Legal Compliance and Verification of Small-Scale Producers in Brazil's Forest Sector

Prepared for Chatham House

by the **Earth Innovation Institute**

Authors

Dr. Shoana Humphries
Dr. David McGrath

With contributions from
Brenda Souza, Consultant
Adriana Margutti, Consultant

Executive Director

Dr. Daniel Nepstad
Phone: +1-415-449-9900
E-mail: dnepstad@earthinnovation.org

This work was commissioned and funded by Chatham House.

Please cite as:

Humphries, S, McGrath, D. 2014. Legal Compliance and Verification of Small-Scale Producers in Brazil's Forest Sector. San Francisco: Earth Innovation Institute and Chatham House

Table of Contents

Acronyms Used 5
Executive Summary 6
1. Introduction 9
1.1 Forest cover and tenure 9
1.2 Forest production 11
1.3 Forest policy 12
1.4 Control of illegal logging in the Brazilian Amazon 15
1.5 Smallholder forest management 17
1.5.1 Timber harvest authorization process for smallholders 18
1.5.2 Current status of smallholder forest management in the Brazilian Amazon 21
2. Methods 23
3. Results 24
3.1 What is the degree of illegality and the types of illegality amongst small-scale producers? 24
3.1.1 Types of illegality amongst smallholders 24
3.1.2 Degree of illegality amongst smallholders 25
3.1.3 Control efforts for illegal wood among smallholders in Brazil and the Santarém region 26
3.2 Level of legality verification or sustainability certification amongst small-scale producers 26
3.2.1 Number of smallholders with legality verification 26
3.2.2 Number of smallholders with sustainability certification 27
3.3 Key challenges for small-scale producers for complying with requirements for legality verification certification 28
3.3.1 Legal right to harvest 29
3.3.2 Approved planning authorizations and operations 31
3.3.3 Payment of relevant fees and taxes 31
3.3.4 Transport and trade 32
3.3.5 Fulfillment of harvesting and environmental regulations, and workers' rights 32
3.3.6 Third parties' rights 32
3.3.7 Control of unauthorized activities 33
3.3.8 Chain of custody 33
3.3.9 Multi-site management requirements 33

3.4 What are the key challenges for small-scale producers to be able to demonstrate legality? 33
3.5 Initiatives to promote legal compliance and to facilitate producers to demonstrate legal compliance, and lessons learned 34
3.6 The impact of enforcement efforts on small-scale producers' livelihoods....40
4. Conclusions 41
4.1 Challenges 42
4.1.1 Bureaucratic barriers to legal forest management 42
4.1.2 Lack of technical and financial assistance 43
4.1.3 Insufficient control of illegal logging and illegal timber 43
4.1.4 Lack of domestic market demand for certified sustainable or legal wood 43
4.2 Effectiveness of efforts to date 43
4.2.1 Programs and projects 43
4.2.2 Certification of sustainability and legality 44
4.2.3 Control of illegal logging 44
4.3 Impacts on livelihoods 44
5. Recommendations 45
5.1 Governments....45
5.2 Civil society and donors 47
5.3 Smallholders 47
Works Cited 49
Annex 1. List of interviewees....54
Annex 2. Interview Guides for Key Informants....56
Annex 3. List of FSC certified small-scale forest management operations for timber production. 60
Annex 4. Legal instruments related to smallholder forest management....61

Acronyms Used*

APAT	Autorização Previa à Análise Técnica
AUMPF	Autorização de Matéria-Prima Florestal
AUTEF	Autorização para Exploração Florestal
AUTEX	Autorização de Exploração de Produtos Florestais
CAR	Cadastro Ambiental Rural
CONAMA	Comissão Nacional de Meio Ambiente
DEGRAD	Sistema de Mapeamento da Degradação Florestal na Amazônia Brasileira
DETER	Projeto de Detecção do Desmatamento em Tempo Quase Real
DETEX	Sistema de Detecção da Exploração Seletiva de Madeira
DD	Diretoria de Desenvolvimento de Projetos de Assentamento
DOF	Documento de Origem Florestal
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária
FLONA	Floresta Nacional
IBAMA	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis
IBGE	Instituto Brasileiro de Geografia e Estatística
ICMBio	Instituto Chico Mendes de Conservação da Biodiversidade
IMAZON	Instituto do Homem e Meio Ambiente da Amazônia
IN	Instrução Normativa
INCRA	Instituto Nacional de Colonização e Reforma Agrária
INPE	Instituto Nacional de Pesquisas Espaciais
IPEA	Instituto de Pesquisa Econômica Aplicada
MDA	Ministério do Desenvolvimento Agrário
MMA	Ministério do Meio Ambiente
PA	Projeto de Assentamento
PAE	Projeto de Assentamento Agroextrativista
PDS	Projeto de Desenvolvimento Sustentável
PMFC	Programa de Manejo Florestal Comunitário e Familiar
PMFS	Plano de Manejo Florestal Sustentável
POA	Plano de Operação Anual
PPG7	Programa Piloto para a Proteção das Florestas Tropicais do Brasil
PRODES	Projeto de Monitoramento do Desflorestamento na Amazônia Legal
RDS	Reserva de Desenvolvimento Sustentável
RESEX	Reserva Extrativista
SFB	Serviço Florestal Brasileiro
SISFLORA	Sistema de Comercialização e Transporte de Produtos Florestais
UC	Unidade de Conservação

* The acronyms used in the document are in Portuguese, but an English translation is provided in the text.

Executive Summary

Brazil's Amazon region is a major producer of tropical timber. About one-quarter of this timber is from smallholders (farmers and forest-based communities), who have been designated approximately 50% of public forests in the Amazon for community sustainable use (mostly in the form of government settlements for smallholders, sustainable use conservation areas, and indigenous territories). Approximately one-third of the timber produced in the region is illegal. In the state of Pará, a top producer of logs in the region, a recent study[1] found timber harvesting was illegal in 78% of the forests logged, and that 25% of forests logged (by area) were in smallholder settlement projects (where family allotments are approximately 100 ha each and 80% must be maintained in forests, with some exceptions). We argue that a combination of major policy and institutional changes over the last decade, which were designed to reduce logging pressure on settlements, and lax law enforcement are partly responsible for encouraging illegal logging, especially in smallholder settlements. Recent changes have reduced bureaucratic barriers to legal forest harvesting activities among smallholders, but much more needs to be done to bring illegal logging under control and to support sustainable forest management among smallholders.

Growing concern about illegal logging and its impacts were behind several major policy changes a decade ago. Notably, the Public Forest Law of 2006 was designed to eliminate the land tenure problem through the creation of a system of national and state forests, the implementation of a concession system for access to public forest timber resources, and the creation of the Brazilian Forest Service to administer the concession system. The law also aimed to facilitate the approval of sustainable forest management plans (Planos de Manejo Forestal Sustentavel – PMFSs) and control of illegal logging through the decentralization of power to state environmental agencies. Proponents of the law, however, underestimated the cost and time needed to implement the new concession system, and as of 2013 only five federal concessions (on 145,000 ha) and six state concessions (on 477,000 ha in Pará state) had been contracted[2]. In addition, the lag time in getting the state agencies going led to significant delays in the authorization of legal forest management activities. Growing concern over illegal logging in settlements specifically led to a Resolution in 2006 by the National Environment Council (Conselho Nacional do Meio Ambiente - CONAMA) (Resolution 387 CONAMA), which prohibited approval of PMFS in settlements that did not have environmental licenses (these are issued by the state environmental agency based on environmental impact studies and proposed land-use planning). The aggregate impact of these policies and a crackdown on deforestation was a decline in timber production in the region of 73% from 2004 to 2013[3].

Then, in 2010, the National Institute for Colonization and Agrarian Reform (Instituto Nacional de Colonização e Reforma Agraria - INCRA) released a new regulation (Normative Instruction 65) that strongly discouraged company involvement in forest management activities in government settlements. As very few settlements had an environmental license and most smallholder associations engaged in legal logging were dependent on companies for forestry-related activities (i.e., management plan preparation, road building, tree felling), the combination of these two measures effectively halted legal logging in settlements across the region and put legal forest management out of reach for the great majority of rural families.

[1] source: Monteiro et al. 2013
[2] source: SFB 2013a
[3] sources: INPE 2014, Nepstad et al. 2014, Nepstad et al. 2009

Several new measures were implemented around the same time to monitor and decrease deforestation and to improve control of illegal logging. These included new official remote sensing programs (System for Detecting Deforestation in Real Time – DETER and the System for Mapping Forest Degradation in the Brazilian Amazon - DEGRAD) and two new systems implemented by civil society organization The Amazon Institute of People and the Environment (Instituto do Homem e Meio Ambiente da Amazônia – IMAZON): the System for Monitoring Forest Harvesting (SIMEX) and the System for Deforestation Alerts (SAD). There were also increased efforts to coordinate law enforcement among government agencies. In addition, a major emphasis was placed on controls to prevent the introduction of illegal timber into supply chains with a new program to document the origin of forest products for transportation: the Forest Origin Document (Documento de Origem Florestal – DOF) system. While these efforts helped to significantly decrease deforestation across the region and to control illegal logging in new federal and state forests, they seem to have had little effect on illegal logging in settlements, as monitoring and enforcement in smallholder forests were minimal and loggers found ways around government efforts to prevent illegal timber from entering supply chains.

An additional reason illegal logging in settlements continued is that timber sales are an important source of income for smallholders. In cases of illegal logging, informal agreements are usually reached between individual families and loggers. This is more common in government settlements where smallholders use cleared land for agriculture and/or cattle, but also occurs among traditional families who live in forested areas. Logging may occur when a family needs additional income or when a logger arrives and offers to purchase the logs.

Legal forest management is a small but increasingly important source of income to families in settlements as well as traditional families. Smallholder forestry models in the Brazilian Amazon vary. A model common in settlements involves formal partnerships between families or associations with companies where the smallholders' legal forest reserves (usually 50 to 80 ha each) are harvested once every 25 to 35 years and timber income is supplemental to families' main income from agriculture. Another model more common among traditional forest communities involves community associations who collaborate with various partners (government agencies, NGOs, and/or companies) to implement forest management over larger family forest areas (100 to 300 ha) or in community forests (typically from 3,000 to 30,000 ha). In these cases timber harvests occur every year in rotation on annual forest harvest areas over a 30 to 35-year cycle, and timber as well as non-timber forest products are among the main family income sources.

Currently, most PMFSs submitted by associations in the state of Pará are prepared in collaboration with a company without oversight by the government or NGOs, and are reported to have terms that greatly favor the companies. While these collaborations, formal and informal, with companies are mutually beneficial, smallholders could realize far greater value from their forest resources if they had the skills and assistance needed to better understand forestry, negotiate better terms with companies, and if desired, to engage more fully in forest management. Today, for associations or cooperatives who would like to pursue forest management with less dependence on outsiders, the technical requirements of an approved management plan are still beyond their reach, and the technical and financial assistance programs they would need are not yet widely operating.

These challenges are widely recognized by the Brazilian government and civil society organizations. In 2013, CONAMA replaced its 2006 Resolution with a new one (Resolution 458 CONAMA) that no longer requires an environmental license for the entire settlement, does not require an environmental license for low-impact activities, and provides a simplified licensing

process for those activities that do need environmental licensing. With this change families and associations have begun renegotiating contracts with logging companies that had been developed previously, but had not been fully executed. As a result, there is likely to be a surge of new management plans in the coming years. It is still not clear what the impact of the INCRA regulation, which is still in place, is on approving PMFSs for company-community collaborations, though it does not appear to be interfering with associations' management plans in western Pará. New government initiatives, such as the Program for Community and Family Forestry and recent funding of short-term contracts for technical assistance in agro-extractive communities, both federal government initiatives, could begin to address the technical, bureaucratic and financial challenges faced by smallholders interested in managing their forests.

In conclusion, the last decade has been a tumultuous one for the logging sector with major changes in policies and the institutional structure of government regulation, which, due to the slow progress in implementation, have inadvertently exacerbated illegal logging in smallholder settlements. While the concession system is still only minimally operational, the lessening of restrictions on forest management in government settlements should reduce the incentive for illegal logging. However, without more effective enforcement and control of illegal logging, this activity is likely to continue. Furthermore, market demand for legal and sustainable products is not yet significant in the region, and consequently there is little market pressure to convince companies of the need to legalize their operations and supply chains.

In terms of recommendations, the government should:

- in the short term, actively facilitate smallholder forest management through further simplifications in the authorization process, the provision of oversight of company-smallholder contracts, the exercise of greater control of illegal logging in settlements, the implementation of financial and technical assistance programs that provide continuous smallholder support, and improvements in access to markets, especially through government procurement policies.
- in the medium term, decentralize forest governance to the municipal and settlement levels and build capacity at these levels to allow for more effective local authorization and control mechanisms.

Civil society organizations, smallholders, companies, and governments should collaborate to strengthen smallholder forest management, as well, through:

- the development of a program to support company-community timber agreements
- active participation in platforms to discuss and monitor smallholder forestry
- the development of regional forestry clusters to create supportive commercial and regulatory environments for developing smallholder forestry initiatives.

1. Introduction

Brazil is among the top producers of tropical timber in the world, and has long struggled with illegal selective logging and deforestation for agriculture and ranching as significant sources of this raw material. While it consumes about 80% of the tropical timber it produces (Pereira et al. 2010), international and domestic concerns about the illegal origin of its products and the impacts of deforestation and forest degradation on global climate change have motivated the government to work on several fronts to reduce illegal logging, better regulate logging and focus it in public forest concessions, encourage forest certification, and improve the tracking of timber in supply chains. These efforts have had mixed results. While deforestation levels have dropped significantly, most logging in Amazonian states like Pará is unauthorized (Monteiro et al. 2013) and legal forest management is still a complicated, expensive, and time consuming endeavor (Cruz et al. 2011). Smallholders, who include farmers, traditional forest-based families, and indigenous groups have been assigned 50% of the Brazilian Amazon region (by land area) for sustainable use (SFB 2013a, Pereira et al. 2010)[4], and are an increasingly important source of timber for the wood products industry. Yet, the legal authorization process is still beyond smallholders' reach, the technical and financial assistance systems they need to engage equitably in legal forest management are not yet fully operating, and they are under heavy pressure from illegal loggers. This study investigates the challenges smallholders face in engaging in legal timber harvesting, reviews the efforts to date to develop legal smallholder forestry in the Amazon region and Pará state, and explores role of timber in smallholder livelihoods.

1.1 Forest cover and tenure

Brazil has the second largest area of forest cover in the world, after Russia, with planted and natural forests covering 463 million ha or 54.4% of its territory (SFB 2013a). The Legal Amazon of Brazil includes eight states and part of a ninth state in the north of the country, and covers approximately 60% of Brazil's territory. Within this region, the Amazon forest covers 325,469,969 ha (SFB 2013a) and accounts for 71% of the country's total forest cover. Public forests (state and federal) make up 87% of the Amazon forest, comprising 282,221,415 ha (SFB 2013a).

Pereira et al (2010) have the most recent complete estimates of land tenure by type in the Amazon region. Land is divided among private landowners (22.7%), public lands (43.9%), special areas (6.2%), and areas under dispute (27%) (Table 1, Pereira et al. 2010). Within public forests, there are indigenous territories (21.7% of total) and conservation units, including 8% for integral protection and 14.2% for sustainable use. Sustainable use conservation units include national, state, and municipal forests set aside for forest management and conservation, as well as Extractive Reserves (Reservas Extractivistas – RESEX) and Sustainable Development Reserves (Reserva de Desenvolvimento Sustentavel – RDS) designated for use by forest-based families. The Special Areas category includes agrarian reform settlements (5.6%), which are public lands to be transferred to families as private land over time, as well as Quilombola (Afro-Brazilian) community lands, who own their land outright, and military lands – the latter two accounting for 0.6% of the total.

[4] This area does not include agrarian reform settlements that are not environmentally differentiated, which have more of an agricultural and livestock focus.

Table 1. Land distribution in the Brazilian Legal Amazon.

State	Area (thousands of km2)	Public land					Private Lands (%)	Areas under dispute (undesignated and private) (%)
		Protected Areas (%)			Special Areas (%)			
		Indigenous Lands	Conservation Units		Rural Settlements	Quilombola communities and military lands		
			Integral Protection	Sustainable Use				
Acre	152.6	15.9	10.6	23.6	11.6	0	22.80	15.50
Amapá	142.8	8.3	33.3	28.8	7.8	0	6.10	15.70
Amazonas	1570.7	27.3	7.8	15.8	2.2	0.1	2.30	44.50
Maranhao	249.6	8.7	5.4	12	3.7	0.1	39.10	31.00
Mato Grosso	903.4	15.2	3.3	1.3	4.8	0	52.90	22.30
Pará	1247.7	22.77	10.1	22.2	6	1.9	18.00	19.10
Rondônia	237.6	21	9.3	12.4	17	0.1	35.10	5.10
Roraima	224.3	46.3	4.7	7.3	4	2.7	7.60	27.50
Tocantins	277.6	9.2	3.7	8.5	2	0	51.50	23.20
Legal Amazon	5006.3	21.7	8	14.2	5.6	0.6	22.70	27.00

source: Pereira D, D. Santos, M. Vedoveto, J. Guimarães, A. Veríssimo. 2010. Fatos Florestais da Amazônia. Belém: IMAZON.

More recent estimates put the land area designated for community use across landholding types at 53% (SFB 2013a) of the region. This includes indigenous territories, Quilombola lands, sustainable use conservation units, and agrarian reform settlements. Colonist families in agrarian reform settlements typically depend mainly on agriculture and livestock for their livelihoods. In recent years "environmentally differentiated" settlements and sustainable use conservation units have been developed to recognize the long-term use rights of families who were already residents in public forests. In these kinds of settlements the primary focus is extractive forest-based activities. Indigenous territories and Quilombola lands continue to be officially designated to recognize the claims of these communities to lands they have historically used. In addition, as part of the forest concession system, smallholders are supposed to have access to 20% of each national and state forest to extract forest resources. However, to date only one cooperative is managing a forest concession in a National Forest, which is the case of Coomflona in the Santarem region of Pará. Smallholders face similar technical barriers in accessing these forests as they do in getting sustainable forest management plans (Planos de Manejo Florestal Sustentavel - PMFSs) for their own forests.

Legal timber extraction is not permitted in indigenous territories, but is allowed in state and national forests, RESEX and RDS conservation units, agrarian reform settlements, and on private lands. Carneiro et al. (2011) provide an estimate of land available for community forestry within the region based on 2010 land distribution data. They included areas designated in national and state forests for communities (20%)[5], 50% of RDS and RESEX areas, 30% of permanent protected areas (e.g., along streams), and 30% of agrarian settlements. **This provides a total of 282,439,000 ha within the Amazon region where smallholder forest management for timber would be possible.** Smallholder forest management would also be possible on private lands, but there is no estimate of the area of forest on smallholder private lands.

1.2 Forest production

Tropical timber production in Brazil has gone through much change since the mid-1950s. Lima et al (2006) describe three phases of Brazilian Amazon timber production. During the first phase (1950s – mid 1970s), timber was harvested through traditional means on smallholder lands along rivers and, due to transport limitations to the rest of Brazil (i.e., the lack of roads), logs (of mainly two species) went to export markets. In the second phase (late 1970s to early 1990s), the construction of new roads and an influx of migrant settlers (or "colonists") opened up the southern region of the Amazon to a dramatic increase in logging and investment in mills. While timber from riverine areas continued to flow to export markets, timber from the southern logging frontier went to domestic markets. The third phase (mid 1990s to 2000s) is described as a period of consolidation and migration, with investment in value added processing in the old frontier and movement of the logging frontier farther north into the Amazon region. Concern about the environmental impacts of tropical logging prompted abrupt changes in approval of sustainable forest management plans. Prior to 2003, approval was granted based simply on the initiation of a titling process to the forest to be harvested. In 2003, the government began requiring clearly established property rights. The lack of titled lands in the region (a challenge still today due to delays in titling by government agencies) left the estimated 2,500 logging companies without a legal forest base to harvest, and therefore many began operating illegally. Changes in forest policy to date have aimed to address this problem, however, as discussed in the next section, many have continued to exacerbate illegal logging.

[5] In National and State Forests, the area is designated for different users as follows: 50% for companies, 20% for communities, and 30% for other uses.

Today Brazil is a major timber producer, processor, and consumer, ranking among the top five countries for production of wood fuel, industrial round wood (logs), sawnwood (the first stage of the log processing sequence in which logs are cut into boards, but not planed), and wood pulp (used mainly for paper products), and for consumption of the first three (FAO 2014). Within the tropical timber sector, Brazil is second (behind Indonesia) in terms of both tropical log production and tropical log consumption (ITTO 2012).

In 2011, 12.9 million m^3 of logs from tropical natural forests were produced in Brazil's Legal Amazon, and this resulted in 5.9 million m^3 of sawn wood (SFB 2013a). Approximately 4.6 million m^3 of this sawn wood was consumed in non-Amazon states (SFB 2013a). The latest estimate of the percentage of total production of tropical timber exported from the Legal Amazon was 21% in 2009 (SFB and IMAZON 2010. The principal importers of Brazilian forest products in general (tropical and non-tropical) in 2011 were the United States (US$ 1.8 billion), China (US$ 1.3 billion) and Holland (US$ 1.0 billion); the UK accounted for US$ 405 million (SFB 2013a).

As far as the source of timber in the Legal Amazon, Pereira et al (2010) reported that in 2009, 29% of logs was harvested from company-owned or controlled lands, **28% was harvested in properties smaller than 500 ha**, and the rest was from other sources.[6] Interestingly, an analysis of timber transportation documents emitted from 2007 to 2010 as part of the system to track legal timber, found that 51% of licensed timber volume in the region was estimated to come from deforestation permits, and **49% from forest management plans** (SFB 2013a). Finally, regarding illegal wood, **36% of tropical timber in the market in 2009 was estimated to be illegal** (Pereira et al 2010). The loss in revenues from failing to collect taxes from illegal timber operations is significant, and for 2009 was estimated at R$ 477 million (USD 272 million) (Adeodato 2011).

Pará state is a major timber producer, with 33% of Brazil's tropical log production in 2011 (SFB 2013a). Regarding the origin of the wood in Pará state, a 2009/2010 study found an estimated 60% of volume was harvested from third party sources, including 28% from small properties (< 500 ha) (Pereira et al 2010). Regarding the types of forests where illegal harvesting is taking place in Pará, data from 2011/2012 (IMAZON 2012) estimate that **78% of the area of forests harvested lacked authorization**, and of the area illegally harvested during this time, **25% was in rural agrarian reform settlements** and 8% was in protected areas, with the rest in private lands or lands without clear tenure.

1.3 Forest policy

The Forest Code (Law 4.771) has governed forest management in Brazil since 1965. It includes requirements regarding the maintenance and management of forest resources, and requires a Sustainable Forest Management Plan (Plano de Manejo Florestal Sustentável – PMFS) for legal timber production in permanent forest areas. In 1996 a change to the code increased the minimum proportion of rural properties in the legal Amazon to be maintained in forests from 50 to 80%, and required technical plans for the management of forest resources. The Forest Code has recently been the subject of much debate and was revised in 2012 (see Soares-Filho et al. 2014).

[6] The smaller (<500 ha) lands included private lands, rural agrarian reform settlements, and public conservation units.

Forest and agrarian reform policies and programs continue to strive for more equitable distribution of land and forests within the Amazon region. When the government opened up the Amazon to settlement through infrastructure projects and cheap credit in the 1960s and 1970s, the land ended up concentrated in large holdings by a relatively small number of families (Pacheco 2009). With the Land Statute of 1964 (No. 4504), the government began identifying unclaimed lands, registering them as federal lands, and colonizing families in lots of 100 ha, which decreased to 50 ha in the 1980s, as a form of agrarian reform. Since 1985, agrarian reform has focused on appropriating large private landholdings that were deemed to not be fulfilling their social and economic potential, and redistributing them to colonist families (Pacheco 2009). The rate of the creation of new settlements grew from 1995 to 2002, slowed until a big surge in 2005 and 2006, and then dropped off again (MDA and INCRA 2013).

In 2000, the National System of Conservation Units (Law 9.985) called for the creation of reserves to promote both sustainable development based on the use of natural resources and to promote the conservation of resources in the development process. The reserves included two types: one for the full protection of biodiversity and one for sustainable use, which included the presence of communities within the unit. The sustainable use reserves provided a way for families who had traditionally relied on forests for their livelihoods (e.g., through the collection of non-timber forest products, hunting, fishing) to obtain legal recognition of their long-term use rights to the forests they resided in, which is required for legal forest management. The 2006 Public Forests Law also encouraged the designation of more forests to communities who were living in them through the creation of environmentally differentiated agrarian reform settlements as well as additional sustainable use conservation units.

With the creation of new agrarian reform settlements, the responsible agency, the National Institute of Colonization and Agrarian Reform (Instituto Nacional de Colonização e Reforma Agraria – INCRA) frequently lacked the resources needed to provide basic infrastructure to newly settled families, including roads, potable water, credit for houses, schools, and medical posts. Therefore, timber companies often stepped in to fill this void. In some cases INCRA contracted logging companies to install roads in settlement projects and facilitated timber agreements with settlers (as part of public-private partnerships). In many cases settlers ended up informally trading trees for roads and precious start-up capital (Sablayrolles et al. 2011).

From 1999 to 2006 the Support for Sustainable Forest Management in the Amazon (ProManejo) Project supported the development and/or strengthening of several pilot community-based forest management initiatives and encouraged the development of policies to support community resource management (IBAMA 2006). Some models involved long-term forest management by community members with annual harvests over 25 to 35 years in large communal forests, and others involved company-community partnerships with management activities implemented by companies once every 25 to 35 years in family plots in government smallholder settlements. There was a surge in interest, experimentation, and learning about community-resource management in the region as a means for providing legal timber to markets, conserving forests, and providing income to rural communities.

In the late 1990s and 2000s, the Brazilian Institute of the Environment and Renewable Resources (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis – IBAMA) began intensifying its control of illegal logging, which often occurred on unclaimed lands or uncontrolled federal lands. Companies needed to find titled lands in order to get PMFS approved, and therefore the agrarian reform settlements became even more attractive timber sources. In some cases loggers helped families obtain legal title, as well as to prepare and get approval for legal deforestation permits or forest management plans. However timber

agreements between companies and communities were often exploitive and informal. There was a growing concern that agrarian settlements were being used to feed the timber industry and that the industry was exploiting poor families, a feeling exacerbated by the fact that new settlements seemed to be created with a capacity beyond demand by landless farmers (Carneiro et al 2011). Despite growing criticism of INCRA for failing to live up to its responsibilities and for facilitating exploitation of public forests by loggers through smallholders, INCRA continued creating new settlements at a much higher rate from 2002 to 2006.

Civil society responded with two proposals for formalizing and making more equitable the agreements between companies and communities. These new models were referred to as the "Legal Harvest" model for areas cleared annually for agriculture, and "Family Forests" or the "MAFLOPS" model, for the implementation of PMFSs in families' legal forest reserves in settlements (the 80% of land maintained in forest), after the company that led the new contracts between companies and communities (Carneiro et al. 2011).

In response to the lack of titled forest land and the conflicts that were occurring in settlements between loggers and families, and to streamline the approval of forest management plans, the 2006 Public Forests Law designated large areas of national forests as forest concessions, created the Brazilian Forest Service to manage the forest concession system, and decentralized approval of forest management plans from IBAMA to state environmental organizations. Also in 2006, the National Environment Council (Conselho Nacional do Meio Ambiente - CONAMA) within the Environment Ministry issued Resolution 387 requiring that agrarian reform settlements have environmental licenses as a requisite for getting PMFSs approved. Since INCRA had yet to develop the plans and studies necessary for the majority of settlements to receive an environmental license from the state environmental agencies, this effectively blocked legal forest management in these areas (this Resolution was recently replaced by another that simplifies requirements for PMFSs in settlements). In addition, in 2007 the Federal Prosecutor's Office (Ministêrio Público Federal) moved to invalidate all of the agrarian settlements created in 2005 and 2006, and thereby annul any forest management plans approved for those settlements (Carneiro et al 2011). Greenpeace also denounced what they perceived to be an industry of creating settlements to legalize timber for the wood industry (Greenpeace 2007, in Carneiro et al. 2011).

The transfer of responsibility for authorizing forest management to the states meant a lot of delays in approving annual operating and forest management plans. New state agencies had to be created, regulations had to be drafted, staff had to be hired and trained, and the forest industry had to adapt to the new regulations. In the meantime, illegal logging continued, if not increased.

After suffering much criticism with regards to logging companies operating in settlements, INCRA reacted by discontinuing its collaborations with companies and discouraging company involvement in forest management in settlements. It issued a regulatory instrument in 2010 (Normative Instruction 65) that required that forest management activities in agrarian reform settlements remain under the control of families or associations and rely on family labor, and strongly discouraged the participation of third parties (i.e., companies) in the implementation of these activities.

All of these changes, combined with a lack of technical and financial assistance from the government or civil society with the end of the ProManejo project, made it quite difficult for the community forestry enterprises initiated and/or supported by the ProManejo Program to continue operating (personal observations). The legal process of approving PMFSs and annual

operating plans was too complicated and expensive for communities to go it alone, and one could argue that government policies had the perverse effect of pushing them towards illegality. The current status of smallholder forest management is presented in section 1.5.

1.4 Control of illegal logging in the Brazilian Amazon

Brazil has several programs in place to detect and control illegal forest clearing, as well as a forest harvest authorization process and a system for tracking legal timber from the forest through timber processing facilities. In 2004, the national government launched a comprehensive and technologically sophisticated system called the Plan for Prevention and Control of Deforestation in the Legal Amazon (MMA 2013). In the first phase (2004 – 2008) focused on land titling and registration, several federal and state conservation units were created and indigenous territories were consolidated. In the second phase (2009 – 2011), with a focus of monitoring and controlling deforestation, concerted efforts between IBAMA, the Federal Police, the National Public Security Force, and the Brazilian Army helped deforestation rates drop substantially – 79% from 2004 to 2013. The third phase (2012 – 2015) focuses on promoting actions compatible with reduced deforestation rates and supporting sustainable production activities.

There are three official programs run by the National Institute for Spatial Research (INPE) that work to detect illegal forest activities remotely, and two programs for similar purposes being run by IMAZON, a non-profit organization. The three official programs have become more advanced over time and include: the Project for Amazon Forest Satellite Monitoring (PRODES), which has produced annual deforestation rates for the region since 1988; the System for Detecting Deforestation in Real Time (DETER), which distributes real time alerts of deforestation and degradation to control agencies since 2004; and the System for Mapping Forest Degradation in the Brazilian Amazon (DEGRAD), which was developed in 2007 by INPE and produces annual maps of areas in the process of deforestation by detecting degradation or selective tree removal (SFB 2013a).

The two programs run by IMAZON are the System for Monitoring Forest Harvesting (SIMEX) and System for Deforestation Alerts (SAD) programs. SIMEX is designed to monitor forest management activities and detect illegal timber harvesting (IMAZON 2012). It can pinpoint exactly where illegal harvesting is occurring and is linked to authorized timber volumes to also detect when volume limits are being passed; the last report available on-line is 2011-2012 for the states of Pará and Mato Grosso. SAD publishes monthly reports available on-line that pinpoint where deforestation and/or degradation are happening within specific agrarian reform settlements, protected areas, etc. (IMAZON 2014). The official numbers are used in most scientific research, and the IMAZON data provide a point of comparison and are readily available on their website.

A recent development is the Rural Environment Registry (Cadastro Ambiental Rural - CAR), in which, according to the revised Forest Code of 2012, all rural properties must be geo-referenced and registered by 2016 (Law 12.651/2012, Decree 8.235/2014). The CAR provides incentives for respecting land-use regulations (80% forest reserve, permanent protected areas, e.g., along streams) and penalties for not doing so (e.g., fines, restricted access to credit). The registry's land cover maps and database will help streamline the pre-approval step in the authorization of sustainable forest management plans and forest suppression (deforestation) permits, especially once all rural properties are registered.

At the forest level, there are several checks in place to ensure that sustainable forest management plans are emitted for forests that can support them. Visits by the appropriate environmental organization (required in some instances) are intended to help ensure in the pre-authorization step that forests are appropriate for management, and in the post-harvest step, that timber was taken from the forest as authorized (however these are rarely required or performed for smallholders in settlements, at least in western Pará according to key informants). Furthermore, a tree coding system is required that uses unique codes for commercial trees in inventories, physical tree tagging, harvest records, transportation documents and credit systems, and is designed to help provide transparency to the system when checked by enforcement personnel.

Finally, in order to track logs from the forest to processing facilities and discourage the purchase of illegal logs, Brazil adopted a new system in 2006 which requires that logs and other forest products be accompanied by transportation documents that specify the volume and species of the trees, as well as the origin and destination. The federal system utilizes the Documentation of Forest Origin (Documentação de Origem Florestal - DOF) system[7], and Pará state utilizes the SISFLORA system[8], which must be linked to the federal DOF system when products are transported out of state. When an annual operating plan is approved, a certain amount of volume credits per species are issued to the applicant based on the documentation in the plan, and these credits are managed and monitored in an on-line database. The plan's owner receives a code and each time he/she wants to transport products, they must use the system website to enter the buyer's information and the volume or credits for each species to be transported, and print the transportation document. The emission of transportation documents and the control of credits via internet have made the process more transparent, more accessible and less time consuming for companies than having to go to a central office for each timber sale.

An IMAZON study using data from the SIMEX system indicated that 87% of the transportation documents emitted in Pará checked out, i.e., the volumes reported corresponded to the level of activity in the forests, however it also found that 78% of the forest management activity in the state (by area) was unauthorized (Monteiro et al. 2013). Therefore, it would appear that timber is being transported to mills with fraudulent or no documentation. Indeed there are no control points along roads within the state to ensure that timber is being removed and transported in accordance with legal documentation or with any documentation at all.

Greenpeace recently launched a campaign (Greenpeace 2014) to draw attention to the "laundering" of illegal timber with legal transportation documents based in part on five case studies they completed in Pará, including one community-company partnership. They identified five ways in which companies are allegedly cheating the system: obtaining credits through a PMFS for an area already logged and/or cleared; declaring inflated volumes of commercially valuable species in forest inventories; forsaking harvesting in an authorized area to utilize credits to harvest from an unauthorized area; as well as working with employees inside the state environment agency (SEMA) to obtain higher credits than those stated in the Timber Harvesting Authorization (Autorização de Exploração de Produtos Florestais – AUTEX at the federal level; referred to as an Autorização de Exploração Florestal - AUTEF in Pará); and getting credits without authorization (Greenpeace no date). Greenpeace is calling for the government to

[7] For more information on the Documentation of Forest Origin system, see https://servicos.ibama.gov.br/index.php/autorizacoes-e-licencas/documento-de-origem-florestal-dof.
[8] For more information on the SISFLORA system of Pará state, see http://monitoramento.sema.pa.gov.br/sisflora/.

reevaluate all PMFS approved since 2006, to implement more consistent regulations for the approval of PMFS and that the approval process be public, and to improve the governance in the region by investing in the capacity and infrastructure of state and federal institutions.

The combined impacts of these initiatives to control illegal logging, as well as others (e.g., efforts within the cattle and soy sectors to exclude products from deforested areas, the creation of new protected areas) are thought to have played a major role in the 73% decline in annual deforestation rates from 2004 to 2013 (INPE 2014, Nepstad et al. 2014, Nepstad et al. 2009). The organizations that share responsibility for controlling illegal logging in the region include IBAMA, the State Secretary of the Environment (SEMA) for Pará, and the State Secretary of Ranching (SEFA). However, government officials require resources to act on alerts of illegal logging or illegal transportation of logs. The director of SEMA Santarém office indicated that his office receives alerts of illegal activities, but they have very limited personnel and financial resources to respond to them. Similarly, local key informants reported that it was infrequent for the government to control illegal activity in the agrarian reform settlements.

1.5 Smallholder forest management

The right to engage in legal forest management in family and community forests has increased dramatically in the last fifteen years, with the creation of both rural settlements for colonists and reserves (considered conservation units) for sustainable use for more traditional, forest-based families (Laws 9.985/2000 and 11.284/2006).

There was a surge in support for smallholder forest management for timber and non-timber forest products from the late 1990s to the late 2000s. The previously mentioned ProManejo project and the Floresta em Pé project invested millions of US dollars from domestic and international donors into developing models of sustainable smallholder forestry and working to improve community-company collaborations. National funds and many states and private foundations continue to support specific projects. In the meantime, the critical need for improvements in technical assistance and training for smallholders is recognized and is slowly advancing (SFB 2013a, SEMA 2010).

While the laws helped establish the legal basis for use rights, the requirements for legal forest management are quite technical and expensive. Other challenges that communities face include providing land tenure documentation, understanding the technical requirements in the sustainable forest management plan documents, paying to have the documents prepared and approved by a registered forest engineer, and finding service providers to implement the plan, as well as having enough volume of commercial species to interest a buyer and the adequate infrastructure for timber transport (Amaral et al. 2007, Pinto et al. 2010, Cruz et al. 2011).

The Santarém micro region in Pará state (which includes 8 municipalities and 92,474 km^2) has a large area of public forests designated for community use. By 2005, the Santarém region had almost 2 million ha of rural settlements (PA) and approximately 650 thousand ha of sustainable use conservation units (Sablayrolles and Miranda 2011) covering 2% of Pará; in 2010 this percentage had increased to 28% of the state (Pereira et al. 2010). For this reason it has become an important timber production area for companies in search of timber (Cruz et al., 2011), especially small and medium firms who do not have the capital and required documents to compete for state and federal concessions. The area has also been the focus of research on smallholder forest management and company-community timber agreements (see Amacher et al. 2009, Mention et al. 2009, Cruz et al. 2011).

In the following sections we present information on the process for securing authorization to harvest timber on smallholder lands and the current status of smallholder forest management. To the extent possible we provide specific information and examples for the Santarem region of Pará state.

1.5.1 Timber harvest authorization process for smallholders

In the Amazon region, the Forest Code requires that all landholdings maintain 80% of the area in a legal forest reserve ("legal reserve"), with some exceptions (Law 12.651/2012). Farmers are required to obtain permits to clear areas for agricultural purposes (crops, animal husbandry, agroforestry, etc.). However, farmers can only clear land in increments of 3 to 5 ha per year, depending on the category of landholding, until they reach the limit of 20%. Recent changes to the Forest Code allow for some exceptions, including a minimum of 50% legal reserve in some cases, and, in the case where the forest reserve is below the minimum percentage, larger landholders[9] have 20 years to reforest their legal reserves, and smaller landholders do not have to reforest their legal reserve to the 80% level, but cannot clear more forest. In order to harvest and sell trees legally, small producers have two options: they can obtain a forest suppression permit to convert a forested area to agricultural uses and sell the trees that are removed, or they can sell trees from the legal forest reserve with an approved sustainable forest management plan (plano de manejo florestal sustentável – PMFS) and an annual operating plan (plano de operação anual – POA). Both types of authorization can be obtained either for individual families in colonist settlements (only allowed in PAs in Table 1) or for groups of families organized in an association or cooperative. Smallholder timber sold without one of these authorizations is illegal.

In the case of a **forest suppression permit**, the applicant must submit personal identification documents, proof of ownership or use rights for the area to be cleared, and proof of registration in the Rural Environmental Registry (CAR) system, in addition to completed forms and several types of management plans (Normative Instruction 03/2011 SEMA Pará). The management plans include: a forest harvest plan, a plan for implementation of an activity for alternative use of soil, an environmental control plan, and, if applicable, a wildlife refuge plan and/or a plan for the use of wood residues. The forest harvest plan must include an inventory of all individual commercial species above 50 cm, and a sample of individual commercial species below this diameter. In the case of private land, the landowner should present these documents directly to the state environmental agency (the State Environment Secretary, or Secretaria Estadual do Meio Ambiente – SEMA, in the case of Pará); if the smallholder lives in a rural settlement project or conservation unit, the organization responsible for the project or unit should present the information on the smallholder's behalf – which implies a prior review and verification of the documentation. The review process by SEMA requires a visit to the area to be cleared, and the authorization is emitted via internet and valid for one year. SEMA will also emit an Authorization of the Use of Forest Residue (Autorização de Matéria-Prima Florestal - AUMPF) document for transporting the logs.

For the approval of **sustainable forest management plans and annual operating plans**, there are actually three phases during which different authorizations are needed: pre harvest, harvest, and post-harvest. The organization responsible for authorizing forest management and annual operating plans and the legal requirements for authorization vary by type of settlement or conservation unit (Table 2). In the *pre-harvest phase*, there are three potential required authorizations. In the case of smallholders who do not have a title to their land, they must

[9] Larger properties are considered to be greater than 4 rural modules, and smaller ones are up to 4 rural modules. The size of a rural module varies depending on the region.

obtain prior consent from the government agency that administers the settlement or conservation unit where they reside based on verification of identify and land rights documentation (Normative Instruction 001/2014 SEMA Pará). For residents of agrarian reform projects, including those with provisionary or definitive title, or who are part of a collective title, this consent should be from INCRA; for residents of state or municipal agrarian reform projects or conservation units, this consent is from the state land tenure agency (ITERPA in Pará). The agency then sends the documents to the state environmental agency (SEMA in Pará) to register the documents for the next step: authorization prior to the technical analysis (Autorização Previa à Análise Técnica - APAT). In this step the state environmental agency reviews the documentation presented to verify: the legal use rights of the applicant to the forest; compliance of the applicant with environmental laws (e.g., no fines have been issued); and that the forest appears to be appropriate for harvest (through review of the CAR system information and satellite imagery). Once the APAT is issued, the smallholder has one year to provide the forest management plan and the first annual operating plan (in practice it is common for the forest management plan and POA to be prepared while the prior consent and APAT processes are being completed). The forest management plan must contain an inventory, maps, and several other technical documents, and the annual operating plan should specify the activities to be implemented and the trees to be harvested (Normative Instrument 005/2011 SEMA Pará). Once submitted, the PMFS and POA should be approved by SEMA in 40 working days. In the case of federal conservation units, resident smallholders do not need previous authorization and can submit their paperwork directly to the Chico Mendes Institute for Biodiversity Conservation (Instituto Chico Mendes de Conservação da Biodiversidade – ICMBio) for the APAT; then the forest management plan and annual operating plan are also submitted to ICMBio.

The approval process for the PMFS and the first POA can take 1-3 years and entail relatively large costs for rural families, as well as significant financial risk. For example, Graffin et al. (2011) found in 2009 that costs associated with preparing for harvest activities and submitting a forest management plan and annual operating plan were approximately R$ 7,000 (USD 3,986) for a typical family with 60 ha in a settlement in the Santarém region. Currently, the cost in the Santarém region is R$ 70/ha for the inventory plus R$12,000 for a PMFS and POA, which would total R$16,200 (USD 7,364) for an area of 60 ha (Edson Cruz, IPAM, *personal communication)*.

When compared to the average total annual income from agricultural activities for settlers in the same region with a range of farm sizes of R$ 911 - 20,352 (USD 519 – 11,590) (Graffin et al. 2011), this cost is quite high. Other estimates of pre-harvest annual costs (including inventory and POA, but not the PMFS) for community forestry initiatives in the Brazilian Amazon in 2008 include USD 653 and USD 1,481 for two associations with 18 ha and 80 ha annual forest harvest area, respectively, in Amazonas state, and USD 27,604 for 300 ha for a cooperative in the Santarem region of Pará state (Humphries et al. 2012).

These costs are significant for communities and bolster community dependency on companies, NGOs, or government programs. In most cases of smallholder forest management in settlements, these costs are covered up front by a logging company or intermediary, and then deducted from the amount paid to the smallholder for the timber. The other options include obtaining credit from a bank or funding program, or, for forest management operations that have annual harvests over larger areas, building up capital with each year's timber sale.

Bureaucratic delays (due to lack of agency resources, changes in staff and/or laws, regulations, etc.) in approving POAs frequently result in authorizations arriving after the end of the logging season (which ends with the onset of the rainy season). In these cases, communities must

request an extension and wait until the dry season of the following year to harvest. This may also require having to extend credit on loans and find capital to prepare the POA for the following harvest area. This represents a significant financial risk and burden for smallholders, individually and collectively, as well as logging companies.

Recent policy changes affect the process for PMFS approval. First, the 2013 CONAMA resolution (Resolution CONAMA 458/2013) cancelled the requirement for settlements to have an environmental license before residents could get a PMFS approved. As very few settlements had environmental licenses, this was a huge bottleneck. However, with the new Forest Code, smallholders are now required to show proof of registration of their landholding in the CAR system. As all rural landholdings are required to be registered in the CAR system by 2016, it is hoped this will not pose a significant barrier to smallholder forest management in the medium term. A significant effort is being made by INCRA and state rural extension services to register smallholder lots in the CAR (personal observations).

In the *harvest phase*, the government requires the use of reduced impact logging techniques, which are based on planning in the pre-harvest phase for how to reduce damage to remaining trees and to the soil from the selective harvest of some trees (usually 4 – 6 trees per ha). The government also requires that workers use personal protective equipment.

In the *post-harvest phase*, the smallholder has to submit an activities report for each annual harvest unit, and if they have more than one annual harvest unit on their property and want to harvest the next unit, they also submit the next POA. The report should describe the activities implemented, and details regarding the trees harvested, sold, and transported. The activity report is evaluated and considered in the approval of the annual operating plan in the following year, if applicable. For smallholders in federal conservation units, a field visit by the responsible authorizing organization is required every year; for other smallholders a field visit is required a minimum of every two years. In effect, SEMA only does a field visit if the smallholder requests a second POA. As most smallholders who submit a forest management plan have their legal reserve harvested as one unit, a field visit is usually not performed, which means there is little control in the field to verify field reports.

Table 2. Types of authorization in the pre-harvest phase of forest management plan approval required by land tenure category, with reference to related legal document.

Land tenure category	Type of Authorization		Legal Documents
	Prior Consent	Licensing of Forest Management Plan and of Annual Operating Plan	
Private land	-	State environmental organization (SEMA)	IN 01/2014, SEMA Pará IN 05/2011, SEMA Pará
Federal agrarian reform settlement	INCRA	State environmental organization (SEMA)	IN 65/2010 INCRA IN 01/2014, SEMA Pará IN 05/2011, SEMA Pará
State or municipal agrarian reform settlement	State land tenure institute (ITERPA)	State environmental organization (SEMA)	State Forest Policy Law 6462/2002 – Pará State Government IN 01/2014, SEMA Pará IN 05/ 2011, SEMA Pará
Federal conservation unit for sustainable use (RESEX, RDS, FLONA)	-	ICMBio	Interministerial Ordinance Nº 3, 3 October 2008 IN 16/2011 ICMBio
State or municipal conservation unit for sustainable use (FLOTA)	State land tenure institute (ITERPA)	State environmental organization (SEMA)	State Forest Policy Law 6462/2002 – Pará State Government IN 01/2014, SEMA Pará

1.5.2 Current status of smallholder forest management in the Brazilian Amazon

Technical and financial assistance for complying with the requirements for getting a forest management plan and annual operating plan approved are supposed to be made available to smallholders through government programs (Normative Instruction 65/2010 INCRA). In reality, the government does not have the human or financial resources to provide this assistance to the large number of families living in settlements in the region – estimated at 452,668 families in the northern region of Brazil and 93,749 in Pará state (MDA and INCRA 2014). Therefore, smallholders depend on timber companies and/or a small number of NGOs to navigate the authorization processes and get their timber products into markets. With third-party assistance, a relatively minute proportion of smallholders in the Brazilian Amazon has secured authorization and is participating in legal timber markets.

At the level of Brazil's Legal Amazon, as of 2006, 150 forest management plans had been submitted for smallholders (including 26 for associations and 124 at the family level) and 148 plans had been submitted for companies, of which a total of 93 were approved (Cruz et al. 2011; the study did not specify how many were approved of each type). A study conducted in 2009 and 2010 identified 902 smallholder timber initiatives with management plans either approved or submitted for approval (Figure 1), of these 127 were community level and 775 (86%) were family level (Pinto et al. 2011). Based on this information it can be assumed that an increasing but still very small percentage of families in the region are involved in legal forest management for timber production.

Although there were several forest management plans developed in Pará state in the mid to late 2000s as part of the ProManejo and Floresta em Pé projects, many were suspended, cancelled,

or left inactive from 2007 to 2013.[10] In 2007, the Public Prosecutor suspended 106 agrarian reform settlements in the Santarém region due to abnormalities in the way settlements had been created in 2005 and 2006 (especially the lack of environmental impact studies) (Carneiro et al. 2011), which invalidated PMFS developed for those areas. Then in 2008, based on the requirement that settlements have environmental licenses as a condition of approval of forest management plans (CONAMA Resolution 387/2006) and that fact that no settlements in Pará had been licensed, the court prohibited SEMA from authorizing PMFSs until the situation was resolved (IBAMA 2011). The recent simplification of the requirements and procedures for obtaining an environmental license (Resolution CONAMA 458/2013) should facilitate the reactivation and implementation of forest management plans submitted since 2006.

According to data recently obtained from SEMA, only 2 associations in Pará state received approval to transport forest products in 2013 (i.e., they requested and received AUTEFs), which corresponded to a total of 4,938 ha of forest and 137,877 m^3 of timber. The SEMA official interviewed said many of the older PMFSs for smallholders in settlements that were inactive the last eight years had been reactivated, and he expects to see an increase in the number of POAs approved for smallholders in 2014.

[10] In 2009/2010, Pinto et al. (2011) found 48 community forestry initiatives (associations and cooperatives) with forest management plans for timber in the state, but data on family level initiatives were not available and it is not clear how many plans resulted in authorized timber harvests. In 2012, Feitosa (unpublished data, 2012), identified 60 association or cooperative PMFSs that had been submitted to the state environmental agency SEMA since 2006, when the state system for controlling the transport of timber, CEPROF, program was initiated. Of these, only 30 (52%) were listed as “active”, with the rest either suspended (45%) or cancelled, perhaps due to issues that arose regarding settlements in 2007 and 2008. It is also not clear how many of the 30 active forest management plans resulted in harvested timber.

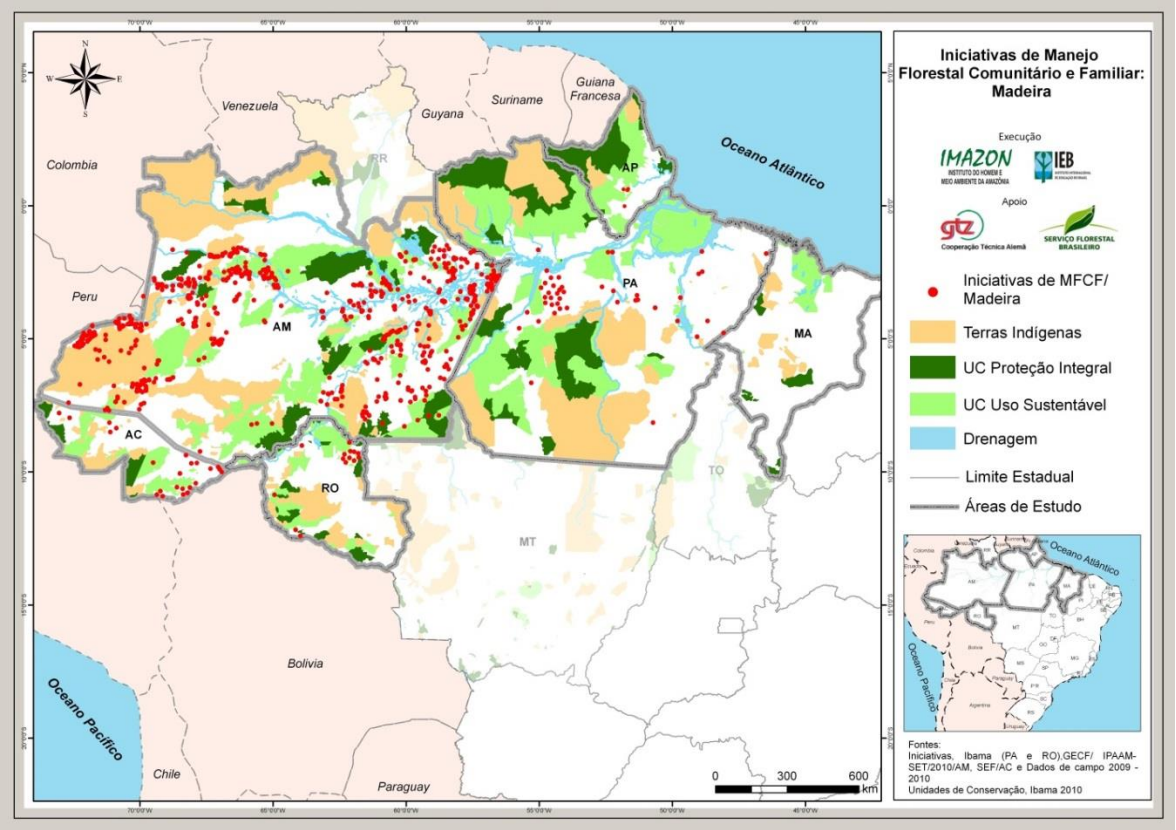

Figure 1. Community and Family Forestry Iniatives in Brazil's Legal Amazon region in 2009-2010. Red dots indicate community or familiy forest management initiatives. (source: Pinto et al. 2011)

2. Methods

This report is the result of a comprehensive literature review, interviews with key informants in the Santarém region (Figure 2), and the authors' experiences with smallholder forest management in Brazil. The literature review included peer-reviewed publications, white papers, project reports, and government databases and webpages. The interviews were conducted with the following types of key informants: smallholders involved in legal timber production, governmental agencies, forest products companies, and non-governmental organizations working on smallholder forest management (Annex 1). The interview instrument was a list of questions for each type of stakeholder (Annex 2), though given time constraints, the interviewer often focused on a subset of questions most relevant for that stakeholder.

Figure 2. Santarem microregion, in Pará state, Brazil. Source: Earth Innovation Institute.

3. Results

The results presented in this section are from the literature review and interviews. We present the results organized by principal research question, as defined by Chatham House.

3.1 What is the degree of illegality and the types of illegality amongst small-scale producers?

In 2010, it was estimated that 36% of wood extracted from Brazilian Amazon forests was illegal (Pereira et al. 2010). In addition, it is recognized that smallholders are significant actors in deforestation and logging in the Brazilian Amazon (Nepstad 2005; Pacheco 2012), though they do not always sell the trees from areas they clear for agriculture (see Amacher et al. 2009). As presented at the beginning of section 1.5.1, the processes for obtaining authorization for selling wood legally are quite complicated, expensive, and take a long time. In addition, some key informants reported that many smallholders may not realize it is illegal for them to sell trees from forests near them, e.g., from forests they have lived in for generations or in lots allocated to them in government settlements. Thus, for many reasons, it is accepted as quite common for smallholders to sell trees illegally, but it is difficult to generate good estimates of how many do so.

3.1.1 Types of illegality amongst smallholders

Smallholders commonly engage in the illegal timber trade by selling standing trees or roughhewn boards (cut by chainsaw or axe) to loggers without required government authorization. To sell trees from their legal forest reserve smallholders need approved sustainable forest management and annual operating plans, and to sell logs from the 3 to 5 ha they are allowed to clear annually (up to 20% of their lot), they need approval of a forest suppression plan. Even when smallholders obtain authorization, it is not uncommon for them to unwittingly contribute to the illegal trade when credits from their approved annual operating plan are sold without the smallholders' knowledge by loggers or foresters "working with" the smallholders.

3.1.2 Degree of illegality amongst smallholders

As a result of the informal nature of many illegal timber sales, it is difficult to estimate how many smallholders are involved in the illegal sale of timber in the Brazilian Amazon and the Santarém region. Contributing factors to illegality include that it is very common for smallholders to clear some forest every year or every other year for crops, while the process of obtaining legal permission to do so is very onerous. Furthermore, it is widely perceived that there are no real consequences for illegal logging.

A 2003 study by Lima et al (2006) of 3,000 smallholders along a 1000 km stretch of the Transamazon highway in Pará state found 26% had sold timber within the previous five years. These smallholders sold an average of 20 standing trees, which the authors estimated to produce about 100 m^3 of timber (assuming 5 m^3 per tree). An estimated 80% of this timber came from the smallholders' legal forest reserves, and all of this timber was harvested illegally as there were no approved forest management plans in this region in 2003,.

While the authors are not aware of recent data specifically on illegal timber harvests by smallholders, studies from 2008/2009 and 2012 provide data that allow us to roughly estimate the number of smallholders engaged in illegal timber in Pará state based on: (1) the estimated volume of timber from smallholders and the estimate of illegal timber in the market; and (2) the area of smallholder forest illegally harvested for timber (Table 3).

First, Pereira et al (2010) report that of the 6.599 million m^3 of tropical wood consumed by the wood industry in Pará from mid-2008 to mid-2009, 28% (1,847,720 m^3) was extracted from smallholder lands (<500 ha). They also estimate that 36% of the timber harvested in the Amazon was illegal. If we assume that illegal wood was taken in equal proportions across landholding types and states, these data allow us to estimate that the volume of illegal timber extracted from smallholders in Pará state in 2008/2009 was 665,179 m^3. If we then assume that smallholders sold an average of 15 m^3 of logs per ha (4 – 6 trees/ha x 5 m^3/tree on average[11]) for areas ranging from 10 ha (250 m^3) to 50 ha (1250 m^3), we could estimate that between 532 and 2,661 families sold timber illegally in Pará state in 2008-2009.

Next, a 2012 IMAZON study (Monteiro et al. 2013) of Pará timber harvesting found illegal harvesting covered 122,337 ha (which was 78% of forests harvested), and 25% of this (30,825 ha) was located in rural agrarian settlements, however the study did not indicate the number of different smallholder lots in which this harvesting occurred. Based on these data, we can estimate that the number of smallholders engaged in illegal activity ranged from 617 (if each harvested 50 ha) to 3,083 (if each harvested 10 ha).

Given these data and assumptions, **we can roughly estimate that between 532 and 3,083 families in Pará were involved in illegal timber harvesting in settlements in the early 2010s, which represented between 1% to 3.3% of the families settled in Pará** [based on an estimated 93,749 settled families in Pará (MDA and INCRA 2014)].

[11] The number and volume of trees harvested may depend on several factors, such as market demand for specific species and the number of times an area has been previously harvested. Lima et al. 2006 and SFB 2013 use an estimate of 5 m^3 per commercial tree harvested.

Table 3. Estimates of numbers of smallholders involved in illegal logging in Pará state.

Period of time	Base data	Assumptions	Estimated number of smallholders involved in illegal timber harvest
mid 2008 – mid 2009	*Timber volumes* - 6.599 million m3 of timber produced in state - 1,847,720 m^3 (28% of total) was harvested from smallholder forests (<500 ha)	- illegal timber was distributed equally between Amazonian states and landholder groups, and therefore, 665,179 m^3 of smallholder timber was illegal (36% of total) - all smallholders were in settlements with an average of 100 ha each - each smallholder harvests 10 to 50 ha (of a total 100 ha) - 25 m^3 of logs are produced per ha (4 to 6 trees per ha, and 5 m^3 per tree) - each smallholder harvested 250 m^3 to 1250 m^3	532 to 2,661
2012	*Forest area harvested* - 157,239 ha of forest harvested in the state - 122,337 ha (78% of total) was illegally harvested - 30,825 ha was located in rural agrarian settlements (25% of illegally harvested forests)	- each smallholder harvests 10 to 50 ha (of a total 100 ha)	617 – 3,083

3.1.3 Control efforts for illegal wood among smallholders in Brazil and the Santarém region
Key informants in Santarém reported that due to a lack of capacity within the agencies responsible for controlling illegal logging, including staff and vehicles, there is very little on-the-ground control of illegal logging among smallholders. Smallholders interviewed said that even when they take the risk of reporting illegal logging in their communities to the authorities, there is usually nothing done about it. There is also a lack of confidence in public agencies and officials, as evidenced by the recent closure of the Santarem IBAMA office in May 2014 by the Federal Police for investigation of documents that disappeared related to environmental infractions (O Impacto 2014). Official statistics on activities to control illegal logging and fine guilty parties were requested from IBAMA and SEMA, but not made available.

3.2 Level of legality verification or sustainability certification amongst small-scale producers

Currently, certification of verification of legal origin and legal compliance are offered in Brazil. The former involves the verification of legal authorization of forest management activities. The latter goes much further into verifying compliance with environmental, labor, and technical forestry regulations.

3.2.1 Number of smallholders with legality verification
The lack of a centralized list of operations with legality verification in Brazil makes it difficult to verify how many company and community operations have received legality verification

certification. The Amazon Alternative, an initiative which encouraged legal forest management and trade of legal timber in the Amazon region, reported that this was a motivation for companies, but did not mention this among communities (Immerzeel and Hamers 2014). IMAFLORA, part of the Rainforest Alliance and one of the main certifiers of companies and smallholders in the country, reported (personal communication) that they have not certified any smallholders for legality, and were not aware of any other certification bodies that had; IMAFLORA has only one company certified for verification of legal origin.

3.2.2 Number of smallholders with sustainability certification

In Brazil there are two main sustainability certification programs: the international Forest Stewardship Council (FSC), which has a national office in Brazil, and CERFLOR, a national program endorsed by the international Program for Endorsement of Forest Certification (PEFC). The FSC is a membership-based organization that implements policies voted on by members and approves standards for forest certification based on transparent, multi-stakeholder processes. CERFLOR certification standards are prescribed by the Brazilian Association for Technical Standards (Associação Brasileira de Normas Técnicas – ABNT) and the certification program is part of the Brazilian System for Evaluation Conformity and the National Institute of Meteorology (INMETRO). Both systems are voluntary and cover forest management as well as the chain of custody for timber; FSC certification is also available for non-timber forest products.

Regarding FSC certification, there are 102 certified forest management operations covering 6.3 million hectares of certified forests in Brazil (Forest Stewardship Council, 2014). Of these, ten are groups of smallholders (nine associations, one cooperative), five are the Brazilian Amazon, and five are in Bahia (Annex 3). Among the smallholder operations in the Amazon, one is in the Santarém region, the Cooperativa Mista Flona Tapajos (COOMFLONA), and four are in Acre state; the four in Acre are also part of a cooperative, the Cooperativa dos Produtores Florestais Comunitários (Cooperfloresta). Both of these cooperatives have received substantial financial and political support as pilot projects and certification has been an explicit goal and condition of support (Humphries and Kainer 2006; Immerzeel and Hamers 2014). The first certifications of community forestry initiatives occurred in Acre state in the early 2000s and were managed originally by civil society organizations, though they are now managed by the associations. Coomflona received FSC certification in 2013 and is directly responsible for its certificate. Other sources of support for FSC certification for smallholders in Brazil include: the FSC International Center's Smallholder Support Program, which provides guidance and resources to support smallholder certification, including a Smallholder Fund, which finances activities to help smallholders prepare for and maintain certification; the FSC Brazil office, which has supported smallholder certification through training and financial support; the Amazon Alternative, which helped finance certification in the Brazilian Amazon for community enterprises and create market linkages between companies and communities; and the certification body IMAFLORA, which has a fund to subsidize certification fees for smallholders.

Challenges for FSC certification of smallholders have been well-documented in general (Molnar et al. 2003), and in Brazil specifically (Humphries and Kainer 2006, May 2006, Immerzeel and Hamers 2014). The first challenge is to operate legally (the challenges for this are outlined in section 3.3). Other common challenges include understanding certification standards, paying the costs of adapting practices to meet the standards and for the certification body fees, maintaining and implementing appropriate internal regulations, meeting internal chain of custody requirements, and controlling contractors who provide services. In addition, the incentive to secure certification is usually to receive assistance from a governmental or non-governmental organization to initiate and implement forest management activities, and when the project ends, communities can have difficulty justifying and paying for certification. While there is usually little

information on the market, there is frequently an expectation that buyers offering a price premium will materialize. In fact, there is currently little demand for certified products within the Amazon or Brazil, and it is logistically complicated and expensive to link international buyers with small-scale producers in the Amazon. Furthermore, without demand for certified products and the provision of price premiums, it is difficult for certified products to compete with lower cost illegal products; this is especially the case for smallholders who have smaller volumes of timber products and thus higher per unit (e.g., per m^3) costs. This may change as the FSC is trying to draw attention to the value of certification and increase demand for smallholder certified products with a new smallholder label and advertising campaign[12]. FSC Brazil is also working to connect certified smallholders with buyers, such as the Brazil 2016 Summer Olympics Organizing Committee.

Regarding the CERFLOR program, there are 20 certified forest management operations covering 1.8 million ha of planted forests in Brazil, none of which involve natural forests (CERFLOR 2014). Of the 20 certified operations, four are associations of smallholder eucalyptus growers in Bahia – two of which are also FSC certified. While increasing the number of smallholders in the PEFC system through group certification is a priority in general (PEFC 2014), there is no direct support for this in Brazil.

3.3 Key challenges for small-scale producers for complying with requirements for legality verification certification

Verification of legal origin and of legal compliance are opportunities that smallholders are not utilizing in Brazil currently, but these mechanisms may grow in importance in coming years. As no smallholders have applied for certification of legality verification to our knowledge, this review of challenges is based on a review of standards and the authors' experiences with the challenges smallholders often face in the FSC certification process.

We reviewed the generic standards for verification of legal origin and compliance for the Rainforest Alliance[13] (2014), which implements legality certification in Brazil, as outlined in Table 4. For verification of legal origin, the forest management unit must comply with items 1-4, which deal with administrative aspects of forest management authorization, and items 10-13 dealing with chain of custody. Items 14-16 are for organizations with multiple forest areas, such as associations or cooperatives. For verification of legal compliance, the forest management unit must comply with all items. There are currently no special standards for smallholders, and we review below per theme the challenges smallholders might face if they were evaluated against the standards.

[12] For more information on the FSC small and community producer label option see https://ic.fsc.org/small-and-community-label-option.618.htm.

[13] IMAFLORA indicated in communication with the lead author that it plans to phase out verification of legal origin, and only implement verification of legal compliance in the future. Imaflora does not have a verification of legal compliance standard for Brazil, so we consulted the Rainforest Alliance generic standards, which were issued in March 2014 for consultation.

Table 4. List of main themes in the Rainforest Alliance's legality verification standards.

No.	Theme	Verification of Legal Origin	Verification of Legal Compliance	Producer Group, Association, or Cooperative *(Additional)*
1	Legal Right to Harvest	X	X	
2	Approved Planning Authorizations and Operations	X	X	
3	Payment for Relevant Fees and Taxes	X	X	
4	Transport and Trade	X	X	
5	Fulfillment of Harvesting Regulations		X	
6	Fulfillment of Environmental Regulations		X	
7	Worker's Rights		X	
8	Third Parties Right		X	
9	Control of Unauthorized Activities		X	
10	Quality Systems Criteria	X	X	
11	Material Handling and Segregation	X	X	
12	Shipping and Sales Criteria	X	X	
13	Claims and Public Information	X	X	
14	Documented Procedures and Responsibility			X
15	Records			X
16	Site Management and Auditing			X

source: Rainforest Alliance 2014.

3.3.1 Legal right to harvest

The legal right to harvest is only granted through approval of a forest management plan or a forest suppression plan (for clearing areas for agriculture or grazing), therefore there is some overlap between themes 1 and 2. The first main challenge for obtaining the legal right to harvest is **documentation of land ownership or use rights.** While the designation of use rights on public lands for smallholders has made considerable progress in the last 25 years since the first extractive reserve was created, such that today families and communities have been designated almost half of the region's forests, very few families have received their individual or collective titles or use rights documents. The tenure issue is further complicated by the high number of disputes and conflicts over land and the lack of government capacity to resolve the conflicts and issue titles or use rights documents. Brazil is one of the top countries for conflict over land where smallholders are frequently intimidated and sometimes killed (CPT 2013, Global Witness 2014).

In 2009, to address the tenure problem, the Brazilian government created the Legal Land Program (Programa Terra Legal) to be coordinated over five years by the Extraordinary Secretary of Tenure Regularization in the Legal Amazon (Secretária Extraordinária de Regularização Fundiária na Amazonia Legal – SERFAL) to regularize land that had not yet been titled within the Amazon region. The program has developed the Tenure Management System, with three components: recovery of land acquisition records, land tenure investigation and verification, and land tenure registration (SERFAL 2011). There has been some progress

in defining and developing the process and registering some land titles, but the demand is enormous. Da Costa et al. (2011) report that in the state of Amazonas, the government was able to provide enough technical assistance to enable over 800 families to submit forest management plans, but only 12% were approved due to tenure problems. Notably, none of these were executed due to delays such that the licenses were issued after the harvest season when conditions did not permit logging in natural forests.

The second main challenge for obtaining authorization (and for community forestry in general) cited frequently by key informants and commonly mentioned in the literature is the **internal organization** of the association or cooperative, in the case of community forest management. Associations and cooperatives must comply with complex and rigid rules for operation, and develop their own clear structures and internal rules. They must also pay fees and fines for delays in financial reporting.

The third main challenge is that the **government presents many obstacles** to smallholders seeking to legally manage their forest resources. These obstacles include: **deficient capacity** to provide documentation of tenure and to help resolve disputes; deficient capacity to provide technical assistance to smallholders for forest management; deficient capacity to analyze and authorize forest management and annual operating plans, analyze annual activities reports, and conduct the field visits required for continued approval of annual operating plans; **conflicting or unclear policies and regulations**; and, in some cases, a **lack of will** to implement policies and regulations.

More investment is needed in state capacity to support smallholder forest management. Although some federal and state programs have provided short-term **technical assistance** through projects, most states still do not offer regular technical assistance for forest management, with Acre, Amazonas, and Amapá states being the exceptions. A lack of forestry engineers and technicians trained to work with communities also compounds this problem (Carneiro et al. 2011), as universities have traditionally focused on training these professionals to work with industry. In 2013, the Ministry of Agricultural Development (MDA), INCRA, and the Directory of the Development of Settlement Projects (Diretoria de Desenvolvimento de Projetos de Assentamento – DD) issued a call for proposals to contract technical assistance for agro-extractive communities, which represents progress in this area, although the fact that each contract was for only one to two years (MDA 2013) makes it unlikely that extension staff will be able to accompany execution of approved plans.

Comprehensive analysis of policies and regulations is needed to resolve problems. Examples of conflicting policies include a requirement that was introduced by the Ministry of the Environment in 2006, after some smallholder forest management plans had already been approved, that agrarian reform settlements must also obtain environmental licenses, which depend on the approval of several studies on environmental viability, technical viability, and environmental impacts, and an environmental management plan (Resolution CONAMA 387/2006). INCRA, also a federal agency, is the organization responsible for drafting the environmental management plan for settlements with public participation, but has historically lacked the resources to do so. Therefore, the same government agency responsible for verifying smallholders' identity and property documentation as the first step in the forest management process, was precluding smallholders in its settlements from implementing forest management due to its own limitations (this requirement was simplified in 2013). In another example, as part of a 2010 decree by INCRA that specified the process for obtaining authorization for a forest management plan, it was also specified that forest management activities in settlements had to be implemented by families, unless there was a very good

reason to contract third party service providers. This effectively blocked several innovative company-community partnerships that were being supported by other government agencies, and which were the main way in which families and communities were selling legal timber. This regulatory instrument has been interpreted several times to try to allow company participation as long as control over activities remains with the community association or cooperative, but it still causes a lot of confusion regarding what level of company participation is allowed.

3.3.2 Approved planning authorizations and operations
As outlined at the beginning of section 3.0, the process for obtaining approval of the required plan(s) for harvesting and selling timber is quite onerous and long. A main challenge here is **obtaining information about and understanding the legal requirements for authorization**, as well as understanding the responsibilities that accompany authorization.

Another challenge is **financial assistance**. Again, some programs and projects have offered assistance in paying for training, infrastructure, equipment, and technical services, but these are usually short term (two to five years). There are several credit programs available for forest-related programs, including several that support smallholder forest management for timber (see SFB 2013b). However, smallholders in the Amazon region are not accessing them for many reasons, including: the insecurity around authorization of forest management plans given the legal requirements for environmental licenses; land tenure documentation challenges; difficulties with collateral, as forestland has low value and communities on public lands cannot offer land as collateral; and a lack of supporting documentation or research for applications (SEMA 2010).

3.3.3 Payment of relevant fees and taxes
Fees related to timber harvesting include the rural activity license (licenciamento de atividade rural – LAR), the authorization of timber harvest (AUTEF), and entry into the state's registry of forest product consumers (or buyers) (Sistema de Cadastro de Consumidores de Produtos Florestais - CEPROF. The fees for the LAR and AUTEF depend on the size of the area to be harvested: R$ 65 to 19,000 for the LAR (USD 29.54) and R$ 65 to 7,863 (USD 29.54 to 3,574) for the AUTEF (SEFA 2014). The fee for CEPROF registration is R$ 537.07 (USD 243). There are no fees related to the value of the tree to be harvested when harvesting occurs on individual or community titled lands.

The Brazilian tax system is quite complex and taxes vary substantially based on the type of enterprise and options chosen for tax payments. Companies operating in Brazil must pay taxes either based on actual income (Lucro Real) or based on presumed income (Lucro Presumido), and options include paying some taxes in a cumulative or non-cumulative way. Cooperatives, micro (gross income less than R$360,000) and small enterprises (gross income between R$360,000 and R$3,600,000), and other social enterprises receive differential treatment in the tax system.

According to a recent study commissioned by the Brazilian Forest Service to understand the tax burden on actors in the timber sector (SFB 2014), the taxes that apply to these actors in general include:

- rural social security (which includes accident insurance and a rural education fund) at 2.3% of gross income
- unemployment insurance and national social security at 3.65 to 9.25% of gross income
- labor taxes at 33.77 to 67.17% of total salaries paid, depending on the size and type of producer
- value added tax, which varies by state, but does not usually apply to the sale of logs or sawn

wood
- income tax at 15% of profits
- social contributions at 9% of profits.

Cooperatives are exempt from: (1) unemployment insurance and social security payments if they process raw materials that they extracted or produced; (2) labor taxes for workers who are cooperative members, (3) income tax, and (4) social contributions. In effect, they only pay the rural social security tax if they use only cooperative members for labor and sell minimally processed timber products.

Associations of producers are not considered businesses, but rather not-for-profit organizations that provide services for their members (Brazilian Civil Code, Law 10.406 of 10 January 2002). This service can include connecting association members with buyers, as in the case of community associations who organize to sell their members' timber. The only tax paid in this case is a service tax of 5 to 10%, based on the volume of timber sold (Alcilene Cardoso, IPAM, *personal communication*).

3.3.4 Transport and trade

As explained in section 1.4, there are national (DOF) and state level (SISFLORA in Pará) tracking systems that manage credits for timber authorized for harvest through the authorization of annual operating plans, and these systems are designed to be accessed and managed on-line. These systems can be challenging for smallholders who do not have access to the internet. As a result, it has been common for families and associations to authorize the forest engineer or logger they work with to issue these documents. However, local experts reported that this is one of the ways that loggers and sawmills can abuse the system to "legalize" wood illegally harvested from other areas. Ultimately, the smallholder whose name is on the forest management plan and transportation document is responsible for how these documents are used, so it is a risk to authorize others to emit transportation documents.

3.3.5 Fulfillment of harvesting and environmental regulations, and workers' rights

There are few cases in the Brazilian Amazon where families or members of associations or cooperatives implement harvesting of trees and removal of trees themselves. It is much more common for companies to purchase standing trees and take responsibility for harvesting them, as well as constructing trails, log yards, and roads. These companies also usually hire temporary workers and/or subcontract other service providers to do this work. However, the individual or group representative whose name is on the forest management plan is still responsible for ensuring that all harvesting, environmental, and labor regulations are met. This can be difficult given the imbalance in technical expertise and power between families/associations and companies, i.e., it can be difficult for smallholders to determine if service providers are complying with regulations and to hold them to any agreement to do so.

3.3.6 Third parties' rights

Smallholders would be responsible for ensuring that their management practices do not infringe on the rights of others and that those impacted have given their free, prior, and informed consent. Even when a community governance body (e.g., assembly, association) has passed a resolution or signed an agreement to allow forest management activities, there can still be individuals who are not in favor of or believe they are negatively impacted by management activities. It usually takes a lot of effort to educate and maintain informed members of larger communities, and this can be very challenging.

3.3.7 Control of unauthorized activities
Community members interviewed indicated that illegal logging is a problem, even when the land owner/occupant has refused to sell their timber. They cited families waking up and finding that trees had been removed from their property during the night. One community member also shared that she had twice received death threats from loggers who wanted her to drop efforts to get forest management plans approved for families in her association, and to sell timber to him instead. This is unfortunately a common scenario in the region (see Global Witness 2014). Greenpeace (2014) also alleges that corrupt governmental officials help facilitate the laundering of illegal logs through the state and federal timber product tracking systems. Therefore, smallholders may have limited capacity for controlling unauthorized logging, even when this is what they would prefer.

3.3.8 Chain of custody
The smallholder is responsible for meeting the chain of custody (CoC) requirements from the point of harvest to when the timber leaves the smallholder's property. Brazilian regulations require that each tree receive a unique code during the forest inventory, that the code be used to identify the trees harvested, and the code be visible on both the stump and log after harvest. Few smallholders or groups manage this requirement without outside technical assistance from non-profit or government organizations or companies.

The additional requirements in the four CoC standards in the Rainforest Alliance generic standards would also likely prove difficult for most families and associations, including:

- training requirements for workers in CoC procedures
- systems, procedures, and practices to control mixing of non-verified with verified products
- rules regarding the use of verification codes and claims.

Again, it is the understanding of these requirements and the documentation of the related processes (as necessary) that would pose the biggest challenges for smallholders. They would likely have to obtain outside assistance to be able to develop the required systems and procedures, and then try to ensure that the companies that harvest and transport the trees observe the requirements.

3.3.9 Multi-site management requirements
The allowance of multiple site verification could help smallholders by centralizing responsibility for verification in the association or cooperative. However, the group must have the organizational and technical capacity to understand and implement the requirements, and/or seek assistance from outsiders.

3.4 What are the key challenges for small-scale producers to be able to demonstrate legality?

As mentioned previously, the main challenges for smallholders to demonstrate compliance with laws are a lack of documentation of land ownership or land use rights and the technical demands for legal forest management. As very few smallholders have the capacity to initiate the preparation of a management plan, most will require assistance from a civil society or government organization, the company that will harvest the wood, and/or a third-party service provider (e.g., consulting forester). Once a forest management plan is approved, which means ownership and use rights and the technical aspects of management have been documented and verified, most requirements for verification of legal origin will be met. The chain of custody system requirements will be difficult for most smallholder associations and cooperatives to manage, but if the certifier allows some flexibility based on the scale of the operation, then this should be reasonable. If the smallholder decides to pursue verification of legal compliance,

then the most difficult part for them will likely be understanding and ensuring conformance by outside operators with harvesting, environmental, and labor regulations (David Escaquete, Imaflora, *personal communication*).

3.5 Initiatives to promote legal compliance and to facilitate producers to demonstrate legal compliance, and lessons learned

Several initiatives at the federal, regional, and state level have promoted sustainable forest management among smallholders (Table 5). These programs promoted forest certification for smallholders, but did not specifically encourage legality verification. Two large federal initiatives that had the longest sustained support for smallholder forestry were the Support for Sustainable Forest Management in the Amazon (ProManejo) program from 1999 to 2007, which was part of the Pilot Program to Conserve the Brazilian Rainforest, or PPG7, (IBAMA 2006, ProManejo 2007) and the Floresta em Pé program from 2006 to 2011 (Cruz et al. 2011). ProManejo provided a big push to initiate and support community forest management across the Brazilian Amazon, from very small associations of families to larger cooperatives, and to stimulate the development of policies to regulate and support smallholder forest management. Many non-profit organizations and professionals were funded to work with community forestry pilot projects, companies, and training centers to design and implement different types of forest management and value-added processing models. Newly founded associations and cooperatives received technical assistance, training, materials, and equipment to initiate activities; in a few cases already existing initiatives (e.g., in Acre) were strengthened and studied. Several smallholder forestry initiatives in the Santarém region were supported through the ProManejo project, including Coomflona and families in the Moju settlements.

Among the major lessons learned identified from the ProManejo project were: 1) land tenure is a serious problem for legalizing forest management; 2) partnerships between companies and communities for commercial and training purposes are necessary, but can be very difficult to manage and need room for adaptation as they mature; 3) the use of third parties for some forest management activities made the use of best practices and capacity building for community and company workers difficult; 4) capacity building is most efficient when smallholders help choose the methods and content of training; 5) technical assistance should be based on continued training of technicians and producers; 6) infrastructure is a serious problem for transporting machinery and products; and 7) much work is still needed to control illegal products and improve the licensing process, which currently acts as a deterrent to legal management (IBAMA 2007).

The Floresta em Pé project followed from 2008 to 2011 (Cruz et al. 2011). The project was led by IBAMA and financed in part by the French Fund for the Environment (FFEM). Collaborators from Brazil included: National Corporation for Agricultural Research (Empresa Brasileira de Pesquisa Agropecuária – EMBRAPA) East Amazonia, International Institute for Education in Brazil (Instituto Internacional de Educação do Brasil - IEB), and Foundation for Forest Technology and Geoprocesssing (Fundação de Tecnologia Florestal e Geoprocessamento - FUNTEC); and from France with offices in Brazil: the Center for International Cooperation in Agronomic Research for Development (CIRAD), Groupe de Recherche et d'Echanges Technologiques (GRET), and the Office National des Forêts (ONF). One of its foci was on building the capacity of communities to collaborate with companies as a win-win situation in which communities did not have to depend on projects to receive technical assistance to manage their forests and sell their timber, and companies obtained access to legal sources of timber.

The lessons learned from the Floresta em Pé project included that the legal framework must be adapted to better support community governance of forests and to make legal smallholder forest management more environmentally and economically sustainable, communities still need a lot of support to enter into fair contracts with companies, and FSC certification could help promote strengthened forest governance in community-company partnerships and add transparency to these arrangements (Cruz et al. 2011). Recommendations included that communities should be given more autonomy in how and when they decide to work with companies, and companies should contribute to making community forestry more viable (e.g., through technical and financial assistance) (Cruz et al. 2011).

The Community and Family Forest Management Program was established in 2010, and is run by the Ministries of the Environment and Agricultural Development (as mandated in Decree 6.874/2009), and housed in the Brazilian Forest Service. The Program was created to coordinate actions to organize and promote sustainable forest management among traditional communities and family farmers who depend on forests for their livelihoods. Annual plans for 2010 and 2011 were published (SFB 2009, SFB 2010), but there has not been one since. Funding is to be provided from the Ministry of the Environment and the Ministry of Agricultural Development, as well as from various funds, including the National Fund for Forest Development, Amazon Fund, and the National Fund for the Environment. The 2010 plan focused on the Amazon region, and included an objective to support community-company contracts that are fair and just in the Santarem region (SFB 2009). Amaral Neto et al. (2011) lament that to date the program has faced difficulties in coordination between the two ministries, suffered from low technical and operational capacity within the ministries, and had made little progress in addressing the challenges of community forestry in the country.

The Forest Stewardship Council Brazil Office is currently implementing a program across the Brazilian Amazon with partner organizations to identify and build the capacity of smallholder associations and cooperatives for certification. The method focuses on self-evaluation of progress towards compliance with certification requirements. To date the program was successful in working with Coomflona (a cooperative in the Santarem region) in its preparation for certification, and the program is currently working with another association in Pará state. A lesson learned is that rather than being overwhelmed by a long list of criteria that seems impossible, which is the usual response upon seeing the list of certification criteria, this methodology is effective in getting smallholders to understand what is required for certification and to develop a road map for achieving certification (Fabiola Muñoz, FSC Brazil Director, *personal communication*).

At the Amazon region level, INCRA, MDA, and DD financed technical assistance through a call for proposals in Acre, Amazonas, and Pará states for agro-extractive families, which could include forest management (INCRA 2013). Eighteen contracts were issued to civil society organizations, government technical assistance institutions, and private companies. In the Santarém region, the contracts include five for the RESEX Tapajos-Apriuns, and at least one will include forest management for timber and artisanal furniture making. The grants are one to two years in duration.

Also within the Amazon region, The Amazon Alternative, a public-private partnership based in the Netherlands and running 2009 to 2014, works directly with companies, communities, governments, and civil society organizations in Brazil, Peru, and Bolivia to promote sustainable management and certification, as well as to increase the flow of certified products into the Netherlands and other European markets. Among lessons learned, Immerzeel and Hamers (2014) concluded it is best to: work with partners engaged in the same value chain and avoid

isolated partners that lack certified suppliers and clients; when working with communities, to work directly with their representatives, recognizing that it will take more time; invest in third-parties as service providers for technical assistance and certification managers; engage governments to include their knowledge of sustainable forestry and certification, and improve their law enforcement capacity; and to develop alliances with national and international partners to build market demand for sustainable and certified tropical timber products. In the six years of the program, they succeeded in helping partners to certify 2.2 million ha of Amazon forest in Brazil, Bolivia, and Peru (which was 300,000 ha short of their goal).

At the state level, Pará launched a program to support forest management in the state in 2009 (PAMFLOR). However, the current government has decided to focus instead on the Green Municipalities program, which is focused on supporting rural production systems, including tree plantations, and registering rural households in the Rural Environmental Registry as strategies to reduce deforestation and reforest degraded areas.

Table 5. Federal and state programs to support community and family forest management.

Scope	Program Name and - Lead Organization	Implementation Model	Objectives	Activities	Years
National	Community and Family Forest Management Program http://www.florestal.gov.br/florestas-comunitarias/programa-federal-de-manejo-florestal-comunitario-e-familiar/programa-federal-de-manejo-florestal-comunitario-e-familiar - Ministry of the Environment (MMA), Agricultural Development Ministry (MDA), Brazilian Forest Service (SFB)	Direct implementation and collaboration with others	Support the creation and management of programs for training, capacity building, research, development and technical assistance for the implementation of forest activities, including forest management, processing of forest products, and the use of forest services. Promote and strengthen community and family forest management initiatives.	Articulate and finance actions for training, promotion, and technical assistance for projects of community and family forest management in Brazil.	2009 - present
National	Program for self-evaluation of certification criteria for smallholders - Forest Stewardship Council Brazil Office	Collaboration with governmental and non-governmental organizations	Build knowledge and understanding of the FSC criteria for certification of responsible forest management by smallholders in Brazil	Workshops in which smallholders learn about the FSC criteria, evaluate their readiness for FSC certification, and develop a roadmap to certification	2013 to present

Amazon region	Support for Sustainable Forest Management in the Amazon (ProManejo) Part of the PPG7 Pilot Program for the Protection of Tropical Forests in Brazil - Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA)	Support to promising sustainable forest management initiatives (one of four components)	Support the development and adoption of forest management systems in the Amazon, with emphasis in the sustainable production of wood products, through strategic actions and pilot projects in priority areas	- Created funds to support CFM - Training and capacity building (from 1999 to 2004 the project trained or otherwise involved through outreach close to 4600 people in the Legal Amazon)	1999 - 2006
Amazon region	Standing Forests Project (Floresta em Pé) - IBAMA-led collaboration of various governmental and non-governmental organizations	Activities in priority regions, including Santarém	Support sustainable management of the Amazon forest with improvement in the direct incomes of local populations, through monitoring and support of a selection of emblematic experiences.	- Strengthen the capacity of communities in organization and decision making - Improve access to credit and subsidies for forest management - Capacity building in forest management tools - Improve transformation rates and values of sawmill residues - Support forest certification	2006 - 2011
Amazon region	The Amazon Alternative http://www.theamazonalternative.org/home	Public-private partnership with forest and timber companies, NGOs, financial institutions, certifying bodies and government institutions	For Brazil, Peru, and Bolivia: - Increase of export of FSC certified timber to the Netherlands and Europe with 20.000 m^3 timber products/ year. - Increase the area of Amazon forest under FSC certified Forest Management by 2.5 million hectares. - Strengthen the FSC National Offices.	- Provides information about FSC certification and co-finances training on certification criteria - Supports improvements in efficiency (promotes lesser known species, improvements in processing) - Supports an environment that enables production and trade of FSC certified products - Supports marketing, trade, and use of certified products	2009 - 2014

Amazon region	Ministry for Agricultural Development (MDA), National Program for Agrarian Reform (INCRA), and the Directory of the Development of Settlement Projects (DD)	Contracts (1-2 years) for technical assistance service providers (governmental or non-governmental organizations, companies)	Strengthen rural production for agro-extractive families (which can include forest management)	Establish productive activities and sales processes at the family and communal levels to strengthen family food security, social inclusion, and higher family incomes	2013 to present
Pará State	Support for Forest Management Program (PAMFLOR) http://www.sema.pa.gov.br/2009/11/27/9703/ - Pará State Environment Secretary (SEMA)	Inter-institutional partnerships between government and civil society	Promote sustainable forest management in Pará state though training, capacity building, qualified and specialized technical assistance, as well as through strategies that aim to facilitate and improve procedures included in technical and legal tools.	- Implement technical assistance, capacity building and training in sustainable forest management - Promote the development of forest management – industrial, community, and family levels - Maintain a system of communication and public transparency regarding environmental licensing - Simplify and increase the agility of the procedures for analysis of environmental licenses for forest management, concentrating on the harvesting activities executed in the forest.	This program was approved in 2009, the state is focusing instead on the Green Municipalities program.
	Green Municipalities Program http://municipiosverdes.com.br/ - Pará state government	Inter-organizational initiative run by the Pará State government with municipalities, civil society, private initiatives, IBAMA, Federal Public Prosecutor's office	Fight deforestation in the state, strengthen rural production systems through strategic actions in environmental and land-use planning and environmental management, with a focus on local agreements, monitoring of deforestation, implementing the Rural Environmental Registry (CAR), and in structuring the environmental management of participating municipalities.	- Develop local economies with forest resources through forest plantations - Promote the recuperation of degraded parts of permanent protection areas and legal forest reserves - Identify strategies to implement and consolidate the CAR in participating municipalities	2011 - present

3.6 The impact of enforcement efforts on small-scale producers' livelihoods

As a reference for the region, a comprehensive global study of rural communities in tropical regions with close proximity to forests (Angelsen et al., 2014) found that in Latin America about 30% of family income was from agriculture, including crops (18.5%) and livestock (11.7%), and 32% of income was from environmental sources, including about 28.5% from natural forests. When forest-related income was disaggregated, approximately 53% was from food and 34% was from wood products, including fuel (13.2%), sawn wood (19.1%), poles (0.9%), and other wooden products (1.4%). In addition, as expected, environmental income was relatively more important for poorer households than wealthier ones. However, when households were divided into five income groups, households in the top 20% income group had environmental incomes five times higher than households in the bottom 40%, so environmental income does not necessarily decrease as absolute income increases. Income from legal and illegal sources was not differentiated.

Livelihood strategies of rural peoples in the Amazon region vary greatly based on their culture, history, environment, and the type of settlement in which they live. The main difference is that families settled in INCRA's original settlement projects (PAs), typically have individual family lots of 50-100 ha each, and live mostly from agriculture and ranching. In contrast, traditional peoples who have a history of living in forested areas and were granted long-term use to those areas in the form of agro-extractive settlements and sustainable use conservation units often have areas of 200-400 ha per family and obtain most of their cash income from the sale of non-timber forest products (e.g., Brazil nuts, acai, natural latex) and in some cases legal timber. Traditional peoples include rubber tappers, fisherman, riverine populations, Quilombola populations, and others, and are not considered the same as indigenous peoples.

As mentioned in the Introduction, in some of the early agrarian reform settlements, INCRA encouraged companies to develop timber agreements with settlers to essentially trade trees for roads and precious start-up capital (Sablayrolles and Miranda 2011). In these cases, timber income was invaluable. Once established, the same families may decide to sell timber again illegally or legally, but their main income is from temporary and permanent agricultural crops, as confirmed by the 2006 census (IBGE 2007a). The census data indicated that the sale of temporary and permanent crops accounted for almost 62% of family income, and only 7% was from the sale of natural forest products (IBGE 2007b,c,d).

Similarly, a 2009 study of income from different agricultural systems for smallholders in the colonist settlement project Moju, in the Santarém region, found that income from agriculture typically ranged from R$ 911 -20,352 (USD 519 – 11,590) per year, or an average of R$ 371/ha/year (USD 211/ha/year) (Graffin et al. 2011). For those who decided to sell timber through partnerships with companies, timber income was reported at approximately R$ 40,320 (USD 22,961) or R$ 22.4/ha/year (USD 12.76/ha/year), assuming a harvest every 30 years of 24 m^3/ha at R$ 28/m^3 over 60 ha. Of course, the scale of activity for agriculture versus timber harvesting is different (5 to 10 ha versus 60 ha), as well as the frequency (every year versus once every 30 years). If we compare the value of entire production cycle per year, timber provided R$ 1,344 (USD 765 on 60 ha) versus agriculture at R$ 1,855 - R$ 3,710 (USD 1,056 - USD 2,113), on 5 ha to 10 ha, respectively. Thus, agriculture provided much higher income than timber for these families (though the family labor costs were not considered in any of these calculations).

In interviews with representatives of two associations of settlers in the Moju agrarian reform settlements near Santarém who are currently involved in management plans to sell their wood

legally once every 35 years, families in their associations with 50 – 100 ha each were reported to have made or were expected to make (for new contracts) between R$ 80,000 – 100,000 each in a lump sum (roughly USD 36,000 to 54,000 depending on the exchange rate) for the selective harvest of timber from their legal forest reserve (80% of the property); notably, this is much higher than the timber income families in the same settlement reported in 2009. Regarding the timber income, they said families often take advantage of the large sum to make the kind of purchases or investments that would normally be difficult and they confirmed this is not the main source of income for families. Examples included expanding the cultivation of black pepper (a very successful cash crop in the region), new homes in the city to give their children a place to live while they attended high school and, in some cases, college, and purchasing automobiles.

Income data for extractive communities (e.g., in extractive reserves and conservation units) are harder to come by because they often did not meet the requirements for small farmers, so their information was lumped together with much larger producers in the 2006 census. When families in these settlements decide to do community forest management, forest management activities usually occur either in individual family forests (often around 300 ha each) or in communal forests. These larger forest areas allow families to harvest different parts of the forest every year for 10 to 35 years (depending on the area and the volume of trees removed per hectare). This provides opportunities for more regular forestry-related employment and income for families who decide to include their forests in the management operations (in contrast to one harvest every 30 to 35 years in the smaller colonist family forests). Humphries et al. (2012) found in 2007/2008 that total average wages per worker in three community forest management operations were USD 175 for a small operation producing sawn wood (for 2 weeks' work), USD 229/month for 3 months (part time) for a small operation producing logs and sawn wood (USD 688 total), and USD 432/month for 8 months for Coomflona, a larger operation producing logs (USD 3,460 total). It was also suggested by representatives of Coomflona in a recent interview that the use of timber income to invest in agricultural activities could facilitate agricultural intensification by families living in conservation units and thereby reduce pressure to clear forests.

In summary, for new settlers in agricultural settlements, and to a lesser degree in extractive communities where families are accustomed to generating cash from non-timber forest products, timber can be a critical source of capital for establishing their farms. In more established colonist settlements with better developed roads, timber income is less likely to be critical to family well-being, but the large lump sum from logging is attractive as investment capital. Furthermore, for some colonists, timber sales can be a first step in liquidating the assets of the farm before selling it (personal observations). Given the difficulties for obtaining authorization to do legal logging, it is not difficult to understand why families would sell their trees illegally to loggers as a source of quick and substantial cash. On the other hand, when families and communities can obtain assistance (from companies, the government, or NGOs) to manage their forests and sell legal timber, this income can be quite significant and important for family livelihoods (as presented above), especially in traditional extractive communities who are in more isolated areas with fewer opportunities to generate cash income.

4. Conclusions

The high bureaucratic barriers to legal forest management and the high demand for timber, in combination with the absence of assistance in forest-related activities to families and communities, and insufficient control of illegal logging and illegal timber in supply chains, have effectively encouraged smallholders to engage in illegal logging over the last 30 to 40 years.

Evidence of this are data that indicate an estimated 532 and 3,083 smallholders sold timber illegally in the late 2000s/early 2010s (based on data from 2008 to 2012).

Changes to laws and regulations over the last 10 years have provided some relief. The 2006 Public Forests Law helped alleviate the tenure situation by creating more options for recognizing community forest use rights and opening more public lands to legal logging, including state and national forests. The 2013 CONAMA Resolution (458) eliminated the obligation for families in settlements to have an environmental license at the level of the settlement (which very few had) as a requisite for approval of a forest management plan. However, authorization is still an overly complicated, time consuming, and expensive process, and foments smallholder dependence on logging companies, as very few have access to other sources of technical and financial assistance for forest management. Unintended consequences of the laws are that small and medium timber companies, who have difficulty meeting the requirements for concession applications and are accustomed to working informally, continue to put pressure on smallholders to sell their timber illegally, and the ease of access of the new timber tracking system has facilitated a black market in timber credits and fueled the trade of "laundered" illegal timber in domestic and international markets.

What are needed are incentives, tools, and decentralized processes that work for smallholders to make it easier for them to engage in legal markets, protect their forests, and improve their livelihoods. This should be complemented by incentives for companies to purchase timber legally from smallholders, including through company partnerships with smallholders, and efforts to control illegal logging and illegal wood in markets. Incentives should become permanent aspects of forest policy, and not subjected to short-term projects or initiatives for a lucky few.

The desire to obtain certification can help motivate smallholders and companies committed to legal and sustainable management to differentiate themselves, but currently the market demand for these products is very small in the Amazon and the rest of Brazil, where 80% of Brazil's tropical timber is consumed (Pereira et al. 2010). Connecting companies that export certified wood with smallholder operations would be a good way to make certification more relevant and beneficial for communities.

4.1 Challenges

4.1.1 Bureaucratic barriers to legal forest management

The processes for obtaining authorization for legal forest management and timber harvesting are too complicated, time consuming, and expensive, and must be simplified. The requirements for smallholder forest management, e.g., the need for prior approval of management plans on titled land, should be greatly streamlined. The CAR system should make it easier to verify the location and ownership of the landholding and that the area proposed for management has forest cover, even for lands that have not received legal title yet. Compliance among smallholders has reached 61.27% in Pará (where it was piloted).

Government agencies do not have the capacity they need to resolve the land tenure problem in the region (disputes and titling), respond to requests for land-use authorizations, provide technical and financial assistance, and control illegal activities. Agencies, namely INCRA, IBAMA, and SEMA, need to greatly increase their staff numbers, improve the training of their staff, and make the resources available needed for reaching smallholders. .

4.1.2 Lack of technical and financial assistance

For smallholders to receive the maximum value for their forest resources, they need technical and financial assistance. At a minimum, smallholders need technical assistance for understanding the value of their trees, the legal process for forest management plan approval and the associated responsibilities, how to negotiate fair terms in contracts with loggers, how to oversee the work of the loggers on their land, and how to verify measurements of the logs removed. Greater access to low-cost credit could also encourage greater investment in forest management and processing, and perhaps the formation of a cooperative that could organize smallholders and timber sales.

4.1.3 Insufficient control of illegal logging and illegal timber

Increased efforts to control illegal logging on some public lands over the last 30 years have increased pressure from small and medium timber companies on smallholder settlements. Smaller timber companies are accustomed to working informally and therefore most do not qualify for the competitive timber concession system on public forests. The greater control of public forests with the 2006 Public Forests Law has led loggers to intensify their pressure on smallholders, where they can take advantage of the vacuum of assistance, information, and government control that could help smallholders to get more fair deals in agreements with loggers. As a result, families are being pressured to sell logs at lower-than-market prices and without the benefit of responsible forest management practices. Worse still, the families who resist often find it difficult to secure police and legal protection from illegal loggers and are fully aware of the ultimate price many pay who stand up for their rights.

4.1.4 Lack of domestic market demand for certified sustainable or legal wood

Domestic markets are not demanding verified legal or certified timber, and it is difficult to link smallholders with international markets where this demand is greater. Illegal timber comprised at least 36% of the timber sold in the region in 2010 (Pereira et al 2010). International market signals are motivating the adoption of certification by some larger companies, and internationally funded projects are motivating some smallholders to pursue certification, but current market forces are not enough to inspire big changes, especially when only 20% of Brazil's tropical timber is exported (SFB 2013a). More needs to be done within the Amazon region and throughout Brazil through awareness campaigns and policies to increase the transparency of the timber industry, raise the expectation of legality and compliance with laws in supply chains, improve the perception of value and demand for legal and certified sustainable products, and make investing in forest management attractive.

4.2 Effectiveness of efforts to date

4.2.1 Programs and projects

Several national-level projects helped introduce smallholder and community forest management to Brazil and to make it a policy issue for the country, especially the Amazon region. Hundreds of families benefitted from these initiatives; some were able to find additional sources of assistance (such as companies, the Acre and Amazonas state governments, or other NGOs with project funds) and others ceased forest management due to a lack of support. Currently, a couple of projects are helping communities in the Santarém region, but again the outreach is limited in both time and in the number of families being reached.

Until technical and financial assistance is more widely available, communities will continue to depend on companies to implement all aspects of management. For this type of collaboration to be more beneficial for communities and companies, the strategy should be to strengthen the capacity of both parties to work with each other, increase the transparency of

agreements, and to promote smallholder forestry as a legal resource management activity in settlements. Ideally, the demand for technical assistance for smallholders and communities who want to be more engaged in the technical aspects of management will be met by both government agencies and fee-for-service civil society organizations and/or consulting firms. This would allow communities to capture more value for their timber resources as they gradually participate in activities further down the value chain of timber products, starting with having approved forest management plans in hand when they negotiate with loggers and eventually to selling logs or sawn wood instead of standing trees.

4.2.2 Certification of sustainability and legality

Certification of sustainable practices, especially FSC certification, is being used by companies and a small number of communities in the Brazilian Amazon, but legality verification certification is not yet widely used. Smallholders who received FSC certification have been strongly supported by internationally and domestically funded programs. Today, most certified smallholders in developing countries are subsidized either by the certifier (which is the case with IMAFLORA in Brazil) and/or local governmental or non-governmental organizations. For smallholders to decide to pursue certification, the benefits must outweigh the costs. Thus, either there must be a highly valued non-market benefit to obtaining certification, e.g., technical or financial assistance, or the price they receive must compensate the extra expenses related to certification – both the auditing fees and the expenses to meet the standards.

It remains to be seen if demand for products with independently verified legality will become a market driver of certification in Brazil in the future. There is some concern that this may actually dilute the efforts of responsible businesses and civil society organizations to push the timber industry towards certification of sustainable practices, in which legal origin and legal verification are only part of the requirements for being sustainable. It may be that legality verification could be a first step for smallholders and companies interested in obtaining certification of sustainability. Indeed, IMAFLORA in Brazil plans to discontinue verification of legal origin, and offer verification of legal compliance as part of a step-wise approach to FSC certification. Ultimately, the current dynamics of the timber industry will need to undergo major changes for there to be a shift towards certification for the small and medium companies who currently buy the majority of timber directly from smallholders.

4.2.3 Control of illegal logging

Abundant information from remote sensing is available on where illegal logging is happening, but the government does not have the capacity to control it on the ground. Key informants report it is often not clear who has responsibility to act, and, regardless, the responsible agencies have too few resources to do so. These situations need to be priorities for improvement to help leave smallholders space to decide how to manage their forests.

In addition, it is obvious from recent reports and campaigns that the national and state systems to track timber are being used to “launder” or “legalize” illegal timber, and that illegal logs still comprise a significant volume (over one-third) of the tropical timber from natural forests in the Amazon region. These systems need to be improved, and smallholders need to be better informed about the systems and offered assistance in managing them.

4.3 Impacts on livelihoods

Timber income is utilized in varying ways for smallholders throughout the Amazon. For legal logging, the harvest cycle for agrarian settlements is usually once every 25 to 35 years, so

income will be supplemental and arrive in lump sums; agriculture is usually the most important source of on-farm income for these families (who may also receive income from other off-farm sources). In extractive communities of traditional peoples, whose landholdings per family are usually larger than 100 ha and/or include communal forests of significant size, legal timber harvesting may take place every year in different harvest areas in a 30-35 year cycle, and be the most significant source of family income, in addition to non-timber forest products.

Income from illegal logging depends on the frequency and intensity of the harvests. For new settlers in agrarian settlements, the initial clearing of agricultural land (3 ha) by loggers can be a quicker and less expensive way to set up their farm by removing trees, providing start-up capital for planting crops and building a home, and getting a road; in fact, when INCRA does not fulfill its responsibilities to settlements, illegal logging may be the *only* way to set up a new farm. Farmers may log their forests illegally two or three times in a 30 year cycle (personal observations). Notably, according to local informants, illegal loggers pay lower prices than legal loggers (even though the former incur fewer management costs and do not pay fees).

Finally, illegal loggers are commonly cited in reports for threats of and actions to harm smallholders over disputes related to land and/or access to resources (see Global Witness 2013). The government has a critically important role in helping to resolve disputes, efficiently issue land titles, protect vulnerable citizens, and control illegal activities.

5. Recommendations

5.1 Governments

In the *short term* (next five years), the federal, state, and municipal governments should work together with civil society and smallholders on several fronts to develop **a comprehensive forest management and development policy** which includes the goal of encouraging and facilitating smallholder forest management. This should be the basis for state policies which aim to: simplify bureaucratic processes and synchronize national and state regulations regarding the licensing of forest management plans[14]; increase the capacity of state and regional offices to fulfill their licensing and control responsibilities; apply a short-term solution to the land tenure problem (e.g., allow local leaders to verify family use rights to forest areas); develop a system to help loggers who have been operating illegally to begin anew as legal operators; provide financial assistance programs and help foster options for technical assistance for smallholders; and generate demand for timber products from smallholder forests in local and regional markets.

Governments should subsidize technical assistance, especially for the licensing process. Currently Pará state government does not offer technical or financial assistance for smallholders to engage in forest management. Yet, it is clear that for smallholders to see the forest as a type of investment and source of sustainable income they need to be able to more easily engage in legal forest management. To facilitate this, the government should immediately dedicate resources to fostering technical support to smallholders by companies and NGOs, as well as develop a long-term strategy for technical assistance. For smallholders who want to sell standing trees, this assistance should focus on completing the licensing process – specifically the preparation of the forest inventory and maps, the sustainable forest

[14] Many differences between national and state technical requirements for legal timber harvesting exist; see Amaral and Cruz (2011) for analysis.

management plan, and the first annual operating plan, which is estimated to cost about R$16,200 (USD 7,364) for an area of 60 ha in the Santarém region (Edson Cruz, IPAM, *personal communication)*. INCRA is looking at the possibility of creating a fund for this purpose (Adriano Milhello, INCRA Santarem Office, *personal communication*). A long term technical assistance strategy for smallholders should include community members trained as forestry extension agents who work for the government, companies, and/or NGOs. Acre and Amazonas state governments have provisioned direct or indirect (through local consulting firms) technical assistance and training for smallholders (Costa et al. 2011).

Make legal sources of timber available to small and medium scale loggers. These are the main sources of illegal logging within settlements. Many are not in compliance with several types of laws (environmental, worker safety, legal wages, taxes), in addition to forest management licensing and timber transportation regulations. A program to specifically help these companies transition to legality and to access public forest concessions could help reduce illegal logging in smallholder forests.

Increase the oversight of companies who harvest timber in smallholder forests through company-community agreements. Currently, the use of one POA in smallholder forests in settlements means that there is usually no effort to verify the activities report (this is usually only done if a second POA is presented for approval). One option would be to specify in the POA the party responsible for logging – the community members, the purchasing company, or service providers, and to check on the state of the forest via satellite imagery after logging was scheduled to occur. If it appears that too much timber was removed or, conversely, none at all, then POAs with the same specified logger should be put on hold until fault is determined. There should be shared responsibility between the community, the forester who signed off on the inventory and POA, and the loggers for illegal activity. Another option is to develop a regulatory instrument that specifies aspects of agreements between companies and communities, as suggested by a key informant from the timber industry in the Santarém region.

Improve control of illegal logging. Major investment is needed in building the capacity of government agencies to control illegal logging and to respond to the demand to approve management plans. Furthermore, greater collaboration with local community governance bodies to control illegal logging as well as better control of illegal timber transport (including road checks for the origin of timber before logs get to sawmills) could be very effective. Finally, the gradual transfer of some responsibility, capacity, and authority for controlling illegal activities to municipal and settlement-level governance bodies is also recommended to get greater local participation in controlling activities.

Build demand for products from smallholder forests. The government is one of the largest consumers of forest products, and procurement policies favoring smallholder timber could help drive market demand for their products. For example, the federal program My House, My Life (Minha Casa, Minha Vida) has provided credit for the purchase or construction of more than 1.5 million homes in Brazil (Ferão Caixa 2013). A requirement for purchasing wood for construction from local smallholders could be a substantial boon to these suppliers. Similarly, the government's Accelerating Growth Program (Programa de Aceleração do Crescimento), which involves infrastructure construction in remote areas of Brazil, could also specify legal timber from smallholders when available.

In the *short to medium term,* the government should work with representatives of civil society, settlement organizations, associations, cooperatives, and timber companies to create **a platform to strengthen smallholder forest management in settlements** and to foster

forestry clusters. In recognition that company-community partnerships are the most realistic option for smallholders to implement legal forest management in the near term (or until technical and financial assistance from public and private sectors are more readily available), the platform could, in collaboration with the Public Prosecutor's office, provide oversight to the contracts between associations and companies, improve the equity of these agreements for communities, and monitor the implementation of the agreements in settlements. Clusters could group businesses, NGOs, policy makers, and others dedicated to building long-term, sustainable sources of legal timber in the region, and be the basis for organizing technical and financial assistance, and for demand for certified and/or verified legal products, allowing for efficient certification processes and streamlined and transparent sourcing of products.

In the longer-term (over the next 20 years) the government should **decentralize the authority and allocate necessary resources for licensing and monitoring of forest management and forest suppression to the municipal and settlement levels.** This would allow regional government agencies to focus on controlling illegal activities in the settlements in coordination with the police. This will require significant investment in capacity building, but could greatly help facilitate legal forest management in settlements.

5.2 Civil society and donors

Civil society (or non-governmental organizations - NGOs) and donor support is critical to the development of regional platforms for smallholder forest management and local forest industry clusters built around smallholder associations. Civil society should lead the development of the platform to promote multi-stakeholder engagement in smallholder forest management issues. These organizations should also focus their efforts on building supply chains within clusters of communities and businesses, instead of disperse and unconnected initiatives. Training should include short courses and longer-term training programs on forest management. Research is also needed on community forestry best practices, challenges and innovations for smallholder forestry, and market opportunities for smallholders.

This sector should also continue to apply pressure to make forest governance and the forest products industry more transparent and to reduce the volumes of illegal timber in markets. Greenpeace plays an important role in raising awareness among government officials, companies, and consumers of the incidence of illegality in the region. Efforts by Greenpeace and other organizations to educate the public on the importance of purchasing legal forest products, both for private and public use, should be increased.

NGOs should continue to assist smallholders with regards to certification of sustainable practices and legality through technical and financial assistance, and by linking them to processing companies who can supply markets for these products. NGOs should also consider helping associations and cooperatives to become better organized, which would help facilitate group certification. For group certification a member of the group (e.g., one association within a group of associations) or a third party (e.g., a consultant, NGO, or company) takes responsibility for organizing efforts among members to comply with certification requirements and for monitoring members' compliance.

5.3 Smallholders

Smallholders need to prioritize getting the full value from their forest resources and conserving these resources for sustained use. To support these activities, community associations and cooperatives need the organizational and technical capacity to represent

community members in negotiations with companies, finance institutions, and government agencies, to enter into fair contracts, to supervise forest management operations, to manage the transportation documents corresponding to members' management areas, and to comply with other administrative responsibilities. To this end, they should pursue training and information related to forest management, and strive to strengthen their internal organization.

Smallholders should also take advantage of opportunities to diversify forest income, including the sale of branches and large limbs for use in local furniture or charcoal industries. Coomflona exemplifies this approach, using a portable sawmill to process branches left over from the trees they harvest into blocks for use by local workshops, and using timber profits to support the harvest and sale of natural rubber and tourism.

Works Cited

Adeodato, S., Villela, M., Betiol, L. S., Monzoni, M. 2011. Wood: From the forest to the consumer. Sao Paulo: FGV RAE. 178 p.

Amacher, G., F. Merry, M. Bowman. 2009. Smallholder timber sale decisions on the Amazon frontier. Ecological Economics. 68: 1787-1796

Amaral, P., M. Amaral Neto, F.R. Nava, K. Fernandez. 2007. Manejo Florestal Comunitário na Amazônia Brasileira: Avanços e perspectivas para a conservação florestal. Brasilia: Serviço Florestal Brasileiro and ProManejo/IBAMA. 21 p.

Amaral Neto, M., H. Cruz, M. Carneiro, K. Miranda. 2011. A Construção de Políticas Públicas para o Manejo Florestal Comunitário e Familiar na Amazônia Brasileira. (Eds) Cruz, H., P. Sablayrolles, M. Kanashiro, M. Amaral, P. Sist. In: Relacão empresa / comunidade no contexto do manejo florestal comunitário e familiar: uma contribuição do projeto Floresta em Pé. Brasilia: IBAMA. pp. 241-253.

Canuto, A., Regina da Silva Luz, C., Lazzarin, F. 2013. Conflitos no Campo – Brasil 2013. Goiânia: CPT Nacional – Brasil. 198 p. Accessed at: http://cptnacional.org.br/index.php/component/jdownloads/finish/43-conflitos-no-campo-brasil-publicacao/344-conflitos-no-campo-brasil-2013?Itemid=23. Accessed on: 05.01.2014

Carneiro, M., M. Amaral Neto, K. Miranda, P. Sablayrolles. 2011. Politicas Publicas e os Desafios para Consolidação do MFCF em Assentamentos e Unidades de Conservação na Amazônia Brasileira. (Eds) Cruz, H., P. Sablayrolles, M. Kanashiro, M. Amaral, P. Sist. In: Relação empresa / comunidade no contexto do manejo florestal comunitário e familiar: uma contribuição do projeto Floresta em Pé. Brasilia: IBAMA. pp. 285-307

Carvalheiro, K., C. Sabogal, y P. Amaral. 2008. Análise da legislacao para o manejo florestal por produtores de pequena escala na Amazônia brasileira. Estudo comparativo “Análise do Marco Legal para o Manejo Florestal por Produtores de Pequena Escala na Amazônia. Belém, Brasil: FORLIVE. 98 p. Accessed at: http://www.imazon.org.br/publicacoes/livretos/analise-da-legislacao-para-o-manejo-florestal-por. Accessed on: 05.01.2014

CERFLOR. 2014. Empresas Certificadas CERFLOR/PEFC. Atualizado 04.04.2014. Accessed at: http://www.inmetro.gov.br/qualidade/pdf/empresas-cerflor.pdf. Accessed on: 05.01.2014

CPT. 2013. Conflitos no Campo – Brasil. Goiânia: Comissão Pastoral da Terra (CPT) Nacional. 198 p. Accessed at: http://www.cptnacional.org.br/index.php/publicacoes-2/noticias-2/12-conflitos/2042-conflitos-no-campo-brasil-2013. Accessed on 05.03.2014

Cruz, H., P. Sablayrolles, M. Kanashiro, M. Amaral, P. Sist. 2011. Relacão empresa / comunidade no contexto do manejo florestal comunitário e familiar: uma contribuição do projeto Floresta em Pé. Brasilia: IBAMA. 319 p.

da Costa, S. R., C. G. Alves, H. da Silva Cruz. 2011. Analise das Diretrizes Técnicas e Aspectos Institucionais no Ambito do Licenciamento das Ativades de Manejo Florestal Comunitário e Familiar. (Eds) Cruz, H., P. Sablayrolles, M. Kanashiro, M. Amaral, P. Sist. In:

Relacão empresa / comunidade no contexto do manejo florestal comunitário e familiar: uma contribuição do projeto Floresta em Pé. Brasilia: IBAMA. pp. 255 - 283

Espada, A. 2013. Contribuição da Governança Ambiental no Desenvolvimento Local: Exemplo De uma Cooperativa de Manejo Florestal Comunitário. CODS - Coloquio Organizações, Desenvolvimento e Sustentabilidade. 1 (4): 294-308

FAO. 2014. Forest Products Yearbook 2008 – 2012. FAO Forestry Series, No. 47. FAO Forestry Statistics, No 203. Rome: Food and Agriculture Organization. 358 p.

Feitosa, T. *Unpublished*. Planos de Manejo Florestal Comunitário Organizados em Associação e Cooperativas no Estado do Pará e Registrados no Sisflora. Date: April 2012.

Forest Stewardship Council (2014) Global FSC certificates: type and distribution. April 2014. info.fsc.org. Accessed April 22, 2014

Forest Stewardship Council International Center. 2014. Public Certificate Search. fsc.info.org. Accessed on: 04.20.2014.

Global Witness. 2014. Deadly Environment: The dramatic rise in killings of environmental and land defenders (1.1.2002-31.12.2013). London: Global Witness. 15 p. Accessed at: http://www.globalwitness.org/sites/default/files/library/Deadly%20Environment.pdf. Accessed on: 05.01.2014

Graffin, A., Barthelon, S., Sablayrolles, P . 2011. A Exploração Florestal a Partir de Manejo: Uma Atividade Acessível e Rentável para as Comunidades na Amazônia Brasileira? (Eds) Cruz, H., P. Sablayrolles, M. Kanashiro, M. Amaral, P. Sist. In: Relacão empresa / comunidade no contexto do manejo florestal comunitário e familiar: uma contribuição do projeto Floresta em Pé. Brasilia: IBAMA. pp. 207-233

Greenpeace. 2014. The Amazon's Silent Crisis: Logging Regulation and 5 Ways to Launder. Accessed at: http://www.greenpeace.org/usa/en/campaigns/forests/Our-current-projects/amazon-rainforest/Logging-The-Amazons-Silent-Crisis-/. Accessed on: 05.15.2014

Humphries S, K. Kainer. 2006. Local Perceptions of forest certification for community-based enterprises. Forest Ecology and Management 235:30-43

Humphries, S., T. Holmes, K. Kainer, C. Koury, E. Cruz, R. Miranda Rocha. 2012. Are community-based forest enterprises in the tropics financially viable? Case studies from the Brazilian Amazon. Ecological Economics 77:62-73

IBAMA. 2006. Iniciativas em Manejo Florestal na Amazônia: Relatos de oito experiências apoiadas pelo ProManejo – Periodo 2000 à 2004. Manaus: IBAMA. 64 p.

IBGE. 2007a. Censo Agropecuário 2006: Agricultura familiar – primeiros resultados. Ministério do Desenvolvimento Agrário e Ministério do Planejamento, Orçamento e Gestão: Rio de Janeiro. 267 p.

IBGE. 2007b. Tabela 1117 - Número de estabelecimentos agropecuários que obtiveram outras receitas e Valor das outras receitas obtidas no ano, por tipo de outras receitas e agricultura

familiar. Censo Agropecuário, 2006. Instituto Brasileiro de Geografia e Estatística – IBGE. Ministério do Planejamento, Orçamento e Gestão: Rio de Janeiro.

IBGE. 2007c. Tabela 1118 - Número de estabelecimentos agropecuários com produção no ano e Valor da produção no ano por tipo de produção e agricultura familiar. Censo Agropecuário, 2006. Instituto Brasileiro de Geografia e Estatística – IBGE. Ministério do Planejamento, Orçamento e Gestão: Rio de Janeiro.

IBGE. 2007d. Tabela 2233 - Produção, Venda e Valores da produção e da venda na extração vegetal nos estabelecimentos agropecuários, com agricultura familiar e não familiar, por produtos da extração vegetal, condição do produtor em relação às terras, destino da produção e grupos de atividade econômica - (MDA). Censo Agropecuário, 2006. Instituto Brasileiro de Geografia e Estatística – IBGE. Ministério do Planejamento, Orçamento e Gestão: Rio de Janeiro.

IMAZON. 2014. Transparência Florestal. Belem, IMAZON. Accessed at: http://www.imazon.org.br/publicacoes/transparencia-florestal/transparencia-florestal-amazonia-legal/boletim-do-desmatamento-sad-fevereiro-e-marco-2014. Accessed on 05.01.2014

Immerzeel, D., and P. Hamers. 2014. Good Wood – Better Future. Lessons and experiences from a five-year program on sustainable forestry. The Amazon Alternative. Accessed at: http://www.theamazonalternative.org/files/download/434/Good%20Wood%20-%20Better%20Future.pdf. Accessed on 05.21.2014

INPE. 2014. Projeto Prodes: Monitoramento Da Floresta Amazônica Brasileira Por Satélite. Instituto Nacional de Pesquisas Espaciais. Accessed at: http://www.obt.inpe.br/prodes/index.php. Accessed on: 05.10.2014

ITTO. 2012. Annual Review and Assessment of the World Timber Situation. Yokohama, Japan: ITTO. 196 p. Accessed at: http://www.itto.int/direct/topics/topics_pdf_download/topics_id=2682&no=1. Accessed online 05.15.2014

May P (2006) Forest certification in Brazil. In: Cashore B, Gale F, Meidinger E, Newsom D (eds) Confronting Sustainability: Forest certification in developing and transitioning countries. Yale School of Forestry and Environmental Studies Publication Series, New Haven, CT

MDA, INCRA. 2013. Projetos de Reforma Agraria Conforme Fases de Implementação. Brasilia: Ministério Do Desenvolvimento Agrário – MDA e Instituto Nacional De Colonização E Reforma Agrária (INCRA), Diretoria de Obtenção de Terras e Implantação de Projetos de Assentamento – DT, Coordenação-Geral de Implantação - DTI – SIPRA.

MDA, INCRA, DD. 2013. Chamada Pública para Seleção de Entidades Executoras de Assistência Técnica e Extensão Rural em Unidades de Conservação de Uso Sustentável e Projetos de Assentamento Agroextrativistas em Situação de Extrema Pobreza. Chamada Pública INCRA Sede – Diretoria de Desenvolvimento De Projetos De Assentamento N° 01/2013.

Menton, M. C. S., F. D. Merry, A. Lawrence, and N. Brown. 2009. Company–community logging contracts in Amazonian settlements: impacts on livelihoods and NTFP harvests. Ecology and Society 14(1): 39.

MMA. 2013. Plano de Ação para prevenção e controle do desmatamento na Amazônia Legal (PPCDAm): 3ª fase (2012-2015) pelo uso sustentável e conservação da Floresta / Ministério do Meio Ambiente e Grupo Permanente de Trabalho Interministerial. Brasília: Ministério do Meio Ambiente (MMA). 174 p.

Monteiro, A., Cardoso, D., Conrado, D., Veríssimo, A., & Souza Jr., C. 2013. Boletim Transparência Manejo Florestal Estado do Pará (2011-2012) (p. 14). Belém: Imazon. Accessed at: http://www.imazon.org.br/publicacoes/transparencia-manejo-florestal/boletim-transparencia-manejo-florestal-estado-do-para-2011-2012/at_download/file. Accessed on 05.01.2014

Nepstad D., C. Azevedo-Ramos, E. Lima, D. McGrath, C.A. Pereira, F. Merry. 2004. Managing the Amazon timber industry. Conservation Biology 18:1-3

Nepstad, D. C., B. S. Soares, F. Merry, A. Lima, P. Moutinho, J. Carter, M. Bowman, A. Cattaneo, H. Rodrigues, S. Schwartzman, D. G. McGrath, C. M. Stickler, R. Lubowski, P. Piris-Cabezas, S. Rivero, A. Alencar, O. Almeida, and O. Stella. 2009. The End of Deforestation in the Brazilian Amazon. Science. 326 (5958):1350-1351.

Nepstad, D., D. McGrath, C. Stickler, A. Alencar, A. Azevedo, B. Swette, T. Bezerra, M. DiGiano, J. Shimada, R. Seroa da Motta, E. Armijo, L. Catello, P. Brando, M. Hansen, Max McGrath-Horn, O. Carvalho, L. Hess. 2014. Slowing Amazon deforestation through public policy and interventions in beef and soy supply chains. Science. 344 (6188): 1118-1123.

O Impacto. 2014. Gerência do Ibama sofre intervenção em Santarém Sede do órgão em Santarém foi fechada pela PF por tempo indeterminado. Accessed at: http://www.oimpacto.com.br/jornal-o-impacto/gerencia-do-ibama-sofre-intervencao-em-santarem/. Accessed on 05.02.2014

Pacheco, P. 2009. Agrarian Reform in the Brazilian Amazon: Its Implications for Land Distribution and Deforestation. World Development 37(8): 1337–1347

Pacheco, P. 2012. Actor and frontier types in the Brazilian Amazon: Assessing interactions and outcomes associated with frontier expansion. Geoforum 43: 864–874

PEFC. 2014. Group Certification Project. Accessed at: http://www.pefc.org/projects/knowledge/smallholder-group-certification. Accessed on 05.13.2014

Pereira D, D. Santos, M. Vedoveto, J. Guimarães, A. Veríssimo. 2010. Fatos Florestais da Amazônia. Belém: IMAZON. 124 p.

Pinto A, P. Amaral, M. Amaral. 2011. Iniciativas de manejo florestal comunitário e familiar na Amazônia brasileira 2009/2010. Belém: IMAZON and IEB. 84 p.

ProManejo. 2007. ProManejo - Relatório de Atividades 2007. Brasilia: MMA, PPG-7, IBAMA. 90 p.

Rainforest Alliance. 2014. Rainforest Alliance Generic Standard for Verification of Legal Compliance (VLC) for Forest Management Enterprises (FME). Draft. Version 4. Accessed at:

http://www.rainforest-alliance.org/sites/default/files/uploads/3/vlc_standard_March2014-DRAFT.pdf. Accessed on 05.13.2014

Sablayrolles, P., K. Miranda. 2011. A região de Santarém e as cadeias madeireiras. (Eds) Cruz, H., P. Sablayrolles, M. Kanashiro, M. Amaral, P. Sist. In: Relacão empresa / comunidade no contexto do manejo florestal comunitário e familiar: uma contribuição do projeto Floresta em Pé. Brasilia: IBAMA. pp. 37 - 63

Sablayrolles, P., I. Drigo, S. Barthelon, A. L. Violato Espada; D.E. de Blas, M.G. Piketty. 2011. O manejo florestal sustentável como alternativa na reprodução social de comunidades no oeste paraense? (Eds) Cruz, H., P. Sablayrolles, M. Kanashiro, M. Amaral, P. Sist. In: Relacão empresa / comunidade no contexto do manejo florestal comunitário e familiar: uma contribuição do projeto Floresta em Pé. Brasilia: IBAMA. pp. 149 - 169

SEFA. 2013. Portaria N. 1654/2013. Valores das Taxas de Licenciamento ano base 2014. Accessed at: http://www.sema.pa.gov.br/wp-content/uploads/2013/05/Valores_anuais_de_taxas_SEMA_2014.pdf. Accessed on 8/29/2014

SEMA. 2010. Plano Safra Florestal do Estado do Para. Belém: Secretaria de Meio Ambiente de Pará

SERFAL. 2011. Programa Terra Legal. SERFAL. Accessed at: http://www.agricultura.gov.br/arq_editor/file/camaras_setoriais/Palma_de_oleo/9RO/App_Serfal_Palma.pdf. Accessed on 05.13.2014

SFB. 2009. Plano anual de manejo florestal comunitário e familiar: período 2010. Brasília: Serviço Florestal Brasileiro. 99 p.

SFB. 2010. Plano anual de manejo florestal comunitário e familiar: período 2011. Brasília: Serviço Florestal Brasileiro. 148 p.

SFB. 2013a. Florestas do Brasil em resumo - 2013: dados de 2007-2012. Brasília: Serviço Florestal Brasileiro. 188 p.

SFB 2013b. Guia de Financiamento Florestal 2013. Serviço Florestal Brasileiro – Brasília. Accessed at: http://www.florestal.gov.br/publicacoes/tecnico-cientifico/guia-de-financiamento-florestal-2013. Accessed on 05.15.2014

SFB 2014. Fortalecimento do Setor Florestal no Brasil: Mapeamento da carga tributária incidente sobre os produtos florestais madeireiros e proposição de medidas desoneração. Brasília: Serviço Florestal Brasileiro. 98 p.

SFB and IMAZON. 2010. A atividade madeireira na Amazônia brasileira: produção, receita e mercados. Belém: Serviço Florestal Brasileiro (SFB); Instituto do Homem e Meio Ambiente da Amazônia (Imazon). 20 p.

Soares-Filho, B., R. Rajão, M. Macedo, A. Carneiro, W. Costa, M. Coe, H. Rodrigues, A. Alencar. 2014. Breaking Brazil's Forest Code. Science. 344: 363-364

Annex 1. List of interviewees

Key Informant Type	Organization	Name	Title	Date
Government agency – licensing and control	State Secretary of the Environment (SEMA)	Jose Maria Esosa Neto	Regional Director	05.05.2014
Government agency – licensing, control, technical assistance	National Institute for Colonization and Agrarian Reform (INCRA)	Adriano Milhello	Head of Land Acquisitions Unit	05.06.2014
Government agency – technical assistance	Brazilian Forest Service (SFB)	Marcelo Melo	Temporary Director	05.05.2014
Government – licensing, control, technical assistance	Chico Mendes Institute for Biodiversity Conservation (ICMBio)	Darilson Andrade	Environmental Analyst	05.05.2014
Smallholder involved in forest management for timber	Faveira Community Association Community of Farmers and Rural Producers	Francisca Aurilice Sousa dos Santos	President	05.06.2014
Smallholder involved in forest management for timber	Association of Small Producers and Settlers of the Community Universal	Maria Eliene dos Santos	President	05.06.2014
Smallholder involved in forest management for timber	Mixed Cooperative of Tapajos National Forest (COOMFLONA)	- Raimundo Jean Feitosa - Jeremias Batista Dantas - Renato Ribeiro	- President - Vice Pres - Forest engineer	05.05.2014
Non-governmental organization that provides technical and financial assistance to smallholder forestry initiatives	Amazon Environmental Research Institute (IPAM)	Antonio Jose Bentes	Technical Coordinator, Project PA Moju II	05.02.2014
Non-governmental organization that provides technical and financial assistance to smallholder forestry initiatives	FSC Brazil	Fabiola Zerbini	Director	05.16.2014

and certification program				
Non-governmental organization that provides technical assistance to smallholder forestry initiatives	Instituto Internacional de Educação do Brasil (IEB)	Manuel Amaral	Director of the Belém Office	05.29.2014
Non-governmental organization that provides technical assistance to smallholder forestry initiatives	The Forest Trust Brazil	Andresa Dias	Belém Office	06.10.2014
Certification body	Institute for Forest and Agricultural Management and Certification (IMAFLORA)	David Escaquete	Forest Certification - Smallholders	05.13.2014
Timber industry	MAFLOPS	Antonio Abelard	President	05.30.2014
Timber industry	Private consultant	Murilo da Moda Cunha	Forest Engineer	06.05.2014

Annex 2. Interview Guides for Key Informants

(I) Government Institutions and Non-governmental Organizations

Dados gerais

- Qual é sua experiência com o manejo florestal comunitário e/ou familiar (MFC/F)?
  - tipo de apoio/trabalho
  - com quantas iniciativas tem trabalhado?
  - quantos venderem madeira?

Informação e percepções sobre MFC/F

- Como vai o manejo florestal comunitário / familiar em Pará e a região de Santarém?
  - Está aumentando / diminuindo? Por que?
- Sabe quantas iniciativas com PMF aprovadas existem para madeira em Pará? em Santarém?
  - Sabe onde posso conseguir essa informação?
- Que porcentagem da madeira dos pequenos produtores em Santarém vai para o mercado local / regional / nacional / internacional?
  - Sabe onde posso conseguir dados/estimações sobre isso?

Desafios com respeito ao MFC/F legal

- Quais são os desafios maiores com respeito ao manejo florestal comunitário ou familiar? ex. processo burocrático, parte técnica, o custo, a comercialização, a competência com a madeira ilegal
  - Exemplos

- O que está fazendo tua organização para promover MFC/F ou responder aos desafios? - Outras organizações?
- Quais são as recomendações para melhorar a situação para pequenos produtores para MFC/F
  - O que pode fazer o governo federal?
  - O que pode fazer o governo estadual
  - O que pode fazer as ONGs?
  - O que pode fazer as associações?

Informação e percepções sobre a ilegalidade entre os pequenos produtores

- Como vai (melhorando, piorando) e por quê?
- Como esta a situação de madeira ilegal em geral e entre os pequenos produtores?
  - Está melhorando/sendo pior? Por quê?
- O que está fazendo tua organização para promover MFC/F ou responder aos desafios? Outras organizações?
- Quais são as recomendações para melhorar a situação com madeira ilegal?
  - O que pode fazer o governo federal?
  - O que pode fazer o governo estadual
  - O que pode fazer as ONGs?
  - O que pode fazer as associações?
- Você acha que se houver maior controle de madeira ilegal que pode afeitar negativamente a famílias na sua comunidade? ou a famílias rurais em geral?
- Você acha que um maior controle de madeira ilegal poderia ajudar a comunidades fazendo manejo legal?

- Tem uma estimação da quantidade de madeira ilegal no mercado em Santarém? no mercado nacional?
    - sabe onde posso conseguir dados/estimações sobre isso?

(II) Smallholders engaged in forest management for timber production.

Dados gerais

- Plano de Manejo Florestal
    - O ano de fundação da associação e numero de associados
    - O ano que se deu o início da construção do plano
    - O ano(s) foi elaborado do plano de manejo
    - O ano que foi protocolado/entregado o PMF
    - O ano que PMF foi aprovado:
    - Para quantos anos é valido o PMF? o é para quantos UPAs?
- Participação no MFC
    - quantas famílias participam no manejo?
    - quantos UPAs são?
    - numero de UPAs explorados ate agora
    - qual é o tamanho media de cada UPA?
    - qual é o área total de manejo florestal? (ha)
    - qual é o volume que tira cada família anualmente?
    - qual é o volume total aprovado anualmente?
- A área de manejo é florestal comunitária ou é composto das reservas legais das famílias participando?
- Qual e a renda media que cada família recebe de madeira cada ano?

Venda da madeira

- Principais espécies vendidas em geral:
- Quem são os colaboradores principais?
    - colabora com o governo?
    - colabora com uma ONG?
    - tem participado em um programa ou inciativa para promover o MFC?
    - colabora com uma empresa?
    - colabora com outros?
- A quem vende a madeira normalmente?
- Como é o contrato para a venda:
    - para 1 ano, para vários anos?
    - para várias espécies?
- Quais são as responsabilidades do comprador e da associação?
- Sabe a onde vai a madeira para beneficiamento?
- Sabe onde é vendido o produto final? (vai para exportação?)
- Sabe o que é a certificação florestal?
    - Como você conhecia a certificação florestal: comprador? ONG? governo?

Desafios com respeito ao MFC/F legal

- Quais são os desafios maiores com respeito ao manejo florestal comunitário ou familiar? ex. processo burocrático, parte técnica, o custo, a comercialização, a competência com a madeira ilegal
    - Exemplos

Os ingressos familiares da madeira e a ilegalidade

- A renda da madeira e importante para sua família?
- Pode me dar uma estimativa da renda por família (R$) para uma UPA?
- Representa o produto mais importante, 2do mais importante na renda familiar? (O grau de prioridade de manejo)
- Você acha que se fosse mais fácil vender madeira legalmente que faria diferença para sua família ou famílias na sua comunidade?
- Acha que o governo esta controlando a madeira ilegal bem na sua comunidade? No assentamento?
- Quais são os pontos fracos na aplicação da lei com respeito a madeira ilegal? ou Por que tem tanta madeira ilegal nos mercados?
- O qué o governo poderia fazer para controlar melhor a madeira ilegal?
- Você acha que se houver maior controle de madeira ilegal que pode afeitar negativamente a famílias na sua comunidade? ou a famílias rurais em geral?
- Você acha que um maior controle de madeira ilegal poderia ajudar a comunidades fazendo manejo legal?

Recomendações

- Quais são as recomendações para melhorar a situação para pequenos produtores para MFC/F
  - O que pode fazer o governo federal?
  - O que pode fazer o governo estadual
  - O que pode fazer as ONGs?
  - O que pode fazer as associações?

(III) Forest products companies that purchase timber from families and/or communities

1. Qual tem sido sua experiência com a compra de madeira de pequenos produtores na região de Santarém?

2. Acha que a compra de madeira de pequenos produtores por empresas madeireiras em geral vai aumentar ou diminuir? Por que?

3. Acha que a compra de madeira de pequenos produtores por sua empresa vai aumentar ou diminuir? Por que?

4. A onde vai a madeira comprada dos pequenos produtores?

	%
Para produzir madeira para construção	
- para mercado local	
- para mercado nacional	
Para madeira serrada	
- para mercado local/regional	
- para mercado nacional	
- para mercado internacional	
Para produzir moveis	
- para mercado local/regional	
- para mercado nacional	

Para piso	
- para mercado local/regional	
- para mercado nacional	
- para mercado internacional	

5. Quais são as vantagens para a empresa de comprar madeira de pequenos produtores?

6. Quais são os desafios/desvantagens para a empresa de comprar madeira de pequenos produtores?

7. O que pode ser feito para melhorar a situação? pelo governo? pelos pequenos produtores/associações?

8. Qual seria a vantagen para os pequenos produtores se fosse mais fácil conseguir um plano de manejo florestal?

9. Qual seria a vantagen para as empresas se fosse mais fácil conseguir um plano de manejo florestal?

10. Tem demanda para madeira certificada em Pará? no pais? do exterior?

Annex 3. List of FSC certified small-scale forest management operations for timber production

Organization Name	Forest area (ha)	Products	State
Associação Seringueira Porto Dias	3,661	rough wood, roundwood logs	Acre
Assoc. Morad. e Produt. do Projeto Agroestrativista Chico Mendes – AMPPAECM	12,989	rough wood, roundwood logs	Acre
Associação dos Produtores do Projeto de Assentamento Agroextrativista do Seringal Equador	6,875	rough wood, roundwood logs	Acre
AMARCA - Associação de Moradores e Agroextrativistas do Remanso de Capixaba, Acre	8,296	rough wood, roundwood logs	Acre
ASPEX - Associação dos Produtores de Eucalipto do Extremo Sul da Bahia - G1	5,472	rough wood, roundwood logs	Bahia
ASPEX – Associação dos Produtores de Eucalipto do Extremo Sul da Bahia - G2	6,377	rough wood, roundwood logs	Bahia
ASPEX – Associação dos Produtores de Eucalipto do Extremo Sul da Bahia - G3	3,395	rough wood, roundwood logs	Bahia
ASPEX – Associação dos Produtores de Eucalipto do Extremo Sul da Bahia - G4	11,968	rough wood, roundwood logs	Bahia
Aspex - Associação dos Produtores de Eucalipto Eucalipto do Extremo Sul da Bahia - G5	14,389	rough wood, roundwood logs	Bahia
Cooperativa Mista Flona Tapajos	9,142	rough wood, roundwood logs	Pará

source: FSC International Center. Public Certificate Search. fsc.info.org

Annex 4. Legal instruments related to smallholder forest management

Federal
http://www4.planalto.gov.br/legislacao

Ordinance N.° 183, 10 May 2001,
Establishes the System for Monitoring and Evaluating Environmental Licenses for Rural Properties in the Legal Amazon (Sistema de Monitoramento e Avaliação de Licenciamento Ambiental em Propriedade Rural na Amazônia Legal).

Law N.° 11.284, 02 March 2006, Public Forests Law
https://www.planalto.gov.br/ccivil_03/_Ato2004-2006/2006/Lei/L11284.htm
Addresses the management of public forests for sustainable production; creates the Brazilian Forest Service within the infrastructure of the Ministry of the Environment; creates the National Fund for Forest Development; transfers approval of forest harvesting to state organizations.

Ordinance N.° 253, MMA, 18 August 2006
http://www.redejucara.org.br/legislacao/Ordinance_253_2006_MMA.pdf
Institutes the Forest Origin Document (Documento de Origem Florestal – DOF) as a substitute for the Forest Product Transport Authorization (Autorização para Transporte de Produto Florestal – ATPF). This is an obligatory license for the control of the transport and storage of forest products and sub-products.

Resolution N.° 387, CONAMA, 27 December 2006,
http://www.mma.gov.br/port/conama/legislacao/CONAMA_RES_CONS_2006_387.pdf
Establishes the process for environmental licensing in smallholders' areas, either for new agrarian reform settlements or for land tenure regularization processes.

- Required environmental license for approval of forest management plans in settlements; effectively halted legal forest management in settlements, very few of which had environmental licenses (2013 CONAMA Resolution modified this requirement).

Normative Instruction N.° 04, MMA, 11 December 2006,
http://www.diariodasleis.com.br/busca/exibelink.php?numlink=216087
Addresses the Authorization Prior to the Technical Analysis of the Sustainable Forest Management Plan and other issues.

Normative Instruction N.° 05, MMA, 11 December 2006,
http://www.diariodasleis.com.br/busca/exibelink.php?numlink=216088
Addresses the technical procedures for preparation, presentation, execution, and technical evaluation of Sustainable Forest Management Plans in primitive forests and their successional forms in the Legal Amazon and other issues.

Decree N.° 6.040, 07 February 2007
https://www.planalto.gov.br/ccivil_03/_ato2007-2010/2007/decreto/d6040.htm
Instituted the National Policy for Sustainable Development of Traditional Peoples and Communities.

- Intended to guarantee the territories/lands of traditional peoples and communities.

Decree N.° 6.063, 20 March de 2007
http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2007/Decreto/D6063.htm

Regulates, at the Federal level, aspects of the 2006 Public Forests Law (N.°11.284), that address the management of public forests for sustainable production and related issues.

- It affirmed the property and use rights of forests in public areas occupied by traditional communities. It states that communities that live in public forests will be identified and the forest will be designated for their use.

Interministerial Ordinance N.º 3, MDA 3 October 2008
http://www.diariodasleis.com.br/busca/exibelink.php?numlink=1-81-31-2008-10-03-3
Recognizes the traditional peoples and communities who reside in the Conservation Unit categories Extractive Reserve, Sustainable Development Reserve, and National Forest, as potential beneficiaries of the National Agrarian Reform Program, and other issues.

Resolution N.° 406, CONAMA, 02 February 2009
http://www.mma.gov.br/port/conama/legiabre.cfm?codlegi=597
Establishes technical parameters to be adopted in the preparation, presentation, technical evaluation, and implementation of Sustainable Forest Management Plans for timber, for native forests and their successional forms in the Amazon region.

Decree N.° 6.874, 05 June 2009,
http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2009/Decreto/D6874.htm
Institutes the Federal Community and Family Forest Management Program

- Provides a better understanding of the concept of Community and Family Forest Management
- Includes the fundamental principal of promoting the development of productive forest activities by rural communities.

Decree N.º 7.167, 5 May 2010.
https://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2010/Decreto/D7167.htm
Regulates the National Forest Development Fund

Normative Instruction 16, ICMBio, 04 August 2010
http://www.icmbio.gov.br/portal/images/stories/o-que-somos/in162011.pdf
Regulates, within the Chico Mendes Institute, the rules and administrative procedures for the approval of community sustainable forest management plans for timber resource harvesting within extractive reserves, sustainable development reserves, and national forests.

Normative Instruction 65, INCRA, 27 December 2010
http://www.diariodasleis.com.br/busca/exibelink.php?numlink=216066
Establishes criteria and procedures for sustainable forest management activities in settlement projects.

- States forest management should be based in family production (Article 4)
- States forest management activities should be implemented directly by “beneficiaries” and only when the amount of labor or the quality of labor is not sufficient should they be implemented with the help of third parties (Article 28).

Complementary Law Nº 140, 8 December 2011
http://www.planalto.gov.br/ccivil_03/leis/lcp/Lcp140.htm
Establishes which organizations have authority over different types of activities at the federal, state, and municipal levels.

Resolution 458, CONAMA, 16 July 2013 (Substitutes Resolution 387 from 2006)
http://www.mma.gov.br/port/conama/res/res13/Resol458.pdf
Establishes procedures for environmental licensing within agrarian reform settlements and related issues.

- Separates documentation of compliance with legal reserve and protected areas within settlements (now covered by CAR) from licensing of activities with environmental impact
- Provided simplified process for obtaining environmental license

Pará State
http://www.sema.pa.gov.br/coluna/instrucoes-normativas/

Law Nº 6462 de 2002, State Policy on Forests
Addresses the state policy on forests and other vegetation forms, and related issues.

Decree N.° 1.976, 27 November 2009
http://www.sema.pa.gov.br/2009/11/27/9703/
Creates the Forest Management Support Project in Pará state.

Normative Instruction N.° 001, SEMA, 14 January 2014
http://www.sema.pa.gov.br/2014/01/14/in-0012014-de-10-de-janeiro-de-2014-publicada-no-doepa-no32563-de-14012014-caderno-5-paginas-6-7-8/
Establishes the requirement for Authorization Prior to the Technical Analysis of Sustainable Forest Management Plans as a prerequisite to the practice of sustainable forest management for multiple uses, and related issues.

Normative Instruction N.° 05, SEMA, 19 May 2011
http://www.sema.pa.gov.br/2011/05/19/instrucao-normativa-no-05-de-19052011/
Addresses the state policy on forests and other vegetation forms in Pará state, as well as sustainable forest management plans and annual operating plans for state public lands and private lands.