuss formulation of Brazil's positions at COP 15 in Copenhagen, the Ministry of Environment presents a proposal that includes the recognition of NAMAs and REDD as compensation/offsets for emissions from developed countries, provided that: (1) developed countries assume targets for emissions reductions superior to 25% by 2020 in relation to a business as usual (BAU) scenario, and honour their financial commitments to the Adaptation Fund and mitigation actions in developing countries, and (2) developing countries honour their commitments to alter BAU trajectories, proposed at a 10—20% reduction by 2020. The Ministry of Environment proposal envisages the elaboration of NAMAs in 3 areas to secure counterpart funding for Brazil to reinforce its National Climate Change Plan in a manner that would allow for reductions of up to 40% by 2020, in relation to a BAU scenario. These NAMAs would include: (1) a Forest NAMA (REDD+ for Amazônia, Cerrado and Caatinga), (2) a NAMA to increase use of biomass and other renewables for the production of energy and (3) a NAMA for implementation of 'green' processing of iron ore (*siderurgia verde*) through use of charcoal from reforestation instead of native forests. The Forest NAMA would involve additional support for the PPCDAM, with the establishment of even more ambitious targets in relation to the National Climate Change Plan: i.e. a reduction of 42% in deforestation rates every 5 years, starting with the 2006—2010 period, using average annual clearing rates of 1996—2005 as a baseline. The proposed target would be a reduction of 80% in emissions from deforestation in the Brazilian Amazon by 2020, in comparison to the first reference period.

2007—2009. Initiation of pilot REDD initiatives in Amazon states (Mato Grosso, Pará, Acre, Amazonas, Rondônia, Amapá).[55]

2010. Congressional bill introduced to permit private landowners to market carbon credits from avoided deforestation. Establishment of civil society and technical working groups on REDD+ themes (finance, benefits-sharing and verification) to advise the Ministry of Environment in programme development.

A fundamental challenge for the success of REDD in the Brazilian Amazon is the creation of a policy

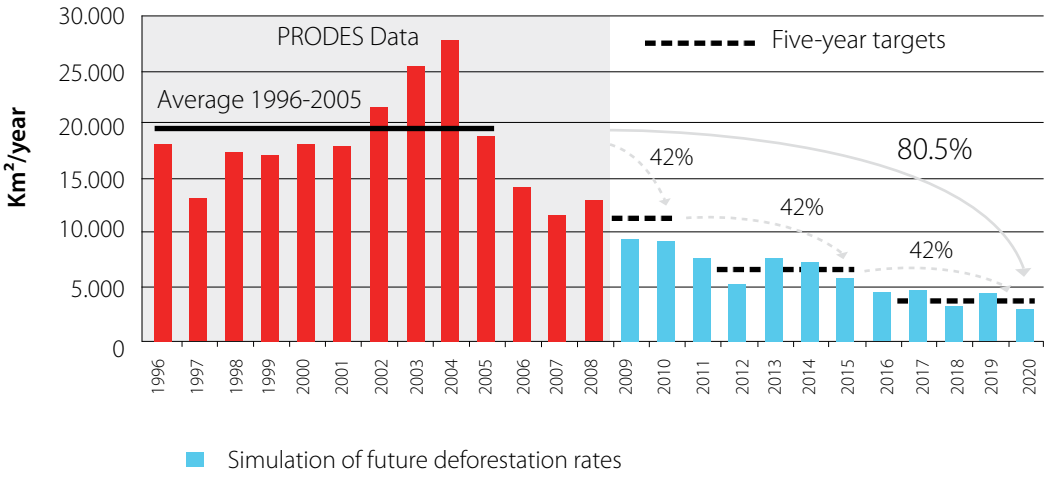

Figure 4.4. Five-year reduction targets in deforestation rates for the Legal Amazon

Source: Ministry of Environment (MMA 2009).

environment conducive to the conservation of forests, with due attention to such key issues as the rights of traditional communities, strengthening forest governance and addressing the drivers of deforestation. Such a favourable policy environment is clearly compatible with such goals as optimisation of financial resources and the avoidance of 'leakage' in the implementation of REDD initiatives.

It may be argued that the reduction of emissions from deforestation and degradation should be understood as a strategic objective for guiding a wide range of public policies, not merely as a mechanism to capture external sources of financial resources. In this regard, the valuing of ecosystem services of forests—such as climate regulation, hydrological regimes and biodiversity conservation—has yet to be sufficiently internalised within a series of relevant public policies in Brazil (MMA 2005). On the other hand, much can be achieved through the effective implementation of existing policies. Herman Benjamin, one of Brazil's leading experts on environmental law, has argued that the country's most important contribution to reduced global emissions from deforestation should be the implementation of the country's advanced environmental legislation, particularly the Forest code (Federal Law 4771/1965) and the legal framework for the national system of protected areas (SNUC; Federal Law 9985/2000).[56]

In recent years, important examples of advances in the creation of a favourable policy environment for promoting forest conservation and addressing the drivers of deforestation and degradation in the Brazilian Amazon have included the following, all of which are discussed above in this report.

A few events protesting against deforestation took place in Brasilia, mainly led by Greenpeace. The last of these took place in September 2009 with the aim of influencing the Brazilian delegation's position at COP 15 in Copenhagen. Besides these protests, some specific initiatives in Brazil have aimed to guide the implementation of the REDD+ regime. Examples include: the development of principles and criteria for REDD, and public hearings on these facilitated by Imaflora; REDD stakeholder meetings organised by the Katoomba Group; and the Sustainable Amazon Forum for supporting debate on REDD and forest issues (see Section 4.5.3).

Table 2. Summary of policy advances associated with REDD+

Policy advance	Dates or period
Development of state-of-the-art capacity in remote-sensing-based monitoring of deforestation in the Amazon, under the leadership of INPE	Since the 1980s
Creation of state-level institutions for developing and implementing conservation strategies	Since 2000
Launch of the Action Plan for the Prevention and Control of Deforestation in the Amazon Region (PPCDAM). Strategic lines of action were defined.	March 2004
Creation of more than 190 000 km^2 of new federal protected areas in the Brazilian Amazon, significant advances in official recognition of indigenous lands	2003—2008
Approval of amendment to federal law regarding the national system of protected areas (SNUC), allowing the federal government to establish special 'areas of provisional administrative limitations (ALAP)'	2005
Approval of the Public Forests Management Law (Law 11284/2006) and creation of the Brazilian Forest Service	March 2006
Launch of Plano BR-163 Sustentável, a pioneer initiative to integrate a major road paving project into a comprehensive sustainable regional development strategy	June 2006
Creation of the state of Amazonas' Climate Change Law (3135/2007), authorising REDD projects and payment for environmental services in the state	June 2007
National Pact to Value the Standing Forest and Reduce Deforestation, proposed by 9 NGOs to reduce deforestation to zero, presented to the Congress	October 2007
Presidential Decree 6321/07, establishing specific procedures to intensify efforts in combating deforestation in municipalities identified as 'hotspots' of forest clearing	December 2007
Resolution 3545 of the National Monetary Council, establishing requirements for proof of legitimacy of land claims and compliance with environmental legislation as a prerequisite for access to rural credit for agricultural and ranching activities in the Amazon biome	February 2008
Initiation of preparations for state action plans for prevention of deforestation under the aegis of PPCDAM in the states of Acre, Mato Grosso, Tocantins and Pará. As of September 2010, 7 states in the Amazon had their PPCDAMs finalised and Maranhão and Roraima were in the process of completing theirs.	May 2008
Acre announces the Policy for Valuing Forest Environmental Assets, with mechanisms for Payments for Environmental Services and incentives for REDD	September 2009
National climate change policy enacted, all Brazilian Amazon governors present their strategies for REDD at COP 15 in Copenhagen	December 2009

4.3. Consultation processes and multistakeholder forums

A multi-stakeholder forum that could conceivably play a significant role in the design of national REDD strategies is the Brazilian Forum on Climate Change (Forum Brasileiro de Mudanças Climáticas; FBMC), created during the Cardoso Administration. This forum, chaired by the president, provides nominal legitimacy to national climate policy as a multi-stakeholder forum. However, the FBMC has assumed primarily a rubber stamp function on behalf of the presidency. It has not yet taken on a significant role in the design of REDD+ policies. Consultation processes with NGOs and other stakeholders have occurred informally with some groups and state forums, including the Amazon governors; many Amazon

states have well-structured climate change forums in operation involving participation of diverse stakeholders.

There is a need to create participatory forums and spaces to address climate and the REDD debate in Brazil. FBOMS and the Climate Observatory (Observatorio do Clima) are good examples of spaces where national legislation and other relevant issues are discussed and members of civil society participate. They led the discussions on the National Plan and Policy for Climate Change, suggesting important topics and relevant issues to be considered by the ministries involved in their creation. However, the creation of forums to discuss state-level actions, in which stakeholders that will be directly affected can participate, is fundamental for REDD+'s effectiveness. Some of the state governments in the Amazon, including Acre and Mato Grosso, have structured such forums, while others have done so only on paper.

4.4. Future REDD policy options and processes

The following points address key issues and debates in Brazil regarding strategic priorities and risks for implementation of REDD+ in the Amazon region.

Addressing the drivers of deforestation. As indicated above, there has been relatively little discussion in Brazil to date about how REDD+ funds may be linked to an overall strategy to address the causes or drivers of deforestation, apart from state PPCDAM plans, whose financial basis for implementation remains to be defined. Although the strategic guidelines of the Amazon Fund mention the need for compatibility of project funding with PPCDAM, it is not clear to what extent the fund will meet this key challenge at the federal and state levels,[57] especially when considering its role as a complement to other key policy initiatives. It may be argued that a strategic priority for the Amazon Fund could be to support 'pacts' between different stakeholders at the local and regional levels, in order to facilitate the collective construction of solutions to address the underlying causes of deforestation and forest degradation, while promoting sustainable alternatives. Such 'pacts' could be a means to integrate REDD, PPCDAM and recent initiatives in territorial planning, such as the *Territórios da Cidadania*, a federal government programme managed by the Ministry of Agrarian Development to promote economic development through regional governance and channelling of infrastructure and capacity support (Araújo personal communication).

Traditional populations and forest conservation. Given the fundamental roles of indigenous peoples and other traditional populations—such as extractivists and riverine communities—in conserving large contiguous areas of forests in the Amazon, it has been argued that such contributions should be recognised within initiatives such as REDD+ (c.f. Nepstad *et al.* 2007). In this regard, key questions have been raised in relation to: (1) the relationship between REDD+ and fundamental needs for land tenure security among indigenous and other traditional populations; (2) the importance of strengthening collective management of natural resources based on traditional knowledge; (3) challenges for REDD+ mechanisms, such as the Amazon Fund, to reach isolated forest communities and provide appropriate support for grassroots initiatives, including capacity-building and empowerment; and (4) need for REDD+ programmes to contribute to strengthening the subsistence base and income-generating capacity of local communities, avoiding risks of new forms of dependence on external funding. Finally, it has been argued that free, prior and informed consent should be carried out among traditional populations with regard to REDD projects that affect their territories and adjacent lands (Griffiths 2008, Leroy 2009).[58] As discussed in Section 2.3.1, rights of indigenous groups over carbon in the forests they protect or manage remains contentious because indigenous areas are part of the public patrimony, although several projects to test this principle are under discussion.

REDD+ and protected areas. It has been estimated that the recent expansion of protected areas (conservation units and indigenous lands) in the Brazilian Amazon is responsible for as much as 37% of the significant reduction in deforestation rates between 2004 and 2008 (Soares-Filho *et al.*

2008). Furthermore, it has been calculated that the combined protected areas of the Amazon may represent a reduction in carbon emissions until 2050 in the order of 8 billion tons, or 3 times the target of the Kyoto Protocol (Soares-Filho *et al.* 2010). Such estimates provide compelling arguments for including protected areas among the beneficiaries of REDD+ funds. However, discussions on appropriate strategies to support protected areas within the context of REDD initiatives have only recently begun.[59]

REDD+ and avoided deforestation. In Brazil, considerable debate has emerged over how concepts of 'compensated reduction' and 'avoided deforestation' should be applied to the distribution of REDD credits among individual states and private landowners (Chiaretti 2009). In the former case, critics have argued that REDD credits tend to be biased towards states with elevated historical rates of deforestation, such as Mato Grosso, and against those where forests have continued largely intact, such as Amazonas. An emerging consensus is that both types of situations (compensated reductions and maintenance of stocks) should be considered in REDD+ programmes.[60] Recent proposals to 'compensate' individual landholders for avoided deforestation as part of REDD+ mechanisms have raised the following questions:

- Given that a significant percentage of deforestation is practised by occupants of public lands without legitimate titles, including land grabbers (grileiros), wouldn't REDD programmes become engaged in 'paying the criminals'?61
- Should private landowners be paid to comply with the Brazilian Forest code, in terms of maintenance of legal forest reserves and areas of permanent protection (APPs), or should REDD credits be restricted to properties that can ensure additionality in this respect (i.e. that include protected areas beyond the existing requirements for Legal Reserves and APPs on private landholdings)?
- How would issues of permanence be addressed in 'compensated reduction' schemes on individual landholdings, given the ephemeral character of REDD+ payments? In a post-REDD+ scenario, to what extent would government budgets have the capacity to cover such payments to landholders?
- To what extent has enthusiasm over the prospect of international REDD+ schemes tended to divert attention from needed reforms in existing public policies, to the extent that these can also promote sustainable management and maintenance of ecosystem services of forests (local and regional climate, hydrological regimes, biodiversity conservation)?
- How to ensure against leakage, whereby economic activities associated with deforestation, such as beef production, simply migrate elsewhere to attend market demands?
- How to achieve the goal of ensuring the greatest possible area be incorporated into REDD+ activities, to reduce future threats of deforestation, while at the same time ensuring adequate response to the needs of low income communities who rely on forest use for their livelihoods? (The issue of benefits sharing in the context of the '3Es' is discussed in detail in Section 5.)

According to Hermann Benjamin (op cit.), an additional risk associated with the creation of new schemes to pay individual landholders for avoided deforestation and environmental services is the creation of a legal precedent for artificially inflating property values, in a manner that renders land expropriations for establishment of protected areas prohibitively expensive.[62] However, there is no indication that the government would pursue massive expropriation to create additional public protected areas as a REDD+ strategy, primarily because it costs too much: if you can convince land users to reduce deforestation using disincentives to do otherwise, it might be possible to achieve similar results without necessitating creation of additional reserves.

REDD+ in the regional economy. It may be argued that REDD+ payments aimed at simply substituting economic activities linked to deforestation and forest degradation will tend to generate negative impacts on employment and local economies, given multiplier effects of conventional activities such as the timber industry. This argument is compatible with the notion that a strategic priority of REDD+

should be to support processes of *economic transition* from extensive practices of resource use, such as high-grading of timber and cattle ranching, towards activities based on the sustainable use of forest biodiversity and value added through local processing industries, with due attention to addressing long-standing bottlenecks (CGEE 2009, Miccolis 2008). However, it should also be considered that REDD could induce a transition from extensive to more intensive practices in traditional activities. As cattle ranching is by far the most important source of GHG emissions in the Amazon, a concentration of REDD resources on cattle production intensification through improved pasture and herd management seems a more appropriate first step.

REDD+ and timber-based forest management. At the international level, there has been considerable debate over whether timber-based forest management, especially at the industrial level, should be included within REDD+ programmes. In particular, questions have been raised about the extent to which management plans in tropical forests can be classified as sustainable, and whether support of improved management would serve to provide additionality. In the Brazilian case, relevant challenges for REDD initiatives would also include improvements in technical assistance, monitoring of management plans and support for expanding independent certification mechanisms.

REDD+ and reforestation/afforestation. There is a need for further debate in Brazil regarding the inclusion of reforestation and afforestation in future REDD+ mechanisms. There appears to be considerable agreement in Brazil that reforestation must not involve conversion of native vegetation to planted forests, and that reforestation should be conducted with native species that are environmentally appropriate, where the goal is restoration of degraded sites that will compose part of a landowner's Legal Reserve. This topic is relevant to current discussions on implementation of the Brazilian Forest code.

Strengthening forest governance. Many recent studies and proposals have emphasised that REDD+ initiatives should be linked to the strengthening of forest governance in such areas as multi-stakeholder dialogue, institutional coordination, enforcement of forest legislation, transparency and capacity-building among local communities (Pacto Desmatamento Zero 2007, ICV 2008, 2009a, 2009b). In this regard, the management of the Amazon Fund poses important challenges, especially in terms of outreach to isolated local communities, with appropriate support for mobilisation and participation from the initial phases of planning. An encouraging advance introduced by NGO members of the fund's oversight committee (COFA) is the creation of a small grants facility for community-level projects and networking on REDD+, which will be administered by one or more separate fund managers.

Project monitoring. Within the Amazon Fund, much remains to be defined in terms of strategies for monitoring projects, particularly with regard to: (1) methods for estimating impacts on emissions from deforestation and degradation, with due consideration to potential countervailing forces in project areas, such as land speculation, inadequate law enforcement and market demands for beef and agricultural commodities; (2) monitoring complementary project objectives, such as capacity-building, biodiversity conservation and strengthening of local livelihoods; (3) use of monitoring and evaluation systems as strategic tools in the management of individual projects and the Amazon Fund in general, as opposed to mere bureaucratic exercises and (4) strategic coherence between Amazon Fund-supported activities and the remainder of the BNDES portfolio, which otherwise work at cross purposes.

Reducing emissions in other biomes. Notwithstanding the importance of the Amazon, there has been increasing debate in Brazil on the importance of reducing emissions in other biomes, especially the tropical savannah or *cerrado.* Because of this, Brazil has committed (under the Copenhagen Accord) to reduce emissions from deforestation in the *cerrado* biome by 40% from the anticipated trend to 2020. A new study by the Ministry of Environment has revealed that deforestation in the *cerrado* averaged 21 000 km^2 during the period 2002—2008—significantly higher than in the Amazon. During this period, the

cumulative area cleared increased from 41.0% to 48.2% of the total area of the biome (approximately 2 million km^2). Currently, GHG emissions from deforestation and land use change in the *cerrado* are similar to those of the Amazon biome. Major drivers of conversion of the *cerrado* include cattle ranching, mechanised soybeans and other export-oriented agricultural commodities.[63]

4.5. Financing REDD+ in the Brazilian Amazon

A high degree of uncertainty persists regarding the potential supply and effective demand for REDD+ funds in the Brazilian Amazon. On the demand side, it may be argued that new external sources of REDD+ funding should be linked to more efficient use of existing sources of domestic financing for activities such as implementation of protected areas (WWF-Brasil 2009).

Much of the controversy over REDD in Brazil has centred on the appropriateness of linking mechanisms of 'compensated reduction' to international carbon markets.[64] Similarly to debates on REDD+ at the international level, most critiques in Brazil have focused on: (1) the potential danger that a massive influx of REDD+ credits might depress international prices of carbon, making it unviable to cover the costs of emissions reductions through this means; (2) potential risks of industrial countries of using relatively cheap forest carbon credits as a means to circumvent urgently needed transitions to low carbon economies; and (3) difficulties in ensuring additionality, permanence and prevention of leakage.

Despite such ongoing controversy, there is growing agreement that if REDD+ is linked to carbon markets, safeguards such as maximum levels of fungibility will be needed in order to avoid potential conflicts with efforts to promote transitions to low-carbon economies in Annex 1 countries and a flood of cheap forest credits on the international market. Moreover, some NGOs have proposed minimum levels for use of REDD+ credits by industrialised countries in carbon markets, as a means to ensure more reliable sources of financing.

A still unresolved issue of debate in Brazil is whether access to international REDD funding should be mediated by a national mechanism such as the Amazon Fund, or if state governments and even individual projects should be allowed to access funds individually through cap-and-trade agreements involving forest carbon markets, along the lines suggested by the Forum of Amazonian Governors and the GCF.

There has been relatively little discussion in Brazil regarding the inherent unsustainability of REDD+ over the medium to long term, assuming that carbon offsets on the international market are linked to mechanisms of 'compensated reduction' that employ a periodically adjusted historical baseline. Alternative sources of long-term funding for REDD or REDD+ in Brazil, such as a tax on fossil fuels (exemplified by Norway's contribution to the Amazon Fund), have not yet been subjected to significant debate. The post-COP 15 commitments by developed countries regarding the provision of transitional voluntary support of REDD+ have at least temporarily assuaged this concern. However, the difficulties of reaching consensus among parties on the nature of the REDD+ partnership agreement has created some pessimism about the real prospects for significant financing.

Finally, another topic that has received scant attention in Brazil concerns demands and opportunities for financing 'readiness' over the short to medium term, including capacity building and measures to address drivers of deforestation. In this regard, a Ministry of Environment proposal for counterpart funding for NAMAs for 'early action' initiatives such as strengthening implementation of the PPCDAM is particularly relevant.[65] Furthermore, although not explicitly set up for this purpose, projects financed by the Amazon Fund have in many cases focused on building local capacity to manage land use, licensing and title regularity—in other words, 'REDD-readiness'. Brazil's poor prior performance in executing its commitments under such major endeavours as the G7 Pilot Program suggests that difficulties will arise during implementation of REDD+.

The Foreign Ministry was the principal actor in maintaining the line adopted in Nairobi, but it

Box 2. The Amazon Fund

Launched in 2008, the Brazil Amazon Fund aims to combat deforestation and promote sustainable development in the Amazon. The fund's creation responded indirectly to Brazil's gradual acceptance of REDD as a worthy approach for climate mitigation, counteracting the country's ongoing national sovereignty objections to any multilateral efforts to control forest land use that date back to the Rio accords. In both Nairobi and Bali, Brazilian negotiators presented an approach for 'compensated reduction' in deforestation that would reward national (and eventual subnational) performance in abating deforestation related emissions, against a 10-year baseline. Compensation payments would be derived, according to this approach, from donations from public or private sources to a central fund, with no direct relationship to the carbon market. Despite initial scepticism regarding the potential to attract funding, the idea caught the interest of the Government of Norway—sceptical about the efficacy of the carbon market to finance deforestation avoidance—and later Germany.

Given negotiators' antipathy towards the fund-based donation approach, Brazil has since shifted towards a more flexible approach, involving eventual access to the carbon market and subnational project architectures. The fund will undoubtedly play a transitional role in REDD-readiness, but there is strong pressure from within Brazil to extend financing towards the broader use of market instruments.

The Amazon Fund has so far received a pledge for up to US $1 billion from the Government of Norway, contingent on achieving reduced rates of deforestation. To date, US $110 million has actually been disbursed to the fund for a first round of projects. However, although more than 60 projects were tallied, only 5 projects had been approved by the end of 2009, leading to concern among donors as to whether Brazil is in fact 'REDD-ready' to move forward on efforts to reduce deforestation.

The Brazilian National Bank for Social and Economic Development (BNDES) is managing the fund as part of its revamped environmental portfolio. This role constitutes a significant change of mission for BNDES, whose profile has otherwise been to finance major public and private infrastructure and investment projects in Brazil and other Latin American countries. BNDES is one of the world's largest national development banks, with annual loans exceeding those of the World Bank globally. It is not a signatory of the Equator Principles, and has had a dismal environmental record over the past decade, having recently been responsible for a number of substantial operations in the cattle industry, having contributed to pasture expansion and deforestation in the Amazon. The Amazon Fund represents part of BNDES' efforts to 'green' its image.

The fund can finance the sustainable use of forests, recovery of deforested areas, conservation and sustainable use of biodiversity, plus environmental control, monitoring and enforcement. Most projects submitted to date include a mixture of these activities, with a substantially greater emphasis on restoring degraded landscapes, enhancing sustainable forest products and enforcing forest codes than on avoiding deforestation through trial payments schemes. Grant awards follow guidelines established by a steering committee (COFA), which includes civil society representatives, but actual grant decisions are being made by BNDES staff (see http://www.amazonfund.gov.br/ for further details on fund management, including a listing of initial projects approved and in the pipeline). Project proposals may be submitted by public institutions, state-owned companies and NGOs. A number of proposals have been submitted by private enterprises; however, a decision was made by a COFA subcommittee to deny grant support for profit-making enterprises. Although international donors will have no direct influence over the award and use of grants, the Government of Brazil has declared that the operations of the fund will be 'results based, transparent and independently monitored'. However, the process through which projects have been selected for approval has so far been seen as a 'black box' by both Brazilian and Norwegian observers. **

* This box is largely equivalent to May (2009).
** 'What can we learn from the Brazilian Amazon Fund?' Summary of public seminar in Oslo, Norway, 28 May 2010.

appears the Ministry of Environment has been able to effectively argue (with the support of the Ministry of Finance) that additional resources could be assured if partial financing from the compliance market could be channelled into REDD+. This accounts for the shift towards a more flexible position on reduced deforestation and related emissions offsets. The issue of subnational projects and state REDD+ programmes will certainly make any such compliance-related commitments more difficult to measure. Since there continues to be greater capacity and engagement among state governments in the Amazon than at the federal level, this is the likely direction for the near future.

4.5.1. Monitoring, reporting and verification (MRV)

As shown in Section 1, Brazil is one of the most advanced countries in the world in terms of its capacity to monitor its forest resources using remote sensing and GIS technologies. Since the creation of INPE in the mid 1970s, the federal government has invested in developing institutional capacity to monitor forests, especially in the Amazon region, based on remote sensing.

Most Brazilian proposals have pointed to INPE and SIPAM as the institutions that would assume responsibility for MRV in REDD. However, the need to develop local monitoring and enforcement systems remains. Furthermore, the more accurate PRODES satellite measurements, developed by INPE to monitor the Brazilian Amazon, have to date not registered vegetation restoration: once land is registered as deforested, it remains in this category. Other data sources have not been made consistent, such as the national emissions inventory for UNFCCC, which is expected to be updated in 2010 from the original 1990—1994 inventory to 2005.

INPE representatives signed at Copenhagen (COP 15) an agreement with the FAO for capacity building and training people in developing countries to analyse satellite images obtained using the PRODES method. The idea is to build capacity among developing countries on how to monitor their forests.[66]

Reference levels in Brazil have been defined primarily based on the proposal for compensated reductions initially presented in Nairobi, in which a 10-year moving average has been set as the baseline. This would enable crediting of reductions over future years as a basis for voluntary commitment and financing.

4.5.2. Benefit sharing

Brazil has no official proposals for benefit-sharing mechanisms. However, there are some incipient initiatives for sharing benefits and costs such as those developed under the auspices of FAS. First, it is relevant to cite in this context a study by IPAM, presented at COP 13 in Bali. This study had an influence on the REDD debate in the National Congress and was one of the reasons the pact for zero deforestation was adopted with the involvement of environmentalists in the Congress. The study envisages the following 3 major components for sharing benefits and costs of a REDD programme (Nepstad *et al.* 2007).

1. A Public Forest Stewardship Fund to compensate indigenous and traditional communities, with the goal of increasing the viability of forest-based livelihoods and strengthening their role as forest stewards. Payments would be tied to performance. Providing all the approximately 150 000 forest steward families living in 'social' reserves (indigenous lands, extractive reserves, sustainable development reserves) with the equivalent of half a minimum annual salary (US $1200 per year) would cost US $180 million per year. Another US $13 million would be needed to support these groups in perimeter patrol of their reserves. Annual compensation equivalent to half a minimum salary would enable an additional 50 000 smallholder families (US $60 million per year) living in government agricultural settlements to restore forests on degraded land as they shift to high-carbon, stable production systems. Payments would decline over time as forest stewards shift to forest-based economies.

2. A Private Forest Stewardship Fund, to give current legal private landholders partial compensation (20%) for the opportunity costs of

any of their private land forest reserves that are required for compliance with the law, and higher compensation (100%) for the opportunity costs of any of their private land forest reserves in excess of the legal requirement. It assumes that half of the forests that are cleared each year in the Brazilian Amazon are privately and legally owned. Annual compensation of private forest stewards would begin at US $9 million, climbing to a maximum of US $90 million after 10 years. Thereafter, payments to private forest stewards would decline as the pool of legally owned, uncompensated private forest land diminishes.

3. A Government Fund. IPAM estimates the annual added costs of monitoring, protecting and managing existing public forests at US $25 million, with an additional US $8 million per year to establish new public forests. The development of a private forest monitoring and licensing system would cost US $16 million per year to establish and implement. Additional services to forest steward families beyond current levels of support (an added US $700 per family per year for improved education, health, justice and technical assistance services) would cost an additional US $140 million per year for 200 000 rural families. Total additional annual government fund outlays would be up to US $190 million per year.

Opportunity costs in the study are calculated using spatially explicit models of potential rents from soy, cattle and timber production; the resources budgeted assume these funds would only be applicable in areas under significant threat of deforestation.

Given the power structure of Brazilian politics, any approach that fails to explicitly provide mechanisms to permit some measure of compensation for avoiding deforestation for the largest sources of deforestation, whether on public or private lands (i.e. cattle ranches), is unlikely to gain the necessary support. The specific share of resources that is allocated to this central task in relation to 'social' mechanisms, as described in the IPAM proposal, will need to be determined through stakeholder negotiation. Such processes are underway in the formulation of state plans for avoided deforestation, such as in Mato Grosso.

Despite this study and other relevant proposals under discussion, the Brazilian government does not yet have a clear position on how benefit-sharing mechanisms will work. Some states, however, have initiated actions on benefit sharing for REDD+ projects and programmes. One good example is the state of Amazonas, which has adopted incipient strategies for sharing avoided deforestation benefits, including investments in monitoring, new technologies, research and the renowned Bolsa Floresta Program, with the aim of generating such co-benefits as adaptation and biodiversity conservation.

Bolsa Floresta, administered by FAS, has implemented 3 main categories of benefit sharing: (1) compensations (benefits to cover the costs involved in implementing REDD+, as payments for environmental services); (2) incentives/rewards (benefits to motivate conservation actions, as social benefits) and (3) interventions (investments necessary to allow REDD+ to become effective, such as legal and technical support). The programme has secured both private and public funding and is seen as an inspiring example for benefit sharing. However, there is a need to construct better processes of participation to enable forest managers to identify the type of benefits and the instruments to distribute them that would best motivate aversion of further forest losses (Gebara in press).

It is important to note that many of the areas benefited by Bolsa Floresta are in areas under little pressure from land use change. Therefore, payments may not be considered as compensation for 'additional' measures to alleviate deforestation pressures, but rather as a reward for those who have sustained forest permanence over the years. In other parts of the region, there is greater divisiveness regarding who should be the target of REDD+ payments, and what outcomes such decisions might have in terms of both equity and efficiency in promoting REDD+. In Mato Grosso, where agribusiness interests are by far the dominant voice in local politics, REDD+ benefits have sparked considerable interest among those who express little willingness to avoid future deforestation without substantial compensation. However, it is difficult to justify magnanimous

payment schemes to actors who have already for the most part exceeded the limits set by law. Distribution of REDD resources to low-income groups such as colonists and agro-extractivists would be more equitable, but would not make a significant dent in meeting REDD targets (Corbera *et al.* 2010).

4.5.3. Proposed participation mechanisms

There have been some initiatives for participation mechanisms within the REDD debate. These are still in the readiness stage, where proposals on how REDD+ should be implemented are being developed. Following are some examples.

The Latin America Forum on REDD (Foro Latino Americano de REDD). Officially launched in February 2009 during the first Workshop on South—South Cooperation for REDD. The coordination of the forum is under the auspices of FAS. It has as its objective the promotion and exchange of information on REDD+ implementation among Latin American countries. For more information, see www.forumredd.org.

Workshops for representatives of forest peoples. Since 2008, after COP 13, workshops for REDD+ debate that involve representatives of forest peoples have been held in Brazil. Examples include: the Latin America Workshop in Manaus organised by the Forest Peoples' Alliance in April 2008, during which the Manaus Declaration with principles for REDD+ was issued;[67] South—South Cooperation for REDD, where workshops are organised from time to time to promote REDD+ dialogue among Latin American countries; and the seminar on Climate and Forest held in Belém in October 2009, which resulted in the 'Belém Letter', which rejected REDD+ financing mechanisms linked to the carbon market.[68]

REDD+ training sessions organised by the Institute for Conservation and Sustainable Development of Amazonas (Idesam) in 2008 to promote REDD+ readiness.

Sustainable Amazon Forum (Forum Amazonia Sustentavel). Created in Belém in 2007 with the mission of mobilising representatives of diverse social segments to promote dialogue, cooperation and synergies for a more sustainable Amazon. The forum establishes different working groups to discuss REDD and forest managers' rights, among other topics.

The construction of the principles and criteria for REDD+ design and implementation, through a wide-ranging consultation process in principal Amazon states facilitated by Imaflora, and coordinated by GTA and IPAM.[69]

All these meetings have recognised that effective REDD+ implementation will depend on interactive participation and free, prior and informed consent of forest managers. Moreover, they also highlighted the need to create legal benefits for forest managers, and to resolve questions about land tenure and property rights.

4.5.4. Policies and institutions

The implementation of some institutional arrangements is already underway, such as the Amazon Fund, the state climate change policy in Amazonas and institutionalisation of government bodies for REDD+ in the states of Amazonas and Acre. These institutions are supporting the implementation of REDD+ in terms of channelling financing and creating benefit-sharing mechanisms with the goal of creating benefits ranging from legal to monetary.

The main challenge for deforestation in Brazil, however, is the resolution of land tenure problems, which are at the root of social and environmental conflicts. Deforestation in Brazil is a result of policies that motivate agribusiness and economic development through the exploitation of natural resources. There is therefore a need to change incentives through policies that aim to value the standing forest (Hall 2010). REDD+ has a key role to play in achieving this, but it will be much more effective if there is agreement among ministries involved in forest governance and a reformulation of the Forest code.

It is also important to create policies on the demand side that prohibit the import of any forest resource

that has been produced or acquired in an illegal manner. The FLEGT Action Plan, in Europe, is a good example of this type of initiatives, but more forestry law enforcement is needed internationally, especially in countries that have recently increased their demand for forest resources, such as China.

4.5.5. Policy learning

Pilot REDD+ and PES programmes and projects in Brazil could help in policy learning for REDD+ implementation. Among several incipient initiatives worth examining are the Proambiente programme and the Juma REDD project in Amazonas.

The Proambiente programme was jointly conceived by environmental NGOs and community groups in Brazil's Amazon region. This 'Programme for the Socio-Environmental Development of Rural Family Production' compensates participating families for the environmental services they provide to Brazil and to the world (Hall 2008). However, Proambiente's 3 years of experience, as argued below, demonstrate that many challenges remain in terms of PES schemes in Brazil.

As Hall (2008) has analysed, the first hurdle is the lack of legal recognition at the federal level in Brazil of the concept of environmental services and their economic value. Another set of issues concerns the compatibility of Proambiente with other government policies for small producers and the extent of cooperation among relevant ministries and implementing agencies, such as the National Programme for Strengthening Family Farming (PRONAF), implemented by the Ministry of Agrarian Development. Furthermore, there has been almost no effective monitoring, quantification or certification of such services, nor systematic impact evaluation. Rather, the programme has operated on the basis of trust and a general, somewhat impressionistic, appreciation of the overall beneficial nature of participants' activities. For this reason, the additionality of these activities to the achievement of net carbon emissions reductions cannot be readily verified.

As the first project implemented as part of Bolsa Floresta (see Section 4.5.1), the Juma REDD project was also the first nominal REDD project in Brazil. Juma is jointly implemented by the state of Amazonas, FAS and the Institute for Conservation and Sustainable Development of Amazonas (Idesam), with financial support from Marriott International. The project has a diversified institutional arrangement which distributes responsibilities and implementation actions among different organisations. FAS, for example, is responsible for implementing the project benefit-sharing mechanism for compensations and incentives (Bolsa Floresta). Marriott and the state are responsible for financial inputs and Idesam (together with other state organisations) for technical issues.

Juma has overcome Proambiente's problems with financing, having secured support from domestic and international, private and public sources, as well as having secured the necessary legal arrangements for its implementation (Vianna 2009). Brazil's first legislation to value the standing forest was enacted by the state government of Amazonas, which in June 2007 introduced a law on climate change, environmental conservation and sustainable development (Amazonas state Law n. 3135/2007[70]). The law defined environmental services, created more than 30 protected areas in the state and regularised land tenure of some beneficiaries. However, some pitfalls have become apparent, including a low level of participation of affected forest peoples in both the formulation of the project and its enabling legislation, inefficiency of some benefits implemented (such as direct payments) and lack of social monitoring (Gebara in press).

The lessons from these 2 experiences are that there exists a need for agreement between subnational and federal initiatives for reducing emissions. Specification of appropriate institutional arrangements—including creation of new institutions and new legislation where necessary—is essential to guarantee legality and efficiency, as well as participation of those directly affected.

It is also worth noting here that, given the complex and diverse relations and issues that deforestation entails, REDD+ may need to adopt a more multidimensional approach for implementing benefits on the ground (Gebara in press). As

schemes such as REDD+ should target areas that are at greatest risk to effectively reduce emissions from deforestation and degradation (Hall 2008, Wunder 2008), benefits for these areas will need to be targeted so as to best reflect their respective conservation efforts and costs. At the same time, a multidimensional approach would include benefits for 'good custodians' based on their requirements for continuing to conserve their habitat, although they will not incur substantial costs in doing so. The implementation of these benefits is essential to confront equity dilemmas, recognising the role of such peoples in forest conservation, and avoiding perverse incentives that could increase pressures in low deforestation areas in the future (Richards and Jenkins 2009).

Other initiatives also are beginning to yield results. The availability of financing from the Amazon Fund and interest among international private donors in supporting the construction of national REDD+ strategies have stimulated the development of new projects. One limiting factor has been the lack of definition of subnational crediting; another has been the absence of clear criteria for certifying reduction against baselines. The following partial list of projects identified by CIFOR researchers engaged in the Global Comparative Study on REDD+ provides a sample of this diversity (Table 3).

Table 3. Subnational forest carbon projects in the Brazilian Amazon (as of August 2010, identified by CIFOR)

Project	State	Implementing institutions	Objectives	URL
Acre State Project for Ecosystem Service Payments	Acre	State of Acre	AD, Adg, RS, AF	http://www.ac.gov.br/index.php?option=com_docman&task=cat_view&gid=44&Itemid=165
WWF Forest Carbon Network Initiative	Acre	WWF, SKY	AD	http://www.worldwildlife.org/what/howwedoit/conservationfinance/Approaches%20to%20Financing%20Conservation.html; http://rainforestrescue.sky.com/
Amazon Reserve rainforest protection, Brazil	Amazonas	Willow Rivers	AD, Adg	http://www.willowrivers.com/sustainableforestry-management-rainforest-protectionamazon.shtml
Apuí Mais Verde Project	Amazonas	Idesam	AD, AF	http://www.idesam.org.br/projetos/apui.php
Southern Amazonas Project	Amazonas	Idesam	AD, Adg	http://www.idesam.org.br/projetos/sulam.php
Bolsa Floresta Program / Amazonas Sustentável Foundation	Amazonas	FAS	AD, Adg	http://www.fas-amazonas.org/pt/secao/programa-bolsa-floresta
Juma Reserve RED Project	Amazonas	FAS	AD, RS	http://unfccc.int/files/methods_science/redd/application/pdf/pdd_juma_reserve_red_project_v5.0.pdf
Avoided Deforestation on Small Rural Properties in the region of the Transamazon Highway	Pará	IPAM, Foundation Live, Produce, Preserve, FUNBIO	AD	http://www.forestcarbonportal.com/pipeline/avoided-deforestation-small-rural-properties-region-transamazon-highway
Calha Norte	Pará	State of Para (SEMA), Imazon, CI, MPEG	AD, Adg	http://www.pa.gov.br/portal/idesp/downloads/Anexo_1_Projeto_Piloto_REDD_Calha_Norte.pdf
Ecomapua	Pará	Ecomapua	AD, Adg, RS, AF	www.ecomapua.com.br
Peabiru Institute	Pará	Instituto Peabiru	RS, AF	http://www.peabiru.org.br/2008/floresta_alimentos.htm
RainTrust REDD	Pará	RainTrust Foundation, Winrock International	AD	http://www.winrock.org/fact/facts.asp?CC=6106&bu=

Project	State	Implementing institutions	Objectives	URL
REDD in São Félix do Xingu Municipality, Pará	Pará	TNC	AD, Adg	http://www.nature.org/initiatives/climatechange/files/brazil_redd_fact_sheet_final.pdf
Rio Guamã Project	Pará	Terra Indígena Alto Rio Guamá, FUNAI, C Trade	AD	http://c-tradeweb.com/wp/projetos/redd/
Mapuera Project	Pará	TI Nhamunda and Trombetas Mapuera, C-Trade, SEMMA, POEMA	AD	http://c-tradeweb.com/wp/projetos/redd/
Genesis Forest Project.	Tocantins	Carbon Fund	RS, AF	http://www.climate-standards.org/projects/files/tocantins/ccba_pdd_tocantins_redd_v_1.pdf
Surui Paite: Capture Carbon with Reforestation	Rondônia	Forest Trends, Ambiental PV, Rede Povos da Floresta, Amazon Conservation Team, Instituto Kaninde	AD, AF	http://www.overbrook.org/newsletter/03_09/pdfs/env/Katoomba_Group.pdf
Cinta Larga	Rondônia	Viridor	AD	http://viridor.net/project-brazil
Alto Teles Pires Carbon Project REDD+	Mato Grosso	TNC	AD, AF	
Mato Grosso REDD demonstration site	Mato Grosso	TNC, ICV, State Government of Mato Grosso	AD, Adg, RS, AF	http://www.nature.org/initiatives/climatechange/files/brazil_redd_fact_sheet_final.pdf
Ouro Verde Institute Project	Mato Grosso	Approved by Amazon Fund	RS, AF	http://www.ouroverde.org.br/
Peugeot/ONF Carbon Sink: Reforestation project at the Amazonian	Mato Grosso	PSA Peugeot Citroen Group, L'Office National des Forêts	AF, AD	http://www.reflorestamentoecarbono.com.br/novo/portal/
Poço de Carbono Juruena	Mato Grosso	Prefeitura municipal de Juruena	AF	http://www.carbonojuruena.org.br
Prolifico Foundation avoided deforestation	Mato Grosso	Prolifico Foundation	AD	http://prolificofoundation.org/
Reforestation in Xingu Region	Mato Grosso	Alianca da Terra, IPAM	Ad, Adg, AF	http://www.aliancadaterra.org.br/
Securing protection of Kayapó Indigenous Territories in the southeastern Amazon; Xingu Socio-Environmental Carbon Project	Mato Grosso	CI, EDF, Wild Foundation, Associação Floresta Protegida (AFP), Instituto Kabu (IK), ICV, Instituto Socioambiental (ISA), FUNAI, IPAM, WHRC	AD	http://icfcanada.org/kayapo.shtml http://www.conservation.org/Documents/CI_REDD_Lessons_Learned.PDF

AD = Avoided deforestation, Adg = Avoided degradation, AF = Af/reforestation, RS = Restoration
Note: CIFOR's Global Comparative Study on REDD+ is engaged in a detailed baseline assessment of a sample of these projects, as well as a less detailed survey of projects in execution in a wider number of projects in Brazil and other countries in Latin America, Africa and Asia. For further details see www.forestsclimatechange.org.

Source: GCS-REDD+, Component2, please send corrections and comments to Liwei Lin, llin@ncsu.edu

5 Implications for the 3Es

5.1. 3Es, national policies and policy option

This chapter considers the implications of REDD+ strategy for the '3Es' of forest policy implementation in developing areas: efficiency, efficacy and equity. That is, to what extent is the chosen strategy likely to result in an *efficient* (lowest cost per ton of carbon) basis for reduction in emissions from deforestation and degradation? Is the strategy likely to be *effective* in terms of the total volume of carbon whose emissions are avoided? To what extent does this strategy respond to concerns for *equitable* distribution of benefits from the proceeds of local efforts towards global climate mitigation, to the extent that these strategies incorporate compensation measures?

As shown in Section 1, deforestation trends in the Brazilian Amazon have been linked to globalised markets for minerals, beef, hides, timber, soybeans, biofuels and other commodities. There is now conflict between Brazilian national policies that encourage trade and commercialisation of these commodities, aiming to achieve economic and development goals, and those that seek to value the standing forest and its direct and indirect goods and services. At present, policies that privilege and encourage economic and development actions, without environmental safeguards, have a greater impact than those intended to reduce deforestation and degradation.

A fundamental challenge for REDD+ implementation will be the development of national policies that can ensure efficient deforestation reduction while achieving an effective and equitable result. Current policies appear contradictory in these terms, as steps to reduce deforestation articulated in government policy appear uncoordinated, while proposals to incorporate REDD+ are in some cases targeted towards those who are legally liable for environmental enhancement. Currently, Brazil's specific national-level REDD+ policy design is embryonic at best. Policies that address deforestation and degradation, despite some state initiatives, either are still being planned, or have been subordinated to accelerated growth objectives, as shown in Section 4. However, signs have emerged of coordination between states to change this scenario, which can be seen as a first step to guarantee effectiveness of REDD+ actions.

In terms of efficiency, there is a need to clarify responsibilities at national and subnational levels through the creation of federal legislation that regulates REDD+ initiatives within the framework of overall national emissions reduction commitments and the full mix of sectoral strategies towards this end. At present, states are taking the lead in the process by launching state programmes and laws that permit REDD+ initiatives to be undertaken, as in Acre and Amazonas. Legislation on the topic remains decentralised at the close of this reporting period. Thus, the need remains for additional regulation at the federal level and in

those states which have not yet legislated on this issue, as well as for an alignment of policy at federal and state levels.[71]

Proposed legislation under consideration by congressional committee (PL 5586) would establish Certified Reductions in Emissions from Deforestation and Degradation (RCEDDs, in Portuguese), which would be inscribed in property titles and would have a minimum 30-year permanence. Derivatives of this instrument would be tradable in the recently established national climate exchange (at BM&F/Bovespa). Inconsistencies of this instrument with legal concepts of property rights and with the potential international sources of REDD+ finance have led to further debate on the content of such a law. State legislation would be needed to provide consistency with any federal policy on this matter. Moreover, REDD+ policies must be made consistent with trade, agribusiness and development policies, with which they currently conflict, by developing criteria and indicators for sustainable commodity production and trade as a basis for industrial purchase policies and government sanitary and environmental enforcement. Commerce and taxation issues associated with international trade in certified emissions reductions remain controversial.

Recognising the complexity of this matter, and the need for national leadership, the Ministry of Environment has organised a series of working groups involving civil society and government agencies to determine the substance of a national architecture for REDD+. Three such working groups have been established on (1) institutional approaches, loci and mechanisms for representation and participation; (2) benefits generation and sharing, property rights, criteria for and implementation of safeguards; and (3) financing sources and mechanisms. A technical panel has been created with responsibility to develop specific proposals on financial mechanisms and benefits sharing. The results are expected to contribute to Brazil's position at COP 16 in Cancún. At the same time, the executive office of the president has organised a series of working groups responsible for developing sectoral plans for climate change, including deforestation in the Amazon and *cerrado* regions, agriculture, energy, transport and industry.

In relation to equity, considerable concern exists over how policies for REDD+ are being developed in Brazil. As previously mentioned, in the case of the state of Amazonas, representatives of civil society such as leaders of the CNS and the GTA have protested against the absence of civil society participation in the development of the Amazonas Climate Change Law, which motivates REDD projects and creates mechanisms for payments for environmental services. Nevertheless, in Amazonas, Bolsa Floresta appears to offer benefits primarily to impoverished forest peoples, which represents an equitable benefit-sharing approach. However, it is questionable in terms of effectiveness in reducing emissions, as many beneficiaries do not engage in activities that generate significant net emissions.

In other states, such as Mato Grosso, the distribution of REDD benefits may provoke inequities because of efforts to target those who are the highest potential emitters. As state initiatives can be seen as signs of decentralisation of power, and state and local governance structures tend to respond to the needs of their respective elites, such decentralisation can have less equitable results than a universalist federal approach. Achieving a proper balance between a desirable decentralised governance structure, effective allocation of scarce resources and equitably applied instruments for benefits sharing appears to represent one of Brazil's principal challenges in adopting REDD+. One promising sign is that in most states, REDD+ initiatives are being structured as multi-stakeholder processes. Thus, although trade-offs between the 3Es are apparent in the Amazon, there has been a tendency to seek greater participation and consensus than has been the case in prior development strategies. Success or otherwise will become evident only in the implementation, however, not the design.

5.2. 3E assessment of major REDD+ aspects

This section analyses the barriers, limits and factors for successful REDD+ implementation in Brazil. The analysis focuses on points reviewed in the previous

sections, highlighting such topics as governance, institutions, tenure, MRV, financing, coordination, participation and benefits sharing.

5.2.1. 3E implications for governance and institutional context

The main contributing factors to illegal deforestation and logging in the Brazilian Amazon have been the lack of coherent policies and institutional presence with regard to enforcement of environmental and forest legislation, coupled with continued demand for land for agribusiness commodity production. Chronic problems of understaffing, lack of sustained funding and corruption within federal and state agencies are further factors.

Any policy for deforestation or REDD+, therefore, will be effective only to the extent that there is effective monitoring and forest law enforcement. Environmental agencies such as IBAMA will have to enhance enforcement and control. Despite the need in some cases for the creation of new institutions to support REDD+ implementation, greater efficiency could be attained through targeted investments and staffing to improve the capacity of institutions already in place in Brazil, such as INPE, CONAFLOR, CONAMA and state environmental secretariats.

In terms of equity, REDD+ policies should be developed that guarantee distributive benefits in response to the directives of macro policies including the National Plan and Policy for Climate Change and the Action Plan for Prevention and Control of Deforestation in the Legal Amazon. These policies as articulated make only vague reference to the need to benefit disadvantaged and economically marginalised groups, and require far more specific action proposals to achieve these aims. Inclusion of representatives of these groups in the governing councils of these initiatives would represent a first step towards ensuring their needs are met.

To improve efficiency, it is necessary to achieve consistency among regulatory roles of the ministries whose responsibilities are directly associated with REDD+ implementation, particularly the Ministries of Environment, Agriculture and Agrarian Development. Such consistency is needed both horizontally (between ministries) and vertically (between levels of government). There is also a need to simplify procedures for approval of community forest management and non-timber forest management (see Section 2.1.2).

5.2.2. 3E implications for tenure and property rights

The Brazilian Amazon is characterised by a high degree of uncertainty regarding land tenure and ownership rights: approximately one-third of the Brazilian Legal Amazon (158 million ha) consists of private land claims yet to be fully verified by the federal land agency. High deforestation associated with livestock expansion generally occurs in areas that are illegally occupied and then cleared for pastures, a process historically recognised by federal and state authorities as representing an 'improvement' of public lands and a formal means of gaining land title.

The regularisation of tenure and property rights conflicts are key steps for guaranteeing effectiveness, efficiency and equity. Without land titles defined and property rights given to 'forest guardians', benefit sharing and co-benefits can be difficult to achieve, affecting the realisation of the 3Es. There is also a need to improve data on land tenure in the Brazilian Amazon. Data have long been characterised by severe information gaps and a high degree of uncertainty. The lack of clarity regarding land tenure rights could contribute to REDD+ inefficiency.

5.2.3. 3E implications for MRV capacity

Brazil is one of the most advanced countries in the world in terms of capacity to monitor its forest resources using remote sensing and GIS technologies. Since the creation of the INPE in the mid 1970s, the federal government has invested in developing institutional capacity to monitor forests, especially in the Amazon region, based on remote sensing. In terms of MRV capacities, the country has all the initial necessary tools to achieve efficiency and effectiveness in REDD+. INPE,

SIPAM and IBAMA have together demonstrated their capacity in this respect.

However, it is also necessary to develop local-level initiatives for MRV, as there are signs that some level of deforestation remains undetected even by the most sophisticated GIS technologies. Another issue is the timing of MRV, as the more accurate PRODES satellite imagery is analysed on an annual basis only, at least 6 months after the fact; the less accurate DETER imagery can be analysed in real time but is subject to greater discrepancies. Local early warning schemes to detect deforestation threat are needed. A good example is the Google initiative for Surui tribes in Rondônia and Mato Grosso, which provides handheld devices that link to locally managed databases, permitting the tribes people to monitor local deforestation themselves. With the help of the US-based Amazon Conservation Team, indigenous peoples are being trained to monitor deforestation through use of these devices. According to Almir Surui, chief of the Surui tribe, this measure has been very effective.[72]

In addition to such local-level innovations, state MRV approaches, such as the ICV/Imazon partnership on deforestation in Mato Grosso, which published a monthly monitoring newsletter from 2006 to 2008 ('Transparência Florestal'[73]), offer a reminder of the potential for independent civil society oversight.

5.2.4. 3E implications of REDD financing and cost—benefit policy options

In terms of capacity to develop strategies to finance REDD+, Brazil took a great step with the creation of the Amazon Fund in 2008. However, the fund is facing difficulties in finding suitable projects to approve. According to former Minister of Environment Carlos Minc, there is a lack of well-structured projects presented by states, municipalities and civil society representatives, and donors are complaining about capacity of implementation. To combat this perception it might be recommended that (a) a more systematic diagnosis of spatially specific drivers of deforestation be made at a regional level, and (b) projects be 'constructed' jointly with the proponents in a manner consistent with the diagnosis under (a). In other words, the projects have to be 'demand driven', that is, focused more on what is needed to stop deforestation.[74]

The administrative actions of the fund and its management are being carried out by BNDES, in the interests of transparency and accountability. However, despite the important role of the independent advisory commission (COFA) created to oversee the fund's activity, final funding decisions are made internally by BNDES, seemingly with little reference to considerations associated with the 3Es. Project actions are primarily focused on improving the governance and enforcement of existing land use policies and tenure constraints, rather than on testing and improving instruments for benefit sharing. Nevertheless, at the outset, given the very high rates of illegal deforestation as estimated in this study, an emphasis in the REDD-readiness phase on building local enforcement capacity and property rights regularisation is an essential first step to achieve the 3Es.

The coherence of REDD+ strategies with sectoral lending policies needs to be addressed throughout the public credit system, in the light of conditions imposed by the National Monetary Council in 2008 (see Section 1.2.2).

5.2.5. 3E implications of participation and coordination

In general terms, it is recognised in Brazil that channels of participation that articulate representatives of the population, forest managers and members of the public sector in practices related to management of public goods are extremely important for reducing deforestation and degradation. Participation right from the early stages of decision-making, effectively engaging the various stakeholders, is a necessary condition of Amazon Fund financing; civil society organisations are seeking to enhance this by creating more dynamic channels of interaction (e.g. recently created websites and discussion groups by ISA and GTA). It is widely perceived that more democratic and interactive processes of participation could

enhance the 3Es in a REDD regime despite the greater transactions costs involved in such efforts.

In terms of coordination, Brazil has until recently conducted its efforts to combat deforestation by following a more vertical approach; in other words, coordination has been centralised and top-down. However, due in part to a policy vacuum at the federal level regarding the specific architecture and intergovernmental coordination, REDD+ strategies have responded to policy development by subnational authorities in collaboration or independently of major national or international NGO initiatives. This strategy has often been pursued without clear partnership with local-level institutions or stakeholders. This approach could decrease efficiency and also have negative implications for equity. It is necessary to include local institutions in REDD+ coordination actions in Brazil, thus creating a more decentralised process of coordination while maintaining unified criteria and standards for monitoring results. The 'roadshows' held by Amazon Fund staff to discuss and stimulate potential project opportunities with state and local governments in each state in the Amazon are a positive example. There is also a fair amount of consultation by federal ministerial authorities with the NGO community about where Brazil is taking its negotiating stance with regard to REDD+ transitional finance.

Decentralisation of coordination has been viewed as a means to promote a variety of goals, including improved management efficiency, better adaptation of public policies to local realities, increased transparency and accountability among government agencies, institutionalisation of democratic participation and stakeholder dialogue, along with empowerment of local communities and, ultimately, progress in achieving socially equitable sustainable development. REDD+, if undertaken with attention to the 3Es, can be responsive to these prerequisites for sustainable development, but cannot substitute for them.

5.2.6. 3E implications of other issues relevant to REDD+

Other relevant aspects of the REDD+ debate in Brazil include the rights of indigenous and traditional communities, benefit sharing and demand for forest resources.

Brazil is a signatory to ILO Convention no. 169 (adopted in June 1989 and in force since September 1989) and the UN Declaration on the Rights of Indigenous Peoples, adopted in September 2007. However, these international agreements have not been effectively implemented in the Brazilian Amazon, especially in the context of the planning of major infrastructure projects (especially hydroelectric dams) that directly and indirectly affect indigenous peoples and their territories.

Despite recent progress in the legal recognition of indigenous lands, many of these areas are subject to pressures from ranchers, placer miners (*garimpeiros*), loggers, commercial fishermen and hunters, resulting in social conflicts that compromise the exclusive use rights to natural resources that are guaranteed to indigenous peoples by Brazilian law.

However, it is clear from the results of recent public hearings on the principles and criteria for REDD+ projects (see Section 2.3.3) that actors representing indigenous and traditional peoples in the Amazon are aware of the relevance of tenure security in obtaining access to benefits associated with REDD+, and are inserting these concerns into the negotiation of a REDD+ strategy that addresses equity issues as a high priority.

Endnotes

1 For full details on the Global Comparative Project on REDD+, visit the project website: http://www.forestsclimatechange.org/The-Global-Comparative-Study-of-REDD+.html.

2 This nomenclature—the result of negotiations in the lead-up to and during the 15th Conference of the Parties (COP 15) to the UN Framework Convention on Climate Change (UNFCCC)—refers progressively to reduced emissions from deforestation (RED), reduced emissions from deforestation and forest degradation (REDD) and REDD+, inclusion in the foregoing of carbon stock enhancement through forest management and enrichment. An additional formulation ('REDD++') would include maintenance or enhancement of carbon stocks in agricultural land use but this approach was not adopted at COP 15.

3 According to the Brazilian Forest Code (Federal Law 4771/65), a sliver of the state of Goiás is also part of the Legal Amazon. However, as most of the development and environmental policies for the Legal Amazon do not affect it, this report will make reference to only 9 states.

4 The remaining 37% (2.4 million km2) is distributed across Peru (10%), Colombia (7%), Bolivia (6%), Venezuela (6%), Guiana (3%), Suriname (2%), Ecuador (1.5%) and French Guiana (1.5%).

5 Not including glaciers and other frozen sources of freshwater (Meirelles Filho, 2004).

6 The Legal Amazon was established by Federal Law 1806/1953 (6 January), upon creation of the Superintendência do Plano de Valorização Econômica da Amazônia (SPVEA). According to Articles I and VI of Brazil's Forest code, the Legal Amazon includes the states of Acre, Pará, Amazonas, Roraima, Rondônia, Amapá and Mato Grosso and the regions situated to the north of parallel 13°S, in the states of Tocantins and Goiás, and to the west of 44°W, in the state of Maranhão (included by Medida Provisória (Provisional Executive Order) 2.166—67/2001).

7 http://www.ibama.gov.br/ecossistemas/home.htm.

8 According to the FAO (2005), approximately 42% of global net forest loss between 2000 and 2005 occurred in Brazil, mostly in the Amazon region.

9 INPE/PRODES data on annual deforestation in the Brazilian Amazon, based on Landsat-TM and CBERs remote sensing imagery, correspond to periods from 1 August until the following 31 July. Estimates of deforestation in the Amazon have been limited to forest vegetation types. However, due to some confusion regarding forests in transition zones, deforestation in areas of dense cerrado vegetation has often been included in these estimates. For data up to 2009, see: http://www.obt.inpe.br/prodes/prodes_1988_2009.htm.

10 INPE-PRODES: Annual rates of deforestation in the Legal Amazon, available at: http://www.obt.inpe.br/prodes/prodes_1988_2009.htm.
11 Between 1990 and 2003, the cattle herd in the Legal Brazilian Amazon increased from 26.6 million to 64 million head, representing a 140% increase. Between 1997 and 2007, the cattle herd in the states making up the Legal Amazon grew 77.4%, compared with a 23.7% growth in the Brazilian herd (Smeraldi and May 2009).
12 'Pecuária gera 44% das emissões', Valor Econômico, 27 August 2009, http://www.amazonia.org.br/noticias/noticia.cfm?id=325215.
13 As much as 95% of the total volume of round logs extracted annually in the Brazilian Amazon may originate from illegal sources, including both deforestation and predatory logging. However, it is likely that the true percentage is now lower than this figure because both deforestation and logging have declined (Lawson and MacFaul 2010; http://www.chathamhouse.org.uk/files/16950_0710pr_illegallogging.pdf).
14 In addition to having recently become the largest producer and exporter of beef, Brazil is the world's biggest producer and exporter of hides (Greenpeace 2009).
15 According to a recent wide-ranging government audit (TCU 2009), the effectiveness of existing government programmes in combating deforestation as a means to mitigate greenhouse gas emissions is limited due to underspending on critical programmes, contradictory credit policies and failure to commit resources to forest restoration.
16 For more details, see http://www.bbc.co.uk/portuguese/lg/noticias/2009/08/090803_amazoniasaepc.shtml
17 See also http://www.amazonia.org.br/noticias/print.cfm?id=320842
18 It is sometimes argued that the free trade zone in Manaus has contributed to protection of remaining forests in the state of Amazonas, as well as to provision of employment to those who would otherwise have remained in the interior, placing pressure on the forest.
19 For further reading on recent infrastructure projects in the Brazilian Amazon and their socio-environmental impacts, see Conservation International (2007), INESC (2007) and International Rivers (2008).
20 For more information on each plan, see http://www.fundoamazonia.gov.br/FundoAmazonia/fam/site_pt/Esquerdo/acoes.html.
21 Congress is also discussing a draft bill (PL 5586/2009) that would involve creation of a national REDD+ programme.
22 For further details see: http://news.mongabay.com/2010/0307-brazil_us_mou.html.
23 See http://www.redd-monitor.org/2010/05/10/arnold-schwarzenegger-and-redd-terminating-deforestation/.
24 For more information on the partnership see: (http://reddpluspartnership.org/65226/en/
25 See http://www.redd-monitor.org/2010/08/06/the-on-going-blunders-of-the-interim-redd-partnership/.
26 Environmental fines imposed by IBAMA have the lowest rate of collection among all federal agencies: as many as 58% of all fines, totalling R$ 11.8 billion (equivalent to approximately US $6.9 billion, had not been collected as of early 2009 (Barreto *et al.* 2009).
27 A major advance in Brazilian legislation in this regard was the passing of the federal 'environmental information' law of 2003 (Law 10650/2003) proposed by Congressman Fernando Gabeira of Brazil's Green Party. However, the mandates of this law, regarding transparency and public access to information (including data on fines for illegal deforestation and logging, along with other environmental crimes), remain to be effectively implemented.
28 See Sections 4.3 and 4.5.3 for more details.
29 Cited in Irving *et al.* (2007).
30 Decree 3420/2000 (20 April): http://www.planalto.gov.br/ccivil_03/decreto/D3420.htm.
31 Article 51, Law 11284/2006.
32 http://www.planalto.gov.br/ccivil_03/_Ato2004-2006/2006/Decreto/D5795.htm.
33 Presidential Decree 3.942/2001: http://www.planalto.gov.br/ccivil/decreto/2001/D3942.htm#art1.
34 See Monteiro, T. 'CONAMA: um conselho doente', at http://telmadmonteiro.blogspot.com/2008/09/conama-um-conselho-doente.html.
35 http://www.planalto.gov.br/ccivil_03/dnn/2003/Dnn9922.htm.
36 See (1) Letter from Brazilian Forum of NGOs and Social Movements (FBOMS) to then Minister Dilma Rousseff, http://ef.amazonia.org.br/index.cfm?fuseaction=guiaDetalhes&id=263084&tipo=6&cat_id=157&subcat_id=552,

dated 23 February 2006 and (2) Greenpeace (2008).

37 This situation is evolving rapidly, with mobilisation in Congress underway to establish legislation to create the formal basis for payments to private landowners for the purpose of REDD+.

38 Since the mid 1990s, considerable resources have been invested in strengthening state-level environmental management in the Amazon states within the context of the G7-funded Rainforest Pilot Program.

39 For further information, see http://www.yikatuxingu.org.br.

40 The possibility that indigenous groups may obtain financial support through voluntary carbon markets for their actions to protect remaining forests is being tested in the case of the Surui Paitê Project in Rondônia, for which a formal legal opinion was elaborated. A similar case is under discussion with regard to the Guamã Indigenous Area in Pará.

41 Although INPE does not register deforestation rates by property size, it does classify areas detected as alerts of possible deforestation or degradation by the DETER early warning system according to the size of the affected polygons, and through inference, it suggests that smallholders are responsible for a smaller share of total deforestation. Polygons smaller than 100 ha comprised less than 20% of the total in 2008 (INPE 2008).

42 For more information, see www.reddsocioambiental.org.br.

43 The superiority of alternative land uses such as protected areas and biodiversity-friendly production practices, energy efficiency or renewable energy supply is not clear to all actors, of course.

44 For further reading on recent infrastructure projects in the Brazilian Amazon and their socio-environmental impacts, see Conservation International (2007), INESC (2007) and International Rivers (2008).

45 Since the late 1990s, there has been far greater penetration of Brazilian hardwood timbers in the international market, particularly in the European Union, including the vast majority of certified Amazon timbers.

46 See Brito *et al.* (2005).

47 Instituto Socioambiental (ISA), Greenpeace, Instituto Centro de Vida (ICV), Instituto de Pesquisa Ambiental da Amazônia (IPAM), The Nature Conservancy (TNC), Conservação Internacional (CI), Amigos da Terra-Amazônia Brasileira (AdT), Instituto do Homen e Meio Ambiente (Imazon) and WWF-Brasil.

48 Pacto pelo Fim do Desmatamento e pela Valorização da Floresta. See: http://www.socioambiental.org/banco_imagens/pdfs/doc-pacto%20desmatamento%20zero%20SUM%20ONGs%20FINAL.pdf

49 http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2008/Decreto/D6527.htm

50 http://www.amazonfund.gov.br/

51 http://www.mma.gov.br/estruturas/169/_arquivos/169_29092008073244.pdf

52 See Section 5 for additional discussion on the design and implementation of PPCDAM, including its relevance to REDD.

53 The task force report is available at http://www.ipam.org.br/download/livro/Relatorio-da-Primeira-Forca-Tarefa-sobre-REDD-e-Mudancas-Climaticas/248. See also http://www.amazonia.org.br/noticias/noticia.cfm?id=331775 and http://www.sae.gov.br/site/?p=1832.

54 http://www.folhadoprogresso.com.br/folha3br2/modules/news/article.php?storyid=130

55 For examples of pilot REDD initiatives in Mato Grosso and Pará states, e.g. IPAM (2009) and TNC (2009) and a list of projects identified in the Amazon region by CIFOR as of August 2010, with respective links, see Section 4.5.5.

56 Benjamin's speech at the colloquium 'Mudanças Climaticas: Balanço de Políticas e Marco Legal', University of Brasília, 17 August 2009.

57 As mentioned above, in 2008 the Ministry of Environment initiated support for preparation of state plans for prevention and control of deforestation within Amazonian states, beginning with Mato Grosso, Acre and Pará.

58 'Mudanças climáticas e povos da floresta: avançando a discussão em redução de emissões por desmatamento e degradação florestal (REDD) e direitos dos povos indígenas e tradicionais, Declaração de Manaus', 4 April 2008 http://www.coiab.com.br/coiab.php?dest=show&back=noticia&id=60&tipo=N&pagina=22

59 cf 'O Papel das Áreas Protegidas na Redução das Emissões por Desmatamento' WWF-Brasil, IPAM, and Linden Trust for Conservation, October 2009; http://www.wwf.org.br/?22140/Governo-recebe-documento-sobre-reas-protegidas-e-clima.

60 Another relevant issue for REDD+ is how to address situations where low rates of clearing

have prevailed in recent years, because of past decimation of forest stocks, but where efforts in forest rehabilitation are clearly warranted. See item (g) on REDD+ and reforestation/afforestation

61 According to Benatti and Araújo (2006), 67% of the total area occupied by rural landholdings in Pará state in 2006 had no documentation or were characterised by fraudulent titles. This situation is a particular challenge for REDD+ schemes that propose the use opportunity costs to landholders as a key variable in defining priority areas.

62 Speech at the colloquium 'Mudanças Climaticas: Balanço de Políticas e Marco Legal', University of Brasília, 17 August 2009.

63 See 'Estudo inédito aponta que o Cerrado já emite CO2 nos mesmos níveis que a Amazônia', Portal EcoDebate, 11 September 2009, http://www.ecodebate.com.br/2009/09/11/estudo-inedito-aponta-que-o-*cerrado*-ja-emite-co2-nos-mesmos-niveis-que-a-amazonia/.

64 cf 'Carta de Belém rejeita REDD no mercado de carbono', http://www.ipam.org.br/mais/noticiasitem/id/365, 16 October 2009.

65 'Proposta do MMA para Construção da Posição do Brasil em Mudanças Climáticas', slide presentation of Ministry of Environment at meeting of the Brazilian Forum on Climate Change (FBMC) with President Lula, 13 October 2009.

66 See www.bbc.co.uk/portuguese/noticias/2009/12/091210_brasiltreina_ebc.shtml.

67 See www.climaefloresta.org.br/biblioteca?categoria=17&page=2.

68 See www.ipam.org.br/noticias/-p-Carta-de-Belem-rejeita-REDD-no-mercado-de-carbono-p-/365.

69 For more information, see www.reddsocioambiental.org.br.

70 Available at: http://www.ciflorestas.com.br/arquivos/lei_lei_3.1352007_31561.pdf

71 It should be noted that this deficiency is not restricted to policies on deforestation but also remains a fundamental sticking point in the structure of national decentralised environmental policies in general, in a constitutional framework that allocates similar responsibilities to all levels of government and leaves to enabling legislation the specifics of how these responsibilities are to be divided between the powers.

72 See www.independent.co.uk/environment/green-living/amazon-tribe-enlists-google-in-battle-with-illegal-loggers-808492.html.

73 See http://www.icv.org.br/biblioteca/boletim_da_transparencia_florestal/.

74 In deference to the Amazon Fund team at BNDES, however, it appears that the specific actions and budgetary structure in all projects receiving serious consideration for support have been developed jointly by the Bank and its grantees (Ramos personal communication).

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