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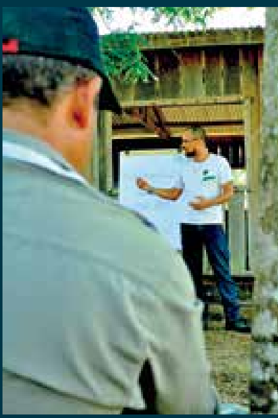

A case book of subnational initiatives across the globe

Edited by

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CIFOR

REDD+ on the ground

A case book of subnational initiatives across the globe

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Most of the researchers who helped design and implement the first phase of field research are co-authors of chapters and boxes in this volume and are thus included in the list of authors. However, four of the people who were key to the design and launch of this study were not available to contribute directly to this book, although all of the research reported here builds on their efforts. We would therefore like to give special thanks to Peter May of CPDA/UFRRJ, who has provided support for the M2 work in Brazil since the beginning; Mrigesh Kshatriya of CIFOR, who led the data management team for the first phase of research, including designing the database; Subhrendu Pattanayak of Duke University, who led the sample design effort, including compiling and analyzing the first raw data characterizing potential sample villages; and Pam Jagger of the University of North Carolina at Chapel Hill, who led the discussion about study design (Jagger et al. 2009, 2010) and organized the initial workshop to launch this research effort.

Foreword

Reducing emissions from deforestation and forest degradation (REDD+) is to me still a very good idea. Interpreting REDD+ as an objective, we need to eliminate most forest emissions if we are to limit global warming to 2°C. Interpreting REDD+ as a policy instrument, I also think the basic idea underlying REDD+ is sound: create economic incentives for reducing emissions.

Good ideas are not, however, necessarily easy to implement. This book takes stock of the challenges faced when trying to implement REDD+ on the ground. REDD+ proponents are facing serious challenges; they are caught between complex local realities, powerful (sub)national stakeholders and a changing global REDD+ landscape.

The speed of implementation has therefore been much slower than expected when REDD+ was put at the top of the international climate agenda in 2007. Many underestimated the technical and practical (and embedded political) challenges: measuring (changes in) forest carbon stocks, setting realistic benchmarks (reference levels) to estimate actual reductions and ensure additionality, creating institutions and mechanisms to channel information and money in a result-based payment system, coordinating information and actions across scales and actors, etc.

Political economy issues remain a strong – and perhaps the most critical – barrier to implementation. Deforestation happens because some people or companies benefit from it: from the poor African smallholder to the rich Brazilian cattle owner and the Indonesian palm oil company. The concept of REDD+ was to make it beneficial for these to conserve forest, but we have, by and large, not succeeded. The international funding mobilized for REDD+ – approaching USD 9 billion and far from a trivial amount – is not sufficient to compensate and make everyone winners. And perhaps we should not do that either: can we justify spending development aid (most of the international funding) on rich and powerful agents of deforestation? The question is particularly pertinent, as the process of allocating concessions and land rights in the first place is often flawed.

These reasons for the slowness of REDD+ have been persistent. Past CIFOR volumes on REDD+ have argued that transformational change beyond the forestry sector is necessary to create enabling conditions for REDD+ implementation. But this is a formidable task, and we cannot wait for this to be fully achieved to make progress toward the realization of REDD+ goals. Keeping a focus on both tracks – the technically-quite-easy-to-implement policy measures and the long-term transformational change – remains a tall challenge, but a necessary one.

Although REDD+ initially had a strong national-level focus, much of the action has been at the subnational level, with more than 300 initiatives launched. “Subnational initiatives are the laboratory in which the REDD+ experiment is being conducted” (Sunderlin et al. this volume). Drawing on research in Brazil, Peru, Cameroon, Tanzania, Indonesia and Vietnam, the book takes stock of the experiences and lessons learned from 23 of these initiatives.

If conserving tropical forests were easy, it would already have been done, and there would be no need for this book. One challenge stands out above all the rest, as the book notes: "This is still a world where interests favoring the conversion of forests to non-forest uses in tropical countries often have the upper hand in land-use decisions" (Sunderlin et al. this volume). REDD+ intended to change this basic equation by making forest conservation more profitable than unsustainable forest exploitation, and we still struggle to implement that. "REDD+ faces a steep uphill climb in reaching its objectives."

As a concerned scientist, I believe that *good* research – as defined by standard scientific criteria – can contribute to a better world. The REDD+ debate and even research are, however, like most policy debates/research, influenced by ideologies and particular interests, e.g. for/against carbon trade (read: market liberalism); those involved either demonstrate the success of specific positions or deny responsibility. Whereas we need "evidence-based policies," I often see "policy-based evidence."

This collection of case reports and the synthesis contribute greatly to our understanding about the realities on the ground, and offer "global insights from local context." Our thinking on how to achieve REDD+ needs to be revised continuously based on lessons from the ground, as well as from shifting economic and political constraints and opportunities.

Read and revise!

Arild Angelsen

Professor, Norwegian University of Life Sciences
and Visiting Professor, Universitat Autònoma de Barcelona

Executive summary

As one of the leading near-term options for global climate change mitigation, REDD+ has been piloted in over 300 subnational initiatives across the tropics. This book describes 23 of those initiatives in six countries: Brazil, Peru, Cameroon, Tanzania, Indonesia and Vietnam. These initiatives were selected in large part because they had defined their specific intervention areas but not yet offered conditional incentives to reduce forest carbon emissions when CIFOR collected baseline data in 2010. By 2014, they had implemented a broad range of actions both to develop enabling conditions and to reduce forest emissions. Thus, it is now timely to report on their experiences and assess early lessons about REDD+, including finance, tenure, scale, MRV and safeguards.

For each of these initiatives, we state the basic facts (where, who, why and when); explain their strategies; describe smallholders living in and around the intervention areas; and highlight key challenges and lessons learned. This information was collected through a household survey at 17 sites, and interviews with key informants and village meetings at all 23 sites.

Basic facts: Where, who, why and when

Most of the initiatives include between 650 and 6500 km^2 of tropical rainforest. There are exceptions in Tanzania and Vietnam, where initiatives are located in dry forest and moist deciduous forest, which have lower carbon stocks and thus lower potential carbon revenues.

Fourteen of the initiatives are led by private nonprofit organizations, while the remaining initiatives are led either by for-profit companies or by the public sector, sometimes in collaboration with nonprofit organizations. To date, the most important funding source for these initiatives has been the public sector, followed by philanthropic organizations and private companies.

Many of the nonprofit proponents were already engaged in conservation work at their sites, which REDD+ has enabled them to continue or expand. In contrast, proponents from the private sector were more often motivated by the carbon market, and proponents from the public sector were generally seeking to demonstrate the feasibility of REDD+ both for climate change mitigation and for co-benefits. While all of the initiatives led by for-profit companies are continuing, six of the initiatives led by nonprofit or public sector proponents have ended and two have re-characterized themselves as low-carbon development efforts.

Strategies

While all initiatives shared the goal of reducing deforestation and degradation, they pursued a broad range of strategies to accomplish this. Most proponents initially planned to access the forest carbon market to pay for performance-based incentives (direct payments or livelihood enhancements) to reduce deforestation. However, to date, only four of the initiatives have sold carbon credits, and only

10 have made direct payments conditional on actions to reduce deforestation or degradation. Many more have obtained bilateral or other public funding to support unconditional livelihood enhancements. Some initiatives are seeking to bundle carbon revenues with other incentives for sustainable management and conservation, such as sales of certified timber. Thus, many initiatives are continuing to follow their previous integrated conservation and development strategies. At the same time, proponents have sought to clarify and secure tenure for local stakeholders in order to identify who bears responsibility for protecting forests in exchange for REDD+ benefits, to protect forests from deforestation agents and to promote equity. Select proponents have encouraged local involvement in MRV.

Smallholders in the initiatives

At most of the sites, smallholders – whether indigenous to the area or recent migrants – are largely dependent on agriculture. Specifically, at 14 of the 17 sites where household surveys were conducted, smallholders derive their largest share of income from crops and livestock, and hence their livelihoods are potentially at risk from REDD+ interventions that restrict forest conversion. At each site, about 40% of the interviewed households had cleared forest within the previous two years, primarily for crop cultivation. The importance of forest clearing by smallholders varies across regions, partly as a function of the size of a typical smallholding (substantially larger in Brazil than in other countries) and partly in comparison with other deforestation drivers (with typically greater external threats in Indonesia). Forest products are the primary income source for smallholders at only three sites, located in Indonesia and Peru.

Challenges and lessons

The experiences of the individual initiatives reveal huge challenges associated with implementing REDD+ on the ground. Many of these challenges can only be overcome with an international agreement that generates the level of support originally envisioned for REDD+. Rather than waiting for such an agreement, the proponents of subnational initiatives have been adapting and innovating. Here, we summarize the challenges experienced and some lessons learned, especially in the following five areas:

Finance. Of the 23 initiatives, 14 are still functioning under the REDD+ label, and only four have sold carbon credits, which was initially envisioned as the primary way REDD+ would be financed. Another six are still in the process of obtaining third-party certification and/or marketing their credits. With the exception of three initiatives led by for-profit proponents that have sold credits, all of the initiatives that are seeking to continue as REDD+ are dependent on public and philanthropic funding, neither of which promises a stable long-term budget. The challenges of accessing carbon funding have also encouraged proponents to halt, transform or at least relabel nine initiatives by the end of 2014, demonstrating the difficulty of sustaining REDD+ interventions in the face of political and financial uncertainty.

Tenure. In addition to a secure source of funding, conditional incentives require a way to identify who holds rights to forest carbon and who bears responsibility for reducing emissions. Thus, pervasive tenure insecurity in tropical forests poses a challenge for implementing performance-based systems; it also potentially encourages more deforestation and undermines local livelihoods. At 11 of the sites, proponents consider tenure to be among their most important challenges. Most of the proponents have therefore given significant, dedicated attention to tenure clarification, but much remains to be done to assure an appropriate tenure foundation for REDD+.

Scale. REDD+ is an inherently multilevel process, requiring coordination between activities on the ground and policies at higher levels. The 23 initiatives in this book include six that are jurisdictional, in the sense that they plan to monitor carbon emissions and removals over an entire political administrative region. Jurisdictional initiatives are enabled by the power of government to work across sectors and scales, but can be hindered by interests counter to REDD+ that are embedded in some sectors of government; initiatives may also be vulnerable to changes in political leadership resulting from electoral outcomes.

MRV. MRV capabilities are highly uneven across countries, initiatives and emission sources. In contrast to the remote sensing capabilities for monitoring large-scale deforestation and the advance of deforestation frontiers that pre-dated REDD+, there has been slow progress on monitoring the small-scale mosaic deforestation and degradation that are ubiquitous throughout tropical forests. The diversity of emission sources across the 23 sites clearly points to the importance of locally tailored MRV systems, e.g. to capture the role of fire in Indonesian peatlands and Tanzanian dry forests.

Safeguards. REDD+ initiatives could place local livelihoods at risk unless they offer alternatives to forest conversion for agriculture – which is the primary income source for many smallholders in our sample. Our survey indicates that smallholders are concerned about whether they will receive tangible (income-related) benefits and whether their incomes could be negatively impacted by REDD+ interventions. Many of the proponents do plan to offer support for sustainable agricultural practices in compensation for restrictions on traditional shifting cultivation. However, survey results from the 23 sites clearly demonstrate the challenges of promoting social co-benefits in a way that is efficient and equitable given the heterogeneity of livelihood portfolios and varying patterns of forest use and dependence among local stakeholders.

In sum, early expectations of large funding flows induced experimentation with subnational REDD+. The resulting experiences – including the 23 initiatives described in this book – could provide the building blocks for implementing REDD+ as part of a future climate change agreement. Meanwhile, REDD+ can be advanced through strong efforts to: mobilize funding both for carbon and complementary forest benefits; ensure that local stakeholders are not just motivated to conserve forests but also protected against external threats to their resource rights; embed REDD+ in state institutions without leaving it vulnerable to electoral politics; increase capacity for MRV adapted to local conditions; and develop social safeguards grounded in a detailed understanding of local livelihoods.

Erin O Sills and Eskil Mattsson

Brazil nut concession trail, Carmen Rosa, Peru.
(Valerie Garrish/CIFOR)

Part 1

Introduction

Chapter 1

REDD+ on the ground

The need for scientific evidence

William D Sunderlin, Christy Desta Pratama, Astrid B Bos, Valerio Avitabile, Erin O Sills, Claudio de Sassi, Shijo Joseph, Made Agustavia, Uji Astrono Pribadi and Aneesh Anandadas

1.1 Background

Climate change is an increasingly urgent global environmental and humanitarian problem, threatening disruption of ecological processes, alterations of land-based and aquatic food production systems, increasing risks to human health, challenges to maintaining and improving human wellbeing, risks to biodiversity and species survival, undermining of economic growth and resilience, and increasing conflict and violence (IPCC 2014a). Tropical deforestation and forest degradation are one key part of the problem, with 12% of total GHG emissions in the period 2000–2009 coming from forests and other land uses (IPCC 2014b, 16) and therefore potentially an important part of the solution (Goodman and Herold 2014).

When REDD+[1] was launched at the Bali COP in 2007, it involved several innovations aimed at overcoming decades of failure in attempts to reduce tropical deforestation. REDD+ would raise billions of US dollars to pay the opportunity costs of forest conservation. It would create a performance-based, conditional system for delivering rewards to those stakeholders who avoid elimination or degradation of forests. Remote sensing technology would be applied toward verifying avoided deforestation against a pre-established reference level. Policies and measures would be implemented at the national and subnational levels to lay the institutional groundwork for REDD+ and exert leverage toward assuring its success.

Seven years after the Bali COP, there is good and bad news to report. On the positive side, the idea of REDD+ has taken hold and grown, reflected in the large number of countries and initiatives participating in the REDD+ experiment, the many publications written about it and the large commitment of donor funds (Angelsen and McNeill 2012, 32–33). There has been explosive growth in the number of REDD+ subnational initiatives and there are now more than 300 (Simonet et al. 2014). REDD+ has been given prominent attention year by year in UN technical SBSTA meetings and COP negotiations because it has been viewed as a leading option for addressing climate change early and affordably. Although negotiations at the COPs from 2008 to 2012 led to incremental progress, the breakthrough finally came at the 2013 COP in Warsaw, with progress made on six key issues involving the coordination of: financial arrangements, transparency and safeguards, national forest monitoring systems, verification at the international level, institutional arrangements, and drivers of deforestation (Stolle and Alisjahbana 2013). Brazil experienced a 79% reduction in its rate of deforestation between 2004 and 2013 (INPE 2014a) and it has made the largest contribution to reduced GHG emissions of any country to date (Springer and Wolosin 2014) (see Box D on Brazil). It is doubtful this achievement can be counted as a REDD+ success because the impetus predates REDD+, and the policy leverage applied is not directly related to REDD+. Nevertheless it demonstrates conclusively the high potential for massive GHG emissions reduction in the forest sector. There are other, more minor, 'deforestation success stories' that are attributed to REDD+ (Boucher et al. 2014).

The bad news is that for all the investment in REDD+-readiness in the last seven years, implementation of REDD+ has fallen far short of what was hoped. The large amount of funding meant to drive REDD+ has not yet materialized. To date, less

1 We define REDD+ both broadly and narrowly, as follows: "A *broad* definition, based on the official COP13 terminology, holds that REDD+ comprises local, subnational, national and global actions whose primary aim is to reduce emissions from deforestation and forest degradation and enhance carbon stocks (increase removals) in developing countries. A *narrower* definition is that REDD+ *also* includes results-based or conditional payments, which was a core idea when REDD+ was launched" (Angelsen et al. 2012, 381).

than USD 10 billion has been mobilized (Voluntary REDD+ Database 2014; Norman and Nakhood 2014), whereas it is estimated that USD 5.0–12.5 billion is needed annually (Stern 2006, 217; Angelsen 2013, 13). At current prices, the supply of forest carbon credits is 13–39 times larger than demand and there will be a USD 15–48 billion funding gap in the coming years (IFF 2014, 8). Public sector funding of REDD+ was meant to be temporary, but it continues to fill the gap because of failure of the market for forest carbon credits (both voluntary and compliance) to develop. Many REDD+ subnational initiatives are 'treading water,' waiting for conditions to be more propitious. Some are drifting away from the concept of REDD+ (Sunderlin et al. 2014a). Formulation of REDD+ policy at the national level has in some cases met stiff resistance by forces aligned against it (Brockhaus et al. 2013). Systems for MRV meant to assure the efficient functioning of REDD+ are substandard in some countries (Romijn et al. 2012; Joseph et al. 2013). Perhaps most importantly, although a binding global climate change agreement would likely propel the regulatory environment necessary for funding REDD+, the prospect of an agreement at the Paris COP in 2015 is said to be dim by some sources (CICERO 2014; Davenport 2014).

It is unclear where REDD+ is going, and there are equal measures of hope and discouragement about prospects for fulfilling its lofty goals. At this juncture, scientific evidence on REDD+ implementation is critically important to provide insights on what is going right, what is going wrong and to propose course corrections. This book provides preliminary information on 'REDD+ on the ground' in the form of REDD+ subnational initiatives. These initiatives seek to move beyond readiness to actually reduce forest carbon emissions and are thus critical empirical reference points on the successes and failures of REDD+ at delivering both reduced emissions and co-benefits for local livelihoods and environmental services. Ultimately, implementation of REDD+ will depend on decisions made at the subnational and local levels, as with all climate mitigation strategies (UNDP 2014). Independent scientific research on subnational initiatives is required to assess whether they provide 'proof of concept' or reason for concern about all of REDD+, as well as to extract lessons for other forest conservation efforts.

Drawing on research in Brazil, Peru, Cameroon, Tanzania, Indonesia and Vietnam, this book describes 23 subnational REDD+ initiatives, including their institutional, socioeconomic and biophysical context, and their structure, strategy and implementation. We discuss the concerns and challenges facing these initiatives, as well as the lessons they offer for REDD+. For each country, the national context is briefly described, and the final chapter draws some synthesis conclusions on the nature of the challenges they face in fulfilling their goals.

This introductory chapter is structured as follows. In Section 1.2, we describe the research project that has produced the case study information in this book (namely Module 2 on subnational initiatives of CIFOR-GCS), with particular attention to how we defined our sample and data collection methods. In the following section (Section 1.3), we describe the locations of the initiatives and discuss implications for the generalizability of the research findings. We then describe the structure of the book and the contents of the 22 case report chapters, and explain the aim of the concluding synthesis chapter (Section 1.4). We close with thoughts on the urgent need for effective forest-based climate change mitigation, and how this book can contribute toward that goal (Section 1.5).

1.2 Sample and methods

The aim of CIFOR-GCS, begun in 2009, is to identify the challenges and enabling conditions for REDD+ to achieve outcomes that are effective, efficient and equitable, and fulfill co-benefits such as protection and improvement of livelihoods, tenure and gender rights, and biodiversity. (These outcomes are abbreviated '3Es and co-benefits' or '3E+.') The results are meant to guide policy makers, governments and initiative proponents in designing and implementing REDD+. CIFOR-GCS is being conducted in 14 countries[2] and is composed of four research modules and one information sharing module.[3]

This book summarizes field data gathered in 2009–2013 by CIFOR-GCS's Module 2 on subnational initiatives. Module 2 is working in the CIFOR-GCS core countries, that is: Brazil, Peru, Cameroon, Tanzania, Indonesia and Vietnam. It is carrying out its research in collaboration with 23 subnational initiatives (Figure 1.1, Table 1.1 and Appendices 1–3 and 5–6). The proponent organizations developing these initiatives are predominantly private nonprofit organizations (13), but also include private for-profit (4), private nonprofit/government (2), government (2), government to government partnership (1), and public bilateral (1) organizations. Seventeen of the initiatives operate at the project scale (smaller than and not developed as part of a government administrative unit), whereas six are jurisdictional (encompassing a government jurisdictional unit). Funding to date comes largely from bilateral public sector funding. Other sources of funding include philanthropic organizations, private companies, international organizations and subnational governments (Appendix 1). The initiatives range widely in area from Acre's 157,490 km^2 (approximately the area of Bangladesh) to SE Cameroon's 28 km^2, encompassing just two villages. Seventeen of the initiatives are in the tropical wet climate region, whereas all six of the Tanzania initiatives are in the tropical dry region (Appendix 2).

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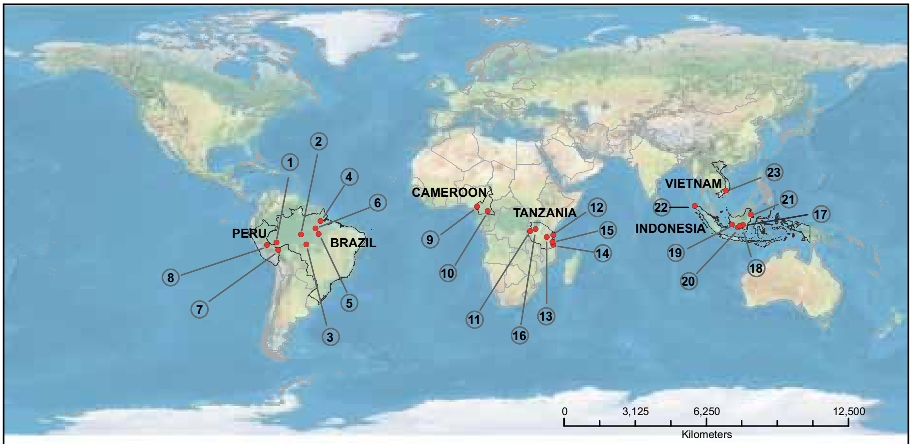
2 CIFOR-GCS as a whole is conducting research in Bolivia, Peru, Brazil, Democratic Republic of Congo, Cameroon, Tanzania, Ethiopia, Burkina Faso, Mozambique, Nepal, Indonesia, Papua New Guinea, Vietnam and Laos.

3 The research modules involve international and national policies and processes (Module 1); subnational initiatives (Module 2); MRV (Module 3); and multiscale governance (Module 4).



BRAZIL

1. Acre

Acre's State System of Incentives for Environmental Services (SISA)

2. Bolsa Floresta

Bolsa Floresta Program

3. Cotriguaçu

Cotriguaçu Sempre Verde

4. Jari/Amapá

The Jari/Amapá REDD+ Project

5. SFX

Sustainable Landscapes Pilot Program in São Félix do Xingu

6. Transamazon

Sustainable Settlements in the Amazon

PERU

7. Madre de Dios

REDD Project in Brazil Nut Concessions in Madre de Dios, Peru

8. Ucayali

Valuation of Environmental Services in the Managed Forests of Seven Indigenous Communities in Ucayali, Peru

CAMEROON

9. Mt. Cameroon

Mount Cameroon REDD Project

10. SE Cameroon

Community Payments for Ecosystem Services (PES) in the south and east regions of Cameroon

TANZANIA

11. Kigoma

Building REDD Readiness in the Masito Ugalla Ecosystem Pilot Area in Support of Tanzania's National REDD Strategy

12. Zanzibar

HIMA – Piloting REDD in Zanzibar, Tanzania Through Community Forest Management

13. Kilosa

Making REDD work for Communities and Forest Conservation in Tanzania

14. Lindi

Making REDD Work for Communities and Forest Conservation in Tanzania

15. Mpingo

Combining REDD, PFM and FSC certification in southeastern Tanzania

16. Shinyanga

Community-Based REDD Mechanisms for Sustainable Forest Management in Semiarid Areas

INDONESIA

17. KFCP

Kalimantan Forests and Climate Partnership

18. Katingan

Katingan Peatland Restoration and Conservation Project

19. KCCP

Ketapang Community Carbon Pools

20. Rimba Raya

The Rimba Raya Biodiversity Reserve Project

21. TNC within BFCP

The Nature Conservancy within Berau Forest Carbon Program

22. Ulu Masen

Reducing Carbon Emissions from Deforestation in The Ulu Masen Ecosystem

VIETNAM

23. Cat Tien

Cat Loc Landscape – Cat Tien National Park Pro-Poor REDD+ Project

Legend

• REDD+ initiatives

☐ Case study countries

Basemap: USA Topo Maps
(Copyright National Geographic Society)

Figure 1.1 CIFOR-GCS abbreviated and formal names and locations of subnational initiatives.

Table 1.1 Forest area, forest loss and carbon emissions in the CIFOR-GCS initiative sites.

Country	Initiative	Area[a]	Forest area 2000[b]	Forest loss 2000–2012[c]		Emissions 2000–2012
		(ha)	(%)	(ha)	(%)	(Gg C)[d]
Brazil	Acre	15,749,099	94.9%	705,662	4.7%	105,849
Brazil	Bolsa Floresta[e]	7,879,392	96.6%	27,825	0.4%	1,469
Brazil	Cotriguaçu	912,077	95.6%	134,029	15.4%	20,104
Brazil	Jari/Amapá	73,546	97.1%	4,656	6.5%	698
Brazil	SFX	8,044,157	94.6%	959,159	12.6%	142,821
Brazil	Transamazon[f]	25,958	95.4%	4,761	19.2%	714
Peru	Madre de Dios	299,217	99.9%	945	0.3%	142
Peru	Ucayali[g]	121,912	100.0%	823	0.7%	85
Cameroon	Mt Cameroon	61,123	97.4%	342	0.6%	36
Cameroon	SE Cameroon	2,664	100.0%	26	1.0%	4
Tanzania	Kigoma	86,393	99.5%	351	0.4%	46
Tanzania	Zanzibar[h]	12,913	96.5%	1,285	10.3%	160
Tanzania	Kilosa	176,742	97.9%	4,510	2.6%	258
Tanzania	Lindi	116,813	99.6%	5,809	5.0%	731
Tanzania	Mpingo	181,580	99.4%	5,338	3.0%	589
Tanzania	Shinyanga	39,873	14.5%	59	1.0%	3
Indonesia	KFCP	113,416	96.0%	12,740	11.7%	2,230
Indonesia	Katingan	102,450	100.0%	2,626	2.6%	460
Indonesia	KCCP	14,402	99.6%	662	4.6%	116
Indonesia	Rimba Raya[i]	44,838	97.9%	3,590	8.2%	628
Indonesia	TNC within BFCP	2,109,680	96.7%	193,879	9.5%	33,823
Indonesia	Ulu Masen	701,945	99.4%	9,803	1.4%	1,705
Vietnam	Cat Tien	63,385	94.5%	3,166	5.3%	291

a Here, areas (in ha) are calculated using the cells of the Hansen raster data, assuming equal cell sizes of 30 x 30 m. Hence, these sizes may differ from size calculations based on projected GIS data.
b Forests are defined as areas with >10% tree cover.
c Forest loss is defined as a change from >10% tree cover to ~0% tree cover.
d Gg C = gigagrams of carbon (1 Gg = 1000 tons).
e Here, the total Bolsa Floresta Program area is included, although only one part of the total program (i.e. Juma) is considered an official REDD+ initiative.
f Only the individual plots in the total initiative area are included.
g Only the protected area within the total initiative area is included.
h Only the CIFOR-GCS sample villages within the total initiative area are included.
i Only the 'carbon accounting area' was included, which corresponds to the area known as 'Proposed project area in 2010.'

Box A
Estimating forest loss and carbon emissions

Astrid B Bos and Valerio Avitabile

To compare forest area, forest loss and carbon emissions associated with that loss in the various REDD+ intervention areas of CIFOR-GCS, there is a need for one consistent method. Here, we follow FAO (2000) and define forests as areas with at least 10% tree cover. We make use of existing global datasets that cover the entire tropics and thus all of the initiatives in the CIFOR-GCS sample. Potentially higher quality, local data are not always available or directly comparable due to different methods and assumptions.

The intervention areas vary significantly in location, size and composition (i.e. ranging from complete provinces to a group of relatively small scattered plots). These differences may have a considerable influence on the forest loss and emission values.

Forest area and forest loss

Forest area and forest loss in all of the CIFOR-GCS sites were estimated on the basis of the dataset provided by Hansen et al. (2013), which contains the results of a time series analysis of Landsat 7 ETM+ images on global forest extent and forest change between 2000 and 2012 at 30 m spatial resolution. There has been significant debate over the extent to which this dataset actually represents forest and deforestation in the tropics. We use these data mindful of the fact that there is a controversy, yet believing these are currently the best globally comparable data for describing forest cover change at the 23 sites. We define deforestation as tree cover loss (according to the Hansen et al. (2013) data on global forest cover loss) that occurred in areas with at least 10% tree cover in 2000, consistent with the FAO definition of forests (FAO 2000).

Carbon emissions

Carbon emissions from aboveground biomass due to forest loss at the CIFOR-GCS sites were estimated by multiplying the area of forest loss (activity data) obtained from the Hansen et al. (2013) dataset with the respective forest carbon stock density values (emission factors). Carbon stocks at the CIFOR-GCS sites were derived from the IPCC Tier 1 default values (IPCC 2006). The activity data were stratified by continent and ecological zones according to the FAO Global Ecological Zone map (FAO 2001), and the respective average IPCC aboveground biomass density value for forest was applied to each deforestation unit, using a conversion factor of biomass to carbon of 0.5. The estimates refer only to the carbon emissions from aboveground biomass and do not include other carbon pools (belowground biomass, litter, dead wood, soil carbon) or emissions from forest degradation. Emissions from aboveground biomass represent the major source of carbon to the atmosphere in most forest types, but in specific contexts the total carbon emissions can be substantially higher, such as in peat forests where large amounts of carbon are stored in the soil.

Module 2 has adopted "before–after/control–intervention" (BACI) as its core method. Through this counterfactual approach, Module 2 aims to provide robust evidence on the performance of subnational initiatives in making REDD+ effective, efficient, equitable and able to provide co-benefits such as poverty reduction, improved livelihoods, secure tenure and biodiversity protection (the so-called 3E+ goals of REDD+). The approach involves comparing changes before and after the introduction of REDD+ in forests, villages and households that are inside the intervention area for REDD+ with matched areas that are outside (controls) (Jagger et al. 2009, 2010). At most of the 23 sites, there are other conservation and development initiatives ongoing in parallel to REDD+. This raises challenges for the attribution of outcomes to the REDD+ initiative, both in our own impact evaluation and in terms of the MRV of carbon additionality and co-benefits. *In this book, we are describing baseline conditions in the intervention area and are thus presenting only the 'before' data from intervention villages and households. In the course of 2015, Module 2 will be analyzing the full panel data in order to assess the impacts of the REDD+ interventions*. Case reports are based primarily on CIFOR-GCS research, including information obtained through interviews with villagers, proponents, government officials, other stakeholders and critics of REDD+. All unattributed information in the case reports is based on CIFOR-GCS research. Where we draw information directly from secondary literature, we cite those sources.

1.2.1 Selecting REDD+ countries

Module 2's target countries were chosen as part of a CIFOR-GCS-wide exercise to identify the optimum countries for all modules. Among the criteria were the following: (i) key tropical forest countries, in particular, those that are pioneering REDD+ (e.g. Brazil and Indonesia); (ii) balance in the number of countries in each of the three main continental regions (Latin America, Africa and Asia); (iii) diversity of stages on the forest transition, for example, a relatively high rate of deforestation and degradation (e.g. Indonesia) and relatively stable forest cover (e.g. Vietnam); (iv) countries with sufficiently stable governance and security conditions to enable productive research; and (v) strong donor interest (Sunderlin et al. 2010, 19). In addition to these criteria, Module 2 favored the selection of countries where the presence of a CIFOR office could support field research activities (initially Bolivia, Brazil, Cameroon, Indonesia and Vietnam) and where REDD+-readiness was sufficiently far along to justify site-level research (which is why we did not choose DRC). Module 2 began to work in Bolivia, but when the government turned against REDD+ in 2010, we switched to Peru.

1.2.2 Selecting subnational initiatives

Candidate subnational initiatives were chosen on the basis of the following five criteria: (i) they conform to our operational definition of the term

'REDD+';[4] (ii) they intend to monitor, report, and/or transact reductions in carbon emissions or increases in carbon stock (in a quantified manner); (iii) they define site boundaries and intervention villages before the beginning of our field research; (iv) REDD+ incentives were not planned to begin until after May 2010, assuring us a risk-free period in which to collect the 'before' data; and (v) the REDD+ incentives had a reasonable chance of being implemented and maintained in the subsequent 1.5 years (July 2010 – December 2011) (Sunderlin et al. 2010, 19–20). The combination of criteria (3) and (4) meant that only initiatives in a particular stage of development were eligible for our sample, and we essentially selected all initiatives in our study countries that we could verify were in that stage.

1.2.3 Selecting villages and households

Our core method was to collect data at the household and village levels in both intervention and control villages. (The 17 initiatives where we collected both village and household data we called our 'intensive' sites.) However, in order to expand our sample within our available research budget, we gathered data only at the village level and only in intervention villages at five additional sites. (These we called our 'extensive' sites.) Finally, we also took advantage of an opportunity to collect data at a site where REDD+ was already well advanced. One among the 23 initiatives (Bolsa Floresta in Brazil) is not part of the BACI analysis. Bolsa Floresta had already introduced REDD+ conditional incentives when the research began, meaning it was not possible to collect 'before' data at this site. We chose to do research at Bolsa Floresta because it was the first REDD+ initiative in Brazil to make direct conditional payments to households. Appendix 3 shows the distribution of the 23 initiatives across countries, type of study design (intensive, extensive, non-BACI), and the number of villages and households researched.

The selection of villages and households at intensive sites followed five steps. First, at each site, the field research teams identified a pool of 15 candidate REDD+ villages. In initiatives that cover a large region, they identified the set of villages where direct interventions are planned and where recent deforestation rates are average or higher than average for the initiative or region, because proponents had identified this as a key criterion for site selection (Lin 2012).

Second, for this set of candidate REDD+ villages, field teams used their knowledge and understanding of site characteristics to identify a pool of potential control villages that were not targeted for the REDD+ intervention but were similar in terms of market accessibility, deforestation pressures and socioeconomic factors. However, potential controls had to be far enough away that they would not be affected by direct spillovers or leakages (i.e. activity shifting) from the intervention area.

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4 Specifically, by our definition, they aim to reduce net carbon emissions primarily by: (a) reducing deforestation/degradation; or (b) implementing forest conservation/restoration/management. That is, they do not derive most of their carbon benefits from afforestation/reforestation outside of existing forest.

Small-scale farmers in Mato Grosso being interviewed by the Brazilian news station, *Rede Globo*, about their agroforestry production. (Icaro Cooke Vieira/CIFOR)

Third, the field teams collected data on 22 key characteristics considered likely to influence both initiative placement, and land use and welfare outcomes. These data were collected from secondary data sources, key informant interviews and by using other rapid rural appraisal techniques. Examples of variables in this data collection include population, village area, ethnicity, distance to roads and markets, forest dependence, forest cover, experience with a forest conservation NGO and major deforestation threats.

Fourth, we compiled these rapid rural appraisal data on the 30 villages per site (15 intervention and 15 control) for each country, in order to statistically match REDD+ villages to similar control villages, based on a set of key characteristics related to the probability of being selected for REDD+ interventions. (The rapid rural appraisal data for a few sites arrived later, and in those cases, villages were matched within the site.) The characteristics that ended up being most influential in matching were: (i) deforestation pressures; (ii) presence of NGO; (iii) forest tenure; (iv) number of village organizations; (v) population; (vi) village forest cover; (vii) forest dependence; and (viii) distance to main road.

Finally, in each site, we selected the four intervention and four control villages that were most closely matched, i.e., that were closest in terms of the Mahalanobis metric estimated at the country level. (One of the four intervention villages was included on the basis of having the highest potential for reducing deforestation, in the view of the proponent.) This statistical matching procedure was conducted by a central analytical team, not engaged in field data collection, to ensure procedural consistency across all countries and to minimize the influence of researcher preferences for particular field sites.

At all intensive sites, a minimum of 30 households were selected through simple random sampling in each of the eight villages (four intervention and four control) for a total of 240 households in the sample (Sunderlin et al. 2010, 27–29). If, due to local circumstances or matching, the number of villages fell below eight, the number of sample households was increased in each village to attain the minimum of 240 households at the level of the site.[5] At three sites, the REDD+ initiative involved specific households, and thus, we stratified our sample based on household participation in the initiative.[6] In this book, we focus exclusively on results from the intervention villages.

At the five extensive sites, villages were selected by identifying a pool of 15 candidate REDD+ villages (or the total number of villages at the site if there were fewer than 15). Four of those villages were then selected for the sample. One village was chosen purposively for having the highest potential for success in reducing deforestation, according to the proponent. The remaining three were chosen randomly.

1.2.4 Survey instruments

Most of the quantitative primary data reported in this volume are from a household questionnaire. The main aim of the household questionnaire (in terms of time consumed in the interview) was to record all household livelihood activities from all sources and the value of household income in the 12-month period prior to the date of the interview. The household income survey records environmental income, distinguishing between forest and non-forest environmental income. For definitions of these and other variables used in the study, see Appendix 4. Other purposes of the questionnaire were to record the type and value of all household assets including land and household goods, tenure of household lands, access to utilities (water, toilet, electricity, cooking technology and fuel), household activities on forest lands in the two-year period prior to the interview, subjective perception of well-being change

5 For example, at the SE Cameroon site (Cameroon), there are only two villages within the boundaries of the site. In each of these intervention villages, 60 households were selected, and four control villages were selected with 30 households each.

6 At the Acre (Brazil) site, the sample was stratified based on participants and nonparticipants in the Certification of Smallholder Properties Program. At the Transamazon (Brazil) site, the sample was stratified based on participants and nonparticipants in the *Proambiente* program. At the Shinyanga (Tanzania) site, the sample was stratified based on households that have their own forest enclosure (*ngitili*) and those that do not. In each of these cases, approximately 15 participants and 15 nonparticipants were selected in each community.

in the two-year period prior to the interview, and knowledge of and involvement in REDD+. A village questionnaire and a women's questionnaire collected the same kinds of data, although at a much lower level of specificity for household income.[7] Also used were a "Proponent Appraisal Form" to get preliminary data on the initiative, and a "Survey of Project Implementation" for gaining insights into the background, history, institutional dynamics and politics of initiative development. The Technical Guidelines, survey instruments and code book used during phase 1 (2009–2013) for this research can be found on the CIFOR-GCS website.[8]

1.2.5 Methods limitations

Several issues are flagged here to help the reader understand the strengths and weaknesses of our approach. First, we have a sample of just four intervention villages in what are, in many cases, large and diverse sites. Second, in a small subset of 'intervention' villages, the proponent interventions have not begun, either because the initiative is on hold (e.g. Ulu Masen) or because the proponent shifted attention to other villages.

Third, the external validity of our results would have been maximized if we randomly selected tropical forest countries, initiatives, villages and households. However, given budget constraints on our sample size, that procedure would have limited our statistical power to detect impacts of a variety of REDD+ initiatives. Thus, countries and initiatives were selected purposively, villages were selected based mostly on statistical matching[9] and households were selected randomly. Given our constraints, purposive selection of all countries and initiatives was a practical requirement to assure conformity with our data needs. Our purposive selection of initiatives was mostly driven by their timing and stage of development and not biased toward particular types of proponents, initiatives or regions. We selected a sample of villages that we could match to 'control' villages outside the intervention area in terms of basic socioeconomic and geographic characteristics, from the set of villages where proponents were definitely planning interventions and where deforestation and degradation rates were at least average for the region. On the whole, we believe our sample to be a source of valuable data, with information on a wide variety of initiative types, including in the two main REDD+ countries (Brazil and Indonesia).

Fourth, the six country teams had somewhat different approaches in gathering the household income data. The Brazil and Peru teams used highly elaborated, pretested and written call-out lists for inquiring about all sources of household income, whereas the other country teams used a mix of written and mental

7 Both the village and women's surveys were conducted through focus group discussions with 10 to 15 adult (16 years or older) respondents selected through collaboration with the village leadership.

8 http://www.cifor.org/library/3286/technical-guidelines-for-research-on-redd-project-sites-with-survey-instruments-and-code-book

9 Three of four villages at extensive sites were chosen randomly.

(unwritten) call-out lists of likely sources of local income. They developed these mental call-out lists during the interviewing process, so the interview of the last household is likely to have been conducted differently than the interview of the first household. While this variation in technique is unlikely to have introduced any systematic bias across intervention and control villages, it does mean that there may have been more complete and consistent reporting of income in Latin America, and this is one of many caveats on drawing comparisons across continents.

1.3 Location of initiatives and implications for generalizability

The sample of 23 initiatives is a broad cross section of sites with a wide diversity of types of proponents, scope, sources of funding (Appendix 1); biophysical characteristics including area, elevation, forest type, ecozone, climate region (Appendix 2); sources of pressure on forests (Appendix 5); and rates of deforestation (Table 1.1). In the period 2000–2012, forest cover loss ranged from a low of 0.3% (Madre de Dios, Peru) to a high of 19.2% (Transamazon, Brazil).

To what extent is it possible to generalize research findings from the CIFOR-GCS sample to the broader universe of REDD+ initiatives? The CIFOR-GCS sample suffers the disadvantage of being only 23 initiatives out of 329 worldwide, and being drawn from only 6 of 47 REDD+ countries. Nevertheless, comparison of the CIFOR-GCS sample to the global database of Simonet et al. (2014) demonstrates that the CIFOR-GCS sample is a reasonable if imperfect representation of the wider universe of subnational REDD+ (see Table 1.2).[10]

The CIFOR-GCS sample contains the three countries (Brazil, Indonesia, Peru) with the most initiatives. The range in the land area of initiatives in the CIFOR-GCS sample is roughly comparable to the world range, but the average area is substantially larger in the CIFOR-GCS sample, which includes two exceptionally large initiatives (Acre and SFX). Because of the inclusion of these two large sites, the area of the CIFOR-GCS sample is half the size of all initiatives worldwide. In the CIFOR-GCS sample, 74% of the sites have humid forests whereas in the global data set the share is 47%. The comparison is complicated, however, by the fact that there are no data for one-third of the cases in the global dataset. The CIFOR-GCS proportion of private initiatives (74%) is similar to the world average (82%), but the inclusion of for-profit initiatives is somewhat smaller and of nonprofit initiatives somewhat higher. The CIFOR-GCS and global figures for the sale of forest carbon credits are similar (17% and 20%).

10 Whereas the CIFOR-GCS sample is limited to initiatives that aim to reduce net carbon emissions primarily by reducing deforestation/degradation or implementing forest conservation/restoration/management, the Simonet et al. (2014) database includes these and also initiatives aiming primarily at afforestation and reforestation.

Table 1.2 Comparison of key characteristics of the CIFOR-GCS sample and REDD+ worldwide.

Characteristic	CIFOR-GCS sample	REDD+ worldwide (Simonet et al. 2014)
Countries with REDD+ initiatives	Brazil, Indonesia and Peru are in the CIFOR-GCS sample, but DRC is not	Countries with the largest number of initiatives: Brazil (47), Indonesia (42), Peru (23), DRC (19)
Area of initiatives – range	2,664–15,749,099 ha	<1,000 to >1 million ha
Area of initiatives – mean	1,605,808 ha	300,000 ha
Area of initiatives – total	36,933,575 ha	73,500,000 ha
Ecological zone/forest type	Humid, 17 of 23 = 74% No data, 0 of 23 = 0% Dry, 3 of 23 = 13% Dry and humid, 3 of 23 = 13%	Humid 47% No data 35% Dry 10% Dry and humid 8%
Proportion private initiatives	17 of 23 = 74%	82%
Of private initiatives, proportion for profit	4 of 17 = 24%	42%
Of private initiatives, proportion not for profit	13 of 17 = 76%	58%
Proportion selling forest carbon credits	4 of 23 = 17%	21%

Simonet et al. (2014, 20) found that the main drivers of deforestation, in terms of the number of initiatives where types of drivers are experienced, are, in rank order: local livelihoods, industrial agriculture, slash and burn agriculture, illegal logging, fire, energy wood, industrial wood exploitation, and oil. It is not possible to make a direct comparison to the drivers identified in the CIFOR-GCS sample because of differences in terminology and clustering. Nevertheless, there are notable similarities to the patterns of pressure experienced at CIFOR-GCS sites (see Appendix 5). Similar to the worldwide pattern observed by Simonet et al. (2014), the most common pressures experienced at the CIFOR-GCS sites are from small-scale agriculture. Unlike the worldwide pattern, pressures from industrial agriculture appear to be less frequent in the CIFOR-GCS sample.

There is strong commonality in the types of forest protection interventions introduced at the sample sites of CIFOR-GCS initiatives (Appendix 6). Almost all initiatives have applied restrictions on forest access and conversion, and non-conditional livelihood enhancements. These are the tandem (combined negative and positive incentives) found in all ICDPs, and most initiatives in the sample are actually continuations of pre-existing ICDPs. The ICDP lineage in REDD+

has been well documented in the literature (Blom et al. 2010; Sunderlin and Sills 2012; Minang and van Noordwijk 2013). *Note, importantly, that Appendix 5 lists only the first year of (re)implementation of an intervention in the REDD+ period. In many cases, interventions were also applied prior to the REDD+ period.* All but two of the sites have carried out environmental education, which is a key part of the FPIC process in REDD+. Likewise, tenure clarification has been carried out at most sites since it is an important preparatory step for REDD+. Based on follow-up research at the sites, we have found that by 2014, conditional livelihood incentives – which is to say performance-based REDD+ incentives – have been carried out at 14 of 23 initiatives, but in almost all cases only on a pilot basis. Only four of the case initiatives are currently selling forest carbon credits. In a similar vein, Simonet et al. (2014, 19) found that REDD+ initiatives tend to be structured along the lines of the ICDP model, and performance-based incentives have not been applied as extensively as expected.

1.4 Structure and content of the book

This book uses CIFOR-GCS Module 2's baseline data to provide *ex ante* insights on REDD+ development on the ground. This introductory chapter gives a thumbnail sketch of the 'big picture' of REDD+ development and why research on it is necessary. It explains the sample and methods of the study, presents contextual information on all 23 cases, and it describes in broad terms some of the content of the case reports (with a focus on the strategies of the initiatives) and of the closing synthesis chapter.

Structure

Each of the 22 case report chapters[11] follows a pre-set template on information to be presented:

- basic factual information on the initiative (geography, stakeholders and funding, motivation, timeline)
- the strategy pursued by the proponent organization, including interventions deployed
- characterization of the villages and smallholders at the site, including information on livelihoods, forest dependence and deforestation
- the key challenges facing the initiative in meeting its goals
- aspects of the initiative that are unique and/or provide lessons about REDD+.

This template approach enables comparative analysis among the cases, and synthesis of key insights in the culminating chapter.

11 Although there are 23 initiative cases, there are 22 case reports because the initiative called "Making REDD Work for Communities and Forest Conservation in Tanzania" encompasses both the Kilosa and the Lindi cases.

Content

The case chapters in this book help disseminate the experience of these pilot initiatives and provide a means to widen and deepen our understanding of the contextual conditions shaping REDD+ in the early stages. Specifically, these chapters enrich our understanding of: the institutional make-up of proponent organizations; the political, economic, social and biophysical conditions that motivate their actions and circumscribe their opportunities and choices; and the socioeconomic characteristics of local communities that proponents collaborate with to carry out their programs and interventions. The cases give first-hand insights into the reasons why initiatives have evolved in the ways they have, and perhaps most importantly, on the range of challenges they have faced in attempting to fulfill their goals and objectives.

One challenge stands out above all the rest. This is still a world where interests favoring the conversion of forests to non-forest uses in tropical countries often have the upper hand in land-use decisions. This legacy has deep roots in the political economies of all tropical developing countries, and the persistence of the past is nourished by various factors – among them: the need of states to increase employment opportunities and foreign exchange earnings through agricultural development; the imperative to feed and provide land for an ever growing population; and infrastructural development in increasingly remote places. Forest conservation need not always be at odds with agricultural development and economic growth, as the case of Brazil mentioned earlier illustrates well. The world is at a crossroads where REDD+ has opened up an opportunity for forest conservation, leveraged by world concern about climate change. But as this book shows, REDD+ faces a steep uphill climb in reaching its objectives.

The proponents are well aware of this fundamental challenge. At the most basic level, all proponents share one common strategy to meet this challenge: reduce incentives to deforest. As explained earlier, most initiatives have an ICDP approach involving restricting forest access to local stakeholders, and compensating that with livelihood enhancements. Livelihood enhancements both compensate for restricting forest access to local stakeholders and secure the support of local stakeholders in efforts to exclude large commercial development. But beyond these common points of departure, there is a wide array of strategies among proponents. Some tend to be common to a country, whereas others are found across countries. Strategies evolve over time in response to changing international, national, and local opportunities and constraints.

Here we summarize some of the most common strategies reported in the case chapters. They are clustered under five headings: obtaining financing for REDD+ and thereby paying the opportunity costs of forest conservation; addressing the tenure status of custodians of and claimants on REDD+ forests; collaborating with government at various scales; creating a system for MRV; and assuring that local stakeholders and biodiversity are not placed at risk by REDD+ (social and environmental safeguards). In the paragraphs that follow, we briefly summarize the nature and scope of these key strategies as they play out in some of the case chapters.

Financing REDD+ interventions. Most initiatives in our sample initially planned to access the forest carbon market to fund livelihood enhancement at the local level. Some intend to apply the rewards at the level of the individual or household (e.g. Transamazon, Kilosa, Lindi), and others at the level of the village or community (e.g. SE Cameroon). Some initiatives are treating potential revenues from REDD+ as just one stream of funding among other possible sources, including, for example, sales of FSC-certified timber (e.g. Acre, Jari/Amapá, Madre de Dios, Ucayali, Mpingo, TNC within BFCP). But as of now, only four have obtained funding through the forest carbon market (Bolsa Floresta, Jari/Amapá, Madre de Dios, Rimba Raya). Most of the initiatives are in standby mode, waiting for the forest carbon market to become sufficiently reliable and predictable to serve as a long-term foundation for REDD+'s reward mechanism. Because this has not yet happened, most continue to rely on short- to medium-term funding sources that include the proponent organization itself, an affiliated implementer, government, a donor organization or some combination of these. Some initiatives have decided not to seek funding through the forest carbon market and are steering a different course, including engagement in low-carbon development at the landscape level (e.g. SFX).

Addressing tenure. Initiative forests face threats from actors large and small, and from both inside and outside the boundaries of the initiative. This state of affairs underscores the need to provide local stakeholders with the legal means to exclude claimants, as well as the right to benefit from the stream of REDD+ rewards as compensation for keeping forests standing. It also highlights the need to review and revise tenure arrangements that have historically provided privileged access to forest resources to large actors. Some approaches to addressing tenure are found at many sites, including ascertaining village and forest boundaries, participatory mapping, and assessing, clarifying and strengthening the forest tenure rights of those local stakeholders the proponent wants to become the custodians of forests. Above and beyond various conventional approaches, some proponents have also relied on various legal mechanisms to link tenure rights to environmental outcomes. Examples are CAR in Brazil (São Félix do Xingu, Cotriguaçu, Transamazon), the village forest (*hutan desa*) tenure classification for local stakeholders in Indonesia (KCCP, KFCP, TNC within BFCP) and the ERC for private REDD+ proponents in Indonesia (Katingan, Rimba Raya).

Collaborating with government at various scales. Proponent collaboration with governments has potential benefits, and there may be further advantages for subnational initiatives that operate at the jurisdictional scale instead of the project scale. Government officials and agencies might, for example, exert leverage for getting licenses, enforce environmental laws, facilitate the provision of services to local stakeholders or support helpful tenure reforms. While collaboration with government at various scales may provide advantages such as these, promote local buy-in and lend legitimacy to initiatives, implementing REDD+ across subnational jurisdictions does not guarantee these benefits. In our sample, there is considerable variation in how subnational initiatives work with governments. Six of the initiatives are subnational jurisdictional programs. The other initiatives are nonjurisdictional projects but still have varying levels of coordination with governments at different scales, ranging from informal agreements with districts to jointly provide technical support to communities, to legal agreements between projects and national governments. These differences have implications for how initiatives are implemented, and these are explored in later chapters.

Establishing an MRV system. For REDD+ to function properly, the proponent organization must put in place a sophisticated, durable and credible MRV system for documenting its performance in terms of carbon emissions and removals. This is an indispensable necessity for being able to sell carbon credits, among other purposes. For example, a well-functioning MRV system is necessary for assuring the efficient and equitable distribution of REDD+ benefits among stakeholders (Skutsch et al. 2014), and is therefore closely tied to the issue of social safeguards (Duchelle et al. in press). The experiences of the 23 initiatives show that their success in developing an adequate MRV system is closely linked to the forest monitoring capacity of the country where the initiative is located. Such success is thus linked to whether the proponent collaborates with a developed country institution, whether the proponent organization is international and whether the level of in-house expertise available to the proponent organization is adequate. For example, the initiatives in Brazil and Peru have access to high quality data and are equipped with sophisticated monitoring technologies, primarily as a result of the high monitoring capacity of their governments. Organizations of international origin such as TNC (SFX in Brazil, TNC within BFCP in Indonesia) and Flora and Fauna International (KCCP in Indonesia) are also making significant progress in MRV in collaboration with their local partners. Official development assistance in the Asia–Pacific region enables the proponents in Indonesia to acquire key components in their MRV systems. It is also important to note that highly motivated in-house experts alone can make a significant difference, as is evident in the case of the MRV accomplishment at the Kilosa and Lindi sites.

Fulfillment of social and environmental safeguards. The six study countries are in the process of elaborating formal, national-level REDD+ social and environmental safeguards. In terms of social safeguards, all of the initiatives either have or plan to carry out FPIC consultations with the local population. In most (but not all) cases, attention to social safeguards is built into the logic of subnational initiatives for instrumental (means-ends) reasons. After all, proponents, at least in principle, have a stake in fulfilling the needs and rights of their chief collaborators – the local stakeholders vested with responsibility to keep forests standing. Attention to the needs of local stakeholders is reinforced by the expectations of donors, the corporate social responsibility mandate of private organizations, the ethical mandate that NGO proponents have brought into REDD+ and the certification process. Most proponents in our sample either have, or are striving for, third-party certification through the CCBA or REDD+ Social & Environmental Standards Initiative, which motivates them to pay attention to how their initiatives affect local stakeholders and the environment (Jagger et al. 2014). However, fulfillment of this social mandate is not automatic given (among other reasons), that REDD+ initiatives almost always by design restrict access to forests that local people depend on for part of their livelihood. Six of the case initiatives (Ucayali, Kilosa, Lindi, KCCP, Rimba Raya and Cat Tien) are likely to give dedicated attention to biodiversity protection, given the proponent's high ranking of this goal.

In the synthesis chapter (Chapter 24), these five categories are analyzed in greater detail, with a focus on the challenges that they present for proponents. These challenges are framed in the context of secondary literature, and then examined in light of the evidence as seen in the case chapters. Comparisons and contrasts are made among the cases with an eye to revealing the inner workings of these obstacles to climate change mitigation in the forest sector. The synthesis closes with recommendations on possible pathways to surmount the challenges encountered.

1.5 Closing thoughts

With scientific forecasts of the consequences of anthropogenic climate change becoming ever more ominous, the need for effective, fast and global-scale approaches to mitigation is ever more urgent. For seven years, REDD+ has been considered a frontline strategy for achieving near-term reductions of GHG emissions in the forest sector. Subnational initiatives are the laboratory in which the REDD+ experiment is being conducted, and in which the human and biophysical consequences can be measured. This volume provides useful insights into progress made, setbacks encountered and possible pathways toward improvement.

The chapters in this book document how subnational REDD+ initiatives set out to contribute to climate change mitigation while also fulfilling a range of other goals – both social and environmental. In response to various challenges, they have adapted and innovated to keep forging a path toward their destination. A few of the 23 initiatives have begun to demonstrate that it is possible to implement REDD+ on the ground more or less in the way originally envisioned, and others are hoping to eventually follow suit. Some, due in part to unresolvable challenges, are either falling back on previous conservation strategies or steering a new course beyond what was initially envisioned for REDD+. Unfortunately, some proponents have had to yield to the reality that sustained efforts to reduce forest emissions require enabling conditions that are not yet in place, and have therefore brought their initiatives to a close. It is abundantly clear that if forest-based climate change mitigation is to rise to the expectations set for it seven years ago, there will have to be an unprecedented groundswell of collective concern and action to move this path-breaking idea towards realization. We hope this book provides both helpful knowledge, and also inspiration, in that direction.

Box B
Challenges to measuring emission sources and sinks in REDD+ subnational initiatives

Shijo Joseph

A functional MRV system, capable of estimating net emissions and removals against an REL, is a major step in REDD+ readiness. The IPCC (2006) put forth guidelines focused on activity data and emission factors, which are central to estimating emission reductions. Activity data reflect the area in which carbon changes occur over time, while emission factors reflect changes in carbon stock densities per unit area. Activity data are generally produced by repeated measurements from a remote-sensing platform, while emission factors are estimated by ground measurements of carbon and noncarbon GHGs.

An assessment of REDD+ proponents' MRV capacity and readiness in 20 of the 23 subnational REDD+ initiatives described in this book found that about half had capacity deficiencies for generating activity data and emission factors (Joseph et al. 2013). This study employed 19 performance criteria and 76 indicators under three categories of capacity and readiness: (i) remote sensing and GIS; (ii) carbon pool measurements; and (iii) REL and monitoring. Capacity and readiness tended to be highest at the Latin American sites and somewhat lower in Africa and Southeast Asia. Landsat was the primary source of activity data, and about half of the proponents had access to high-resolution (>10 m) satellite imagery. The majority of organizations (70%) showed in-house expertise and used advanced classification and change detection techniques for generating activity data. With respect to emission factors, only a few initiatives monitored all five carbon pools, none inventoried nitrous oxide or methane, and about half had site-specific allometric equations. For REL and monitoring, there were limitations in all the initiatives. A few had well-defined strategies to slow and halt proximate causes of deforestation, but all were limited in addressing underlying causes that originated outside the intervention area. A few initiatives showed reasonable monitoring plans, while the rest had loosely defined monitoring plans or no plan at all.

Technical challenges are the main reason for delays in attaining MRV readiness. REDD+ requires monitoring of three trajectories: deforestation, degradation and regrowth. Remote sensing is the most important tool available to monitor these trajectories, with hundreds of images available for a given area. However, these images are affected by atmospheric scattering, clouds, cloud shadows, geometric errors and other sensor-related factors, and require careful filtering before meaningful interpretations of the data can be made. The filtering can be either at the pixel or image level. In the pixel-based approach, individual pixels are evaluated and those that meet the quality criteria are selected. In the image-based approach, each image is taken as a whole, and those that do not pass the quality criteria are filtered out. In most cases, very few images meet the quality criteria, which makes remote-sensing-based monitoring fragmented and less real time. Although deforestation can be detected using these multi-temporal data, the monitoring of degradation and regrowth requires denser time series (hyper-temporal) data. Several research efforts are progressing toward that end (see Verbesselt et al. 2010, 2012). Emission factors are also equally important when converting activity data on degradation and regrowth to estimates of emission sources and sinks, and recent methodological advice from GFOI (2013) should help REDD+ proponents in mainstreaming their efforts.

Remote sensing is rapidly progressing with new sensors, analytical algorithms and high data-handling capabilities (Joseph et al. 2011). The constellations of mini- and nanosatellites and the dawn of civilian drones/unmanned aerial vehicles open up a new age where it is possible to gather ultra-dense time series data of hundreds of daily observations (The Economist 2014). The entry of technological giants such as Google into the space- and location-based business (Samuels 2013; Oremus 2014) can bolster forest monitoring. Quite soon, detection, monitoring and quantification of even minute resource extractions from the forest (e.g. felling, skidding and transport of logs) will be possible. Algorithms for analyzing data are also being developed so as to synthesize terabyte data and deliver meaningful results. Questions remain on how to institutionalize such technological innovations for the benefits of society, which is key in REDD+ readiness and in determining the fate of REDD+.

Box C
REDD+ in-depth costing

Eduardo Marinho, Noah Greenberg, Demetrius L Kweka and Erin O Sills

Introduction

The Stern Review (Stern 2006) identified the reduction of emissions from deforestation as a highly cost-effective approach to climate change mitigation. This provided strong support for the implementation of REDD+ initiatives throughout the world. Now, the time has come to assess the actual costs of REDD+. Here, we compare and contrast two very different REDD+ initiatives in Brazil and Indonesia – two countries that together store more than one-third of the world's forest carbon (Achard 2002; Gibbs 2006; IPCC 2006; Gibbs et al. 2007) and account for more than half of the world's forest carbon emissions. To gain insight into how much REDD+ really costs, we quantify and analyze the implementation costs as budgeted during the design phase of two subnational initiatives operating in different institutional frameworks, facing different drivers of deforestation and choosing different strategies to combat them.

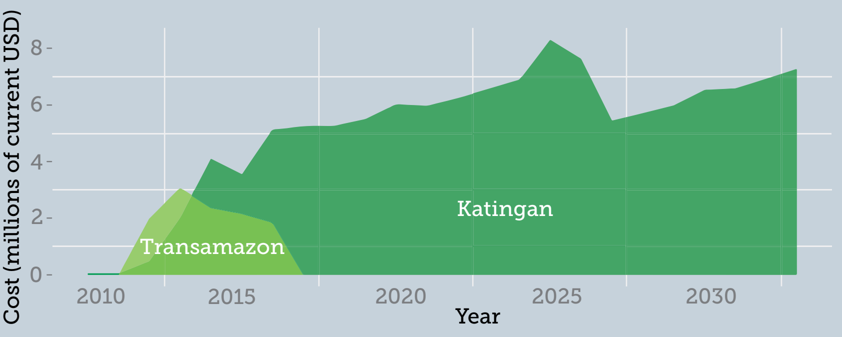

Figure C.1 Budgeted annual costs of the REDD+ initiatives over time.

The budgets for these two initiatives vary in duration, application, total costs and per-unit costs (see Figure C.1). The budget for the Transamazon initiative (Chapter 7) covers a period of five years, as specified by the donor. Its interventions are expected to change local conservation practices and livelihoods. In contrast, the Katingan Project (Chapter 18) aims to restore degraded peatlands and prevent future large-scale forest conversion through a 60-year ERC license, which was granted in 2013. The Transamazon initiative's focus on promoting sustainable practices among smallholders (local deforestation agents) translates into higher per-household costs. The Katingan Project has relatively higher costs per hectare (see Figure 1-2) due to its ecosystem restoration and patrolling activities, as well as higher costs for MRV and marketing because it plans to sell carbon credits.

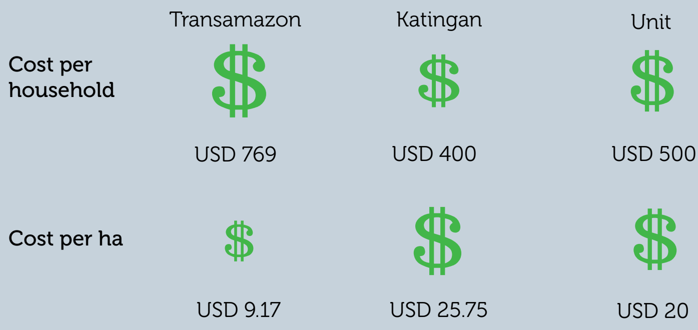

Figure C.2 Cost per household and per hectare of the Transamazon initiative and the Katingan Project.

The Transamazon initiative

Country: Brazil
Duration: Five years
Funding: Public (Amazon Fund)
Yearly cost: USD 2,250,245

Proponent: IPAM
Households: 2926
Area: 245,485 ha

Although deforestation rates have significantly decreased in Brazil, the success of the national policy is less apparent among smallholders living in Amazonian settlements. The Transamazon initiative seeks to address this problem by increasing settlers' income with no need for additional forest clearing. *Community development* (agricultural inputs and technical guidance, tree nurseries and PES) accounts for 54% of the costs of the initiative, while expenditures in *protection and enforcement* are negligible (at least in part because this is a government function). Notably, *finance and administration* is the second major source of costs (19%) because of the complex legal requirements and relatively high salaries in Brazil. High salaries also explain why more than half of the initiative budget is spent on *personnel*. Other reasons for this high contribution of personnel are high costs of taxes and benefits and a relatively small number of activities run by consultants. The direct cost of PES accounts for only 9% of the budget, although this number would be substantially higher if all households, and not only 12% of them, received payments.

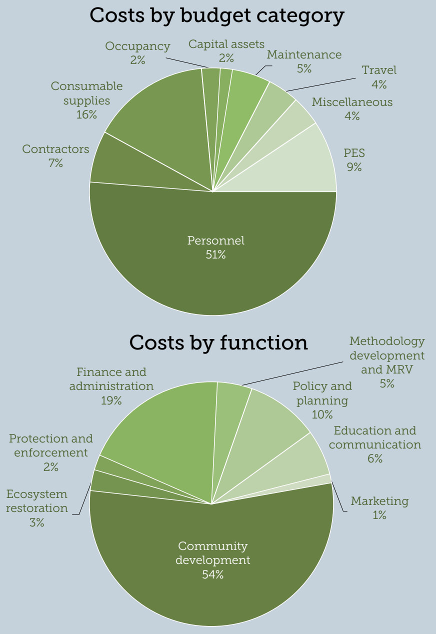

Figure C.3 Costs of the Transamazon initiative.

The Katingan Project

Country: Indonesia
Duration: Undefined
Funding: Private (carbon markets)
Yearly cost: USD 5,149,629
Proponent: PT. Rimba Makmur Utama
Households: 12,880
Area: 200,000 ha

Indonesia has demonstrated the largest increase in forest loss over the past decade and hence offers significant opportunities to reduce emissions. There are a number of legal pathways toward REDD+ initiative development in Indonesia, each with different implications for initiative structure and cost profile. The recent advent of ERCs has provided a relatively clear regulatory pathway for private sector REDD+ initiatives. Our detailed budgeting exercise for the Katingan Project reveals that the ERC pathway has high upfront costs driven by concession fees (IDR 39.4 billion, or USD 3.2 million as of this writing). The greatest overall cost driver is ecosystem restoration activities (36%), required under the ERC model to "restore biological equilibrium." Significant human resources are required to implement ecosystem restoration and protection (14%) activities leading to high expenditures, much funneled to community and other local partners, categorized here as contracted services (40%). Overall, however, a comparatively lower level of economic development in Indonesia appears to keep personnel costs relatively low in the Katingan case (26%) compared to what we find in the Transamazon initiative in Brazil.

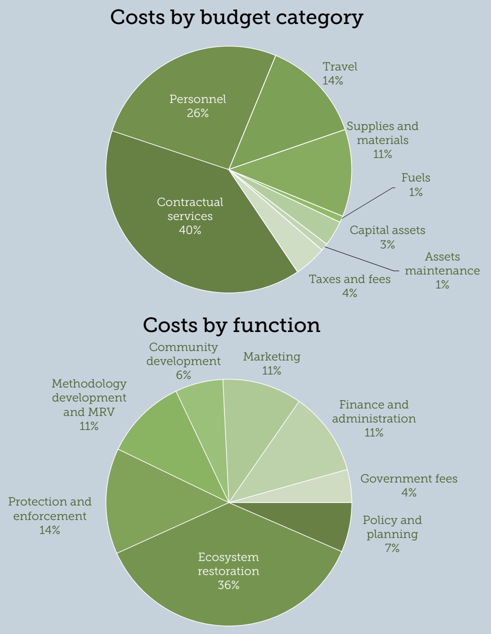

Figure C.4 Costs of the Katingan Project.

Conclusion

As might be expected given the wide variation in strategies employed by REDD+ initiatives documented throughout this book, their costs also vary substantially. This is partly due to national context. In Brazil, the strong command and control policy at the federal level relieves initiatives of protection and enforcement costs while imposing higher needs for fostering sustainable livelihoods through community development. In Indonesia, the ERC license fees result in front-loaded costs. In our research on the costs of various REDD+ initiatives, we have found that personnel costs are always a significant budget item, albeit in the Brazilian context they are overwhelmingly the largest cost driver.

This is a first attempt to understand REDD+ initiatives through analysis of their costs. Although our focus on only two initiatives prevents any generalizations, our analysis suggests that the source of emissions being targeted, the strategies used by initiatives, and the institutional and legal context, all affect the implementation costs of REDD+ on the ground.

Part 2

Case Reports

Part 2. Case Reports

Brazil

Box D
REDD+ in Brazil: The national context

Sven Wunder and Amy E Duchelle

Two-thirds of the Amazon biome, the world's largest remaining tropical forest, is located in Brazil. Around 370 million ha, or 85% of the Brazilian Amazon and 43% of Brazil's land area, remain forested. From the mid-1970s until 2004, aggressive land development strategies made Brazil the world's largest deforesting country: annual forest loss peaked in 1995 and again in 2004, at almost 3 million ha, with much of that cleared land ending up as cattle pasture. Timber extraction still only plays a minor and indirect role in Brazil's forest carbon losses. Large- and smallholders alike contribute to deforestation, facilitated by policy drivers such as subsidized agricultural credits, large-scale road building and resettlement programs (May et al. 2011). The resettlement programs involve the colonization of smallholders into land reform settlements managed by Brazil's agrarian reform institute, INCRA, where there are typically high levels of deforestation due in part to the use of forest clearing as a way to secure tenure rights (Brandão et al. 2012; Duchelle et al. 2014).

However, since 2004, Brazil has gradually cut Amazon deforestation by a spectacular 79%, to 'just' 0.6 million ha in 2012 (INPE 2014a). This reduction mostly predated the emergence of REDD+ as an international initiative: it was the result of a series of policies, plus a slowdown in the growth of commodity prices that curbed private investments in land clearing (Assunção et al. 2012). After 2004, many deforestation-sensitive civil society representatives entered the Lula administration, and the Action Plan for the Prevention and Control of Deforestation in the Amazon Region (PPCDAM) has since functioned as an interministerial coordination tool. During 2003–2008, 19 million ha of new protected areas were created, and large tracts of indigenous territories also gained official recognition. Satellite-based monitoring of changes in forest cover, principally by the National Institute for Space Research (INPE), empowered timely command-and-control enforcement actions by Brazil's environmental police, IBAMA – perhaps the single most effective action to curb deforestation. Municipalities with high deforestation were blacklisted and consequently blocked from certain resource transfers from central government. To get off the blacklist, municipalities had to register 80% of their private properties in the CAR system – a step toward compliance with the Brazilian Forest Code and tenure regularization – and reduce the area deforested annually below predetermined thresholds. Additionally, commodity roundtables increased private sector environmental compliance in supply chains.

Brazil thus became an 'early bird' showcase for how REDD+ countries could potentially turn around high-deforestation scenarios to mitigate forest carbon emissions substantially (UNEP 2012). State governments such as Amazonas, Acre and Mato Grosso played proactive roles in achieving these conservation gains, including through six Amazonian states' participation in the Governors'

Climate and Forests Task Force. Additionally, over 50 Brazilian subnational REDD+ initiatives emerged, the highest among all tropical countries (CIFOR 2014), although probably with some turnover. Many of these initiatives are supported by the Amazon Fund, funded by USD 1 billion from Norway for 2008–2015 (plus some German and national Petrobras funds). This fund was launched in 2008, is managed by the Brazilian Development Bank (BNDES) and supports projects by government agencies, NGOs and universities that demonstrate a direct or indirect contribution to reducing deforestation and degradation (Amazon Fund 2014). Various state governments also participated in subnational initiatives or have since created jurisdictional REDD+ programs.

Perhaps the most interesting potential of these subnational initiatives is to pilot intervention mixes at subnational scales of aggregation. It has been argued that the recent successful anti-deforestation policies at the national level have emphasized 'sticks' over 'carrots,' putting most opportunity costs of avoided deforestation on Amazon land users, which calls into question the political sustainability of these drastic reductions (Börner et al. 2014; Nepstad et al. 2014). In turn, many subnational initiatives are pursuing more balanced policy mixes of forest law enforcement (negative) incentives, conditional and/or nonconditional landholder (positive) incentives, and land-tenure regularization (enabling) measures. The customization of these intervention mixes to different subnational REDD+ contexts may thus also provide some valuable lessons about how to design national policy mixes.

Brazil is currently developing a legal framework for REDD+ implementation, under a working group led by the Ministry of Environment. A national law on PES is well advanced, and is also being informed by pilot REDD+ experiences, such as Juma – the oldest Brazilian REDD+ initiative (Börner et al. 2013; also see Chapter 3: Bolsa Floresta Initiative). Subnational initiatives could cross-fertilize these complex national efforts. Yet, the Brazilian case also features significant challenges on how to equitably share REDD+ benefits across levels of governance (local, state, national) (GCF 2014a). Brazil could also set an example here, especially for other large, forested countries with multilevel governance structures.

Chapter 2

Acre's State System of Incentives for Environmental Services (SISA), Brazil

Amy E Duchelle, Maron Greenleaf, Denyse Mello,
Maria Fernanda Gebara and Tadeu Melo

Acre's State System of Incentives for Environmental Services (SISA) is known as the world's first jurisdictional REDD+ program. It was created through State Law 2.308 (Government of Acre 2010), which was passed in October of 2010. This law was preceded by more than a decade of sustainable forest-based development policies in the state, notably the Ecological–Economic Zoning (ZEE) and the Valuation of Forest and Environmental Assets Policy (Valuation) (EDF n.d.). The ZEE was passed into state law in 2007 and provides the basis for sustainable forest management activities in forested areas, and the regulation of economic, land use and planning activities on already-deforested lands. The Valuation policy, which stems from the ZEE and began in 2008, comprises diverse governmental actions, programs and projects that aim to promote the sustainable use of natural resources and adequate territorial management. The ecosystem services included in SISA are carbon sequestration, maintenance of water and hydrological services, conservation of soils, conservation of biodiversity, and valuation of traditional knowledge, most of which do not yet have specific regulations. The carbon sequestration program, called ISA-Carbono, is the first to be implemented under SISA. Its general objective is to reduce GHG emissions from deforestation and degradation, following the State Plan for Control and Prevention of Deforestation. Through 2014, it has been implemented primarily through the state's existing policies and programs to reduce deforestation – including the ZEE and the Valuation policy.

2.1 Basic facts: Where, who, why and when

2.1.1 Geography

SISA applies to the entire state of Acre, which is a relatively small and remote state in the western Brazilian Amazon. Acre encompasses an area of approximately 164,221 km^2, which comprises 4.7% of the Brazilian Amazon (IBGE 2014b). It consists of two main watersheds that are drained by the Juruá River in the northwest and by the Purus River and Acre River in the southeast (Salisbury and Schmink 2007). The state had over 86% of its original forest vegetation intact as of 2013 (INPE 2014b), and almost half of its territory has been designated as protected areas (ZEE 2010). The state's principal forest types are tropical dense forests and bamboo forests with high floristic heterogeneity, which are considered to hold great economic value (Government of Acre 2013). Acre is also rich in vertebrate diversity, particularly in terms of birds and mammals. The state holds about 40% of all Brazilian mammal species, representing 4.5% of the world's mammal species, along with 45.8% of existing bird species in Brazil, or 8.5% of the world's bird species (ZEE 2010).

The human population of Acre is estimated at 790,101, with most inhabitants concentrated in the southeastern portion of the state (IBGE 2014b). The population density is 4.47 people/km^2, and the state experienced a population growth rate of 31.6% between 2000 and 2010, which was twice the Brazilian average (IBGE 2014b). The urbanization process in Acre reflects what is happening in Brazil as a whole. Nowadays, 73% of Acre's total population is found in urban areas, with most living in the capital Rio Branco, which holds 45% of all inhabitants (Government of Acre 2013).

The history of land use and economic activities in Acre is tied to the rubber boom, which began in the late 19th century and was reinvigorated during World War II. Since the 1970s, there has been a transition to land use based on cattle ranching, even among traditional forest extractivists (Gomes 2009). While Acre is still a poor state, contributing only 0.2% of the national GDP, during the last decade, its economic growth exceeded the national growth rate (10.9% in Acre vs. 7.5% in Brazil). The state GDP is comprised of services (33%), the public sector (33%), agriculture, ranching and forestry (19%), and industry (13%) (Government of Acre 2013). Public welfare programs, such as *Bolsa Família*, are the main income source for 44% of the population (MDS 2014). Agriculture is generally practiced for subsistence, but some crops, such as cassava, rice, bananas and maize, are important cash crops, as well as being essential for local livelihoods. Livestock production primarily focuses on cattle (which increased from 334,336 head in 1985 to 1,784,472 head in 2005), but also includes pigs, sheep, chickens, and more recently, fish farming (Government of Acre 2013). While timber is the primary forest product, representing 43% of Acre's exports, there are also markets for natural rubber (*Hevea brasiliensis*), Brazil nuts (*Bertholletia excelsa*), açai (*Euterpe precatoria*) and other NTFPs. Industrial activities primarily focus on the production of food, timber, ceramics and furniture (Government of Acre 2013).

The initial idea was that Acre's government-led REDD+ initiative would be implemented in 7–8 priority areas of high deforestation risk based on information in the state's Ecological and Environmental Zoning. The priority areas concept was abandoned after an extensive stakeholder consultation process during the development of SISA in 2009 and 2010. When SISA was eventually created, it did not focus on priority areas, but rather on the state of Acre as a whole. This statewide approach is often called 'jurisdictional-REDD,' and ISA-Carbono is considered the most advanced of such programs to date worldwide (Alencar et al. 2012).

For CIFOR-GCS, we focused on the priority assistance zone of the BR-364 highway (ZAP BR-364), which was an initial focal area for proponents' efforts and resources (Figure 2.1). This area corresponds to a 5 km buffer along either side of the BR-364 highway located within the municipalities of Manoel Urbano and Feijó. As of 2010, it was minimally deforested (4%) yet threatened by imminent highway paving, which opened it to year-round access. Acre's government initiated activities in the ZAP BR-364 in 2008, which were aligned with its low carbon development plan for that region.

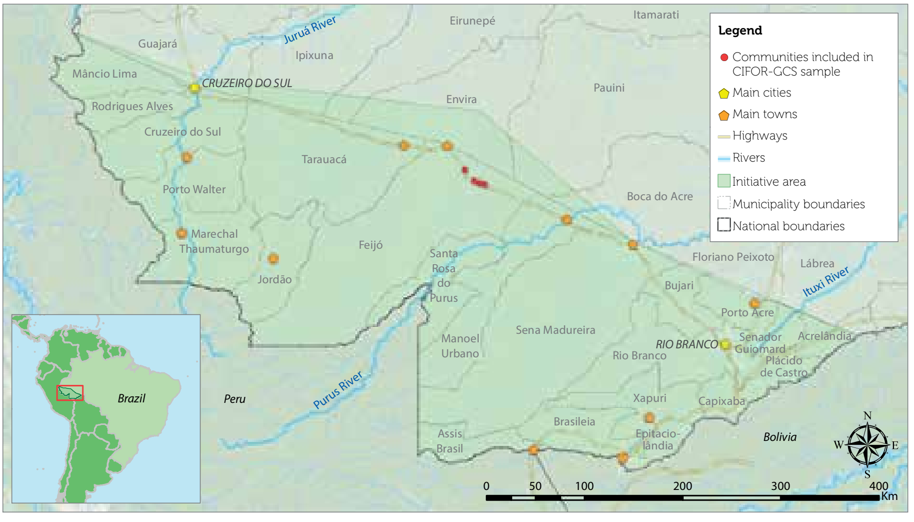

Figure 2.1 Map of Acre.

Data sources: Acre State System of Incentives for Environmental Services, Instituto Brasileiro de Geografia e Estatística, GADM and World Ocean Base.

2.1.2 Stakeholders and funding

Acre's environmental enforcement and sustainable production initiatives are managed by multiple governmental agencies that comprise the Climate Change Management Committee. These agencies include SEMA, Acre's Institute of Environment (IMAC), the State Secretariat of Family Production and Rural Extension (SEAPROF), the State Secretariat of Forest Development, Industry, Commerce and Sustainable Services (SEDENS), and Acre's Land Institute (ITERACRE). SEMA is responsible for the elaboration of environmental policy and management instruments, while IMAC enforces these policies through command-and-control initiatives. SEAPROF is responsible for rural technical assistance, along with implementation of the Certification of Smallholder Properties Program and initiatives to recuperate degraded lands. SEDENS is responsible for sustainable forest management activities, and ITERACRE is responsible for land tenure regularization. Acre's government created its own remote sensing institution, called the Central Geoprocessing and Remote Sensing Unit (UCEGEO), to monitor deforestation occurring at a smaller scale than the Brazilian national monitoring institution (INPE) can detect. UCEGEO's finer monitoring resolution (0.54 ha, as compared with INPE's 6 ha resolution) is particularly important in Acre, where most deforestation occurs at a small scale.

The SISA law created a number of institutions to administer the system and procure funding for it. Among these are the Institute of Climate Change and Regulation of Environmental Services (IMC), which regulates SISA and registers and monitors private REDD+ projects; the Commission for Validation and Accompaniment (CEVA), which monitors SISA and approves regulations, norms and implementation approaches; and the Company for the Development of Environmental Services (CDSA), which is involved in the implementation of SISA and the procurement and administration of private funding (WWF 2013). CEVA is comprised of four civil society organizations and four governmental organizations. Civil society and stakeholder participation occurs through CEVA, as well as through public consultations. The CDSA is a public–private company charged with assisting with financing, including through the sale of carbon credits, and preparing and implementing subprograms and projects under each of SISA's ecosystem service programs. The State Attorney General's office (PGE) is also an important part of SISA, providing legal guidance and participating as a member of CEVA. The SISA ombudsman is based at the PGE.

Funding for SISA and sustainable development initiatives in the study area come from a few sources. WWF, through its Sky Rainforest Rescue project (WWF-Sky), funds sustainable family farming including through the Certification Program, the development and promotion of NTFPs, and environmental educational initiatives, as well as providing some funding for SISA's institutional development. The World Bank provided support for the State Program of Social Inclusion and Sustainable Economic Development, known as PROACRE. Funding for sustainable development initiatives and SISA also comes from the Amazon Fund. Additionally, Acre signed two payment-for-performance agreements with the German Development Bank (KfW) in 2012 (four-year payment period) and 2013 (single payment) through the bank's Global REDD Programme for Early Movers. Through these agreements, the government of Acre receives yearly payments for demonstrated emissions reductions, which are measured and accountable at the state level, totaling approximately USD 25 million through 2015. A set percentage of these payments (70% or higher) are required to be distributed to beneficiaries such as the smallholders in our study site; these benefit-sharing guidelines were established for the KfW funding and not for SISA as a whole. Finally, Acre's agreement with the state of California for potential REDD-based emission offsets through California's cap-and-trade system could eventually provide an important source of funding for SISA (ROW 2013).

2.1.3 Motivation

Acre's state government, known from 1999–2010 as the 'Forest Government,' is credited with the creation of an innovative, forest-based development model in the state. This model combines market-oriented strategies with local participation and social development (Schmink et al. 2014). It was largely inspired by the success of the rubber tapper social movement, in which Chico Mendes was an important leader. That movement resulted in the creation of Extractive Reserves and recognition of some traditional land rights (Allegretti 1990). As part of this development model, the government undertook ecological–economic zoning; worked to restimulate the rubber economy, which had declined after federal price supports were removed (Hall 1997); created new agencies responsible for timber management and smallholder production systems; experimented with PES (Bartels 2009); and pursued sustainable forest management initiatives at both the industrial and community scales (Kainer et al. 2003). Some communities in Acre have been at the forefront of integrating sustainable timber extraction into their livelihoods (Rockwell et al. 2007) and were some of the first communities in the Brazilian Amazon to attain FSC certification (Humphries and Kainer 2006). SISA can be understood as a culmination of these efforts as Acre continues to pioneer initiatives for sustainable development.

2.1.4 Timeline

SISA was preceded by a series of sustainable forest-based development policies in Acre, many of which are highlighted in the timeline below (Figure 2.2). Although SISA was passed into law in 2010, our study includes interventions in the ZAP BR-364 that predate the law, including the Certification of Smallholder Properties Program, since they are now connected to SISA.

Pre-2000	**1992** - State System of Environment, Science, Technology Law (1.022/1992)		**1994** - State Environmental Policy Law (1.117/1994)		**1997** - State Biodiversity Law (1.235/1997)	**1999** - State Chico Mendes Law (1.277/1999)
2000						
2001	State Forestry Law (1.426/2001)					
2002						
2003						
2004						
2005						
2006						
2007	State Ecological–Economic Zoning Law (1.904/2007)					
2008	State Valuation of Forests and Environmental Assets Policy	State Certification of Smallholder Properties Program Law (2.025/2008)	Creation of UCEGEO			
2009	PROACRE begins	ITERACRE begins georeferencing rural properties in ZAP BR-364	SEAPROF begins Certification Program in ZAP BR-364	Stakeholder consultation on SISA begins		
2010	CIFOR-GCS baseline survey	SISA Law (2.308/2010)	Acre and California sign memorandum of understanding for potential REDD-based emission offsets		Acre begins developing SISA social and environmental safeguards with the REDD+ SES Initiative	
2011	Institutional structure of IMC established (Decree 1.471)		CIFOR-GCS presents baseline results to study communities			
2012	CEVA's first regular meeting	First training program for indigenous leaders	First Acre agreement with KfW (four-year payment period)			
2013	CDSA established	Acre included as a pilot in VCS jurisdictional and nested REDD+ program	CIFOR-GCS phase 2 survey	Second Acre agreement with KfW (single payment)		
2014	REDD+ SES Initiative reviews SISA safeguards	SISA Ombudsman established				

REDD+ initiative active

Figure 2.2 Timeline of SISA in Acre.

2.2 Strategy for the initiative

SISA, and specifically ISA-Carbono, is a state policy designed to reduce emissions from deforestation and forest degradation, while promoting conservation and sustainable forest management. This jurisdictional REDD+ approach is based on three overall strategies: (i) command-and-control – promotion of environmental compliance, including application of CAR required by the Brazilian Forest Code; (ii) monitoring – improved monitoring of small-scale deforestation and forest degradation through technological advancements; and (iii) sustainable production – promotion of sustainable activities in both the agriculture and forestry sectors, including beef and milk production, family agriculture, CFM and reforestation. Through SISA, the government of Acre is working to increase the diversity of sustainable land uses, the productivity of land already cleared in Acre and the financial value of standing forests, through the promotion of sustainable timber and NTFPs.

As mentioned earlier, SISA was expanded from a set of priority areas to apply to the entire state of Acre based on feedback gathered during a stakeholder consultation process. In 2009, the draft law was published and made available through Acre's website, in addition to being sent to 120 people from more than 72 national and international organizations for evaluation and feedback. The State Secretariat of Environment also held public consultation meetings with more than 170 people to discuss the document and to work toward a fair and efficient structure of benefit sharing. Five meetings were held with technical staff from local NGOs, three workshops brought together potential beneficiaries, and a technical seminar included 10 national and international organizations that represented civil society, as well as representatives of seven State Secretariats. During the stakeholder consultation process, however, it became clear that the concept of priority areas was insufficient and politically untenable, since areas with a low risk of deforestation also needed to be included for two main reasons: (i) people living in these areas should be rewarded for having conserved forests; and (ii) areas with a low deforestation risk could quickly become areas of high risk.

REDD+ financing is considered a way to support the low emissions rural development initiatives being undertaken by Acre's government. Currently, KfW funding is being distributed among SISA's organizational components (IMC, CDSA, etc.) and SISA beneficiaries, including traditional forest extractivists, indigenous communities, small colonist farmers and cattle ranchers, primarily through financing of existing programs and projects. SISA works primarily through existing sustainable development initiatives, as well as through direct support to some community associations. Up-front benefits, such as technical assistance for more sustainable land-use practices, are an important part of SISA.

Proposals have been made for linking SISA benefit sharing to national Brazilian climate policies. One proposal is a hybrid between stock-flow accounting and benefit allocation based on program planning (Alencar et al. 2012). In this proposal, stock-flow benefit-sharing estimates in Acre would depend on 50% of revenue allocations to the Brazilian Amazonian states through the National Climate Change Plan (Moutinho et al. 2011), which would then be divided among the four main land tenure categories in Acre (medium and large private properties, land reform settlement areas, conservation units, and indigenous lands) through a programmatic approach. A more recent proposal has suggested an 80% allocation of benefits to the Brazilian Amazon states, with Acre receiving 3.7% of these benefits for internal distribution (GCF 2014). REDD+ benefit distribution from the national level to the state level will be defined through the national REDD+ framework, which is still under development.

SISA is structured to work primarily through land-use programs implemented by existing state organizations. In line with Acre's ongoing vision and policies for sustainable rural development, one goal of SISA is to secure rural peoples' legitimate claims on land and natural resources. Cattle ranchers and small colonist farmers are primary targets for reductions in high carbon-emitting activities through promoting more sustainable agriculture and cattle raising, along with recuperation of degraded lands, to discourage new deforestation and burning. For reasons of both effectiveness and equity, SISA tries to improve the livelihoods of smallholders, which is why there are special strategies for forest extractivists (including riverine groups), indigenous people and small colonist farmers. While technical assistance for sustainable production is contemplated for all three groups, there are slight differences in strategies. Community Development Plans will be developed for many small colonist farmers and forest extractivists through local NGO consultation with communities. In addition, small colonist farmers will receive agricultural assistance and inputs, while forest extractivists will receive incentives for sustainable production chains (i.e. multiple-use forestry). The strategy for indigenous people is the Indigenous Land Management Program as well as promotion of community territorial monitoring.

In the ZAP BR-364, these interventions reflect a combination of enabling conditions (i.e. readiness), disincentives and incentives. The primary readiness activity to date has been the georeferencing of small properties by ITERACRE. While ITERACRE was active in the ZAP BR-364 in 2009 and 2010, the organization has not yet granted property titles to families in this area. The main disincentive applied in the ZAP BR-364 was IMAC's enforcement of a 'zero burning' policy from 2010 through 2012 which, according to local community members, led to a reduction in deforestation and use of fire in agriculture. Following a judicial decision in 2013, smallholders were allowed to burn a small area of land for subsistence production with a permit from IMAC. Many incentives for sustainable land-use practices are connected to the Certification of

Smallholder Properties Program. When small farmers voluntarily adhere to this program, they receive an initial bonus payment of BRL 250 to stop deforestation and burning, and SEAPROF works with them to create a property management plan. They are then given priority in the government's provision of technical assistance and inputs, including support in the use of *Mucuna spp*. (a nitrogen-fixing legume that allows for farming without burning), fish farming, chicken production or enrichment planting with açai seedlings, depending on what is jointly established by the producer and SEAPROF in the property management plan. Up to nine future annual bonus payments of BRL 500–600 are conditional on the continued cessation of deforestation and burning according to the property management plan. Importantly, smallholders who are not part of the Certification Program are also eligible to receive technical assistance and agricultural inputs. Additionally, other incentives have been provided to smallholders in the ZAP BR-364 through PROACRE, including the creation of Community Development Plans and a farm plowing service provided by SEAPROF.

2.3 Smallholders in the initiative

The CIFOR-GCS sample in Acre includes small colonist farmers and forest extractivists residing in the ZAP BR-364 region. From June to July 2010, we interviewed 127 households (~33% of the total number) in the four main communities and also held community-level and women's survey meetings. In each community, households were randomly selected from a stratified sample of nonparticipating households and households participating in the Certification Program at the time of fieldwork.

Table 2.1 characterizes the study communities. While the four study communities were founded relatively recently, residents include descendants of rubber tappers who migrated to the area during the rubber boom of the late 19th century and again during World War II, along with more recent colonists in search of land. Most individual smallholder properties are distributed along the main highway in rectangular plots, but there are also households distributed throughout the forests in a more irregular, rubber tree-based tenure system. In all four communities, tenure was considered insecure due to a lack of land titles and, in two communities, due to the inability to exclude outsiders from local landholdings (Duchelle et al. 2014). At the time of fieldwork in mid-2010, the BR-364 was unpaved, and the area was inaccessible during eight months of the year due to heavy rainfall. Highway paving was completed in 2011, granting year-round access to the area.

Local institutions are fairly well developed in the ZAP BR-364. Each community is represented by an association with elected representatives and regular, inclusive meetings. In ACRE1, in addition to the community association, there is a

Table 2.1 Characteristics of the four communities studied based on the 2010 survey.

	ACRE1	ACRE2	ACRE3	ACRE4
Basic characteristics				
Total number of households	32	120	120	114
Number of sampled households	29	30	30	38
Total land area (ha)	4,800	25,000	25,000	60,000
Total forest area (ha)	4,000	18,750	22,000	42,000
Year founded	2001	1996	1999	1999
Access to infrastructure				
Primary school	Yes	Yes	Yes	Yes
Secondary school	Yes	Yes	Yes	Yes
Health center	No	No	No	Yes
Road usable by four-wheel drive vehicles, in all seasons	No	No	No	No
Bank or other source of formal credit	No	No	No	No
Distance to closest market by most common means of transport (km/min)	50/60 (vehicle)	52/60 (vehicle)	45/600 (walking)	29/300 (walking)
Previous experience with conservation NGO	No	No	No	No
Agriculture				
Main staple food	Maize	Maize	Rice	Maize
Crop with highest production value per household on average	Maize	Maize	Maize	Cassava
Price of a hectare of good quality agricultural land (USD)	411	153	412	735

school board and a church group. In ACRE2 and ACRE4, some community members are part of the municipal workers' union. There are no women-specific organizations in these communities and, in all four communities, women expressed a desire for more leadership in decision making. Residents manage their landholdings individually, so local collective rules for forest and land use in these communities are minimal.

Maize was considered the main staple food by residents of most study communities, and had on average the highest production value per household. Rice was considered the main staple in ACRE3, but it was reported that rice production had started to decrease two years prior due to government restrictions on swidden agriculture. In ACRE2, decreases in cassava, maize and rice production were also attributed to government restrictions on swidden agriculture. In ACRE1, community members also reported rice production to be on the decline, but in that community, this was attributed to a disease outbreak that had negatively affected the crop. Cassava had the highest production value per household in ACRE4, even though maize was reported by residents as the primary staple food, possibly because most cassava was used for the production of cassava flour. In this community, an increase was reported in cattle herd size in comparison with two years prior due to natural reproduction, while the production of natural rubber was reported to have decreased due to poor prices. In the other three communities, açai fruit was reported to have had the largest growth due to increased market demand and a higher price for this forest product.

Table 2.2 presents basic socioeconomic characteristics of the households sampled in the four communities. In terms of education, household members (≥ 16 years old) across the four communities had studied on average only 2 to 3.6 years. There was no access to piped water in any of the communities, and a minority had access to their own latrines. At the time of fieldwork in 2010, access to electricity was much more limited than it is now. In ACRE1, no households had electricity, and in the other three communities, the portion of households that accessed electricity did so either through a paid connection to the municipal grid (especially in ACRE4), a community generator or an individual generator. During our fieldwork period, community members held protests requesting access to the government *Luz para Todos* (Light for All) program, which they were subsequently granted. Phone access was considerably more widespread in ACRE4, and transport asset values were higher, reflecting its closer proximity to town. There was little variation in average household landholding size among the four communities, but ACRE4 showed greater investment in cattle herds.

Table 2.2 Socioeconomic characteristics of households interviewed in 2010.

	ACRE1	ACRE2	ACRE3	ACRE4
Number of households sampled	29	30	30	38
Household average (SD)				
Number of adults	2.8 (1.2)	2.6 (1.1)	2.4 (1.2)	3.0 (1.3)
Number of members	5.6 (1.9)	5.0 (2.1)	4.5 (2.3)	5.9 (2.7)
Days of illness per adult	19.4 (36.9)	16.0 (33.2)	35.7 (54.4)	47.0 (68.4)
Years of education (adults ≥ 16 years old)	3.6 (3.6)	3.6 (3.5)	2.0 (2.7)	2.9 (2.9)
Total income (USD)[a]	8,260 (5,978)	8,397 (6,169)	7,263 (4,120)	9,558 (4,522)
Total value of livestock (USD)[b]	4,700 (6,174)	5,167 (6,522)	5,102 (5,634)	8,192 (11,323)
Total land controlled (ha)[c]	125.5 (37.4)	130.8 (46.3)	136.0 (42.1)	120.8 (49.8)
Total value of transportation assets (USD)	658 (1,500)	402 (786)	345 (515)	995 (1,942)

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Table 2.2 (continued)

Percentage of households with:				
Mobile or fixed phone	28	10	17	53
Electricity	0	7	23	34
Piped water supply	0	0	0	0
Private latrine or toilet	17	20	13	24
Perceived sufficient income	62	60	77	76

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.
b Total livestock value at the time of interview.
c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

Figures 2.3 and 2.4 reflect the livelihood portfolios of sampled households. Overall, the greatest share of household income was derived from crops (26%), followed by other sources (20%; largely government aid), forest and non-forest environmental income (19%), wage labor (18%), and livestock (16%). The reliance on agriculture indicates the importance of agricultural assistance and inputs as intervention strategies in the ZAP BR-364 so as to impact land use and improve livelihoods. Crop and livestock income was highest in ACRE4, likely because of the higher reliance on cattle. Off-farm income was highest in ACRE1, at least partly because of jobs in the local school located in that community.

Table 2.3 summarizes information related to forest reliance. Although households are located relatively close to forests, very few identified their primary or secondary occupations as being forest based. Indeed, agriculture was considered the main occupation by the majority of households in all four communities, which is reflected by the higher reliance on crop income shown above. That said, in three of the four communities, more than 50% of households had sold forest products (mostly açai) during the previous year. In ACRE1 and ACRE3, a very high percentage (79% and 59%, respectively) of households reported a change in their sale of forest products in relation to two years prior. Most of this change reflected an increase in sales, with higher demand and higher prices for açai given as the main reason for the increase. Additionally, between 38% and 55% of households in all communities reported a change in consumption of forest products. For those that reported an increase, the main reason given was a greater need to collect food from the forest, often related to an increase in household size. For those households that had decreased their forest product consumption, the main reason was a lack of available wild game due to a population increase in the area. In all four communities, households were highly dependent on the use of fuelwood for cooking. Such information on household consumption and sale of forest

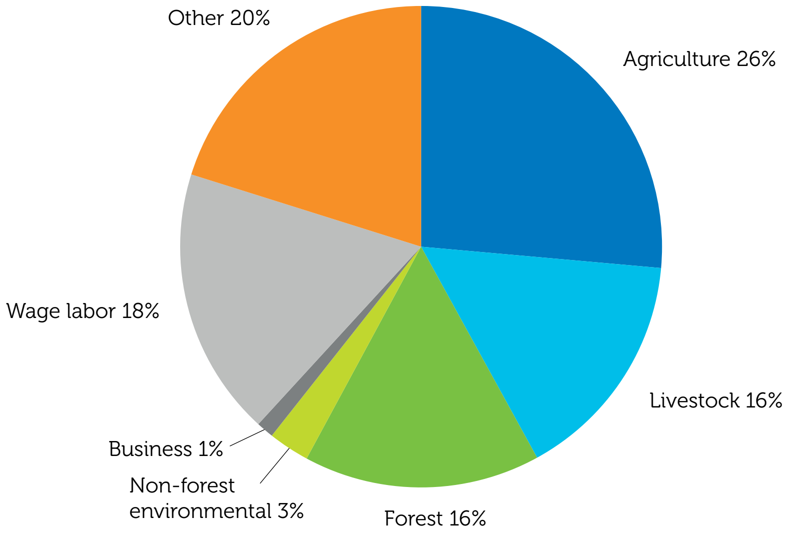

Figure 2.3 Sources of income for all households in sample (n = 127).

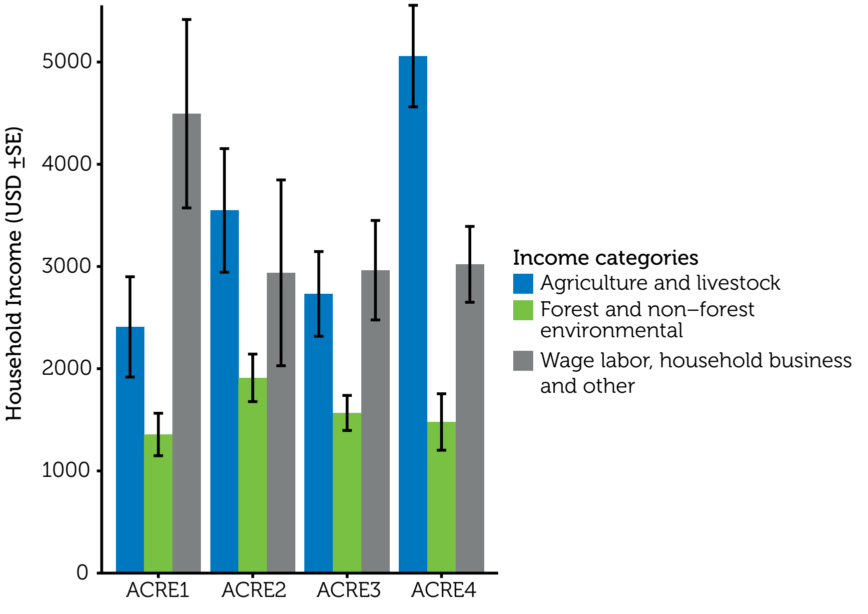

Figure 2.4 Sources of income for average household by community (or village) (+/- SE) (n = 127).

products can help inform those SISA strategies that aim to increase the value of standing forests for people's livelihoods by indicating where more investments and government support might be beneficial.

In all four communities, the majority of households reported clearing at least one parcel of forest for cropping in the previous year, but concurrently reported a decreased opportunity for forest clearing in general (Table 2.3). Indeed, in three of the four communities (ACRE1, ACRE3 and ACRE4), community members reported a decrease in swidden agriculture due to government restrictions on forest clearing and the use of fire. Only in ACRE1 and ACRE3 did respondents report a simultaneous increase in the number of households practicing permanent agriculture, likely due to restrictions on swidden. This information was complemented by observations during the community meetings of ACRE2, ACRE3 and ACRE4, where participants reported an overall increase in forest cover from 2008 to 2010, with the main reason given that enhanced government restrictions made it more difficult to clear forests. Government restrictions on forest clearing continued between 2010 and 2013, particularly with the 'zero burning' policy from 2011–2012 mentioned earlier.

Table 2.3 Indicators of household forest dependence based on the 2010 survey.

	ACRE1	ACRE2	ACRE3	ACRE4
Number of households sampled	29	30	30	38
Household average (SD)				
Share of income from forest	18.37 (15.04)	23.81 (18.50)	22.68 (17.27)	13.69 (12.43)
Share of income from agriculture	32.24 (22.42)	39.10 (25.93)	36.15 (23.42)	52.61 (22.18)
Area of natural forest cleared (ha)[a]	1.09 (0.92)	1.50 (1.66)	1.42 (1.28)	1.43 (1.64)
Area of secondary forest cleared (ha)[a]	0.84 (0.80)	0.93 (1.32)	0.95 (1.27)	1.25 (1.78)
Area left fallow (ha)[b]	1.93 (1.24)	2.81 (2.38)	4.26 (4.77)	2.28 (1.91)
Distance to forests (minutes walking)	28	6	13	16
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	65	84	81	82

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Table 2.3 (continued)

With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	5	5	8	4
Reporting increased consumption of forest products[e]	34	25	10	19
Reporting decreased consumption of forest products[e]	21	18	45	19
Obtaining cash income from forest products[f]	62	60	57	32
Reporting an increase in cash income from forest[f]	67	33	41	8
Reporting a decrease in cash income from forest[f]	6	6	18	8
Reporting fuelwood or charcoal as primary cooking source	86	80	77	84
Leaving land fallow[g]	76	73	70	79
Clearing forest[g]	97	80	97	89
Reporting decreased opportunity for clearing forest[g]	90	90	87	92
Clearing land for crops[g]	93	80	93	89
Clearing land for pasture[g]	10	7	3	11

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

2.4 Challenges facing the initiative

As a pioneer initiative globally, Acre's SISA has faced the formidable challenge of having to innovate at every step of its development. After many years of hard work, SISA is considered to be a global model of jurisdictional REDD+ and low emissions rural development more broadly (Alencar et al. 2012). There are still challenges for moving forward, including: (i) the disconnect between REDD+

advancement at national and subnational levels in Brazil; (ii) financing for SISA; and (iii) providing support for the thousands of rural producers who are expected to change their land-use practices.

While Acre has worked to make SISA flexible and compatible with other REDD+ strategies, stakeholders report that a recent decline in transparency and progress on REDD+ at the federal level has created a difficult degree of uncertainty about funding and other issues at the state level. Some of the most important institutional advances for REDD+ in Brazil have been at the subnational level, which have been in part facilitated through coordination and learning through the Governors' Climate and Forests Task Force (GCF), an international–subnational collaboration among 22 states and provinces. Brazilian Amazonian states have also acted individually. Eight Amazonian states have initiated plans to control deforestation within the framework of the National Plan for the Prevention and Control of Deforestation in the Amazon (May et al. 2011). The state of Amazonas passed climate change legislation in 2007 with its Climate and Conservation Law (3.135/2007). Following implementation of Acre's SISA, Mato Grosso passed its 2013 State System of REDD+ (Law 9.878/2013; Government of Mato Grosso 2013). Acre and Amazonas are also pilots for the VCS Jurisdictional and Nested REDD+ framework, and Acre has led the development of social and environmental safeguards at the jurisdictional level in collaboration with the REDD+ Social and Environmental Standards (SES) Initiative.

Future funding for SISA and Acre's low carbon development strategy is uncertain. While the state has been successful in attracting international donations, the price of carbon in the voluntary market is low, and compliance markets do not accept REDD+ carbon credits. As mentioned earlier, there is hope that the Acre–California agreement will help support SISA. However, California has not yet committed to include REDD+ credits in its cap-and-trade program, and discussions with the Brazilian states of Rio de Janeiro and São Paulo about the sale of forest carbon credits remain at a nascent stage. While not unique to Acre, this funding situation leaves the breadth and depth of SISA uncertain. The state and its partners are investigating alternative sources of funding as REDD+ financing continues to be slow to materialize.

Finally, the ultimate success of SISA will depend on the cooperation of thousands of rural producers in adopting land-use practices that do not rely on deforestation. Worldwide, such efforts aimed at changing smallholders' land-use practices risk dispossessing smallholders and traditional peoples of their land and rights (Sunderlin et al. 2009). Changing land-use practices is a long-term and difficult process that requires consistent, equitable and culturally sensitive engagement with smallholders. This challenge is compounded by poor infrastructure. For instance, the continued isolation of many smallholders in the state makes it difficult for them to sell their agricultural produce and for

CIFOR scientist Amy Duchelle and consultant Kaline Rossi visit an açai nursery in Acre, Brazil. (Kate Evans/CIFOR)

agricultural extension workers to provide sufficient assistance. In adopting a statewide approach to REDD+, Acre took on a large number of potential beneficiaries – the thousands of rural households that live in the state. This ambitious goal, while beneficial in some ways, risks spreading already scarce resources even more thinly across the state, thereby reducing the agricultural assistance and other benefits that each family receives. The second phase of our CIFOR-GCS research clearly showed current limitations in the government's ability to provide sufficient technical assistance to farmers in the ZAP BR-364, with certification bonus payments coming late or not at all, and inconsistent technical support for helping farmers transition to agriculture without the use of fire and cultivate açai seedlings. A lack of consistent government support could demotivate farmers who are making big efforts to change their land-use practices, and may result in decreased levels of participation. While Acre has made impressive advances in sustainable development policy, challenges remain for effectively translating that policy into direct support for more sustainable land use on the ground.

2.5 Lessons from the initiative

While SISA is not the first subnational REDD+ initiative in Brazil, it is the first jurisdictional REDD+ program at the state level and is considered to be among the most advanced programs of this kind in the world. SISA creates an institutional framework for REDD+ at the state level, which strives to mitigate problems of leakage, perverse incentives and heavy transaction costs. There are multiple lessons to be learned from this early experience in the implementation of jurisdictional REDD+. These lessons can be harvested from the various elements of SISA's approach, including Acre's focus on statewide performance, the benefits of building on an existing foundation of policies and programs for reducing deforestation and degradation, development of a state framework before encouraging forest carbon projects, and cross-sector dialogue between state secretariats (Alencar et al. 2012). The SISA experience also highlights the importance of participation of multiple stakeholders in initiative design and implementation.

Acre has had a strong influence on other Brazilian Amazonian states and REDD+ programs outside of Brazil, in part because of its efforts to create the world's first jurisdictional REDD+ program. In Brazil, Acre has actively participated in the national REDD+ working group – along with other Amazonian states and the Brazilian Secretariat of Climate Change in the Ministry of Environment – to discuss the national REDD+ strategy. At the international level, the Memorandum of Understanding with California, participation in the GCF Task Force, and pilot roles in the REDD+ SES Initiative and VCS Jurisdictional and Nested REDD+ framework have put Acre on the map as a global leader in bottom-up innovation for low-emissions rural development.

2.6 Acknowledgments

We are grateful to the families of the ZAP BR-364 and surrounding land reform settlement areas for their generous sharing of time and knowledge. Members of Acre's Climate Change Institute, SEAPROF, ITERACRE and WWF have been key partners since the beginning of our work in Acre. We also thank the members of the 2010 field team for their contribution to collecting the data that is presented in this chapter: Angela Cristina Silva, Bartolomeu Lima da Costa, Ederlan Pereira Bezerra, Fredson Silva de Souza, Genildo da Silva Macedo, Gisele Aparecida Monteiro, Hycaro Mattos Silva, Jamaica Kelle Matias de Souza Araújo, Kaline Rossi do Nascimento, Marcelo Gomes de Almeida and Tiago do Nascimento Barbosa.

Chapter 3

Bolsa Floresta, Brazil

Riyong Kim Bakkegaard and Sven Wunder

The *Bolsa Floresta*[1] program encompasses a set of integrated interventions aimed at conserving forests and improving the welfare of residents in selected sustainable development reserves (SDRs) of the state of Amazonas in the Brazilian Amazon. Only 1 of the 15 conservation units where Bolsa Floresta is working is a certified REDD+ initiative (Juma), while the other 14 are in the REDD+ readiness phase.

The program was started in 2007 and contains a financial compensation program, where a small economic incentive of BRL 50 per month (USD 30)[2] is paid to households for their commitment to zero net deforestation. Moreover, the program includes a set of integrated conservation and development components implemented at the community or association level and aimed at improving livelihood opportunities and thereby preparing communities to meet oncoming deforestation pressures.

1 Translated from Portuguese, this means 'forest allowance.'

2 1 BRL = 0.6014 USD (OANDA 2011).

3.1 Basic facts: Where, who, why and when

3.1.1 Geography

The state of Amazonas is the largest of 10 federal states in the Brazilian Legal Amazon and still has 96% of its forests intact (INPE/PRODES 2014). In recent decades, pressures have expanded from the 'Arc of Deforestation' to new frontiers, including the southeastern border of Amazonas state (May et al. 2011). However, with drastic reductions in Brazilian deforestation since 2004, deforestation pressures in Amazonas have also diminished.

The Bolsa Floresta program currently works in 15 state conservation units – or protected areas – throughout Amazonas state and covers over 10 million ha (FAS 2014). Protected areas have been shown to be effective barriers to deforestation in the Amazon. This includes human-occupied protected areas, such as indigenous territories, extractive reserves and SDRs (Nepstad et al. 2006, 2014; Viana et al. 2009). Thirty-seven percent of the reduction in the Brazilian Amazon's total deforestation between 2004 and 2006 has been attributed to the expansion of protected areas (Soares-Filho et al. 2010). The addition of Bolsa Floresta has been questioned because the program has been implemented in protected areas. For our study, we selected two SDRs that face high deforestation risk as projected in deforestation scenarios, in order to assess conditions where there is potential for good outcomes from REDD+.

In this chapter, we focus on the implementation of Bolsa Floresta in two SDRs in Amazonas: Juma (589,612 ha) and Uatumã (424,430 ha; see Figure 3.1), both of which face relatively high internal and external deforestation pressures compared with other SDRs, as shown in a recent study of Bolsa Floresta by Börner et al. (2013). SDR Juma was created in 2006 and is located in the Municipality of Novo Aripuanã in the southeastern region of Amazonas. It lies approximately 200 km south of Manaus, the capital of Amazonas, and 100 km north of the regional market town of Apuí. The western boundary of the reserve is defined by the Mariepauá River, which forms the border with Manicoré Municipality. The southern boundary is defined by federal land (100 km north of the Transamazon Highway, BR-230). The Acari and Madeira Rivers limit the reserve in the east and north, respectively (SDS 2007).

Juma can be accessed by the Aripuanã, Mariepauá and Madeira Rivers, and by road from Novo Aripuanã (AM-174). According to early simulation models, plans to pave AM-174 and BR-319 further south would threaten to escalate deforestation, with up to 62% of forest cover potentially lost by 2050 (based on the SimAmazonia I model by Soares-Filho et al. [2006]), although other models that consider different inputs have indicated a more modest forest-cover loss (19% by 2050) (Yanai et al. 2012).

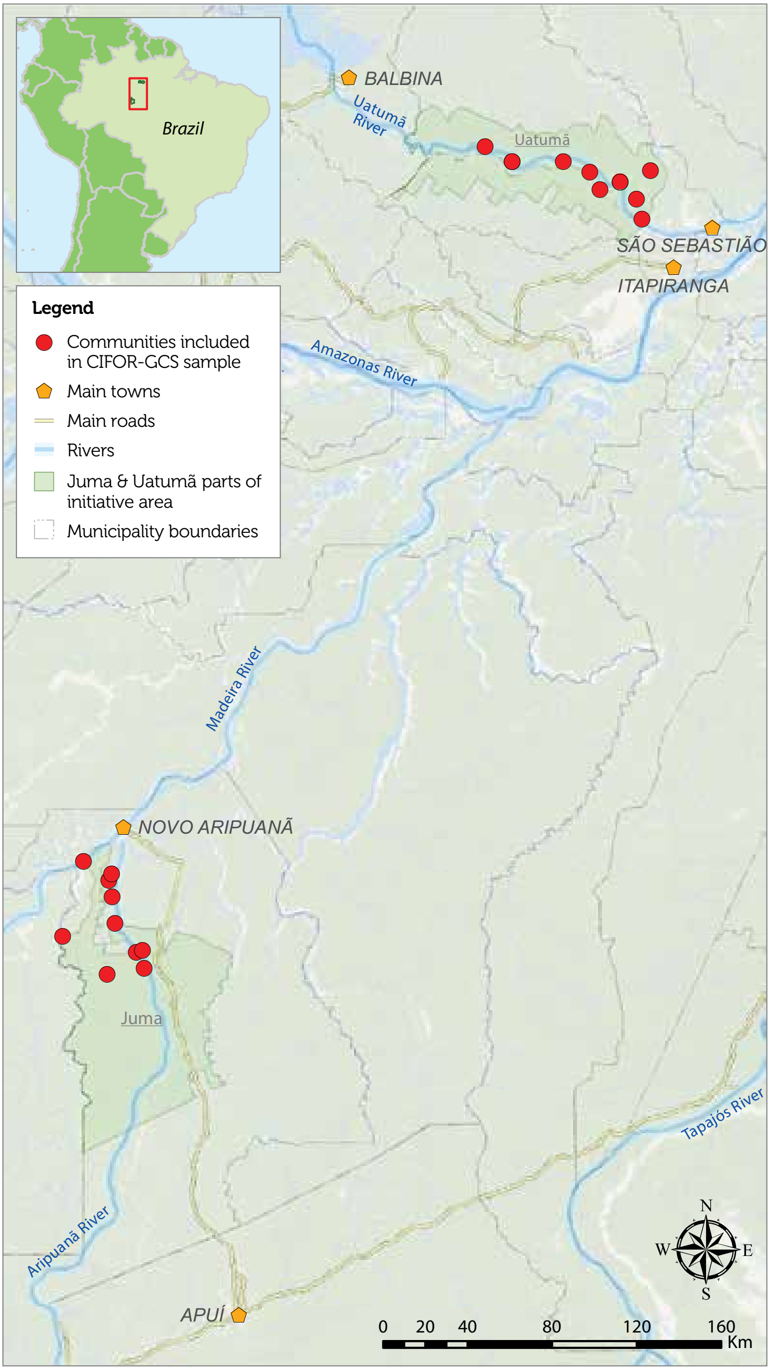

Figure 3.1 Map of the Bolsa Floresta initiative.

Data sources: FAS-Amazonas, Instituto Brasileiro de Geografia e Estatística, OpenStreetMap, GADM and World Ocean Base.

The SDR Uatumã, created in 2004, is 337 km east of Manaus by road (SDS et al. 2009). Projections simulate that 70% of the reserve's forest cover could be lost by 2050 (Soares-Filho et al. 2006; SDS et al. 2009). The northern shore of the Uatumã River and upland is part of the Municipality of São Sebastião do Uatumã, where the southern side belongs to Itapiranga Municipality. The reservoir for the Balbina hydroelectric plant is located on the western side of the reserve.

Industrial logging has taken place historically in forest concessions on the southern side of the reserve on lots both inside and outside the Uatumã reserve, which has led to the illegal timber exploitation of commercial hardwoods. These illegal practices are currently being converted to sustainable forest management operations, with support from a local NGO, The Institute for Conservation and Sustainable Development of the Amazon (IDESAM).

Current access to Uatumã reserve is by road or river from Manaus. There is a regular boat service from Manaus to Itapiranga or São Sebastião do Uatumã. From the north, there is also a boat service, and from the south, the state roads AM-010 and AM-363 connect the reserve to Itapiranga. There are better connections to the west via the federal road BR-174, which connects to Balbina and then continues via AM-240 from Balbina to Ramal da Morena. These transport connections west of the reserve have allowed better access to markets and thus for the development of more commercially oriented agriculture and production of perishable yet valuable agricultural products (such as watermelons). Table 3.1 gives a description of the biophysical characteristics of the study areas.

Table 3.1 Biophysical characteristics of the study areas.

Name of conservation unit	Juma SDR (SDS 2007)	Uatumã SDR (SDS et al. 2010)
Area (ha)	589,612	424,430
Biome	Amazon forest	Amazon forest
Average temperature	25°C	25°C
Seasons	Wet (October–April); Dry (May–September)	Wet (February–April); Dry (July–October)
Annual precipitation (mm)	2,435	2,078
Forest types	Submontane ombrophilous dense forest, lowland ombrophilous dense forest and ombrophilous dense alluvial forest	Lowland ombrophilous dense forest, ombrophilous dense alluvial forest, camparina and campina[a]

a Refers to vegetation that has developed on extremely poor sandy soils (oligotrophic; SDS et al. 2009).

Smallholder household near Juma SDR. (Neil Palmer/CIAT)

SDRs were created to conserve nature and biodiversity, while ensuring sustainable resource use and the development of local communities' livelihoods (Medeiros 2006). Both Juma and Uatumã have been divided into strict preservation, intensive-use and extensive-use zones, which increase in the degree of allowed human intervention and land use. Main livelihood activities inside the reserves include smallholder agriculture (cassava as the mainstay, and banana and watermelon), fishing and harvest of forest products including fruits, nuts, bushmeat and timber – mainly for subsistence, but sometimes also for trade. Small livestock (chickens and pigs) are common, but only a few households have cattle (SDS et al. 2009, 2010).

According to SDR rules, households are allowed to deforest up to 20% of their land but land sales are strictly prohibited. Management plans specific to each reserve stipulate the exact area of forest that resident households may clear each year. In Juma and Uatumã, forest clearing is limited to 3–4 ha/year, preferably of secondary forest (with some exceptions for clearing primary forest) (SDS et al. 2009, 2010). The state is the *de jure* land owner, but *concessão de direito real de uso* (CDRUs or concessions of real right of use)[3] are issued individually to households

3 Specified under Decree-Law No. 271 of 28 February 1967, the Concession of Real Right of Use grants use of public or private land, paid or free, for a specified or indeterminate period, and is resolvable as a real right for specific purposes of settlement in social interest, urbanization, industrialization, construction, cultivation of land, sustainable use of wetlands, preservation of traditional communities and their livelihoods, or other forms of social interest in urban areas (Amended by Law No. 11,481, 2007).

or to community associations (Carvalheiro et al. 2010). However, over half the resident families in the Uatumã reserve held no CDRU documentation (SDS et al. 2009). Table 3.2 compares the rules of the Bolsa Floresta contract with the specific SDR management rules for Juma and Uatumã. Bolsa Floresta imposes conservation rules going slightly beyond the reserve management plans in terms of stabilizing agricultural production areas and including social requirements (children's education, association membership).

Both reserves house relatively small populations. We sampled approximately 122 households inside Uatumã SDR, and 70 households inside Juma SDR. An additional 47 households were sampled outside of Juma SDR, as they also received benefits from Bolsa Floresta. However, for the purposes of comparing benefits at these sites to REDD+ benefits in Juma, only the households inside the carbon accounting area were included. Both reserves have had low deforestation, and households survive mainly on subsistence agriculture of cassava, and production of a cassava derivative, *farinha*, for later sale (Table 3.3).

Table 3.2 Comparison of Bolsa Floresta Program rules for participating families and SDR rules for Juma and Uatumã (Börner et al. 2013).

	Bolsa Floresta rules	Reserve management plan for Juma	Reserve management plan for Uatumã
1	Comply with the rules of the reserve management plan	Establishes preservation, extensive-use and intensive-use zones (ca. 123,000 ha or 21% of the reserve) in the reserve. Defines use intensity for each zone	Establishes preservation, extensive-use, and intensive-use zones (ca. 25,000 ha or 6% of the reserve). Defines use intensity for each zone
2	Be a member of the reserve association and regularly pay association fee	No regulation	No regulation
3	Maintain agricultural fields no larger than in the year when a community entered Bolsa Floresta and only convert secondary vegetation (zero net deforestation)	Primary forest areas can only be opened by new families. Agricultural fields cannot be larger than 4 *quadras* (approx. 4 ha)/year. The total area for shifting cultivation should not be larger than 12 ha per family	Opening primary forest requires authorization. Agricultural fields cannot be larger than 3 ha/year unless authorized otherwise
4	Send children of school age to school if a school exists nearby	No regulation	No regulation
5	Implement fire breaks and inform community when fire is used for land preparation	Requires fire breaks to be implemented and limits use of fire to once per year per family	Requires fire breaks to be implemented and fire use to be minimized

Table 3.3 Major characteristics of the reserves.

	Uatumã	Juma
Basic characteristics		
Year reserve founded	2004	2006
Total population (2014)	1,468	2,055
Total number of communities	20	48
Number of households receiving Bolsa Floresta benefits (2014)	393	495
Number of sampled households participating in Bolsa Floresta inside (+outside) SDRs	122	70 (+47)
Total land area (ha)	424,430	589,612
Percentage of deforested land (2010) (%)	0.64	0.85
Access to infrastructure		
Main markets	Itapiranga, São Sebastião	Novo Aripuanã
Previous experience with conservation NGO	Yes	Yes
Agriculture		
Main staple food	Cassava (*farinha*)	Cassava (*farinha*)
Agricultural crop with highest production value per household on average	Cassava (*farinha*)	Cassava (*farinha*)

3.1.2 Stakeholders and funding

Fundação Amazonas Sustentável (Amazon Sustainable Foundation; FAS) is a private Brazilian nongovernmental foundation based in Manaus, Amazonas. In a partnership between the Amazonas State Government and Bradesco Bank, FAS was created in 2007 to implement environmental conservation activities through sustainable livelihood development programs in state conservation units.

Bolsa Floresta is the flagship program of FAS, and is implemented with assistance from affiliated NGOs, government bodies and other private actors. IDESAM supports Bolsa Floresta in aspects of monitoring, natural resource management and community organization in SDR Uatumã through its program on supporting protected area management. It also contributed to the technical coordination of baseline methodology and monitoring in Juma SDR and development of the PDD (FAS et al. 2008). Various state agencies are also tied to the management of state protected areas. The Amazonas State Secretariat of the Environment and Sustainable Development (SDS) coordinates the State Center for Protected Areas, which is responsible for the administration and management of protected areas in Amazonas. The State Center on Climate Change and the State Secretariat of Planning and Economic Development provide assistance in reserve management. Amazonas State Institute for Environmental Protection carries out monitoring and law enforcement in the protected areas. The National Institute for Amazon Research is also responsible for carbon monitoring. Several private organizations offer *pro bono* assistance in initiative management and auditing, including PricewaterhouseCoopers and Bain & Company, among others.

The Bolsa Floresta program is funded mainly by Bradesco Bank and the Amazon Fund (The Brazilian National Development Bank BNDES/ Government of Norway). Almost 80% of FAS funding is from private sources, including Coca-Cola, Samsung, Abril Media Group and Marriott International, among others. In addition, the Juma REDD+ initiative has been co-funded by Marriott International and Abril Media Group (personal communication from V Salviati, 8 October 2014).

3.1.3 Motivation

Brazil has had the highest deforestation in the world with a 10-year average of 19,500 km^2/year between 1996 and 2005. Annual forest loss then gradually reduced from the peak in 2004 until 2012 by 70% in the Legal Amazon, although deforestation increased slightly from 2011 in the state of Amazonas. This large overall decrease in deforestation was mainly through changes in national protection and enforcement policies, as well as supply-chain interventions that aimed at some of the major drivers of historic deforestation (Nepstad et al. 2014).

The Bolsa Floresta program was born out of a series of initiatives begun in 2003 by SDS, entitled *Zona Franca Verde*. These initiatives aim to promote the sustainable use of natural resources in the state with a view to increasing the value of the environmental benefits provided by forests (Viana 2008).

Protected sustainable-use areas became the target sites for the Bolsa Floresta interventions to equip local forest dwellers with sustainable alternatives in the face of oncoming deforestation pressures. Following dire deforestation forecasts, the Juma SDR was established in 2006 and became the site of the first test REDD+ initiative in the Amazon and the first to be implemented under the new State Policy on Climate Change Law (PEMC; Law 3.135/2007) and the State System of Protected Areas (SEUC; 53/2007), which both provided the legal framework necessary to implement REDD+ initiatives in Amazonas state (Viana et al. 2008).

3.1.4 Timeline

The start date for the Bolsa Floresta program is essentially the time when sustainable development policies were being created at the state level to give value to the environment and its services. From that point on, the enabling policy environment assisted the creation and implementation of the Bolsa Floresta program and initiation of the first REDD+ initiative in Juma SDR (Figure 3.2).

Juma was also independently validated to 'gold status' according to CCBA Standards in 2008 and became the first certified REDD+ program in the Amazon. Over its first crediting period in 2006–2016, the program is expected to prevent an estimated 3.6 million tCO_2e, and 190 million tCO_2e by the initiative end in 2050 (Viana et al. 2009). To access a wider voluntary carbon market, plans are already underway to generate verifiable emissions reductions (VERs) using the VCS, which started with the approval of a carbon accounting methodology in 2010 (WWF 2009; FAS 2012).

Pre-2000		
2000		
2001		
2002		
2003	Development of sustainable development initiatives by Amazonas State Government	
2004		
2005		
2006	Juma SDR established and REDD+ initiative begins	
2007	Bolsa Floresta program established for all SDRs in Amazonas	State Policy on Climate Change Law and the State System of Protected Areas enacted
2008	Juma REDD+ initiative receives gold standard from CCBA	
2009		
2010	Carbon accounting methodology for unplanned avoided deforestation approved under the VCS	
2011	CIFOR-GCS research conducted in two SDRs	
2012		
2013		
2014		

REDD+ initiative active

Figure 3.2 Timeline of the Bolsa Floresta initiative.

3.2 Strategy for the initiative

The major objectives of the Bolsa Floresta program are forest conservation and improvements of local people's livelihoods. FAS sees these two goals as inherently interrelated. The underlying logic closely resembles that of ICDPs: change the productive logic locally so as to increase sustainability, add value to the forest and divert production factors from environmental degradation. At the same time, productive investments and income transfers are seen as tools to make smallholder SDR residents into potential conservation allies against predominantly external deforestation threats, thereby reducing needs-based deforestation. Avoiding outmigration, and thus maintaining high smallholder populations, is seen as a plus in this respect. Nevertheless, beyond the ICDP logic, Bolsa Floresta has also integrated a minor (in terms of cost), but much debated PES component (see Section 3.5).

Participation in the Bolsa Floresta program is voluntary. Nevertheless, some components, e.g. education and health facilities, are delivered at the community or reserve level, and therefore equally benefit nonparticipants. To avoid 'magnet effects,' a prerequisite for receiving PES is residence in the reserves for at least two years. In practice, almost all households that are entitled to participate in Bolsa Floresta do.[4]

The program is comprised of four interrelated components:

1. *Bolsa Floresta Renda* (income component)

Communities in SDRs receive annual equivalent productive investments of BRL 140,000[5] (USD 84,916) per SDR, to support income-generating activities that are in line with the protected area's management plan. Examples are on-farm processing activities for value-added of existing products, NTFP value chains, or for alternative income sources such as ecotourism, aquaculture, small-livestock breeding and natural honey production.

2. *Bolsa Floresta Social* (social component)

An additional total of BRL 140,000 (USD 84,916) per SDR is allocated to improve education, sanitation and health services, as well as communication and transportation infrastructure in the reserves. This is done in collaboration with the respective public sector institutions.

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4 The few eligible residents who did not participate in Bolsa Floresta were not in the program due to missing out on registration day.

5 According to the 2013 FAS Annual Report, total spending for the Income Component was BRL 266,952 (USD 160,545) per SDR; total spending for the Social Component was BRL 52,771 (USD 31,736) per SDR; and total spending for the Association Component was BRL 44,773 (USD 26,926) per association (FAS, 2013).

3. *Bolsa Floresta Associação* (association component)

Targeting reserve-level collective action, this component supports the associations of reserve dwellers. It corresponds to 10% of all the family forest allowances granted (see item 4. *Bolsa Floresta Familiar*), and associations may decide freely on how to allocate these funds for the benefit of their members.

4. *Bolsa Floresta Familiar* (family component)

This component is a monthly transfer of BRL 50 (USD 30) to the female spouse at the household level, subject to a signed agreement that commits the household to good forest management practices, including zero net deforestation (see Table 3.2). In itself, it is not designed to be a source of income for families, but rather a reward for forest conservation (Viana et al. 2008).

3.3 Smallholders in the initiative

Table 3.4 summarizes the main socioeconomic characteristics of the reserves. Average household total income is similar for Uatumã and Juma, as is average household forest income. However, Uatumã residents have a higher average household value of transport assets and higher average household value of livestock in this reserve, reflecting a small concentration of nonrecipients of Bolsa Floresta engaging in livestock farming, as well as a generally better market integration as a result of proximity to Manaus.

Generally, Uatumã communities have more access to piped water or artesian wells (31%) and have better sanitation (97%) than do communities in Juma. Nevertheless, Juma households have more access to electricity (89%) and control, on average, larger areas of land.

This difference in socioeconomic characteristics between the two reserves is best reflected in the distribution of income sources per household (Figure 3.3). While forest shares are quite similar, Uatumã households have a greater share from wage labor, which may also reflect the better connection to regional markets around Uatumã. Juma households have a greater share from agricultural sources, where 74% of household members 16 years or older report agriculture as their primary or secondary occupation (compared with 56% in Uatumã; Table 3.5).

In cash terms, the average household income in the two study areas was found by Börner et al. (2013) to be close to Brazil's 'extreme poverty' line (monthly BRL 70 or USD 42 *per capita*). However, households are shown to be markedly better off when subsistence sources are included (as seen in Figure 3.3, which gives average household income). High subsistence incomes come from swidden cassava cropping, and forest and fish extraction. Indeed, forest and fish extraction, making up 29% of income in both reserves, was generally found to be as important an

Table 3.4 Socioeconomic characteristics of the reserves based on the 2011 survey.

	Uatumã	Juma
Household average (SD)		
Days of illness in past 12 months per adult (adults ≥ 16 years old)	30.9 (68.5)	8.85 (24.1)
Years of education (adults ≥ 16 years old)	4.0 (3.3)	4.5 (3.2)
Total income (USD)[a]	9,790 (8,340)	9,706 (6,123)
Total income from forest (USD)[b]	3,046 (4,088)	3,002 (3,581)
Total value of livestock (USD)[c]	1,465 (3,487)	175 (156)
Total land controlled (ha)[d]	72.4 (83.4)	92.0 (272.8)
Total value of transport assets (USD)	3237.56 (8395.93)	923.02 (812.57)
Percentage of households		
Who agree that household's income over the past three years has been sufficient to cover the needs of the household	51	60
With piped water or access to a well	31	9
With private latrine or toilet	93	62
With electricity	70	89
With a mobile or fixed phone	45	19

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.
b Total annual income (12 months prior to survey).
c Total livestock value at the time of interview.
d Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

income source as agriculture, even across income quintiles (Börner et al. 2013). In the women's meetings, participants reported that men go to the forest weekly, if not daily (81–100% frequency), throughout the year to hunt and collect wild products. Throughout the year, women occasionally go to the forest (0–20%) to collect wild products or traditional medicines, but go daily during the dry season to make charcoal and hunt alongside the men. One community reported daily visits only during the wet season (21–40%) for wild food and fuelwood collection. The sparse population in the SDRs benefits from protected access to land and natural resources of high quality and value, which clearly makes the difference that lifts reserve dwellers above the levels of extreme rural poverty.

Smallholders in the reserves are not the primary threat to forest conservation, as clearing in the forest buffer has been found to be several times higher (Reimer et al. 2012). Current livelihood strategies are largely focused on forest extraction and small-scale clearing for agriculture and are therefore still quite harmonious

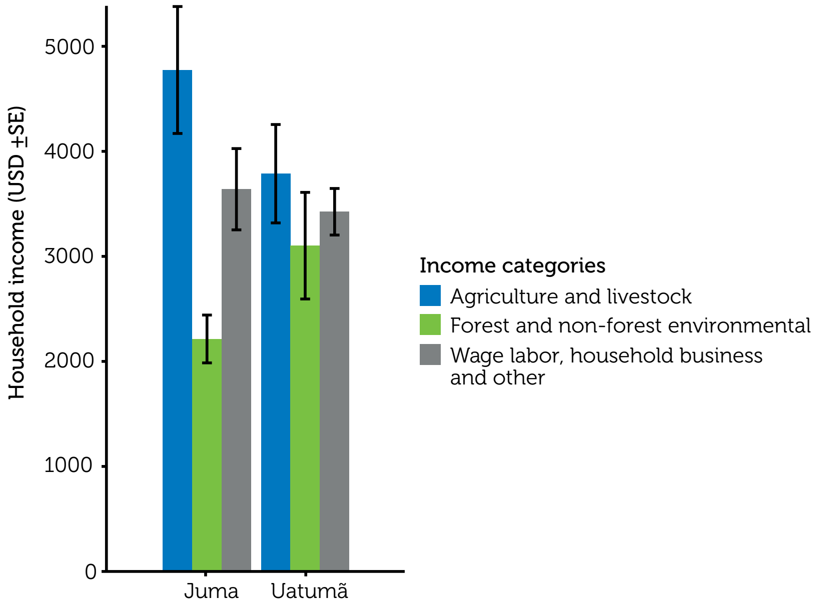

Figure 3.3 Annual income shares among households in two Bolsa Floresta reserves (n = 192).

with SDR and Bolsa Floresta regulations (Table 3.5) (Börner et al. 2013). Indeed, several households in the reserves were reported to have left up to 30 ha fallow over the last three years, which could be a result of conservation efforts under Bolsa Floresta. Also, the availability of forestland for clearing has decreased for almost two-thirds of respondents from Uatumã and Juma. Sixty percent of respondents attributed this decrease to the creation of the reserve or related reasons (e.g. sanctions).

3.4 Challenges facing the initiative

The vastness, expanse and seasonality in these areas make it difficult for the proponent to maintain a technical and institutional presence at a reasonable cost. According to the proponent, transaction costs including start-up fees were also initially a huge challenge for the organization, reducing their cost efficiency; they have been limited to an average of 25% of the overall budget for the program in all conservation units (personal communication from J Tezza, 1 May 2013).

The large geographical scale of the initiative also poses a challenge for monitoring and enforcement. Remote sensing cannot detect the relatively small changes in land cover that are characteristic of the small-scale forest clearing in this region (Börner et al. 2013). In BBC coverage of the Juma REDD+ initiative in 2009,

Table 3.5 Indicators of household forest dependence based on the 2011 survey (n = 239).

	Uatumã	Juma
Household average		
Share of income from forest (%)	29	29
Share of income from forest product sales vs. subsistence (% vs. %)	20.62 vs. 79.38	31.09 vs. 68.91
Share of income from agriculture (including livestock) (%)	37.18	43.89
Area of primary and secondary forest cleared (ha)[a]	1.70	1.72
Area left fallow (ha)[b]	2.65	2.81
Percentage of households		
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	56	74
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	5	2
Reporting fuelwood or charcoal as primary cooking source (%)	23	47
Leaving land fallow[e]	66	77
Clearing forest[e]	84	87
Reporting a change in availability of forestland for clearing (% increased; % decreased)[e]	3; 61	6; 54
Clearing at least one parcel of land for crops[e]	84	87

a Average no. of hectares cleared over the past three years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e In the three years prior to the survey.

Amazonas State Governor Eduardo Braga was reported as saying that although policing infrastructure should be improved, surveillance needs to be delegated to the people in the region. In fact, Bolsa Floresta's implementers have placed much emphasis on this – namely, building the capacity of local communities and reserve associations to assist in monitoring and to take responsibility for the program, as well as developing a monitoring methodology that can detect small-scale clearing of 0.25 ha. More than 180 families to date have been excluded from the program for reasons including relocation or violating the rules of the contract, and the current process of enforcement and sanctioning relies on an external FAS monitor to evaluate the infringement (personal communication from V Salviati, 8 October 2014). The remoteness of communities has implications for compliance, detection and enforcement, both now and in the future, making it critical to invest in the capacity of the communities to ensure effective reductions in deforestation and degradation.

Another challenge has been the focus on Bolsa Floresta's family component, which was the first direct cash payment for avoided deforestation to be implemented in the Amazon (see also Section 3.5). Currently, the financial reward (family component) is very minimal, and according to the proponent, it is not meant to be permanent, nor necessarily intended as compensation for the opportunity cost of keeping forest standing. Rather, it represents a conditional reward in return for good forest stewardship. However, when asked about their hopes for the program, the majority of respondents mentioned the need to increase the value of this payment (62% and 77% for Uatumã and Juma, respectively). Similarly, half of the main worries (49% and 50% in Uatumã and Juma, respectively) were that Bolsa Floresta would lead to a decrease in household income through changes in livelihood practices, or that it would not properly compensate the household for the loss in forest income. However, the proponent argues that increasing the value of the payment to match opportunity costs would only compensate for current income, which is very low relative to the national average (personal communication from J Tezza, 1 May 2013). Thus, such a complementary mix of integrated development components targeted at health, education and sustainable livelihoods could do more than cash payments to improve lives in the communities.

3.5 Lessons from the initiative

The provision of a small economic reward, or PES, makes this initiative a pioneer in direct cash transfers for avoided deforestation in the Brazilian Amazon.[6] Past studies have shown that conditional cash transfer programs, defined as any program that requires a specific course of action to receive a benefit (cash or in-kind; after Das et al. 2005), can improve household well-being through impacts on health, purchasing power, household productivity and resource allocation, asset consolidation, and reduction of inequality (Hanlon et al. 2010; Arnold et al. 2011; Barrientos 2012). Regular and reliable transfers can enhance investment into productive assets (e.g. livestock and agricultural production in Paraguay; Soares et al. 2010), facilitate coping with shocks and improve labor market access (Arnold et al. 2011). Only a few studies (e.g. Alix-Garcia et al. 2012, 2013), however, have dealt with potential environmental and socioeconomic spillover effects from PES, i.e. effects that go beyond the implied conditionality rules on how recipients spend their additional money, and what feedback effect this has on development paths and the environment.

To analyze these effects, Bakkegaard et al. (2013) looked at the effect of cash transfers on conservation behavior, or so-called 'conservation spillovers,' in

6 Other poverty-focused conditional cash transfers with conservation conditionalities do exist (e.g. Alix-Garcia et al. 2012).

the sample group, since governmental transfers were the main source of cash income for these households. Results showed that transfers did not have negative spillovers on land use, but rather led to (positive) marginal reductions in the area of land under crop and early fallow. Using a Gini decomposition, they found (unsurprisingly) that transfers were income equalizing, while BAU strategies (i.e. agriculture) were unequalizing. Thus, conditionalities attached to conservation transfers could potentially curb these unequalizing effects. Thus, for the time being, these transfers have positive conservation and equality effects and provide a welcome cash injection, in addition to the in-kind benefits from other Bolsa Floresta components. Figure 3.4 shows that the cash payments mainly supporting current consumption, such as the purchase of food, clothes and other basic goods, are similar to how cash transfers are used elsewhere (Hanlon et al. 2010; Arnold et al. 2011).

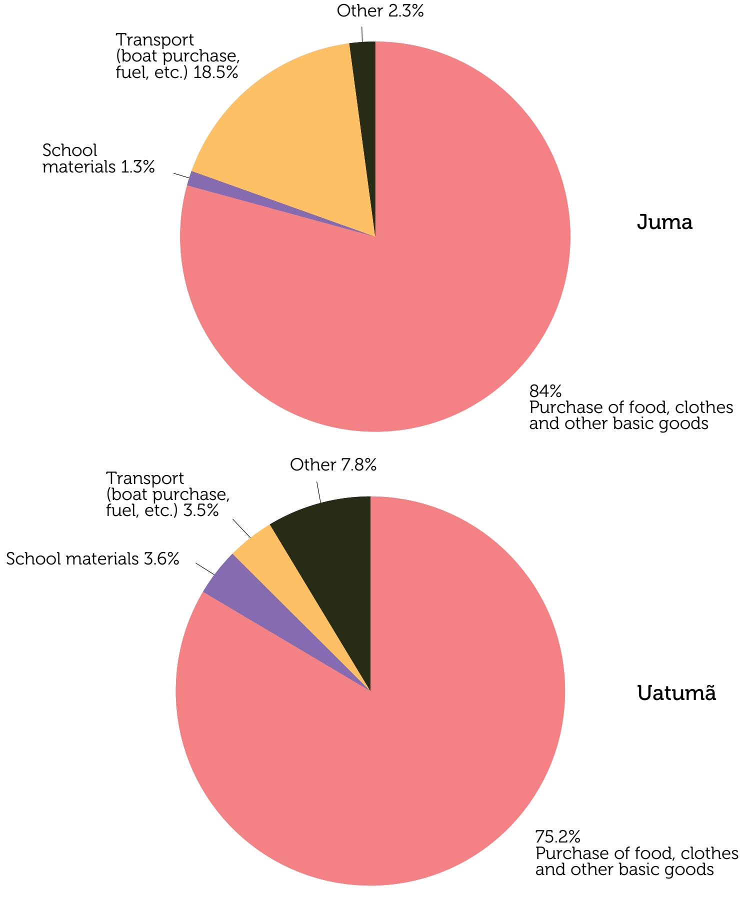

Figure 3.4 Household self-reported use of Bolsa Floresta family component payment in Juma and Uatumã reserves.

The use of cash transfers to promote forest stewardship could be considered as culturally appropriate for Brazil. Eighteen million households in Brazil already benefit from cash transfers, such as the retirement pension and *Bolsa Família* (family grant) – one of the largest conditional cash transfer programs in the developing world that provides transfers based on educational and health conditionalities to poor families (Medeiros et al. 2008; Bunting 2010). Combined, Brazil's cash transfers have helped in reducing the number of people in poverty from 28% in the decade preceding their introduction in 2001, to 17% in 2008 (Ferreira et al. 2009; Hanlon et al. 2010).

Bolsa Floresta's success is largely dependent on contextual factors, including: low deforestation pressure in target areas; homogeneous, subsistence-oriented resident populations; and program rules that are very similar to preexisting conservation rules in the protected areas (Börner et al. 2013). The replication of low-value, uniform per-household cash transfers such as Bolsa Floresta's family allowance may be challenging in different settings. That said, the Bolsa Floresta approach is an innovative model and offers an important example of implementing REDD+ on the ground.

3.6 Acknowledgments

We are first and foremost grateful to the several hundred people in and around SDR Juma and SDR Uatumã, who let our team of dedicated enumerators and assistants into their homes with our seemingly endless questionnaires. We thank the enumerator team Denise Reis dos Nascimento, Simone Santos, Mario Acuna, Ivan Zarros and Patricia Gallo, research assistant Kaline Rossi do Nascimento, and boat crews. We also thank Fundacão Amazonas Sustentável (FAS) and The Institute for the Conservation and Sustainable Development of Amazonas (IDESAM) for their field support.

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Chapter 4

Cotriguaçu Sempre Verde, Brazil

Conservation and sustainable management of natural resources

Raissa Guerra, Amy E Duchelle, D Sergio de Freitas Jr. and Maytê Rizek

Cotriguaçu Sempre Verde (CSV)[1] is an initiative to promote social and economic development in the municipality of Cotriguaçu in northwestern Mato Grosso, Brazil, through conservation and sustainable management of natural resources. The initiative is led by the Instituto Centro de Vida (ICV), which has focused initially on helping landowners come into compliance with environmental regulations and encouraging them to adopt more sustainable production practices. These activities are expected to simultaneously reduce deforestation and forest degradation in the municipality and promote local development.

By engaging multiple stakeholders from many different sectors, ICV is taking a revolutionary approach to the environmental governance of a subnational jurisdiction. CSV is organized into five components: (i) structuring municipal environmental management; (ii) support for sustainable forest management;

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1 CSV, or Cotriguaçu Forever Green in English, is the name for the first phase of the Northwest Mato Grosso REDD+ Pilot Project, which was initiated in 2009 to promote forest conservation in order to offset carbon emissions and as a tool to mitigate climate change.

(iii) promotion of best agricultural practices; (iv) support for natural resource governance in land reform settlements; and (v) integration of the Rikbaktsa indigenous group (ICV 2011). ICV is seeking to develop local ownership of the initiative by engaging with and building confidence among indigenous groups, cattle ranchers, loggers, small farmers and the municipal government of Cotriguaçu. Thus, the initiative offers important lessons for other initiatives pursuing a multisectorial and multistakeholder approach (ICV 2011).

4.1 Basic facts: Where, who, why and when

4.1.1 Geography

Cotriguaçu municipality covers 9123 km^2 in northwestern Mato Grosso (Figure 4.1) in the Brazilian Legal Amazon. Several rivers pass through the municipality, including the Juruena, which has the largest volume of all rivers in Mato Grosso. Around 25% of the municipality has level terrain, 60% is irregular and 15% is mountainous, with an average elevation of 240 m (IBGE 2014a). The climate is equatorial, hot and humid, and the predominant vegetation is dense rain forest. The average annual temperature is 24°C, and the average annual rainfall is 2750 mm. The dry season occurs from May to September, and the wet season occurs from October to April with the greatest rainfall intensity in January through March (IBGE 2014a).

Cotriguaçu was traditionally occupied by indigenous peoples, particularly the Rikbaktsa group who speak the Tupi language. In the mid-1980s, the Cooperativa Central Regional Iguaçu Ltda., a company from Paraná in southern Brazil, bought one million ha of land in northwest Mato Grosso. They planned to sell land to small producers from southern Brazil where agricultural land was scarce, due partly to the creation of the reservoir for the Iguaçu Dam. The first immigrants began arriving in Cotriguaçu in 1984, and in 1988, Juruena municipality – which included Cotriguaçu – was created (Guerra in press). In 1991, Cotriguaçu became an independent municipality. In the mid-1990s, INCRA launched a second phase of colonization in the municipality, attracting families from other parts of Mato Grosso and nearby states including Mato Grosso do Sul and Rondônia. This colonization has meant continued rapid population growth in the region (Guerra in press).

In addition to small farmers and the Rikbaktsa indigenous group, there are large private landholders in Cotriguaçu, including cattle ranchers and loggers. Privately owned lands occupy 54% of the municipality. In addition, the municipality has a conservation unit, the Parque Nacional do Juruena (14% of the total area); an indigenous territory, Terra Indigena Escondido (18% of the total area); and three land reform settlements (*Projetos de Assentamento* or PAs) – Juruena, Nova Cotriguaçu and CEDERES II (14% of the total area).

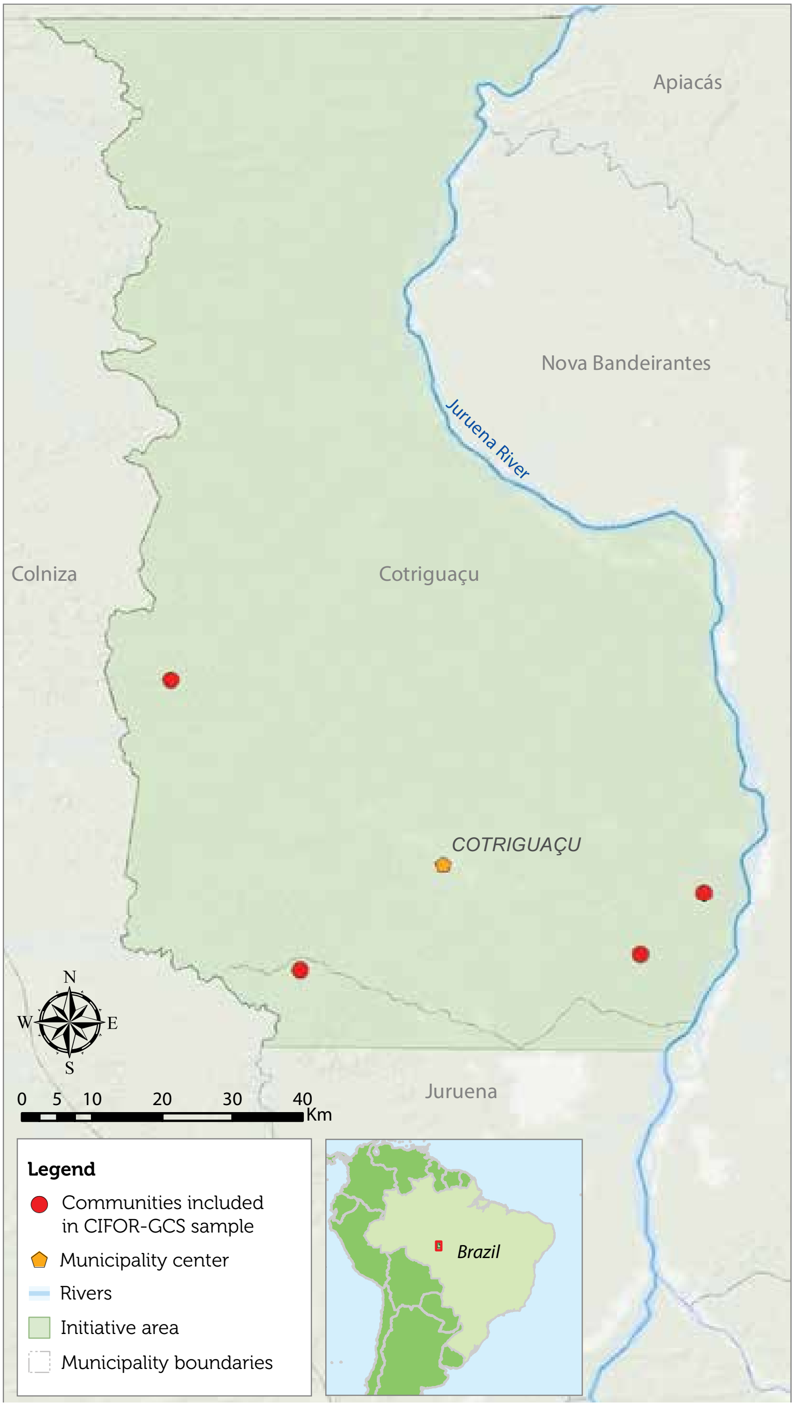

Figure 4.1 Map of the REDD+ initiative in Cotriguaçu.

Data sources: Instituto Centro de Vida, Instituto Brasileiro de Geografia e Estatística, GADM and World Ocean Base.

The most important economic sectors are forestry, cattle ranching (beef and dairy), timber, agroindustry and small-scale agriculture (production of food for consumption in the municipality). Logging was the main source of employment in Cotriguaçu in the 1990s, but is currently in decline due to improved control of illegal logging and conversion of forest to agricultural fields and pasture. As of 2014, the most important drivers of deforestation are cattle ranching and small-scale agriculture.

Cotriguaçu's population grew from 4379 inhabitants in 1996 to 14,983 in 2010 (IBGE 2014a). The Human Development Index (HDI) of Cotriguaçu was 0.721 in 2005, slightly lower than the national HDI of 0.76 (UNDP 2005). Small farmers in the land reform settlements (representing about 80% of the municipal population) are generally considered the most disadvantaged people in the municipality. In this chapter, we report results from a survey of 122 households in four communities in the three land reform settlements included in the CSV intervention area.

4.1.2 Stakeholders and funding

ICV, the lead proponent of the CSV initiative and a Brazilian NGO, has been working in Mato Grosso since 1991 and in Cotriguaçu since 2001. ICV has conducted numerous studies on regional deforestation dynamics, and therefore has a good understanding of deforestation issues in Cotriguaçu. To implement the CSV, ICV initially received USD 500,000 in start-up funds from the David and Lucile Packard Foundation (ICV 2009) and later received funding from Fundo Vale para o Desenvolvimento Sustentável (Fundo Vale) for implementation. Fundo Vale is a civil society public interest organization created in 2009 by the Vale Company; it seeks to strengthen the connection between institutions and initiatives for sustainable development.[2]

To implement CSV, ICV initially partnered with the Mato Grosso SEMA and TNC. SEMA supported the first component of CSV, which focuses on municipal environmental management. TNC initially played a key role in bringing landowners into compliance with environmental regulations, specifically by helping them register in CAR. Registration in CAR has been required by the Brazilian Forest Code since 2012, and is widely considered to be a necessary first step for REDD+. Since the launch of CSV, other partners that have joined the initiative include the International department of Office National des Forêts (ONF-I), the Instituto Floresta Tropical (IFT) and EMBRAPA (the Brazilian federal agency for agricultural research). ONF-I was invited due to its previous experience with reforestation and carbon sequestration in the municipality, and IFT was invited due to its vast expertise in promoting sustainable forest management throughout the Amazon. In addition to sustainable forest

2 Details about Fundo Vale can be found at their website: www.fundovale.org.br

management, ONF-I is supporting activities related to agroforestry, Brazil nut production, environmental education and technical training for small producers. EMBRAPA is collaborating with ICV to promote best practices among cattle ranchers in the municipality.

ICV supported the formation of Cotriguaçu's Municipal Council of Environment (CMMA), which has held regular meetings since 2012 to debate various issues related to public management and the environment (not limited to forests). Since 2013, CMMA has sought to reduce forest fires in the municipality by developing materials on fire prevention and disseminating them in places where fire outbreaks are common.

4.1.3 Motivation

Mato Grosso has historically been one of the states in the Brazilian Amazon with the highest deforestation rates (Governo do Estado do Mato Grosso, ICV, TNC 2009), and as of 2008, it included 20 of the 43 municipalities 'blacklisted' by the Ministry of Environment for their high deforestation rates. By 2008, about 38% of the area originally under forest cover in the state had been deforested. With 80% of its tropical forest intact, northwestern Mato Grosso is the last forest frontier in the state, located in the 'arc of deforestation' of the Amazon. For this reason, the region has been a top priority in recent efforts to curb deforestation (Governo do Estado do Mato Grosso, ICV, TNC 2009).

In 2008, the state government of Mato Grosso decided to take action to address the state's reputation as one of the leaders of deforestation in the Brazilian Amazon (Governo do Estado do Mato Grosso, ICV, TNC 2009). Specifically, in 2009, the state developed the Mato Grosso Action Plan for the Control of Deforestation and Fires (PPCDQ_MT) with the goal of reducing deforestation in the state by 80% by 2020 (as compared to the average deforestation rate in 1996 – 2005). ICV, TNC and SEMA began discussing a potential state REDD+ proposal as a way to capture funding for the implementation of the PPCDQ_MT. In April 2011, the REDD+ technical working group from Mato Grosso designed the REDD+ State Law (9878/2013), which was approved in January 2013. This law could eventually strengthen the CSV initiative. The working group is seeking to make the process as participatory as possible, reflecting the positions of all societal sectors.

Originally, ICV planned to implement a REDD+ initiative in the entire northwest portion of Mato Grosso, with a total area of 108,000 km^2 and a population of 120,000 people (Governo do Estado do Mato Grosso, ICV, TNC 2009). The high costs and other challenges associated with implementing such a broad initiative, however, led ICV and partners to start with a pilot in a smaller area. After spending several months (in 2009–2010) analyzing potential pilot sites based on deforestation rates, the land tenure situation and other key factors, they finally selected the municipality of Cotriguaçu.

4.1.4 Timeline

ICV began working in Cotriguaçu in 2002. The CSV initiative began in December 2009, when ICV submitted a proposal to the Packard Foundation and diagnostic activities began on the ground (Figure 4.2). There had been other forest conservation efforts in Cotriguaçu prior to the CSV project. In 1995, the Pilot Program to Protect Tropical Forests developed activities in northwestern Mato Grosso, and in 2000, the United Nations Development Programme started a rural development project. These projects sought to improve both forest and non-forest livelihoods, and they engaged local political stakeholders such as SEMA, the Rural Development Association of Juruena, the Juruena Municipal Secretariat of Agriculture and the Instituto Pró-Natura.

Pre-2000			
2000			
2001			
2002	ICV starts working in Cotriguaçu		
2003			
2004			
2005			
2006			
2007	ICV identifies priority areas for possible REDD+ intervention		
2008	ICV hires TNC to conduct viability study for REDD+		
2009	REDD+ initiative launched with funding from the David and Lucile Packard Foundation		
2010	CIFOR-GCS baseline survey with medium and large landholders	Consultant study of logging and cattle ranching in Cotriguaçu	
2011	Start of the first phase of the CSV initiative, funded by Fundo Vale.	CIFOR-GCS baseline survey with smallholders	ICV establishes geotechnology lab in Cotriguaçu
2012	CIFOR-GCS presents baseline results to study communities		
2013	ICV begins building environmental capacity of local leaders	ICV begins supporting CAR in land reform settlements	
2014	CIFOR-GCS phase 2 survey		

REDD+ initiative active

Figure 4.2 Timeline of the REDD+ initiative in Cotriguaçu.

4.2 Strategy for the initiative

CSV intends to reduce deforestation and forest degradation and hence GHG emissions, while reducing poverty as a co-benefit. Benefit-sharing mechanisms do not include direct cash payments, but rather are focused on the promotion of sustainable production activities among various stakeholder groups, as described below.

ICV and partners were initially interested in implementing a REDD+ pilot project, as reflected in their 2009 proposal to the Packard Foundation entitled "Developing the Northwest Mato Grosso REDD Pilot Project." An REL for the intervention area was developed in 2010 through linear projection of pre-initiative deforestation rates from 2000 to 2008 using data from PRODES (2008). The reference level is 14,000 ha of deforestation per year, which corresponds to approximately 7.1 million tCO_2e emitted annually. It has not been updated since 2010. In 2011, the initiative was granted funding by Fundo Vale for implementation of CSV. As of 2014, CSV is no longer considered a REDD+ initiative by its proponents, mostly due to the uncertainties and differing perspectives on REDD+. If (and when) the funding and rules for REDD+ become clearer, then the municipality of Cotriguaçu could be well positioned to launch a REDD+ initiative based on CSV.

In terms of (i) structuring municipal environmental management, ICV's principal approach has been to provide support for CMMA, the municipal environmental council, and to back CAR implementation on private properties and in land reform settlements. Support for CMMA includes establishment of a geotechnology laboratory for environmental monitoring and a regular meeting process (both started in July 2011). Since 2011, the Government of Mato Grosso has required implementation of CAR to promote compliance with the Brazilian Forest Code. While large landowners bear the costs of registering their properties in the CAR system, the municipal government of Cotriguaçu subsidizes the costs for small properties (up to 400 ha).

To provide (ii) support for sustainable forest management, ICV partnered with IFT and ONF-I to implement the *Programa de Desenvolvimento do Bom Manejo Florestal no Estado do Mato Grosso* (PRODEMFLOR) program, which began in 2011. PRODEMFLOR seeks to increase the number and improve the quality of sustainable forest management plans by offering technical training in skills needed to develop these plans. It is a voluntary membership program in which forest entrepreneurs submit their management plans to an independent monitoring group and commit to improving their practices. In return, producers receive advice and technical training. PRODEMFLOR has been less successful than expected in Cotriguaçu due to the difficulty of establishing a formal agreement between the various organizations involved and an overall lack of efficiency in approving sustainable forest management plans. There is still ongoing dialogue with some timber producers, however, and PRODEMFLOR's annual monitoring still occurs.

The (iii) best agricultural practices component focuses on improving cattle ranching practices. Specifically, this component promotes: (1) implementation of technology developed by the Brazilian Agricultural Research Corporation (EMBRAPA; Guide for Good Agro-pastoral Practices); (2) access to subsidized credit to finance large-scale investment in pasture recovery and recuperation of Permanent Protection Areas (APPs); and (3) involvement of production chain stakeholders in debates about improving cattle production systems. Considering the current situation of animal husbandry in the region and the lack of good examples for landowners, the first step of the program is to develop innovative and replicable models of sustainable production systems for beef and milk.

The (iv) support for natural resource governance in rural settlements is the component that is most directly related to the communities sampled by CIFOR-GCS. It is operationalized through the Rural Development Initiative, which seeks to support traditional rural communities (family farmers and indigenous groups) in their organization and planning, collaborative management of territories, and development of low-impact production technologies following the principles of agroecology.

The final component, (v) integration of the Rikbáktsa indigenous group, focuses on the creation of a management plan for the Escondido Indigenous Land, which comprises the largest forested area in the municipality of Cotriguaçu. ICV's move away from REDD+ in CSV was particularly important in relation to this stakeholder group. In 2011, the National Indian Foundation (FUNAI) declared that some REDD+ initiatives had fraudulent practices, citing as an example community leaders signing documents without the effective support of their communities. ICV engaged in dialogue with the Rikbaktsa tribe and slowly built confidence through a focus on the participatory design of the Escondido Indigenous Land management plan. The Rikbaktsa tribe showed interest if community members could participate as co-managers of the initiative, and as a result various ethnographic studies and activities were carried out and the indigenous management plan was elaborated. The current goal is to incorporate this management plan into the municipal environmental management plan of Cotriguaçu.

Along with CSV, there are also other development and conservation initiatives taking place in Cotriguaçu. First, Coopercotri is a cooperative that opened in Cotriguaçu in 2012 to support the commercialization of rural agricultural products. It initially worked with the dairy sector, but ended up seeking to address needs related to the processing of coffee; the wholesale trade of agricultural pesticides, fertilizers and soil correctives as well as the wholesale trade of fruits, vegetables, roots and tubers. Second, the *Balde Cheio* (Full Bucket) project is a partnership between EMBRAPA, SEBRAE (Serviço de Apoio às Micro e Pequenas Empresas, an agency that supports small business) and local partners to provide technical support to improve milk production and commercialization, and to try to ensure that local producers have guaranteed outlets for their products. Third, *Luz para Todos* (Light for All) is a national program of rural electrification, which has reached all of the communities included in the CIFOR-GCS sample (COT1 and COT2 more than a year before the other two). Fourth, since 2013, improvements to the unpaved highway connecting the municipalities of Cotriguaçu and Juruena have benefited the inhabitants of Cotriguaçu. Finally, *Bolsa Família*, which is a federal government program of conditional cash transfers, has been actively enrolling and making payments to families in Cotriguaçu since 2009.

4.3 Smallholders in the initiative

Through the 1980s, the strategy of the military government in Brazil was to occupy lands in the Amazon in order to protect it from foreign invaders as well as to provide land to landless people. Only in the 1990s were these settlements established in Cotriguaçu and, even today, none of the settlers in these settlements have obtained land titles (Guerra in press).

Our sample includes smallholders in four communities among the three different land reform settlements in Cotriguaçu. Cotriguaçu has many roads, and households are normally distributed along narrow, unpaved, straight-line secondary roads. Communities are organized socially, often along religious lines. In our sample, each community has a church, and people who frequent the same church are associated with the same community. In most cases, people who attend the same church live along the same road.

Between March and April 2011, we interviewed 122 randomly selected households (approximately 30 in each of the four communities). To attain a random sample, we obtained a complete list of households living in each community from the local health agent and/or other local leaders. After verifying that the list was complete, we wrote the names of all households on slips of paper, put them in a box, and randomly selected 30.[3]

3 After selecting the initial 30, we selected 10 extra names to place on a waiting list. We drew names from that waiting list to substitute for the few respondents who were not available or willing to complete the interview.

Each community has its own internal political organization, which allows households to lodge complaints with government officials or request goods and services for the community. In all the political associations (except for religious organizations), representatives are elected by members of the association. Female participation is not common in these political organizations, but women are becoming conscious that they need to organize themselves to be able to fight for their interests. This awareness is already visible in COT2, where there is a women's organization focused on improving access to markets. Table 4.1 lists the institutions in each sample community.

Table 4.1 Institutions present in the four communities.

	Organization
COT1	Small Producers Association (political) Coopercotri (production)
COT2	Associação das Mulheres Virtuosas (gender, production and political)
COT3	Small Rural Producers Association of Nova Aliança (political)
COT4	Small Producers Association (political) Pastoral da Saúde (religious) Congregação Cristã (religious) Assembleia de Deus (religious) Catholic Church (religious)

Table 4.2 presents some basic characteristics of the communities studied. The oldest community was founded in 1992, whereas the newest community was founded in 2006. In terms of infrastructure, all communities are accessible by road, but without exception, they all face transportation problems during the rainy season, when roads can become impassable. COT4 is the only community with a full set of basic infrastructure, including a primary and secondary school and a health center. This is because the community is located in the largest land reform settlement area in the municipality, which has a large block of voters and is represented by a small-producers association that has actively and effectively pressured the government to provide these services.

In all communities, rice was unanimously reported as the main dietary staple. More maize than rice was produced, but it was primarily used to feed small livestock. Many small farmers turned to urban markets to buy rice, often imported from southern Brazil at substantial cost. The specific reasons given for limited local production of rice varied by community, but many people blamed the difficulty of transporting rice to market due to the poor condition of the roads, as well as damage by wild pigs (*Pecari tacaju*) and by diseases.

Table 4.2 Characteristics of the four communities studied based on the 2011 survey.

	COT1	COT2	COT3	COT4
Basic characteristics				
Total number of households	185	35	65	70
Number of sampled households	31	30	30	31
Total land area (ha)	9,324	7,296	4,500	3,500
Total forest area (ha)	1,955	1,000	2,250	1,200
Year founded	2004	2006	1992	1993
Access to infrastructure				
Primary school	No	Yes	No	Yes
Secondary school	No	Yes	No	Yes
Health center	Yes	No	No	Yes
Road usable by four-wheel drive vehicles in all seasons	Yes	Yes	Yes	Yes
Bank or other source of formal credit	No	No	No	No
Distance to closest market by most common means of transport (km/min)	45/105 (motorcycle)	36/120 (motorcycle)	35/50 (motorcycle)	60 /120 (motorcycle)
Previous experience with conservation NGO	Yes	Yes	Yes	Yes
Agriculture				
Main staple food	Rice	Rice	Rice	Rice
Crop with highest production value per household on average	Maize	Maize	Maize	Maize
Price of a hectare of good quality agricultural land (low-high) (USD)[a]	363–545	363–545	1,136–1,590	159–227

a Exchange rate used: 1 USD = 1.76 BRL.

Table 4.3 presents basic socioeconomic characteristics of sampled households. In terms of years of education, adults (≥16 years old) had studied for approximately five years on average in all communities. In terms of health, adults were unable to work on average 7–17 days in the 12-month period prior to the interview (2010–2011) due to health problems. In all communities except for COT4, more than 50% of households had private toilets. There was high variation in total household income among communities. In COT2 and COT4 (highest income), total annual income was nearly 50% higher than in the community with the lowest income (COT3). In the community with the highest average

Table 4.3 Socioeconomic characteristics of households interviewed in 2011.

	COT1	COT2	COT3	COT4
Number of households sampled	31	30	30	31
Household average (SD)				
Number of adults	2.3 (0.7)	2.7 (1.5)	2.3 (0.9)	2.5 (1.1)
Number of members	3.5 (1.4)	3.7 (1.9)	3.1 (1.4)	3.6 (1.7)
Days of illness per adult	7.3 (25.3)	4.9 (12.3)	8.1 (24.7)	18.1 (39.0)
Years of education (adults ≥ 16 years old)	4.7 (2.9)	5.5 (3.6)	5.4 (2.6)	5.0 (3.1)
Total income (USD)[a]	12,017 (14,479)	14,085 (21,435)	9,481 (4,862)	14,018 (18,883)
Total value of livestock (USD)[b]	36,969 (66,301)	16,271 (29,898)	21,153 (12,508)	23,659 (26,438)
Total land controlled (ha)[c]	47.7 (16.9)	29.6 (16.6)	52.7 (27.6)	89.0 (22.0)
Total value of transportation assets (USD)	2,247 (3,409)	2,527 (4,946)	2,078 (3,262)	4,802 (10,274)
Percentage of households with:				
Mobile or fixed phone	65	37	27	23
Electricity	100	93	20	23
Piped water supply	0	10	17	19
Private latrine or toilet	94	90	87	97
Perceived sufficient income	58	67	77	61

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.
b Total livestock value at the time of interview.
c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

household income (COT2), the average land holding was the smallest and there were significant conflicts over land tenure.

At the time of our baseline fieldwork, COT3 and COT4 barely had access to electricity, whereas COT1 and COT2 were almost fully served by electricity. This difference was due to the government *Luz para Todos* Program, which was present in COT1 and COT2 and about to arrive in the other two communities. Phone communication is another limitation in Cotriguaçu. Cell phone reception was rare in the four communities, but many households had a cell phone, which they would use when they traveled to areas with cell phone reception. Finally, household transportation choices seemed to depend on distance to the nearest city. COT1, COT2 and COT3 are not far from the city and are therefore served by regular collective transport. Households in these communities had therefore invested an average of only USD 3000 in transportation assets. On the other hand, COT4 is much farther from the city, with highly irregular collective transport, and households had invested much more in motorcycles and other private transportation assets.

Figure 4.3 shows that cattle ranching generated more than a third (34%) of the total income reported by households in the four communities studied, followed by wage labor, other and crops (16% each). Households in all of the communities except for COT3 are highly reliant on agriculture, including both cattle and crops (Figure 4.4). Except in community COT4, income from the forest and the environment was negligible. The importance of "other income" highlights the role of government transfers (e.g. *Bolsa Família* and pensions) in the local economy. Finally, wage labor is also a significant source of income, especially in COT1, COT2 and COT3. This is due to medium and large landholders around the land reform settlements hiring smallholders to maintain their farms. One large producer stated that small producers play an important role in sustaining the livelihoods of large landholders and expressed concern that this labor force is being lost due to outmigration from the settlements, although other evidence suggests that outmigration has decreased due to improved conditions (such as electricity) in the settlements.

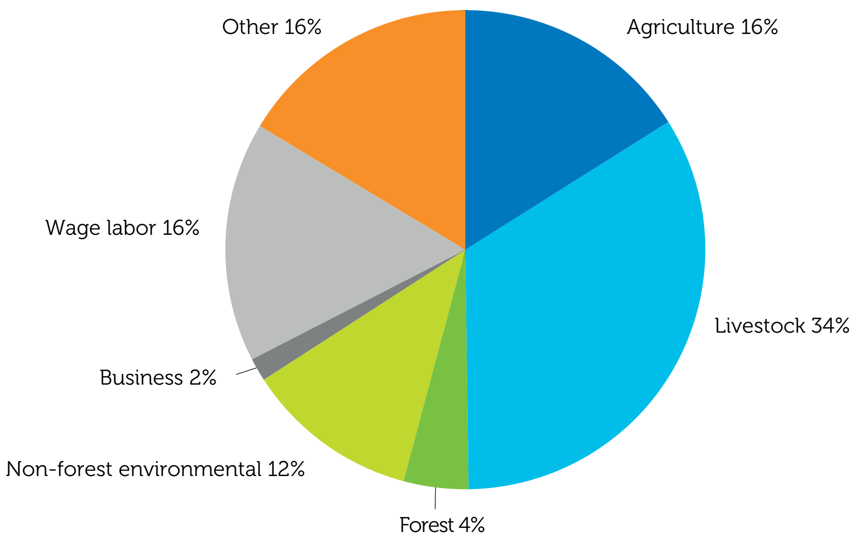

Figure 4.3 Sources of income for all households in sample (n = 122).

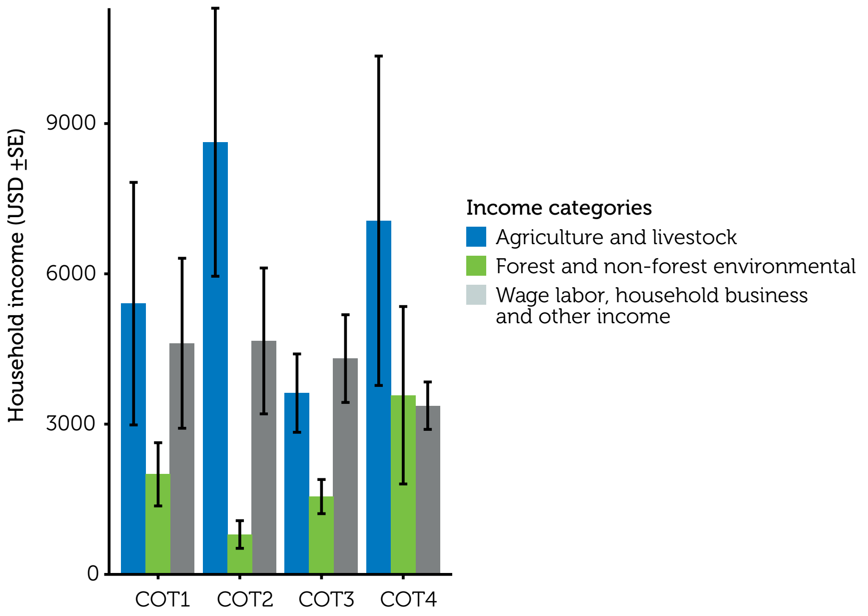

Figure 4.4 Sources of income for average household by community (or village) (+/- SE) (n = 122).

Table 4.4 presents the relationship between people and the forest in the four communities. Although the average time needed to walk to the forest was less than an hour in all communities, only a few household members reported having occupations related to forests. The highest percentage was 4.4% in COT3, but nonetheless, households in that community reported that only 2% of their income came from forest products.

In general, households in the sample communities in Cotriguaçu show minimal reliance on forest products. The most important forest product is charcoal, which many households use for cooking. However, there is now increasing interest in products derived from babaçu (*Orbignya phalerata*), a palm that locals had considered a pest because it invades pastures. ICV considers babaçu to have great economic potential for small producers since it can be transformed into many different commercial products such as oil (from the fruits), charcoal (from the coconut cover) and handicrafts (from the palm leaf).

Rather than harvesting forest products, households in these communities are seeking to construct livelihoods around cattle ranching for milk or beef production. In fact, households are also reducing their reliance on cultivation of crops as they shift into cattle ranching. As a result, producers reported that they sometimes were obliged to buy maize from neighboring municipalities in

Table 4.4 Indicators of household forest dependence based on the 2011 survey.

	COT1	COT2	COT3	COT4
Number of households sampled	31	30	30	31
Household average (SD)				
Share of income from forest	3.02 (8.80)	2.27 (6.50)	2.13 (5.63)	3.69 (7.96)
Share of income from agriculture	53.86 (38.97)	55.50 (29.95)	40.34 (40.96)	36.83 (67.26)
Area of natural forest cleared (ha)[a]	1.94 (40)	2.28 (4.44)	3.18 (8.11)	0.27 (0.76)
Area of secondary forest cleared (ha)[a]	1.32 (3.71)	0.10 (0.44)	0.00 (0.00)	2.01 (4.35)
Area left fallow (ha)[b]	4.89 (8.54)	3.34 (2.87)	3.36 (2.71)	9.73 (11.81)
Distance to forests (minutes walking)	25	12	20	50
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	73	66	64	68
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	1	1	4	3
Reporting increased consumption of forest products[e]	14	0	6	4
Reporting decreased consumption of forest products[e]	41	57	41	16
Obtaining cash income from forest products[f]	29	10	10	6
Reporting an increase in cash income from forest[f]	22	33	33	0
Reporting a decrease in cash income from forest[f]	33	33	67	100
Reporting fuelwood or charcoal as primary cooking source	68	77	77	74
Leaving land fallow[g]	23	37	37	42
Clearing forest[g]	42	47	37	39
Reporting decreased opportunity for clearing forest[g]	74	67	86	90
Clearing land for crops[g]	26	23	17	29
Clearing land for pasture[g]	3	10	20	6

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

Cattle ranching has changed Cotriguaçu's forested landscape into extensive pastures. (Icaro Cooke Vieira/CIFOR)

order to feed their animals. Even though it is not legal, some small producers have consolidated large areas of pasture by buying out settlers who have abandoned their settlement areas. In Cotriguaçu, many small producers dream of becoming large cattle ranchers, no longer dependent on crops, and certainly not on forests.

4.4 Challenges facing the initiative

CSV faces many challenges. Mato Grosso is a difficult state for NGOs to work in due to the ongoing duel between environmentalists and defenders of BAU development. These opposite visions are considered the first obstacle for the CSV initiative. Given its multistakeholder nature, CSV must be seen as something beneficial for all groups involved or its success will be compromised. Since CSV is not currently linked to the sale of carbon credits, but rather to articulation among several sectors to reduce deforestation and forest degradation, local governance is a major challenge. As mentioned initially, the different local stakeholders involved in CSV have notably different goals due to their divergent views on land use. This creates a challenge for institutionalizing the program locally and meeting the demands of these different sectors while maintaining a holistic vision for sustainable development in the municipality.

There is also a temporal component related to the governance challenge. In Brazil, as in many other countries, there is the culture of discontinuity of policy initiatives from opposing parties. A political party will rarely continue an initiative from the opposition party – even if the initiative is beneficial for local people – simply because it represents a different political position. Thus, there is a risk that the municipal government in Cotriguaçu might not support CSV in the future if there are big changes in leadership resulting from electoral politics. This is another reason that ICV has promoted strong local autonomy for CSV in order to promote its continuity.

Interestingly, the focus on multiple stakeholders in CSV has not been free of criticism within local civil society groups. For instance, some members of local NGOs have expressed concern about the potential side effects of including owners of medium and large cattle ranches in CSV. The argument is that incentives for cattle ranching activities in a heavily forested municipality, even if under the best practices program, could stimulate the opening of more areas for cattle raising through producers envisaging higher profits. Even within the proponent organization, ICV had to work on its own internal 'multistakeholder' process, since the staff who worked with indigenous people had a different vision than those who worked with cattle ranchers. This initial internal organizational work was key to being able to work subsequently with a diversity of external actors (personal communication from R Farias, 27 March 2013).

Finally, even though there have been improvements in the highway connecting Cotriguaçu and Juruena, local road infrastructure still represents a large barrier to any conservation and development initiative. In general, the roads in Cotriguaçu are of poor quality, and many areas remain isolated during the rainy season. This limited access represents a substantial obstacle for marketing of products. This presents a barrier to CSV's efforts to promote sustainable production, due to the difficulty of accessing markets.

4.5 Lessons from the initiative

The evolution of CSV reflects a common trend among subnational REDD+ initiatives in the Brazilian Amazon. The initial idea of the REDD+ Pilot Program in Northwestern Mato Grosso was to compensate people for avoided deforestation, which was in line with the international discussions at that time. Interestingly, local producers in Cotriguaçu caught wind of this, and there were stories of people planting trees on their properties with the goal of receiving direct economic benefits. However, like other subnational REDD+ initiatives in Brazil, CSV took a direction that did not include direct cash payments and stopped being identified as REDD+, mostly due to the lack of progress on REDD+ at the international level. While proponent organizations needed to mend some initial expectations regarding the receipt of immediate cash benefits, CSV evolved to incorporate a broader vision of promoting green development in the municipality through responding to local demands and building confidence with multiple stakeholders.

CSV is not the only multistakeholder initiative of this scope in the Brazilian Amazon, but it provides some important lessons for this kind of approach. First, it offers an innovative example of creating a multistakeholder team within the proponent organization itself, and internally working through conflicts associated with different values and visions, in order to work effectively with the diverse actors in Cotriguaçu. Second, it demonstrates the challenges and importance of promoting local autonomy for an initiative, and truly listening to the demands of different stakeholder groups when formulating intervention strategies, even if they conflict with the proponent's ideas. For instance, even though ICV views biodiversity conservation through the strengthening of protected areas as important, it is not currently a priority issue for local stakeholders. Therefore, while ICV can bring the issue into local discussions, it is not included as a key CSV strategy. Finally, CSV highlights the importance of linking to broader initiatives. For CSV to be successful in the future, Cotriguaçu still requires more infrastructure and greater political maturity to accommodate it. There is a need to find a way to internalize these practices, not only among local producers, but also into the political agenda of the municipality so that they will not be forgotten after the next election. Demonstration of the early positive effects of CSV could be one way to strengthen the initiative and keep it on the political agenda of the municipality over the longer term.

4.6 Acknowledgments

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Chapter 5

Jari/Amapá REDD+ Project, Brazil

Marina Cromberg, Mariana G Pereira and Renata B Caramez

The Jari/Amapá REDD+[1] Initiative, which is led by the private investment company Biofílica and a corporate group called Grupo Jari, aims to protect an area of FSC-certified forest in the Jari Valley, which straddles the states of Pará and Amapá in the Brazilian Amazon. This area was acquired by the Grupo Jari in 2000 from the former Jari enterprise. The main goals of the initiative are to reduce deforestation and forest degradation in the forest management area. Proponents also plan to promote social co-benefits by providing technical assistance for sustainable production to some of the smallholders living inside and around the intervention area. These activities are coordinated by both Biofílica and Fundação Jari, and executed by Fundação Jari, which is the social branch of Grupo Jari. Fundação Jari has worked for 14 years with communities on company lands in the state of Pará and recently began working with smallholders in five communities in Amapá as part of the REDD+ initiative. A key challenge for the initiative is the

1 The initiative name in Portuguese is *Projeto de REDD+ Jari/Amapá*.

historical lack of land tenure clarity in the area, which is reflected in smallholders' insecurity regarding both their land holdings and the initiative. In this chapter, we describe the goals and strategies of the initiative, characterize the smallholders in the intervention area, and discuss key challenges and concerns.

5.1 Basic facts: Where, who, why and when

5.1.1 Geography

The Jari/Amapá REDD+ Initiative is located in the southern part of the state of Amapá in the Jari River Valley, which is an affluent of the Amazon River. The intervention area is a 659.8 km^2 subset of the overall Jari Initiative area of approximately 10,000 km^2. It encompasses the municipalities of Laranjal do Jari and Vitoria do Jari (Figure 5.1). According to the Köppen system, the climate in Amapá is tropical monsoon characterized by year-round monthly mean temperatures above 18°C, with wet and dry seasons. In southern Amapá, the average annual rainfall is 2100 mm (Arvorar and IPÊ 2011). Ninety percent of the initiative area consists of low and medium plateaus. Elevations measured in our five study communities were 75 masl, 69 masl, 25 masl, 22 masl and 12 masl. Amapá is largely dominated by soils with high concentrations of aluminum, which are fairly acidic, and represent varying degrees of soil fertility. The major soil types in the study area are yellow/red latosols, yellow latosols, yellow podzolics, and red/yellow nitosols (Arvorar and IPÊ 2011). In the intervention area, there are two main kinds of forest: Submontane Open Ombrophilous Forest with lianas, and Dense Ombrophilous Forest Lowlands with Emergent Canopy (Arvorar and IPÊ 2011).

Forests in the intervention area are extremely rich in natural resources, including timber and NTFPs such as Brazil nuts (*Bertholletia excelsa* Humb. & Bonpl.) and natural rubber (*Hevea* spp. Aubl.). Rubber was historically the basis of the regional economy. In 1882, during the rubber boom, a migrant from northeastern Brazil, José Julio de Andrade, began to acquire lands in the Jari Valley. He established commercial relations with local extractive communities and eventually declared himself the owner of 3 million ha. He organized and controlled the sale of rubber and Brazil nuts to international markets until 1948 when he was forced to leave the region by popular uprisings (Greissing 2010). Subsequent rubber and Brazil nut commerce was controlled by a group of Portuguese traders who then sold the area to an American billionaire named Daniel Ludwig in 1967 (Greissing 2010). Supported by Brazil's military government, Ludwig acquired 16,321 km^2 of land in Amapá and Pará, with the intention of creating a large agro-silvopastoral project focused on cellulose production, but also including kaolin and bauxite mining, buffalo ranching and

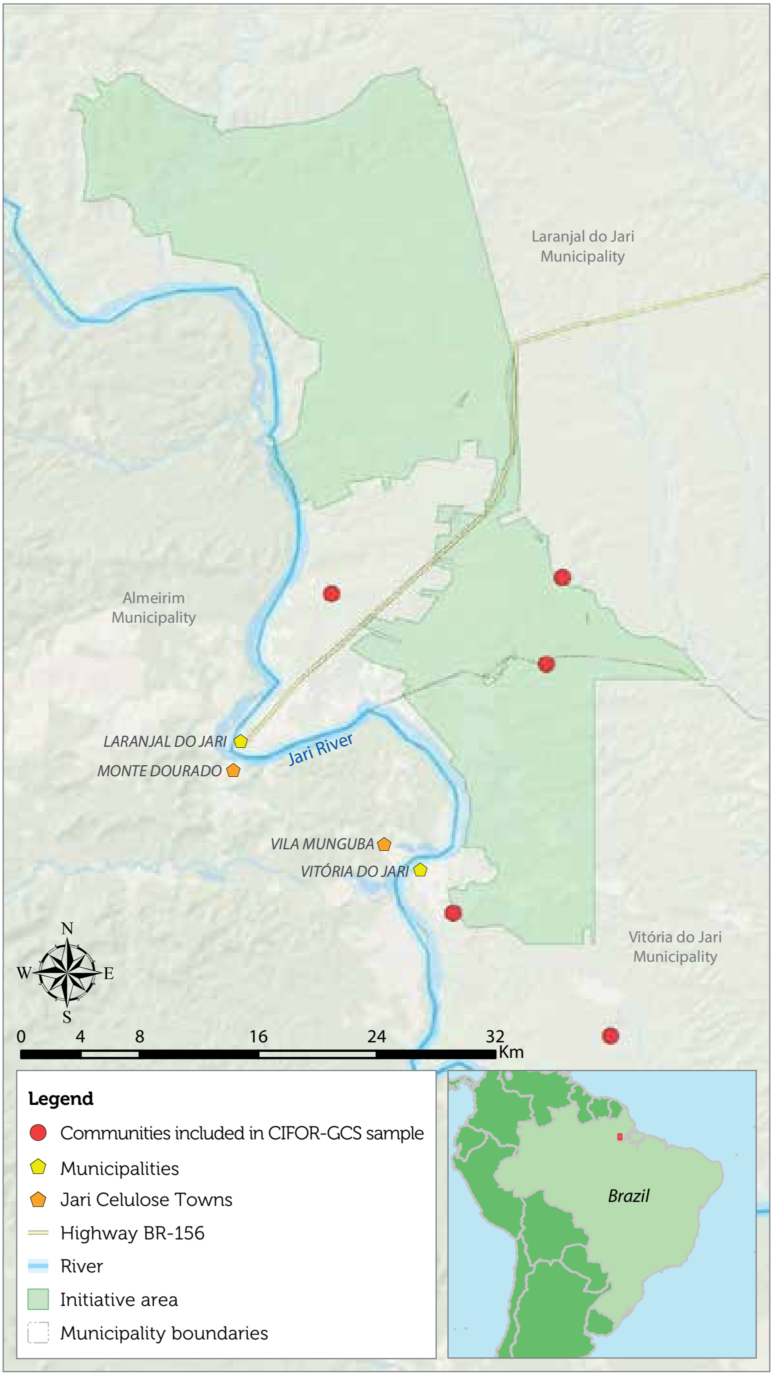

Figure 5.1 Map of the REDD+ initiative in Jari/Amapá.

Data sources: Biofílica, Instituto Brasileiro de Geografia e Estatística, GADM, OpenStreetMap and World Ocean Base.

rice cultivation (Arvorar and IPÊ 2011). To implement this enterprise, Ludwig built roads, an airport and two cities (Monte Dourado and Vila Munguba) for company employees. Cellulose production began in 1978 after installation of a cellulose factory constructed in Japan, and some of the natural forests were converted to Gmelina (*Gmelina* spp.) and eucalyptus (*Eucalyptus* spp.) plantations.

This major transformation negatively affected extractive communities that had traditionally occupied the area. In the early 1970s, many families were forced to leave their residences when they lost access to forest resources due to conversion to other land uses and move to more remote areas or to the new urban settlements. At the same time, thousands of migrants from all over Brazil, especially the northeast, moved to the area in search of work with the cellulose company. Once their temporary contracts were over, they colonized the banks of the Jari River (Lins 2001). This settlement resulted in the emergence of two makeshift towns known as 'Beiradão' and 'Beiradinho,' which later formed the cities of Laranjal do Jari and Vitória do Jari, respectively. While the company towns in the state of Pará were very well planned, with modern houses and infrastructure, Laranjal do Jari and Vitória do Jari in Amapá received minimal government and company support. Both cities still face a lack of basic sanitation, fires due to poor electrical installations, floods and poor housing conditions. In 1987, when Laranjal do Jari became an official municipality, it was known as a 'pistol city,' afflicted by prostitution, violence and serious sanitation issues (Greissing 2012). The rural areas of these municipalities, which according to Grupo Jari fall within its boundaries, also suffer from a lack of roads, transport and technical assistance for production. The rural population that has re-settled this area over the past decade suffers from a lack of formal land tenure and pollution from Jari Celulose (one of the companies of Grupo Jari), including contamination of soils and water from pesticides used in the eucalyptus plantations and siltation of streams from trucks transporting logs (Greissing 2010).

Grupo Jari is central to the economy of Laranjal do Jari and Vitória do Jari, as reflected in the large shares of the service and industry sectors in the municipal GDP of both municipalities. In 2009, the service sector was the largest in both municipalities. In Laranjal do Jari, the second most important sector was industry, while in Vitória do Jari, it was agriculture/livestock (IBGE 2012b). In terms of agricultural products, in 2009, cassava had the highest production value in both municipalities (IBGE 2012a). Logs, followed by Brazil nuts, were the forest products with the highest production values (IBGE 2012a).

In 2010, the total population of Laranjal do Jari was 39,942 inhabitants (5% rural) and that of Vitória do Jari was 12,428 inhabitants (21% rural). Between 2000 and 2010, the municipality of Laranjal do Jari grew by 40.07% and Vitória do Jari grew by 45.18%. For our study, we focused on the five communities (Figure 5.1) targeted by the initiative, interviewing a total of 122 households (57.3% of the total).

5.1.2 Stakeholders and funding

The Jari/Amapá REDD+ Initiative is being implemented through a partnership between Biofílica and Grupo Jari (specifically, Jari Florestal and Jari Celulose). Biofílica is a private company in São Paulo that promotes management and conservation of Amazonian forests through the commercialization of environmental services. Grupo Jari is comprised of a group of private companies, originally from southeastern Brazil, which specialize in cellulose pulp production and packaging. The group (formerly called Grupo Orsa) was founded in 1981, and in 2000 expanded its activities to the Jari Valley when it bought Ludwig's original Jari enterprise. The group acquired the enterprise with a debt of USD 215.2 million, which it was able to resolve by 2011. In 2011, the group sold seven companies from southeastern Brazil to concentrate activities in the Jari Valley. In 2000, Grupo Jari created the Fundação Jari with the initial goal of providing social services to children and teenagers living within or close to the company's forest management units. After 3 years, Fundação Jari shifted its focus to local development, by supporting local associations and cooperatives and incentivizing productive activities such as agroforestry and eucalyptus plantations, and good practices for Brazil nut harvesting (personal communication from J Almeida, 26 August 2014).

Biofílica and Grupo Jari each have a specific role in the REDD+ initiative. Biofílica is responsible for the design and management of the initiative. Jari Florestal is responsible for sustainable forest management activities that are certified by the FSC, along with initiative management. One of the companies in Grupo Jari (Jari Celulose) is the legal owner of the intervention area. Fundação Jari is not considered a proponent, but rather a partner institution. Its function is to provide social services and technical assistance to the five communities targeted by the REDD+ initiative. Biofílica currently covers initiative costs, and once carbon credits are sold on the voluntary market, benefits will be shared between Biofílica (15%) and Jari Florestal (85%). Fundação Jari receives a fixed amount of money (USD 45,455/year) to perform its work in the target communities independent of the amount of carbon sold. In the first crediting period (2011/2012), the initiative offset 200,000 tC, but was only able to sell 20% of the credits produced to Brazilian companies seeking to neutralize their carbon emissions. Carbon offsets from the 2013/2014 crediting period will be verified in October 2014 and sold in the voluntary market.

5.1.3 Motivation

Biofílica was the first organization to introduce REDD+ in the Jari Valley. According to the Biofílica initiative manager, after two years of searching for a site in the Amazon that met their criteria of clear land tenure and technical and economic feasibility of REDD+, Biofílica identified Jari Amapá. In 2010, Biofílica presented a proposal to Grupo Jari, which they accepted by the end of that year (see the initiative timeline, Figure 5.2).

Even though there were no previous conservation initiatives in the intervention area, Jari Florestal always monitored the region to deter new settlers and conversion of forests for other uses, including by reporting to the federal environmental agency (IBAMA). Proponents perceive the primary threats to forests in the intervention area to be small-scale swidden agriculture, small- and medium-scale cattle ranching, and illegal small-scale logging by people living both inside and outside the area. Although Grupo Jari does not inventory its emissions,[2] because they are outside the scope of its REDD+ initiative, it is important to note that the industrial cellulose pulp production realized by Jari Celulose is a major emitter of GHGs.

5.1.4 Timeline

While Grupo Jari agreed to partner with Biofílica at the end of 2010, February 2011 is considered to be the initiative start date, since this is when Biofílica and Grupo Jari held their first socioeconomic and environmental assessment planning meeting. Biofílica developed the PDD between early 2012 and 2013, and in July 2012, representatives of Biofílica and Fundação Jari presented the initiative to target communities. The timeline (Figure 5.2) summarizes the history of the initiative and interventions applied until early 2014. Details on specific interventions are presented in Section 5.2.

5.2 Strategy for the initiative

The proponents consider the initiative as 'REDD+' and have set specific goals to reduce deforestation (RED), reduce forest degradation (second D), and promote forest conservation and management (+). The co-benefits of highest priority to the proponents are livelihood benefits for smallholders through technical assistance oriented to sustainable production. The initiative was certified by the VCS in 2013 for access to the voluntary carbon market and the proponent will pursue complementary certification by the CCBA. The reference level established for the initiative was based on historical deforestation data (2000–2010) obtained from the National Institute of Spatial Research (INPE) and the Brazilian Institute of Geography and Statistics (IBGE), following the VCS VM0015 methodology. The proponents also use INPE and IBGE products to evaluate and monitor changes in forest cover in addition to ground measurements.

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2 Grupo Jari emissions are not reported in the Brazilian emissions public registry. Available at: https://registropublicodeemissoes.com.br/index.php. Acessed September 2014.

Pre-2000						
2000						
2001						
2002						
2003						
2004						
2005						
2006						
2007						
2008						
2009						
2010	Biofílica presents REDD+ initiative proposal to Grupo Jari					
2011	Biofílica and Grupo Jari hold meeting to plan socioeconomic and environmental assessment					
2012	Biofílica and Fundação Jari present the REDD+ initiative to target communities	Proposed REDD+ initiative presented to target communities	Biofílica and Fundação Jari create the REDD+ Thematic Chamber	CIFOR-GCS baseline survey		
2013	VCS certifies the Jari/Amapá REDD+ Initiative	Fundação Jari holds workshops to develop Community Participatory Organizational Diagnoses and Community Action Plans	CIFOR-GCS presents baseline results to study communities	Fundação Jari presents the five Community Action Plans to the REDD+ Thematic Chamber	REDD+ Thematic Chamber holds special meeting to discuss land tenure issues	Fundação Jari holds course on açai seedling production and plant nursery construction in one target community
2014	Fundação Jari selects participant households and completes socioeconomic survey	Fundação Jari provides technical assistance and develops 'property management plans' for participating families	CIFOR-GCS phase 2 survey			

REDD+ initiative active

Figure 5.2 Timeline of the REDD+ initiative in Jari/Amapá.

The proponents plan to accomplish their goals of reducing carbon emissions and generating co-benefits through four strategies: (i) certified forest management; (ii) deforestation monitoring through remote sensing; (iii) regular surveillance by Jari Florestal security; and (iv) provision of technical assistance for sustainable production in the five target communities. For the first strategy, although the forest management area is already FSC-certified, Jari Florestal has yet to attain government permits to begin operations. The second strategy is performed through the generation of an annual bulletin of deforestation that is checked in the field by Jari Florestal security. The third strategy is essentially a continuation of the monitoring already performed by private security guards of Jari Florestal in the intervention area to restrict access to company lands which are only partially titled, prevent land occupation by new settlers, and monitor land use and deforestation by families already settled in the area. In addition to monitoring, the security guards report forest clearing and fires to the environmental agencies. The fourth strategy builds on Fundação Jari's experience with communities on company lands in Pará, but is tailored to the target communities in the REDD+ intervention area in Amapá.

The five participant communities were selected in April 2012 according to five criteria: (i) location outside the Cajari River Extractive Reserve and the area of influence of the newly constructed Santo Antônio hydroelectric power plant; (ii) livelihoods relying on agriculture and/or extraction of NTFPs; (iii) inclination toward social organization; (iv) existence of public interventions; and (v) production potential of sustainable activities focused on agriculture and extractivism (Biofílica 2013).

After the selection of communities, Fundação Jari and Biofílica organized one meeting per community to explain the initiative goals in July 2012 (Figure 5.2). By the end of these meetings, Fundação Jari and Biofílica decided to create the REDD+ Thematic Chamber as a forum for the REDD+ initiative proponents and partners, public agencies and community representatives to discuss REDD+ and the Jari/Amapá REDD+ Initiative. Along with promoting conceptual discussions, the objective of the Chamber was to discuss how to decrease deforestation in the initiative area, and strengthen relations among government agencies, proponents and communities. The next interaction with target communities was in May to September 2013 when Fundação Jari led the Community Participatory Organizational Diagnosis that consisted of three workshops to: (i) build awareness about conservation and REDD+; (ii) allow community members to assert preferences; and (iii) elaborate community action plans. The five community action plans were then presented to the REDD+ Thematic Chamber as a way to promote their recognition and monitoring.

Contrary to the expectations of Fundação Jari and Biofílica that smallholders would mostly be concerned with rural production systems, their demands largely focused on land tenure regularization, road improvement, and access to transportation and educational facilities (personal communication from R Lima, 29 July 2014). When Fundação Jari and Biofílica emphasized that their work would focus on technical assistance, and that the other demands would be brought to the REDD+ Thematic Chamber on REDD+, many smallholders decided not to participate in the initiative. For the 48 families that voluntarily signed on, Fundação Jari technicians conducted a household-level socioeconomic diagnosis and elaborated individual property management plans based on the experience of the *Proambiente*[3] Program. The plans consisted of a set of steps to reach desired productive outcomes and simultaneously reduce deforestation. During the diagnosis and property management plans, Fundação Jari also provided punctual technical assistance based on smallholders' specific demands. Technical assistance in upcoming years will be specifically aligned with the goals of the property management plans and include technical training at the community level. One training course was already held in one of the target communities (JARI5) and focused on the production of açai (*Euterpe oleracea* Mart.) seedlings and nursery construction (Figure 5.2). Importantly, the proponents do not plan to use conditional incentives, at least in the short term while they are still building communication and trust with communities.

According to the proponents, selection of families for the initiative is not complete. During the household diagnosis, some families decided to leave the initiative and others decided to join. Nonetheless, proponents have a limited budget that currently allows them to work with a maximum of 50 families. Although the Fundação Jari activities focus mainly on technical assistance, the proponents view the REDD+ Thematic Chamber as an opportunity to involve public agencies in discussions related to the broader community demands. For instance, in December 2013, Fundação Jari organized a special Thematic Chamber meeting to discuss land tenure issues. In addition, in 2006, Grupo Jari signed a memorandum of intention with the state government of Amapá to carry out an exchange of lands in the intervention area as a way to secure land rights for local communities. Grupo Jari would concede select areas occupied by smallholders to the state for regularization (creation of official rural settlements or individual land titles) and in return would receive land titles for areas of equivalent size, where the company is the *de facto* user. Although the state land institute, Instituto de Meio Ambiente e de Ordenamento Territorial do Amapá (IMAP) has already mapped the smallholders' properties, the exchange process had not progressed since 2010.

While the proponents were rolling out their REDD+ initiative, there were few other interventions related to forest conservation and/or support for rural livelihoods in the intervention area. In terms of forest conservation, two communities mentioned command and control actions. In one (JARI3), there was the first occurrence of an IBAMA fine for a community resident in 2011. In the other (JARI5), community members mentioned a recent increase in surveillance by IMAP. In JARI4, Jari Florestal held a training course for smallholders on controlled burning. In terms of support for rural livelihoods, in JARI3, CADAM (a kaolin mining company in the Jari Valley) promoted beekeeping courses and provided beekeeping equipment. In JARI2, the state rural assistance agency (RURAP) provided support to households for transporting production to the market and worked with three households on implementation of an experimental

3 *Proambiente* was a federal pilot program designed to reconcile smallholder production and natural resource conservation through land-use planning, technical assistance and PES.

mechanized agricultural plot. Also, in this community, some families participate in two federal food security programs.[4] Households in all five communities obtained support from *Bolsa Família* (national government social welfare program, based on cash transfer) and *Renda para Viver Melhor*, which is similar to *Bolsa Família*, but implemented by the Amapá state government.

5.3 Smallholders in the initiative

Our sample includes the five communities targeted by the initiative. In August 2012, we interviewed 122 of a total of 213 households in these five communities. Households were randomly selected in JARI1 and JARI5; given the small size of the other three communities (JARI2,[5] JARI3 and JARI4), we interviewed all families present during the fieldwork period (Table 5.1). In each community, we also held one community meeting, and one meeting with women, with an average of 15 participants.

Local institutions were not well developed in the study communities; only two of the five communities (JARI1 and JARI5) had active small-farmer associations with leaders elected by members, and JARI3 had a beekeepers' group. In the two communities with local associations, the majority of women reported not being sufficiently represented on community decision-making bodies. No community had local organizations specific to women.

Table 5.1 summarizes basic characteristics of the study communities. In terms of access to infrastructure, none of the communities had health facilities, and there was a health agent only in JARI3. This was also the only community with a primary school. JARI3 has greater access to basic infrastructure, because it is situated in an area that was granted to smallholders by Jari Celulose. The municipal government encouraged the settlement through the construction of a church and school and installation of an electric generator with governmental provision of fuel.

In the other communities, the tenure situation is very unclear, and smallholders lack schools, decent roads, transport, health agents, electricity and general means of communication. This lack of basic infrastructure creates a situation in which most households alternate between the city and rural area for their livelihood activities. Many have two houses, one in the city and one in the community (rural

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4 These two programs are the Food Acquisition Program (PAA) and the School Nourishment National Program (PNAE). In PAA, the government purchases agricultural products from family farmers, exempt from bidding, at prices compatible with those of regional markets. PNAE focuses on the purchase of food from family farmers for school meals, prioritizing land reform settlement areas, indigenous communities and *quilombola* (former escaped African slave) communities.

5 JARI2 is comprised of four household clusters located along four different roads. We grouped these clusters to attain a minimum of 30 households needed for the CIFOR-GCS sample.

area). The women usually stay in the city with their children, while the men go to the community for a few days during the week or stay for an extended period of time (15 days) to take care of the household crops and/or animals. Some men also have a job in the city, so they spend only weekends and/or holidays on production activities in the community.

In terms of agricultural production, cassava flour was the product with highest value (cash and subsistence) for all communities in the sample period of August 2011 to August 2012 (Table 5.1). In addition, in JARI1 and JARI2, households indicated that cassava production had increased in 2010–2012 due to the ease of cultivation, processing and commercialization, and also due to families' participation in government food security programs (PAA and PNAE). In the other three communities, however, smallholders noted that cassava production declined due to a lack of access to technology and mechanization, and increased monitoring by IBAMA. IBAMA does not allow forest clearing without authorization, which households reported they cannot obtain since they do not hold land title. The production of rice declined in three communities (JARI1, JARI2 and JARI4) due to the high competition with rice from other regions sold in local supermarkets. Three communities (JARI1, JARI3 and JARI4) mentioned an increase in açai palm fruit (*Euterpe oleracea* Mart.) production due to growing market demand. In JARI5, the production of leafy greens increased during this period, which can be explained by their short growing cycle and this community's proximity to the city of Vitória do Jari, where there is a market for these products.

Cassava flour production in one of the study communities. (Claudio de Sassi/CIFOR)

With the exception of JARI5, which is less remote (Table 5.1), people from the other communities face challenges in transporting their produce due to poor road conditions and infrequent transportation. JARI3 has access to municipal transportation that reaches the community twice a week. JARI1 and JARI2 have access to a municipal truck that transports their produce every 15 days, but households need to carry their produce to the highway (1–20 km away) to be able to use this service.

Table 5.1 Characteristics of the five communities studied based on the 2012 survey.

	JARI1	JARI2	JARI3	JARI4	JARI5
Basic characteristics					
Total number of households[a]	86	25	15	27	60
Number of sampled households	32	18	14	22	36
Total land area (ha)[a]	8,935	2,800	480	3,500	3,600
Total forest area (ha)[a]	7,595	2,380	240	2,800	2,340
Year founded	1987	1987	2000	1999	2002
Access to infrastructure					
Primary school	No	No	Yes	No	No
Secondary school	No	No	No	No	No
Health center	No	No	No	No	No
Road usable by four-wheel drive vehicles in all seasons	No	Yes	Yes	No	No
Bank or other source of formal credit	No	No	No	No	No
Distance to closest market by most common means of transport (km)	36	20	36	25	1
Previous experience with conservation NGO	No	No	No	No	No
Agriculture					
Main staple food	Rice	Bean	Cassava flour	Bean	Cassava flour
Crop with highest production value per household on average	Cassava flour	Cassava flour	Cassava flour	Cassava flour	Cassava flour
Price of a hectare of good quality agricultural land (low-high) (USD)	392–392	245–490	162–245	49–245	162–490

a No. of households, total land area and forest area reflect estimates by key informants, such as the presidents of community associations or community health agents.

Table 5.2 summarizes socioeconomic characteristics of the sampled households. In terms of education, household members (≥16 years old) across the five communities had studied on average for 4 to 6 years. Only two of the communities had access to electricity (JARI2 and JARI3). In JARI2, this was through the municipal connection, and in JARI3 it was through a community generator. Most households accessed water directly from streams or springs, but in JARI5, one-third of families had piped water and 47% had their own wells. About half the households from the rural community had latrines or flush toilets, while the other half (49%) did not have any kind of toilet in the house.

Table 5.2 Socioeconomic characteristics of households interviewed in 2012.

	JARI1	JARI2	JARI3	JARI4	JARI5
Number of households sampled	32	18	14	22	36
Household average (SD)					
Number of adults	2.8 (1.3)	3.2 (2.0)	2.7 (1.1)	3.3 (1.8)	3.6 (2.0)
Number of members	4.8 (2.7)	4.5 (3.7)	5.2 (2.4)	4.3 (2.5)	5.7 (3.2)
Days of illness per adult	30.3 (53.4)	27.0 (35.9)	5.3 (8.1)	14.5 (34.3)	19.4 (36.9)
Years of education (adults ≥ 16 years old)	5.5 (3.6)	4.4 (4.0)	4.1 (3.0)	6.1 (4.4)	5.0 (4.0)
Total income (USD)[a]	18,996 (28,211)	22,029 (20,202)	18,985 (11,773)	20,247 (14,614)	12,780 (9,704)
Total value of livestock (USD)[b]	722 (1,583)	980 (1021)	4,376 (10,774)	5,066 (9,860)	325 (723)
Total land controlled (ha)[c]	49.0 (40.9)	91.0 (49.3)	71.2 (93.1)	125.0 (91.5)	12.9 (12.4)
Total value of transportation assets (USD)	2,848 (8,213)	5,376 (11,728)	1,736 (3,885)	5,250 (13,566)	624 (680)
Percentage of households with:					
Mobile or fixed phone	88	94	71	100	83
Electricity	3	67	64	9	25
Piped water supply	0	0	0	0	36
Private latrine or toilet	22	50	57	50	47
Perceived sufficient income	66	72	71	77	64

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.

b Total livestock value at the time of interview.

c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

In terms of income, households in JARI2 had the highest average income and JARI5 the lowest. Although there was great variation in mean income levels between communities, more than half of households in all five agreed that their incomes had been sufficient to cover basic household needs. Households from the two communities with higher mean incomes (JARI2 and JARI4) controlled larger parcels of land and had more transportation assets.

Figures 5.3 and 5.4 show that households in the five study communities were reliant on different types of income. In JARI2 and JARI3, more than a third of income was derived from crops (JARI2, 43%; and JARI3, 36%). In JARI1, business (30%) and crops (27%) comprised the largest shares. In JARI4 and JARI5, off-farm labor represented the principal income source (43% and 32%, respectively). The high reliance on business income and wage labor reflects smallholders' dual livelihoods between the city and rural area. The 'other income' category included mainly government support through the *Bolsa Família* and *Renda Para Viver Melhor* programs, which was also very important for the study communities, ranging from 11% to 24% of total household income. Livestock income was negligible in all communities. In general, smallholders in the area were not highly reliant on forest income, but they did collect a diversity of products from the forest.

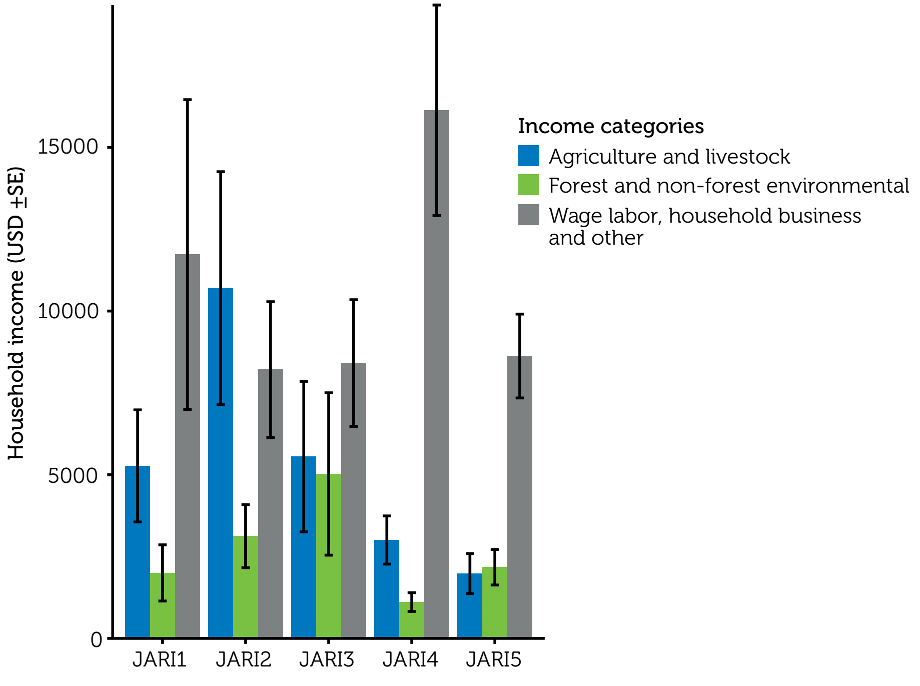

Figure 5.3 Sources of income for average household by community (or village) (+/- SE) (n = 122).

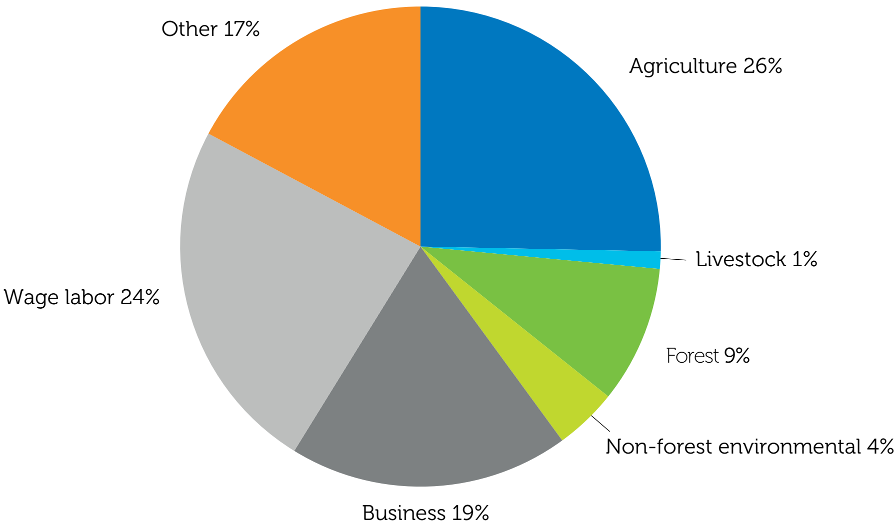

Figure 5.4 Sources of income for all households in sample (n = 122).

Female participants in the women's meetings in all five communities reported that nearly all men and women go to the forest to collect forest products. They reported that women generally collect wild fruits, firewood, vine, charcoal, traditional medicine, organic material, seeds, Brazil nuts and thatch and for hunting and fishing. Men were said to collect similar products in addition to logs and poles. In three communities (JARI1, JARI2 and JARI3), women reported that most men and women go to the forest during the rainy season, especially in May, to collect uxi (*Endopleura uchi* (Huber) Cuatrec.) and piquiá (*Caryocar villosum* (Aubl.) Pers.) fruits. In JARI4, the main season for forest product collection is during the school holidays (July, December and January) when the family can stay in the rural area for a longer period of time. In JARI5, this period coincides with the Brazil nut collection season (January–March).

Table 5.3 summarizes other information about forest dependence among households sampled. Our data show that the collection of forest products was for households' own consumption and sale. The five categories of products collected by the largest percentage of families were fruits (93%), followed by mammals (bushmeat, 76%), firewood (39%), Brazil nuts (36%) and medicinal plants (34%). The main products sold by households were Brazil nuts (21%) and açai (4%).

In terms of forest cover change, during community meetings, smallholders from three communities (JARI1, JARI4 and JARI5) reported a decrease in forest cover in the community in 2010–2012. In all three communities, the main cause was forest clearing for swidden agriculture. In JARI4, there was also a reported increase in clearing forest for cattle ranching. Community meeting participants

Table 5.3 Indicators of household forest dependence based on the 2012 survey.

	JARI1	JARI2	JARI3	JARI4	JARI5
Number of households sampled	32	18	14	22	36
Household average (SD)					
Share of income from forest	5.05 (7.38)	15.17 (19.97)	15.89 (20.13)	10.01 (17.34)	12.66 (18.62)
Share of income from agriculture	29.36 (33.08)	16.09 (97.14)	41.34 (25.74)[h]	19.66 (21.69)	15.70 (24.39)
Area of natural forest cleared (ha)[a]	1.18 (1.82)	0.44 (1.08)	0.26 (0.81)	0.67 (1.36)	0.23 (0.58)
Area of secondary forest cleared (ha)[a]	0.11 (0.44)	0.17 (0.48)	0.55 (0.83)	0.26 (0.59)	0.28 (0.47)
Area left fallow (ha)[b]	2.34 (3.56)	3.61 (3.88)	2.38 (2.27)	1.30 (0.97)	0.72 (0.65)
Distance to forests (minutes walking)	20	30	15	25	60
Percentage of households					
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	44	69	63	37	61
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	12	16	0	8	2
Reporting increased consumption of forest products[e]	13	28	21	10	23
Reporting decreased consumption of forest products[e]	22	33	14	25	20
Obtaining cash income from forest products[f]	22	67	57	45	78
Reporting an increase in cash income from forest[f]	0	17	25	10	32
Reporting a decrease in cash income from forest[f]	29	17	13	10	18
Reporting fuelwood or charcoal as primary cooking source	31	67	36	41	42
Leaving land fallow[g]	38	44	71	45	36
Clearing forest[g]	56	33	64	50	67
Reporting decreased opportunity for clearing forest[g]	66	94	93	77	69
Clearing land for crops[g]	56	33	64	50	61
Clearing land for pasture[g]	0	0	0	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.
h Average calculated after dropping one household with very large negative income share from agriculture.

in JARI3 reported a recent increase in forest cover and in JARI2 that forest cover had not changed. In JARI3, the increase was attributed to amplified enforcement of government restrictions by IBAMA and to the monitoring carried out by Jari Florestal security staff.

With the exception of JARI2, at least half of households in all communities reported clearing forest between 2010 and 2012 for the main purpose of growing crops (Table 5.3). Yet, three communities (JARI1, JARI4 and JARI5) reported that the area under swidden agriculture did not change in this period. Importantly, in JARI1, residents said that the number of families practicing swidden increased, but since they were clearing smaller areas, the overall area under swidden stayed the same. In JARI2, there was a reported increase in the area under swidden, and in JARI3 a decrease mainly due to government restrictions. With the exception of JARI1, in all other communities, the net area of permanent agriculture increased.

5.4 Challenges facing the initiative

The proponents and partners of the initiative, along with local participants, identified a variety of challenges and concerns with implementation of the Jari/Amapá REDD+ Initiative. From Biofílica's point of view, the main challenge is the heavy oscillation of the carbon market (price and demand), which makes it hard to estimate the revenues to be obtained, and likewise, to budget for investments. They relate this oscillation to the lack of stronger national and international policies for REDD+. Biofílica also stressed the complexity of standards and methodologies for estimating emissions reductions and the difficulty of adapting them to local contexts, since they were created in the United States and Europe (personal communication from P Ribeiro, 27 March 2013). For the Fundação Jari, a primary concern is the unclear land tenure situation in the intervention area, which depends on support from the state government to resolve (personal communication from J Almeida, 9 September 2012).

During community meetings, we asked local people about their concerns and recommendations regarding the initiative. Importantly, at the time of our fieldwork, the initiative was in an early implementation stage and proponents had held only one meeting with community members. In JARI3, where the land tenure situation was relatively secure and there was some infrastructure, the primary concern was that the initiative would not actually be implemented and nor would it provide the technical assistance that they needed. In JARI1 and JARI4, local people feared that the initiative would restrict swidden agriculture, that they would lose autonomy and be encouraged to produce products that they could not sell. In JARI5, worries were related to initiative management and benefit sharing. Households felt that the initiative might only benefit the proponent organizations with no benefits allocated to the community members.

They also worried that proponents would not be transparent during initiative implementation and would not inform households about the use of funds gained from their efforts to reduce deforestation. In JARI2, the main worry was that the initiative would cause the households to lose their land.

In fact, in three of the communities (JARI1, JARI2 and JARI4), the main recommendation for the initiative was to first realize land tenure regularization. Other important recommendations focused on improving local production systems through technical assistance, and provision of machinery and inputs. In terms of technical assistance, they highlighted that extension agents must be sensitive to and respect families, that activities should focus on individual family needs and that all steps of the initiative should be widely discussed with them. They also mentioned that for the initiative to work, proponents should invest in the improvement of basic infrastructure, such as roads, transportation and electricity.

Households also recommended that Grupo Jari use its influence on the municipal government to promote construction of a school and health center in the communities. As seen in one woman's statement, the lack of basic infrastructure is an immense challenge for rural families: "For me, it is much better to live on my rural property than [in the city]. If there was a school, I could move [to the community] with my children and be without worries. Today, I would not feel comfortable spending one month there and leaving the children [in the city], because transportation is very difficult" (woman, 9 August 2012).

While some households believed in the positive influence of the proponents, others were more distrustful, as seen by the following two statements: "If Grupo Orsa (Grupo Jari) wanted to help, they would already have done that. They have forestry engineers, rural technicians, they have everything" (man, 10 August 2012). "Grupo Orsa (Grupo Jari) is here with IMAP, giving fines (…). It would be easier if they helped the families" (man, 10 August 2012). Also, during the initial presentation of the initiative by Biofílica and Fundação Jari to the communities, the daughter of one rural producer said, "See the contradiction, the company from São Paulo (Biofílica) and the Fundação Jari come here to discuss a project that depends on the land tenure that Orsa (Grupo Jari) does not want to clarify" (woman, 11 July 2012).

As mentioned by many households, there is an urgent need for clarification of land tenure in the intervention area. Nearly half of the households (43%) reported feeling insecure about their land rights, mainly due to the lack of land titles and competing claims with Grupo Jari. Families also mentioned their insecurity regarding the presence of the Jari Florestal security agents who monitored their lands and reported them to IBAMA when they cleared forest. Additionally, smallholders reported that many people who settled on Grupo Jari company lands in Pará had been forcibly expelled from their lands, and they feared that the same would happen to them. Even though the company claims to be the owner of about 10,000 km^2, some smallholders contest that they are settled on public lands for which the state government provided land titles in 2006, but that these were not considered valid by Grupo Jari.

5.5 Lessons from the initiative

From a technical perspective, the Jari/Amapá REDD+ Initiative has a well-developed carbon baseline and system of monitoring and reporting carbon emissions. In terms of social co-benefits, since 2013, Fundação Jari has begun to educate local people about the initiative, and to construct community and household property management plans to allow the provision of targeted technical assistance. The creation of the REDD+ Thematic Chamber was an important advance in promoting discussions about the initiative with a diverse group of stakeholders. From an equity perspective, however, local households were not involved in designing the initiative, and their insecurities related to land tenure and monitoring by Jari Florestal highlight clear historical power differences that have continued to the present day.

Undoubtedly, the greatest challenge facing this initiative is the local land tenure situation, which has been ambiguous since José Julio Andrade's first acquisition of land in the Jari Valley. During this acquisition and subsequent transactions with new owners, traditional land rights of smallholders in the area were ignored. Many families were expelled from their lands when Jari Celulose decided to expand its activities and newcomers were prevented from settling, which explains the ongoing insecurity felt by many community members in relation to the REDD+ initiative. Although the proponents reported that they intend to resolve this situation through the exchange of private and public lands, Grupo Jari and the state must arrive at a new agreement for the development of the smallholders' land regularization process. Despite the lack of land tenure clarity, Grupo Jari received large amounts of credit from the national government to invest in the cellulose industry, and the REDD+ intervention area was certified by VCS and FSC.

While this unclear tenure situation has not posed problems for Grupo Jari in terms of certifying forest production and obtaining credit, it prevents smallholders in the area from accessing credit and basic government infrastructure and from obtaining environmental permits for their productive activities. This is the reason that families' main recommendations for the initiative focused on land tenure regularization and subsequent access to infrastructure, since the state will not invest in public infrastructure on private lands. In addition, many families decided not to participate in the initiative when they realized that it would focus mainly on technical assistance, which they felt would not resolve the underlying structural problems that needed to be addressed to improve local well-being. That said, families from JARI5 have been working to restructure their community association and engage with the national agency of land tenure regularization (INCRA) to create an official land reform settlement.

Even though Biofílica chose the Jari site specifically because of the company's clear title to the land, in practice, conflict over tenure is a barrier to the fair distribution of REDD+ benefits at this site, as in other REDD+ initiatives around the Amazon. Follow-up research at this site will need to investigate if indeed the REDD+ initiative can regularize smallholder land tenure, enabling the development of basic infrastructure, smallholder permanence on the land and well-being, or if the initiative will only be able to produce carbon credits.

5.6 Acknowledgments

We are grateful to the households of Jari Valley for their friendliness, hospitality and patience in answering our endless questionnaires and to Biofílica, Fundação Jari and Jari Florestal for sharing their REDD+ initiative information with us. We are also thankful to the members of our field team. Cley and Dadá shared their knowledge of the region and transported us safely. Carlos Henrique Menezes da Silva, Denise Reis do Nascimento and Eliude de Jesus Brito Lopes provided outstanding collaboration as enumerators and data encoders.

Chapter 6

Sustainable Landscapes Pilot Program in São Félix do Xingu, Brazil

Maria Fernanda Gebara

São Félix do Xingu (SFX) is one of the largest municipalities in the world and has historically been a major contributor to deforestation in the Brazilian Amazon. The Sustainable Landscapes Pilot Program[1] (or simply, the pilot program) being implemented by TNC in SFX supports REDD+ efforts by addressing the major underlying causes of deforestation in the municipality. With a focus on sustainable land-use alternatives for rural economic development, the initiative aims to involve different local actors (local organizations, government agencies, smallholders, medium-and large-scale farmers, and indigenous people) to create a politically and economically favorable scenario for reducing deforestation. This diversity of actors is the distinctive characteristic of the initiative; it is also one of its main challenges. This chapter shows how REDD+ plays out in a jurisdiction with a wide range of diverse actors and the role that smallholders play in this context. The diversity

1 The Sustainable Landscapes Pilot Program was formerly called the Central Xingu REDD+ Pilot Program. Due to local actors' difficulties in understanding REDD+ and uncertainties regarding REDD+ at the international level, TNC decided to change the name.

of actors required the initiative to adopt a mix of different strategies to reduce deforestation. Developing the right mix required consideration of the relevant institutions, interests, ideas and information – the 4Is framework, as defined by Brockhaus and Angelsen (2012). The case also shows that even when benefits reflect local demands, they may not be sufficient to achieve transformational change. This requires an enabling 'policyscape,' defined as the spatial expression of a policy mix (Barton et al. 2013) that includes 'command and control,' economic incentives and information sharing (Vatn 2005). Finally, the initiative clearly demonstrates how REDD+ is being adapted to reflect potential conservation and development synergies on a large scale, suggesting that strategies with broader and multilevel goals beyond solely mitigation of climate change and results-based funding are shaping what comes after REDD+.

6.1 Basic facts: Where, who, why and when

6.1.1 Geography

At the epicenter of Brazil's expanding agricultural frontier, the state of Pará is struggling to balance the demand for agricultural commodities with environmental and cultural conservation. Historically, economic development has taken place at the expense of conservation, leading to one of the highest deforestation rates in Brazil, largely due to colonization, land title falsification and speculation, cattle ranching, and soy and subsistence agriculture. Located in the southeastern portion of the state of Pará, the municipality of SFX is one of the top deforesters in the Amazon and has been included on the Ministry of Environment's blacklist, making it subject to increased enforcement efforts and cross-compliance measures (e.g. restricted market access).

The geographic area for the pilot program corresponds to the municipal area (Figure 6.1). This intervention area was selected for various reasons. First, it still has large areas of standing forest that should be protected, and has a history of high rates of deforestation. Second, it is like a microcosm of the Amazon, with all major types of land ownership (federal conservation units, indigenous lands with federal protection, state protected areas and private lands), land uses and actors, allowing TNC to gain experience with all of these while working at the landscape level. Third, it has a high diversity of ecosystem services. Finally, it is supported by the local government and there are civil society organizations present in the area that could lead different aspects of the initiative (TNC 2013a).

SFX is the second largest municipality in Brazil and holds the largest cattle herd, with over two million head, compared to 91,340 people (50% urban) (IBGE 2010). Beef cattle ranching is the main economic activity in the municipality, due to its high profitability, secure and immediate financial returns, minimal labor and input requirements, and the product's ability to walk to market

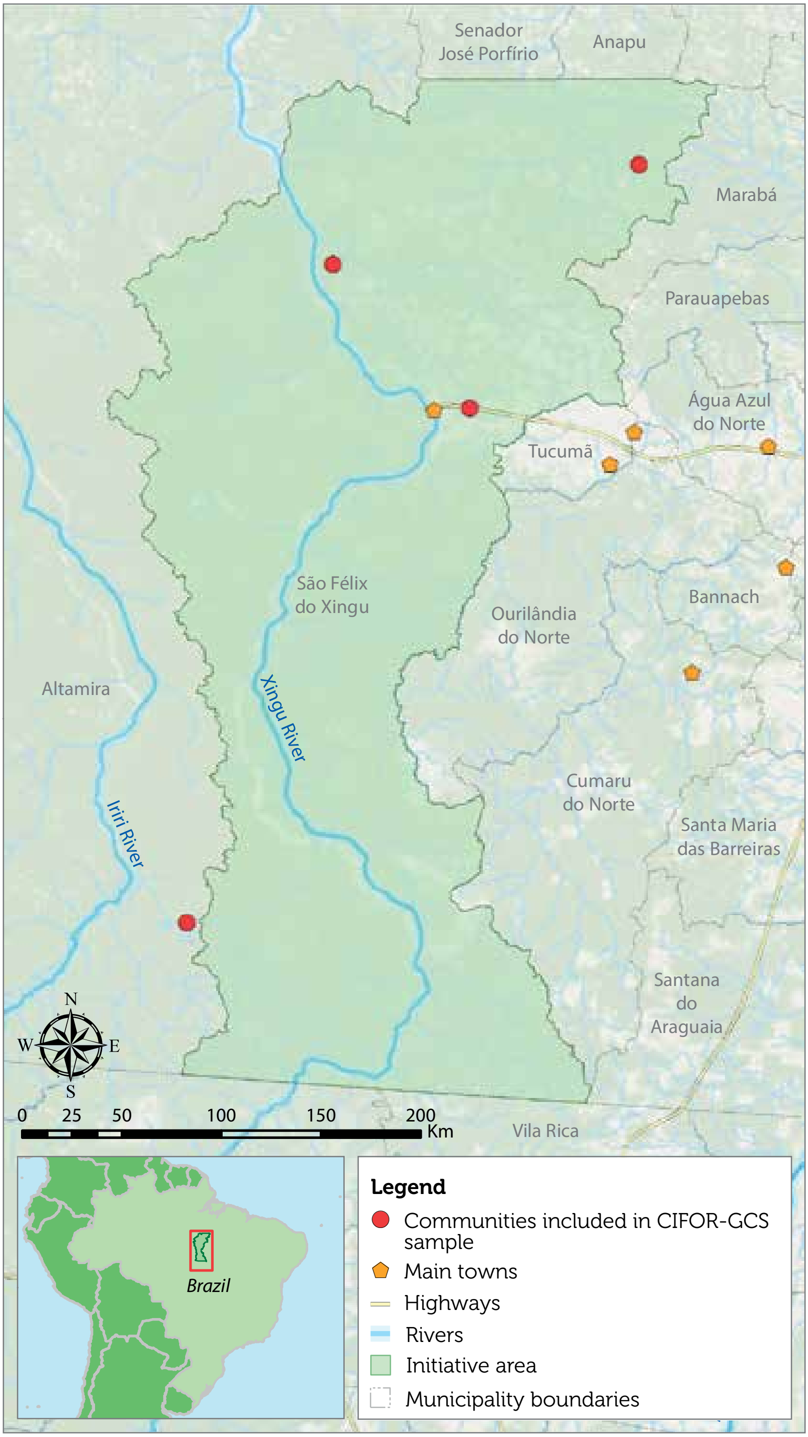

Figure 6.1 Map of the REDD+ initiative in SFX.

Data sources: Instituto Brasileiro de Geografia e Estatística, GADM and World Ocean Base.

Table 6.1 Primary forest threats in different areas of SFX.

Area	Main pressures
Triunfo do Xingu Environmental Protected Area (APA Triunfo do Xingu)	Land grabbing, ranching and small-scale agriculture
Private areas	Ranching and small-scale agriculture
Indigenous lands	Illegal logging, invasions and illegal ranching
Conservation units	Illegal logging, invasions and illegal ranching
Land reform settlements	Ranching, small-scale agriculture and illegal logging

(i.e. no transportation costs). Other products cannot be sold easily outside the municipality, due to limited infrastructure and poor quality roads. Other important activities that drive the local economy are: mining, logging and cocoa production. The main causes of deforestation are: pasture expansion; fires (due to techniques used to manage pastures and the strong dry season); land speculation; illegal logging; illegal roads (Phillips 2007); and mining. The primary threats to forest under different tenure arrangements, as perceived by the proponent at the outset of the initiative, are summarized in Table 6.1.

SFX is also known for having high levels of illegal slavery (or bonded labor) among rural laborers. The municipality has one of the highest incidences of slave labor and exploitation of workers in subhuman conditions in Brazil (GPTEC/UFRJ 2011). The most disadvantaged actors in the area are smallholders, indigenous people and youth.

6.1.2 Stakeholders and funding

The pilot program is led by TNC, in partnership with SEMA for the state of Pará, the SFX Municipal Secretariat of Environment (SEMMA) and the Alto Xingu Association for Agriculture Development (ADAFAX) in collaboration with various state and local partners. As there are different local actors (civil society, government, grassroots communities) involved in the design and implementation of the initiative, it has a higher chance of reaching its goals, as it facilitates coordination of different interests and actors. On the other hand, it also creates large transaction costs that could limit its success.

The primary sources of start-up funding for the initiative were the Vale Fund, Bank of America and the Amazon Fund. Other sources of funding include USAID, the Norwegian International Climate and Forest Initiative, the British Embassy, the Anne Ray Charitable Trust and the Moore Foundation. Because of the perceived risks of relying on voluntary carbon markets for financing, the proponents decided to only sell credits in a regulated market under the UNFCCC. For this reason, they do not plan to certify the initiative under any

Livestock at Santa Bárbara Farm (the biggest farm in SFX). (Rodrigo Calvet)

voluntary market scheme such as VCS. Instead, they aim to obtain additional financing through economic instruments adopted by the Brazilian Government under its REDD+ strategy (still under development).

6.1.3 Motivation

Federal, state, and local governments have historically incentivized deforestation in the state of Pará by promoting activities that are the driving forces behind forest loss (Barreto et al. 2005; Ferreira et al. 2005). However, since 2004, the federal government has also made reducing deforestation a policy priority. As a result, Pará and the municipality of SFX have been under considerable pressure to reduce deforestation. The policy mix to achieve this goal includes measures such as: (i) the *Programa Municípios Verdes* (Green Municipalities Program) and (ii) the Municipal Embargo.

Municípios Verdes was launched in 2011 and, according to the Governor of Pará, it helped reduce deforestation levels from 6000 km^2 to 3000 km^2 in its first year (Pará 2012). One requirement for municipalities to participate in the program is to create a pact for achieving zero illegal deforestation by 2020. SFX's local government signed the municipal pact with diverse local representatives and producer associations in 2011. It also established a commission under the pact to serve as a forum for inclusive environmental governance. The involvement of smallholders in the commission has been a crucial step, given their exclusion from previous political processes (Schneider et al. 2013). The commission's goal is to define a long-term agenda to sustain anti-deforestation efforts in the municipality. However, it lacks a clear decision-making process and financial resources, given that it currently relies on funding provided by TNC.

The most effective action for reducing deforestation in SFX has been the federal blacklist for embargoed municipalities. Since 2001, SFX has topped the list of municipalities in the Brazilian Amazon for rates of deforestation, and in 2008 it was included in the Ministry of Environment's blacklist of embargoed municipalities. Since then, all farmers in the municipality have faced restricted access to credit and other sanctions. According to the former municipal Secretary of the Environment, these sanctions include constant monitoring and inspection of land-use operations, increased enforcement, and restrictions on issuing licenses for activities with environmental impacts. The consequences of being blacklisted were quickly felt in the municipality as expansion of cattle pastures nearly came to a halt and deforestation fell significantly.

To be removed from the blacklist, municipalities are required to reduce their rates of deforestation and register 80% of private properties in the CAR system, which includes geo-referenced property information, serves as a first step towards clarifying tenure and allows landholders to access subsidized credit. The embargo led to implementation of the CAR system in SFX, with support from TNC. More than 80% of private properties have been registered. Another outcome of the embargo was that the national government was able to share responsibility for reducing deforestation with the municipal government and private actors, which was crucial to improving governance and reducing deforestation. In 2012 and 2013, deforestation rates started to rise again (PRODES/INPE 2014) suggesting that other measures may be needed to reach a zero deforestation goal over the long term.

TNC was the first organization to involve local actors in SFX in actions related to REDD+. Beginning in 2009, the pilot program focused on financial and technical support for CAR implementation. Due to the lack of state resources and institutional capacity for CAR implementation, TNC supported the process with a USD 19 million grant from the Amazon Fund (distributed among 12 Amazonian municipalities), and financial resources from USAID and the Vale Fund.

Analysis by TNC (Balieiro 2013) showed that deforestation in 2011 and 2012 increased in areas registered in CAR and in land reform settlements. Just 9% (2011) and 0.6% (2012) of deforestation occurred on indigenous lands and no deforestation happened inside conservation units. This reflects a recent pattern in the state of Pará where deforestation has been particularly high in land reform settlements (Brandão et al. 2013). Many of these settlements were established by the government in the 1970s and 1980s and are now abandoned; smallholders live there largely without government support. Laws against deforestation are difficult to enforce in these areas, because INCRA (a federal government agency) owns the land, rather than individual households. Moreover, local actors do not have any sort of incentive to change their land use. They feel helpless and blame the national government and INCRA for not helping them develop land-use alternatives and land management plans.

Deforestation in the settlements is a result of smallholder livelihood strategies, with higher deforestation in areas where cattle ranching is the primary land use (Pacheco 2009). Thus, improvement in tenure security alone, as provided by registration in CAR, will not assure conservation by smallholders (Gould 2006; Robinson et al. 2011). In fact, deforestation may initially increase when land rights are secured, since subsidized credit for ranching is liberated for properties in CAR. A recent study concluded that CAR alone was ineffective in reducing deforestation in Mato Grosso and Pará from 2008 to 2012 (Azevedo et al. 2014). In this sense, it is important to combine CAR registration with other incentives for landowners to meet environmental criteria. For instance, given the importance of cattle ranching in the local economy, TNC is promoting both improved pasture management and alternatives to draw people out of cattle ranching.

6.1.4 Timeline

The initiative has evolved since its conception, changing its name and intervention area more than once. According to TNC, the REDD+ nomenclature was misunderstood at the local level. For small farmers, the market-based connotation of REDD+ was of little interest; for large producers it seemed like an opportunity for profit; and for indigenous groups it tapped into anti-REDD+ sentiments. Because of these misunderstandings, TNC eliminated the term 'REDD+' from the name of the initiative even though actions to reduce deforestation remain at its core. Figure 6.2 summarizes the main events and interventions of the initiative to date.

6.2 Strategy for the initiative

The pilot program combines command-and-control, economic incentives and information-sharing strategies. The specific strategies are land-use zoning; improved enforcement and compliance with environmental legislation; sustainable finance and management for indigenous and protected areas; sustainable production alternatives for local actors; technical assistance and promotion of alternative livelihoods; restoration of degraded lands; enhanced participation of vulnerable groups in REDD+ related decision making; economic opportunities; and shared lessons (Table 6.2).

These strategies were designed to support local actors, especially smallholders, in the transition towards a low-carbon economy. As argued by Schneider et al. (2013),

Pre-2000					
2000					
2001					
2002					
2003					
2004					
2005					
2006					
2007					
2008	Study to evaluate REDD+ potential in the area				
2009	First meeting to start dialogue with local actors	Start of initiative	Efforts to implement CAR begin		
2010	Workshop about REDD+	Support for APA do Xingu activities	CIFOR-GCS baseline survey	*Fronteiras Florestais* project begins	
2011	CIFOR-GCS presents baseline results to study communities	Support for creation of municipal commission and implementation of municipal pact	Xingu *Ambiente Sustentável* project begins	The European Commission and Ministry of Environment initiative to reduce deforestation begins	
2012	Restoration of permanent protected areas begins	Implementation of cocoa socio-environmental certification project begins	Meetings to create the Terra Verde Fund		
2013	Restoration of degraded areas begins	Terra Verde Fund created	Begin supporting intensification of small scale ranching, best practices for agricultural production, and diversification	Itinerant courses on REDD+	Regional workshops informing about new forest law
2014	CIFOR-GCS phase 2 survey	Support for land titling activities			

REDD+ initiative active

Figure 6.2 Timeline of the REDD+ initiative in SFX.

many smallholders have the will to reduce deforestation but they lack the technical and financial means to make the transition from extensive cattle production. To reduce deforestation, they need technical support to adopt agricultural practices that are more profitable on smaller areas of land, including alternative commodities. While the focus of the pilot program is to reduce deforestation and forest degradation, co-benefits of the initiative include reduction in poverty and social inequality, along with enhanced environmental governance.

Table 6.2 The Sustainable Landscapes Pilot Program strategies, 2013–2017 (TNC 2013a).

Strategy	Actions
Environmental and territorial management and governance	• Register at least 95% of private lands in the state system for monitoring, creating maps and diagnostics for each property, indicating zones of permanent protected areas, legal reserves and production areas. • Strengthen commission to implement the municipal pact and ensure representation of all relevant stakeholders by facilitating linkages with state and national political agendas. • Create a management plan for the APA Triunfo do Xingu and an environmental management plan for the indigenous land Trincheira Bacajá. • Support construction of a rural development plan that integrates all levels of territorial management. • Support development of environmental management plans on indigenous lands.
Environmental conservation	• Stop illegal logging on private lands and conserve 56,000 ha of forest, avoiding the emission of approximately 179 million tCO_2e. • Reduce illegal deforestation by at least 80% of its historical rate on indigenous lands and in federal conservation units. • Restore 50% of legal reserves and permanent protection areas.
Better practices	• Improve livestock and agriculture practices on 25% of properties within the pilot program area. • Increase sustainable forestry production and management opportunities through implementation of a demonstration project. • Disseminate best practices for cocoa production with 50% of producers, allowing for forest restoration in places where environmental legislation prohibits more deforestation.
Economic opportunities	• Improve livelihood opportunities in indigenous territories. • Maintain or increase income of families participating in the pilot program by expanding the opportunities for production and marketing agricultural products.
Increase access to financing	• Increase access to financial resources through existing lines of credit for low-carbon and sustainable production agriculture. • Establish fund for the pilot program with a participatory governance structure that channels a package of incentives to local actors.
Dissemination of lessons and results	• Document experiences and disseminate widely to inform the implementation of green development and REDD+ at state and national levels, as well as globally. • Facilitate reproduction of key pilot program elements through the *Municípios Verdes* program.

One important recent achievement in June 2014 was the launch of the Terra Verde Fund, which will channel support for sustainable production and REDD+, with increased autonomy for local actors (TNC 2013b). The fund is intended to provide a less bureaucratic and more decentralized process for accessing resources, when compared to existing state and national mechanisms, such as the Amazon Fund. It was created by TNC and the Brazilian Biodiversity Fund (Funbio) through a participatory and inclusive approach in 2012–2013 and will be managed by local organizations. In the stakeholder meetings, local actors expressed the importance of meeting social, economic and structural needs through differentiated benefits in line with the already established municipal pact for reducing deforestation. The pact commits the local government to fulfilling its obligations by granting licenses, providing technical assistance, facilitating the land tenure clarification process, increasing access to credit and providing infrastructure. Simultaneously, it commits rural producers to comply with environmental regulations and to adopt sustainable models of production. The Terra Verde Fund is expected to provide financial support for achieving these goals, while the pact acts as an informal local contract.

It is important to note that both performance-based and up-front benefits are part of the pilot program. CAR, for example, is an up-front benefit that positions actors to receive performance-based benefits, such as access to the Terra Verde Fund and technical assistance for implementation of best management practices. Performance-based benefits will be based on progress in reducing emissions (Griscom and Cortez 2011). The proponents are still deciding whether to offer PES as a positive incentive, since opportunity costs are high in the area, and they want to prioritize benefits that help local actors make the transition to a low-carbon economy.

TNC is still collecting data and producing a forestry inventory to define reference levels for the area. Griscom and Kerkering (2010) estimated that 34.6 million tCO_2e were emitted from deforestation and degradation each year from over 16 million ha of forests within the SFX accounting area. The majority of these emissions (~90%) were from deforestation, and the remaining 10% from forest degradation, largely due to logging. As much as 80% of annual emissions from deforestation and degradation came from the 9 million ha that constitute the northern region of SFX. In this region, deforestation is highest (3.8%) in land reform settlements and second highest on private lands (3.2%). Deforestation was relatively low in conservation units (0.18%); the lowest rates of deforestation occurred on indigenous lands (0.06%).

6.3 Smallholders in the initiative

In four selected intervention communities, CIFOR-GCS surveyed a random sample of 124 families, including at least 30 in each community, or 13%–69% of the community populations. Information on community characteristics was also collected (Tables 6.3, 6.4 and 6.5). All interviews were conducted between September and October 2010.

Most people living in the sample communities[2] came from other regions of Brazil, especially the central and southern parts of the country. Rising land prices in southern Brazil (relative to the north) were one catalyst for this migration. Because of this occupation process, land conflicts are an intrinsic characteristic of the area. Land tenure was considered secure in SFX2 and SFX3, as they are located in land reform settlement areas. Residents of the other two communities

Table 6.3 Characteristics of the four communities studied based on the 2010 survey.

	SFX1	SFX2	SFX3	SFX4
Basic characteristics				
Total number of households	45	226	166	200
Total land area (ha)	5,000	12,650	9,300	500,000
Total forest area (ha)	1,000	7,500	4,650	325,000
Year founded	1975	1998	2000	1989
Access to infrastructure				
Primary school	No	Yes	Yes	Yes
Secondary school	No	No	No	No
Health center	No	No	No	No
Road usable by four-wheel drive vehicles in all seasons	Yes	Yes	Yes	Yes
Bank or other source of formal credit	No	No	No	No
Distance to closest market by most common means of transport (km/min)	25/65	50/120	20/45	180/420
Previous experience with conservation NGO	Yes	Yes	Yes	Yes
Agriculture				
Main agricultural commodity	Cocoa (38%) and cassava flour (17%)	Cocoa (63%) and banana (15%)	Cocoa (28%) and orange (19%)	Banana (19%) and green onion (18%)
Crop with highest production value per household on average	Cocoa and cassava flour	Cocoa and banana	Cocoa and orange	Banana and green onion
Price of a hectare of good quality agricultural land (USD)	1,000	1,000	1,200	500

2 The local term for communities is *comunidades*.

reported feelings of insecurity as they were informally settled on public lands without any land documentation (Duchelle et al. 2014).

The main reported causes of deforestation and degradation in the communities were: large-scale ranching (SFX1), small-scale traditional agriculture (all communities), small- and medium-scale ranching (SFX2, SFX3 and SFX4), small-scale illegal logging (SFX2, SFX3 and SFX4) and subsistence fuelwood collection/charcoal production (SFX1). Local land-use and livelihood dynamics reflected a high reliance on livestock (especially cattle ranching) and agricultural production (Figures 6.3 and 6.4), which motivates promotion of better cattle ranching practices as an initiative strategy. Cattle ranching generates employment, and wage labor is a significant source of household income. Another important source of income is the *Bolsa Família* (family stipend) program, which has been credited with alleviating absolute poverty in Brazil; it is also blamed for the spread of clientelism and patronage and the growing dependence of Brazil's poor on income transfers rather than on productive employment (Hall 2012).

Average annual household income in the communities was between USD 10,184 and USD 11,835 (Table 6.4), and most households considered their income to be sufficient for their needs (Table 6.4). In the two years before the survey, the number of households practicing permanent agriculture increased, while the number practicing swidden agriculture and the area used for swidden agriculture decreased in three out of four communities, due to stricter environmental regulations.

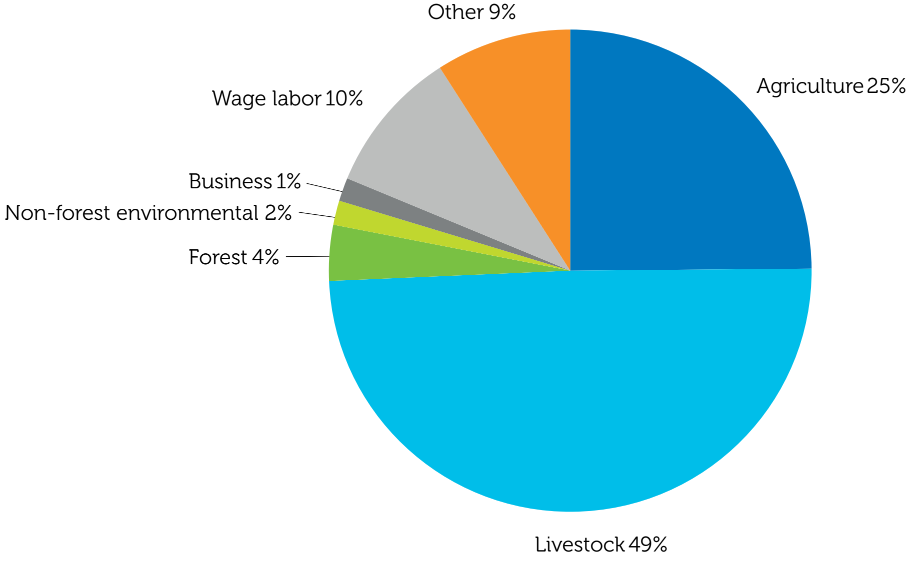

Figure 6.3 Sources of income for all households in sample (n = 124).

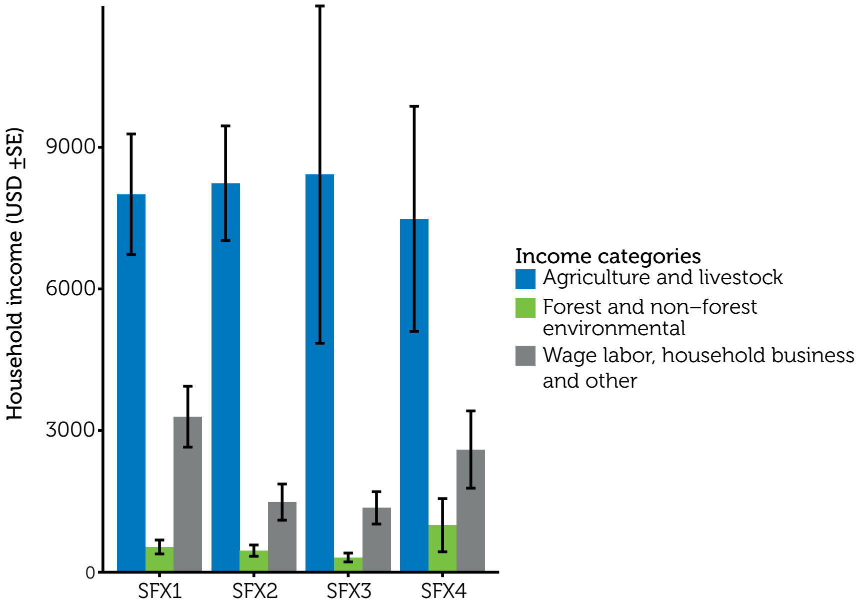

Figure 6.4 Sources of income for average household by community (or village) (+/- SE) (n = 124).

In all of the study communities, respondents in community meetings indicated that production of cocoa had increased over the two years prior to the survey. Reasons cited by respondents included farmers' need to diversify agricultural production and the high income earned from cocoa. Local associations and NGOs have promoted this expansion of cocoa production, because it is produced in an agroforestry system and because it has the potential to be more profitable than cattle. Indeed, cocoa production is now the main alternative to cattle ranching in the municipality, with a recent price increase and TNC support for implementation of best management practices (O Globo 2014).

Households did not rely heavily on the forest and environment as an income source in any of the communities (Figures 6.3 and 6.4; Table 6.5). Households reported using forests mainly for collection of wild fruits (SFX1 and SFX4), poles and thatch (SFX2), logging (SFX2) and hunting (SFX2, SFX3 and SFX4), with the first two sets of products collected mostly by women and the last two by men. None of the households received forest-related PES.

Community members are normally organized in a local association and choose leaders by consensus to represent them in important meetings outside the communities. Some of them are also part of other local organizations, including religious organizations, cooperatives, and labor and rancher unions. The participation of smallholders in these networks and unions encourages them to

Table 6.4 Socioeconomic characteristics of households interviewed in 2010.

	SFX1	SFX2	SFX3	SFX4
Number of households sampled	31	30	31	32
Household average (SD)				
Number of adults	3.0 (1.4)	2.0 (0.6)	2.4 (1.2)	2.5 (1.3)
Number of members	4.3 (2.1)	3.5 (1.7)	3.8 (1.6)	3.7 (2.1)
Days of illness per adult	24.0 (38.5)	9.8 (15.1)	13.0 (16.6)	23.7 (42.5)
Years of education (adults ≥ 16 years old)	4.3 (3.3)	3.7 (2.6)	3.2 (2.6)	3.9 (3.4)
Total income (USD)[a]	11,835 (7,808)	10,184 (6,731)	10,098 (20,108)	11,081 (15,657)
Total value of livestock (USD)[b]	26,200 (25,068)	18,036 (12,685)	16,362 (22,280)	14,799 (22,390)
Total land controlled (ha)[c]	62.1 (46.8)	56.1 (16.4)	52.4 (14.5)	121.4 (108.0)
Total value of transportation assets (USD)	3,203 (6,284)	3,034 (5,556)	2,164 (4,138)	3,810 (7,063)
Percentage of households with:				
Mobile or fixed phone	65	0	6	6
Electricity	48	50	13	31
Piped water supply	3	10	0	0
Private latrine or toilet	71	53	35	41
Perceived sufficient income	77	77	77	63

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.

b Total livestock value at the time of interview.

c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

have environmental awareness (Schneider et al. 2013). The role of women is still to be strengthened. Most women in the sample communities felt they were not well represented in decision-making processes concerning the community because of women' s lack of interest and time spent on household activities. TNC aims to develop strategies for women's empowerment, such as facilitation, promotion and articulation in the municipal commission and in local decision-making.

Smallholders are key to reducing deforestation rates in SFX. Those living in land reform settlements (SFX2 and SFX3) are responsible for high rates of deforestation and lack incentives and enforcement measures to change their land-use practices. Together with large-scale farmers, they are the group that is expected to make the greatest contribution to reduced carbon emissions by changing their land or forest use. The mix of strategies designed by the pilot program reflects the diversity of smallholder needs that must be met in order for them to change their land- and forest-use practices. Examples include the dissemination of better practices for cattle ranching, promoting more permanent agriculture (i.e. cocoa production) and facilitating environmental compliance through CAR implementation and restoration activities. Because these benefits focus on 'asset building' (Pirard and Treyer 2010), their performance is more challenging to measure than that of 'use restricting' benefits.

Table 6.5 Indicators of household forest dependence based on the 2010 survey.

	SFX1	SFX2	SFX3	SFX4
Number of households sampled	31	30	31	32
Household average (SD)				
Share of income from forest	5.23 (11.30)	2.33 (4.98)	4.23 (16.06)	6.27 (14.18)
Share of income from agriculture	61.44 (32.81)	69.96 (32.09)	69.29 (33.45)	72.34 (66.94)
Area of natural forest cleared (ha)[a]	0.39 (1.44)	3.28 (4.04)	1.49 (2.07)	5.22 (9.35)
Area of secondary forest cleared (ha)[a]	0.87 (2.15)	0.43 (1.39)	0.20 (0.54)	0.59 (1.98)
Area left fallow (ha)[b]	5.48 (4.64)	5.88 (3.59)	2.6 (1.16)	4.67 (4.09)
Distance to forests (minutes walking)	15	5	30	25
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	64	70	73	64
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	0	2	0	0
Reporting increased consumption of forest products[e]	8	0	0	10
Reporting decreased consumption of forest products[e]	38	16	22	52

continued on next page

Table 6.5 (continued)

Obtaining cash income from forest products[f]	6	10	3	3
Reporting an increase in cash income from forest[f]	0	0	0	0
Reporting a decrease in cash income from forest[f]	50	33	0	100
Reporting fuelwood or charcoal as primary cooking source	77	90	84	84
Leaving land fallow[g]	52	27	23	28
Clearing forest[g]	35	70	61	63
Reporting decreased opportunity for clearing forest[g]	77	90	87	84
Clearing land for crops[g]	32	43	61	56
Clearing land for pasture[g]	3	27	0	13

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

6.4 Challenges facing the initiative

According to the proponent, a mix of measures to reduce deforestation – beyond command and control – is important in SFX given the diversity of actors involved. Yet this creates the challenge of coordinating these different measures, tailored to motivate different actors to change their BAU land-use practices. The Terra Verde Fund is designed to address this challenge by supporting a multidimensional approach to benefit-sharing, instead of a one-size-fits-all approach (see Gebara 2013).

Based on experience with the municipal pact, TNC believes that the greatest challenge facing the initiative is land tenure clarification, since this depends on the will of government agencies. Tenure clarification has been considered key to implementation of both regulatory and incentive-based REDD+ mechanisms (Duchelle et al. 2014), and is central to many discourses about

REDD+, e.g. ‘tenure first then REDD+ second’; ‘no rights, no REDD+’ (Brockhaus and Angelsen 2012). In the case of SFX, however, land tenure clarification may inadvertently support ranching and other activities that drive deforestation by offering access to benefits that require land titles, such as public subsidies for ranching and agriculture.

The SFX initiative also faces challenges that are common to many REDD+ initiatives, such as the lack of state and municipal policies to specifically regulate REDD+, corruption and limited governance capacity.

6.5 Lessons from the initiative

This initiative provides insight on the trade-offs involved in engaging diverse local stakeholders, including smallholders. Relying on existing institutions to engage stakeholders in REDD+ initiatives can increase legitimacy. However, existing institutions often need to be adapted or strengthened in order to be effective. To overcome path dependency and ‘stickiness’ (Baumgartner et al. 2011), the creation of new institutions and the introduction of new actors, such as TNC, can also help (Brockhaus and Angelsen 2012). Local actors should be engaged early on and eventually lead the process in order to mobilize broad support. However, effective engagement of local actors is a costly and time-consuming endeavor and requires strong partnerships to be implemented successfully.

An enabling policyscape that includes a mix of regulatory, economic and informational measures greatly facilitates buy-in from local actors, including their agreement on a common objective. With this agreement, actors may work together successfully despite past or current conflicts. Diverse stakeholders with conflicting interests require diverse incentives. Therefore, there should be an early focus on what types of benefits motivate which actors (Gebara 2013). Promoting sustainable landscapes and low-carbon strategies comes with the challenge of offering sufficiently large portfolios of technological alternatives, allowing smallholders to choose from diverse livelihood strategies within the same intervention.

The ‘asset-building’ strategy and investment in sustainable land uses may be the most appropriate approaches to move a region onto a sustained low-carbon development path. However, it is more difficult to monitor and control performance in these approaches compared to a single-use restricting payment scheme. For example, the proponents must ensure that actors who benefit from different strategies are those who actually stop deforesting. Experience with CAR in SFX highlights the possibility that benefits might inadvertently result in increased forest clearing. While CAR enables improved environmental monitoring, it also allows access to subsidized credit for cattle ranching. In SFX, the proponents have responded to this concern by disseminating information about 'low-carbon credit,' such as through the federal program for low-carbon agriculture (ABC program).

TNC believes that despite the challenges of working at a large scale, critical on-the-ground problems are linked to a wider context that encompasses different actors, interests and jurisdictions, and thus a large-scale approach is necessary to achieve transformational change through REDD+. Given that the REDD+ arena is characterized by a multitude of actors at different levels that operate within existing institutions, interests and ideas (Brockhaus and Angelsen 2012), such an approach makes sense to generate lessons and overcome complex challenges.

Finally, the SFX initiative shows that REDD+ is losing some of the initial characteristics that made it such a novelty, as argued by Angelsen and McNeil (2012). The initiative is now targeting broader and multilevel goals, rather than focusing exclusively on climate change mitigation and results-based funding for reduced deforestation. This mitigates the risk of losing financial support if carbon funds do not materialize. While such broader strategies can be advantageous, broadening the focus too much can present a barrier to adopting the performance-based measures that were originally at the heart of REDD+ (Sunderlin et al. 2014). The enabling policyscape for REDD+ needs to be shaped by strong measures, such as fundamental policy reforms, to remove the incentives that drive deforestation. This will allow transformational change that will outlast REDD+.

6.6 Acknowledgments

I am deeply grateful to the families of SFX and surrounding areas for their patience and generosity while sharing their time and knowledge. Local organizations, especially ADAFAX and SEMMAs, also played a key role in enabling this research. Angelica Toniolo, Rane Cortez and Edenise Garcia, together with other members from TNC, were crucial and always accessible in sharing their knowledge and their experiences with the initiative. Finally, special thanks to the 2010 field research surpervisors: Gisele Aparecida Monteiro and Leonela Guimaraes, and to the members of the field team for their outstanding contribution: Rosiany Miranda, Edson Silva, Tatiana Izidoro, Hanoica Caceres and Izabel Marinho.

Chapter 7

Sustainable Settlements in the Amazon, Brazil

Marina Cromberg, Amy E Duchelle, Gabriela Simonet and Alexandra Coraça de Freitas

Sustainable Settlements in the Amazon[1] is an initiative led by the Amazon Environmental Research Institute (IPAM), which aims to pilot a model for smallholder production with low carbon emissions. IPAM's stated goal is "to increase the profitability of areas already deforested to reduce the need for farmers to open new forest areas" (IPAM n.d.). In 2009, when the initiative was first designed and proposed to the Amazon Fund,[2] it targeted 350 families who lived along the Transamazon Highway and who had previously participated in a government program called *Proambiente*.[3] At the end of 2010, the initiative was

1 The complete initiative name is Sustainable Settlements in the Amazon: The challenge of family production in a low carbon economy, or in Portuguese *Assentamentos Sustentáveis na Amazônia: o desafio da produção familiar em uma economia de baixo carbono* (PAS). The first proposal that was submitted to the Brazilian National Development Bank (BNDES) was entitled *Desmatamento evitado em pequenas propriedade na região da rodovia Transamazônica*.

2 The Amazon Fund (see Box D) is managed by BNDES.

3 *Proambiente* was a federal pilot program designed to reconcile smallholder production and natural resource conservation through land-use planning, technical assistance and PES.

approved on condition that it be expanded to include a larger number of families. By establishing partnerships with local institutions (including rural labor unions and producer associations) and government agencies such as INCRA, IPAM has expanded the initiative to encompass 300 more families in three land reform settlements. The initiative provides technical assistance to these families to support implementation of sustainable management plans on their farms, helps them with environmental and land tenure regularization, and seeks to address the structural challenges of increasing and legalizing production while reducing deforestation. In addition, the 350 families living in the Transamazon region are receiving direct payments to support their transition to sustainable agriculture. In this chapter, we describe the goals and strategies of the initiative, characterize the smallholders in the Transamazon region originally targeted by the initiative, and discuss key challenges and concerns about the initiative and strategies for addressing them.

7.1 Basic facts: Where, who, why and when

7.1.1 Geography

The 350 families that were the initial focus of this initiative have farms on secondary roads along the Transamazon Highway (BR-230) in the municipalities of Senador José Porfírio, Anapu and Pacajá in the state of Pará. These farms are on average 90 ha and are scattered across an area of more than 10,000 km^2 (IPAM 2013). Some of the farms are in the Bom Jardim agricultural reform settlement, which was one of three settlements later selected for the initiative (Figure 7.1). Bom Jardim has 692 families and an area of 960 km^2. The other two settlements are Moju I/II (1578 families and 1364 km^2) and Cristalino (110 families and 62 km^2). In this chapter, we focus on the 350 families initially targeted by IPAM in the Transamazon region.

The Transamazon region has dense and open ombrophilous forest. The climate (classified as Aw by the Köppen system) is characterized by a rainy season from December through June and a dry season in the remaining months of the year. The very marked difference in precipitation between these two seasons profoundly influences the phenological cycles of plants and animals, as well as the productive and cultural activities in the region (Smith 1982). Average annual rainfall varies between 1500 and 2500 mm; the average annual temperature is above 22°C; and relative humidity averages around 81% (FVPP 2002). The topography of the region ranges from flat to heavily undulating. Elevation measured in the centers of our study communities is 96 masl in two communities, and 61 masl and 91 masl in the other two. The major soil types are yellow/red latosols, red/yellow podzolics and yellow humic latosols,[4] along with small patches of alfisols that have superior fertility, known locally as *terra roxa* (IPAM and FVPP 2009). The annual

4 These soil types are part of the Brazilian soil classification system.

deforestation rate has been estimated as 4.8% based on historical deforestation data from 1998 and 2008 (IPAM and FVPP 2009).

Historically, land use and forest management in the region were shaped by the opening of the Transamazon Highway. Until the 1970s, the region was occupied primarily by indigenous people and *caboclos*.[5] However, the National Integration Plan (1970–1974) of the Brazilian military government led to road construction and the settlement of small colonist farmers in the region. During the construction of the Transamazon Highway (1971–1973), the government encouraged families from all over Brazil, especially from the northeast, to migrate to this new frontier area, promising them fertile land, technical assistance and basic infrastructure. INCRA was created to help manage this process. When settlers received land, they were encouraged by INCRA to deforest at least 50% of their plots to guarantee possession (Souza 2006), contradicting the minimum 50% forest cover required by the National Forest Code (Law 4771) at that time. In the first years of settlement, INCRA promoted the cultivation of annual crops, mainly rice (Smith 1977). However, in 1975, the state reneged on its promised investments in these settlements in favor of subsidies for large-scale cattle ranching, forestry and mining. The government stopped settling new farmers and abandoned farmers already settled in the region, who were left in a precarious situation without public health services, education or transportation.

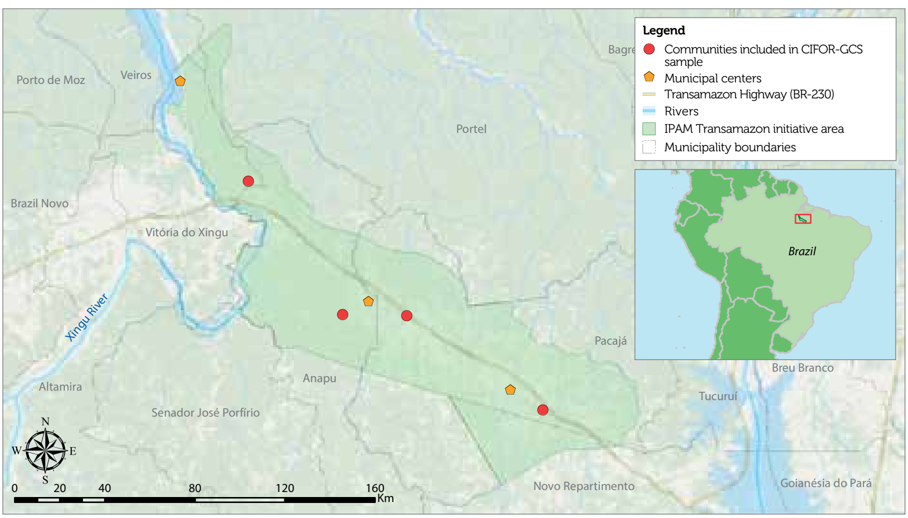

Figure 7.1 Map of the REDD+ initiative in the Transamazon.

Data sources: IPAM, Instituto Brasileiro de Geografia e Estatística, GADM and World Ocean Base.

5 *Caboclos* are mixed descendants of Amerindians, Portuguese and Afro-Brazilians.

Table 7.1 Population and main crops of Anapu, Pacajá and Senador José Porfírio, in Pará.

Municipality	Total population (% rural) (IBGE 2010a)	Main crops (Almeida et al. 2006)
Anapu	20,493 (52%)	Rice, cassava, banana, cocoa
Pacajá	40,052 (66%)	Cassava, banana, cocoa
Senador José Porfírio	12,998 (50%)	Banana, coconut, orange

The families who remained in the settlements initially focused on cultivation of annual crops. At the end of the 1970s, there were some efforts to implement permanent agriculture (mainly cocoa and pepper) in areas with the more fertile alfisols. However, by the end of the 1980s, prices for cocoa and pepper had decreased and productivity had declined due to pests and diseases (Sablayrolles and Rocha 2003). This crisis contributed to the development of cattle ranching as an alternative livelihood strategy, encouraged by credit for cattle subsidized by the *Fundo Constitucional de Financiamento do Norte* (FNO). Currently, households throughout the area raise annual and perennial crops, as well as beef and dairy cattle. Some are also engaged in small-scale logging (IPAM and FVPP 2009). Table 7.1 characterizes the three municipalities with families that were initially targeted by the initiative, and Figure 7.1 shows the four locations where these families were interviewed for this study.

7.1.2 Stakeholders and funding

IPAM, the lead proponent of the Sustainable Settlements in the Amazon initiative, is a Brazilian nongovernmental research organization that has worked in the Amazon since 1995. Its two key partners are INCRA and Fundação Viver, Produzir e Preservar (FVPP), which has been promoting the rights of farm families in the Transamazon region since 1990. IPAM has also formed other important partnerships, including with the Casas Familiares Rurais;[6] local governments (Environmental Secretariats of Anapu and Senador José Porfírio, Economic Development Secretariat of Pacajá); rural labor unions of the three municipalities; and the Federation of Agricultural Workers of Pará (FETAGRI). The initiative has been funded by the Amazon Fund since 2012 (see the initiative timeline, Figure 7.2) and is also supported by the Gordon and Betty Moore Foundation, Climate and Land Use Alliance, and the Ford Foundation. There is no plan to sell carbon offset credits in voluntary markets or future compliance markets.

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6 Students from Casas Familiares Rurais, which are vocational schools for young people from rural areas, will collaborate with the initiative in various activities and receive a scholarship.

7.1.3 Motivation

This REDD+ initiative grew out of the *Proambiente* experience with sustainable agriculture and PES. The idea for *Proambiente* was first proposed by FETAGRI in 2000 as a way to support families in the Transamazon who were developing farming methods that did not employ fire (Souza 2006). From 2000 to 2002, FETAGRI received financial support from Brazil's Ministry of Environment to pilot *Proambiente*, with FVPP as the main proponent and IPAM as a key partner in select activities (IPAM and FVPP 2009). In 2004, *Proambiente* became a federal government program managed by the Secretariat of Sustainable Development Policies (Mattos 2010) with 12 pilot sites across the Amazon, including in the Transamazon.

Implementation in the Transamazon began in 2002 with the selection of households, followed by the creation of 15 community groups[7] in 2004. Families were selected based on two main criteria: (i) membership in a representative organization (mainly the Rural Workers Union); and (ii) interest in adopting agroecological practices such as avoiding the use of fire for preparing the land, improved pasture management and agroforestry systems. A property appraisal and a management plan[8] were both created for each selected household, and each community group established a community agreement[9] (Araújo 2007). In 2005–2006, the 350 selected households in the Transamazon received payments over a six-month period, conditional on adoption of sustainable agricultural practices, including collective fire management. However, federal funding for *Proambiente* was cut off at the end of 2006 due to lack of a national framework for PES, limited funding and implementation capacity, and incompatibility of the program with regional development policies (Hall 2008). In response to the cancellation of *Proambiente*, IPAM in partnership with FVPP sought funding for a REDD+ initiative in this area as a way to continue supporting farmers who had signed up for *Proambiente* (see initiative timeline, Figure 7.2).

7.1.4 Timeline

Preparation for this REDD+ initiative began in earnest in April 2009, when a proposal for an initiative called "Avoided Deforestation on Small Rural Properties in the Transamazon Highway Region" was submitted to the Amazon Fund.

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7 The community groups or *núcleos* formed during *Proambiente* do not correspond to the traditional definition of communities in the Amazon, but rather are clusters of participant households located in relatively close proximity.

8 The property management plan was a long-term plan for the families' transition to sustainable agriculture. The plan identified the families' goals and ways to reach those goals.

9 The community agreements were a pact established by the members of each of the 15 community groups. These agreements were used for the participatory monitoring of the compromises assumed by the group and by each household through their property management plan.

However, there were clearly many related activities before this time, and activities under the REDD+ initiative only began when funding was awarded at the end of 2012. The timeline (Figure 7.2) summarizes the history of the initiative and interventions applied until early 2014. Details on the initiative interventions are presented in Section 7.2.

Pre-2000				
2000	FETAGRI presents preliminary idea for *Proambiente* at *Grito da Amazônia* 2000			
2001				
2002	FVPP begins implementing *Proambiente* in the Transamazon			
2003				
2004				
2005				
2006	*Proambiente* interrupted in the Transamazon			
2007				
2008				
2009	IPAM submits first REDD+ initiative proposal to the Amazon Fund	IPAM meets with *Proambiente* participants to present the original REDD+ initiative design		
2010	CIFOR-GCS baseline survey	Amazon Fund approves initiative conditional on increasing the number of beneficiaries		
2011	IPAM creates the Inter-municipal Consortium for Sustainable Development of the Transamazon and Xingu	IPAM submits revised proposal (including three additional land reform settlements) to the Amazon Fund	IPAM and INCRA launch partnership to work in the land reform settlements	CIFOR-GCS presents baseline results to study communities
2012	IPAM receives funding from Amazon Fund			
2013	IPAM disseminates information about the initiative, selects participants and implements socioeconomic and land-use surveys			
2014	Contracts for payments signed between IPAM and participating families	CIFOR-GCS phase 2 survey	IPAM makes first payments to families	IPAM begins developing individual property management plans

REDD+ initiative active

Figure 7.2 Timeline of the REDD+ initiative in the Transamazon.

7.2 Strategy for the initiative

IPAM considers the initiative as 'REDD+,' but believes that it should be understood as part of a broader vision for REDD+ as national or state public policy, and not as an isolated REDD+ project (personal communication from O Stella, 22 May 2013). The broad goal of the initiative is to serve as a development model for the Amazon to inform and promote more appropriate public policies for sustainable production in rural settlements. Specifically in the Transamazon region, the initiative aims to reduce deforestation (RED), reduce degradation (second D) and promote forest conservation and management (+). The co-benefits of highest priority to IPAM are livelihood benefits for smallholders gleaned from the transition to sustainable production. Because there is no plan to sell carbon offset credits, IPAM has not sought any certifications (e.g. from VCS or CCBA). The forest cover reference level for the initiative was established for the farms of the 350 participating families. Deforestation was projected 15 years into the future, based on annual historical deforestation data obtained from the National Institute of Spatial Research (INPE) for the period 1996–2005. IPAM also uses INPE images to evaluate and monitor changes in forest cover in the intervention area, although it is also testing imagery with higher spatial resolution, such as from the Spot satellite.

To identify 350 farm families to participate in the initiative, IPAM worked with the 13 remaining community groups (or *núcleos*) from the 15[10] that had been formed under *Proambiente*. IPAM initially sought to recruit the same 350 families that participated in *Proambiente*, inviting them to informational meetings held in the communities in 2013 (see initiative timeline), but the recruitment of all 350 families was not possible (personal communication from L Souza, 4 February 2014). Many families that had participated in *Proambiente* left the area or became disillusioned and were not willing to participate in the REDD+ initiative. IPAM overcame this by asking families already enrolled to recommend others who would be willing to participate, finally attaining their target of 350 families by the end of 2013.

IPAM plans to accomplish its goals of reducing carbon emissions and generating co-benefits through three activities: (i) direct cash payments; (ii) investments in alternative production activities; and (iii) bringing properties into compliance with environmental regulations. First, in January and February 2014, IPAM signed PES contracts with the families. To be eligible for payments, a family's farm must have at least 30% forest cover (including mature forest, secondary forest designated for regeneration, cultivation of agricultural trees such as cocoa or coffee, forest tree plantations and agroforestry), and there must be no illegal logging in mature forests, no use of fire without control measures and no use of

10 Because some families that had participated in *Proambiente* moved or decided not to participate in the REDD+ initiative, two of the original community groups were dissolved.

pesticides without technical orientation. A family can receive up to USD 759/year, depending on their level of compliance with different conditions.[11] One of these conditions is that a certain percentage of forest cover must be maintained on the property, with IPAM encouraging at least 50% (through forest cover maintenance or reforestation for the households with less than this percentage but with at least 30% of forest cover). However, all participants have been grandfathered in under the 2012 amendments to the Brazilian Forest Code, which only require as much forest as existed in July 2008 on properties smaller than 400 ha (see Box D). Payments will be distributed every three months during the 38-month contract, through national postal electronic vouchers. The first payment was delivered to all the selected families (in March/April 2014) as an initial incentive, but for the next payments, compliance will be monitored through remote sensing, field visits by the project technicians to assess progress in implementing the household property use plan and participatory evaluation of compliance with the community agreement. The payments are intended to make forest conservation economically viable and are considered by IPAM as a temporary tool until smallholders successfully transition to sustainable production.

Second, IPAM will support implementation of household property management plans, which outline systematic steps to reduce the use of fire as a land management tool and to reduce deforestation, with all steps adapted to each family's preferences and capabilities. As indicated in the timeline, IPAM started developing these plans in April 2014. Even before then, families reported that the plans were a very positive aspect of *Proambiente* and the REDD+ initiative, since they combine local and technical knowledge (Cromberg et al. 2014). After finalizing the property management plans, IPAM intends to elaborate the community agreement for each of the 13 community groups, based on the *Proambiente* experience. IPAM also plans to provide assistance with restoration of permanent preservation areas (*Área de Preservação Permanente*, APPs), to invest in improved production systems and to promote internal capacity building, for example, through exchange visits between different community groups.

Third, in the meetings that IPAM held in 2013, its representatives explained environmental legislation, land tenure regularization and related topics, such as the rules regarding forest clearing and burning. Also in 2012–2013, IPAM partnered with FVPP, municipal governments and the Institute of Technical Assistance and Rural Extension of Pará (EMATER) to register properties in CAR. This requires drawing the property boundaries and identifying different land uses and areas for

11 The value received by each participant depends on the level of compliance with three conditions: (i) conservation or restoration of APPs such as riparian zones (30% of the payment); (ii) conservation or restoration of forest cover according to the goals established in the property management plans (30% of the payment) – only families with the legally required 50% of forest cover receive the full 30% of the payment; and (iii) adoption of better production practices (40% of the payment) aligned with the commitments made in the property management plans.

preservation on a satellite image. Registration in CAR was established by the new Forest Code in May 2012 as a first step toward compliance with environmental regulations, making it a key initial step in many REDD+ initiatives in the Brazilian Amazon.

While IPAM and its partners were rolling out the REDD+ initiative, there were numerous other policy changes and interventions in the Transamazon region. These included more effective monitoring and enforcement of the Forest Code by IBAMA. In 2013, after a year of particularly high deforestation in the Amazon, IBAMA intensified its control in multiple municipalities in Pará, including Anapu and Pacajá, where some of the community groups are located. Small farmers report that they have been negatively impacted by IBAMA's efforts to stop forest clearing and burning beyond legal limits, with fines and seizure of equipment. At the same time, the region was receiving development support, especially for cocoa production. For example, IPAM constructed cocoa seedling nurseries with funding from Petrobras, and the local cooperative promoted organic cocoa through education, distribution of seedlings and a system of guaranteed purchase (since 2011). Also, since 2013, technical assistance for cocoa production has been delivered by two private local firms (COPCAU and COMATER) in two of the community groups.

7.3 Smallholders in the initiative

For the CIFOR-GCS survey, we defined four 'communities' built on community groups created by FVPP for *Proambiente* and expanded based on local definitions of social organization, e.g. to encompass a defined portion of a land reform settlement or all households along one or more secondary roads that branched off the Transamazon Highway. Between July and August 2010, we interviewed 137 households (19.7%) of the total 696 households in these four communities. The household sample was stratified by community and by participation in the initiative (see Table 7.2). In each community, we also held one general meeting with an average of 15 participants (both men and women) and one meeting with only women.

Local institutions are well developed in the intervention area, with multiple small farmer associations and a local cocoa cooperative. The leadership of the most important local institutions is elected. IPAM coordinates with the communities by working through a representative they appoint and pay to serve as a communication channel with the participating families. In three communities, the majority of the women reported that women are not sufficiently represented on important community decision-making bodies. However, most reported that women are able to influence community decisions when they want to. None of the communities have institutions specifically for women.

Table 7.2 characterizes the study communities. One of the communities was created in the 1970s during the opening of the Transamazon, while the other three were established in the 1980s. Therefore, the household heads are migrants from other regions, especially from the relatively impoverished northeast of Brazil. In terms of access to infrastructure, the communities have schools only until the 4th grade, and older students must go to the closest city (16–74 km away) to continue their studies. Health centers available to community residents are also in the cities, although the government does pay public health agents who live in the communities. While it was reported that all four communities have year-round access to a road usable by four-wheel drive vehicles, most households do not have access to these vehicles, and transportation is a major challenge during the rainy season. This influences decisions about investments in agricultural production, since it is not economically viable to sell products in regional markets during the rainy season.

The main staple food in the four communities is rice (Table 7.2). However, rice production was reported to have declined between 2008 and 2010 due to its low price in the market relative to the high production costs, including labor requirements. In the community meetings, farmers reported that it was easier and/or cheaper to buy rice in the market than to produce it. Nevertheless, in 2009–2010, rice remained the crop with the highest production value (cash and subsistence) per household in two of the four study communities, and it was cultivated by 72% of the sampled household in 2009–2010. Producers also reported having decreased their cassava production due to a lack of market, predation by wild pigs and government restrictions on swidden agriculture.

Farmers have reduced the production of annual crops mainly because they have become less profitable, while increased production of cocoa was reported in three of the four study communities (TAMZ2, TAMZ3 and TAMZ4). In TAMZ2 and TAMZ3, cocoa was the product with the highest production value on average per household in 2009–2010 (Table 7.2). The main reasons reported by the households for the increase in cocoa production were the guaranteed market and high prices. In one of these communities, smallholders also mentioned that as a permanent crop, cocoa does not require the use of fire as a management tool. In fact, cocoa has been promoted by NGOs in the region, including IPAM, and other private firms as a sustainable crop with good economic returns for families. However, it is important to highlight that the cultivation of cocoa requires fertile soils, which are not uniformly distributed in the Transamazon region, despite government claims in the 1970s (Moran 1981). In addition, cocoa involves high startup costs and a large labor demand for the crop maintenance and harvest, which means that small families need to hire external labor. Therefore, in the first years of settlement, families usually invest mainly in annual crops and only after accumulating some capital do they invest in cattle and/or perennial crops (cf. Perz and Walker 2002). In the community where cocoa had not grown in importance

Table 7.2 Characteristics of the four communities studied based on the 2010 survey.

	TAMZ1	TAMZ2	TAMZ3	TAMZ4
Basic characteristics				
Total number of households[a]	198	220	158	120
Number of sampled households (p[b]; np[c])	33 (17 p; 16 np)	33 (15 p; 18 np)	36 (21 p; 15 np)	35 (20 p; 15 np)
Total land area (ha)[a]	41,000	18,500	19,900	5,500
Total forest area (ha)[a]	20,500	9,250	7,960	3,300
Year founded	1982	1987	1972	1982
Access to infrastructure				
Primary school	Yes	Yes	Yes	Yes
Secondary school	No	No	No	No
Health center	No	No	No	No
Road usable by four-wheel drive vehicles in all seasons	Yes	Yes	Yes	Yes
Bank or other source of formal credit	No	No	No	No
Distance to closest market by most common means of transport (km)	74	16	27	28
Previous experience with conservation NGO	Yes	Yes	Yes	Yes
Agriculture				
Main staple food	Rice	Rice	Rice	Rice
Crop with highest production value per household on average (2009–2010)	Rice	Cocoa	Cocoa	Rice
Price of a hectare of good quality agricultural land (USD)	283	566	340	354

a Number of households, total land area and forest area reflect estimates by key informants, such as the presidents of community associations or community health agents.
b p = interviewed families that were previously selected to participate in the REDD+ initiative.
c np = interviewed families that were not selected to participate in the REDD+ initiative.

over the two years prior to our research (TAMZ1), households were increasing the production of cashew (*Anacardium occidentale* L.), murici (*Byrsonima crassifolia* (L.) Kunth) and urucum (*Bixa orellana* L.), due to their adaptability to different soil conditions. This community has poorer quality soils, which is reflected in lower agricultural productivity and household incomes, as can be seen in Table 7.3.

Table 7.3 summarizes socioeconomic welfare indicators of the sampled households. TAMZ3 has the highest average household income, the highest percentage of families that agreed that their income has been sufficient to cover basic household needs, and the largest average land and livestock holdings per household. This demonstrates the congruence of income and other measures of welfare. In addition, access to transportation assets, especially motorcycles, is higher in the two communities with the highest average income. In terms of education, household members (those ≥ 16 years old) had studied on average four years across most communities, which generally corresponds to the completion of the 4th grade at school. Most families in the study communities had access to electricity with the exception of TAMZ1, where only one-third of households had electricity connections. Although some households in TAMZ2 and 3 had access to piped water, most obtained water from their own wells.

The data clearly show that the smallholders' livelihoods are based on agriculture and cattle ranching (Figures 7.3 and 7.4 and Table 7.3). In three of the four communities, households derived the largest share of their income from crops (TAMZ1, 34%; TAMZ2, 37%; TAMZ4, 23%). Only in TAMZ3 was livestock the main source of income (39%), specifically cattle ranching, although agricultural crops remained important (28%). In TAMZ2, cattle ranching also represents a high share (35%). The higher average value of agricultural income in TAMZ2 and TAMZ3 is partly explained by their more fertile soils, which is particularly important for cocoa production. Forest and environmental income were negligible in all four communities (Figures 7.3 and 7.4). Government support, especially through *Bolsa Família* (cash transfer), was a very important source of income in TAMZ1 (26%) and TAMZ4 (32%), which had the lowest average household incomes. In these communities, the direct payments from the REDD+ initiative could also represent an important source of income, with the maximum value equal to 13% of average household income in TAMZ1 and 12% in TAMZ4 during 2009–2010, whereas for the families from the communities with higher income, it represented 5% of average household income. However, families with lower income that are mainly reliant on swidden agriculture might also incur higher opportunity costs for adopting new productive strategies. These families have less capital to invest in permanent cultivation, which requires high initial implementation costs. They may also be limited in their ability to invest in those crops if their properties have low soil fertility.

Although only a small percentage of household income is derived from the forest, in the meeting with women, significant forest use was reported. According to

Table 7.3 Socioeconomic characteristics of households interviewed in 2010.

	TAMZ1	TAMZ2	TAMZ3	TAMZ4
Number of households sampled	33	33	36	35
Household average (SD)				
Number of adults	3.1 (1.3)	3.0 (1.5)	3.5 (1.8)	2.8 (1.5)
Number of members	4.8 (2.1)	4.8 (2.5)	5.0 (2.5)	4.9 (2.9)
Days of illness per adult	13.4 (24.9)	17.1 (27.8)	14.7 (38.0)	22.5 (49.0)
Years of education (adults ≥ 16 years old)	4.5 (3.5)	4.5 (2.9)	4.3 (3.8)	3.1 (2.7)
Total income (USD)[a]	5,699 (3,741)	13,827 (27,984)	16,500 (20,806)	6,456 (5,093)
Total value of livestock (USD)[b]	3,244 (5,716)	5,522 (7,745)	12,319 (20,523)	4,592 (10,292)
Total land controlled (ha)[c]	81.7 (26.5)	90.7 (44.1)	119.9 (102.8)	66.5 (68.9)
Total value of transportation assets (USD)	681 (846)	3,779 (6,618)	4,407 (12,130)	938 (1,066)
Percentage of households with:				
Mobile or fixed phone	39	52	42	26
Electricity	33	97	97	100
Piped water supply	6	45	31	17
Private latrine or toilet	82	67	86	74
Perceived sufficient income	61	61	72	54

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.
b Total livestock value at the time of interview.
c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

participants in these meetings, nearly all men go to the forest (generally on their own plot) to collect products. In three communities, they also reported that nearly all women collect products from the forest. Most men and women go to the forest during the dry season; however, in TAMZ4, women reported going to the forest more during the wet season. Women are most likely to collect firewood, vines, fruits, herbs and traditional medicines and to fish. Men's principal activities in the forest are hunting, fishing, logging, collecting fruits and vines, monitoring the forests on their properties and clearing the vegetation around the property limits.

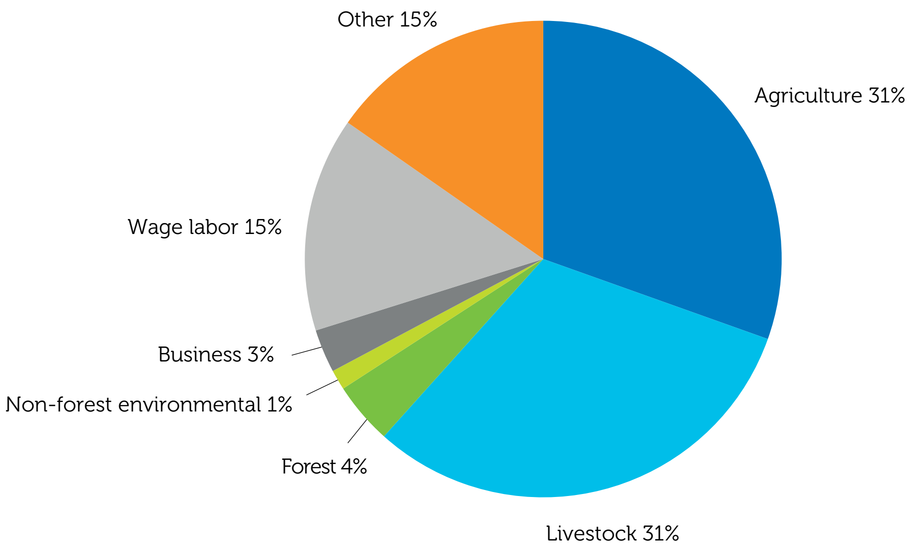

Figure 7.3 Sources of income for all households in sample (n = 137).

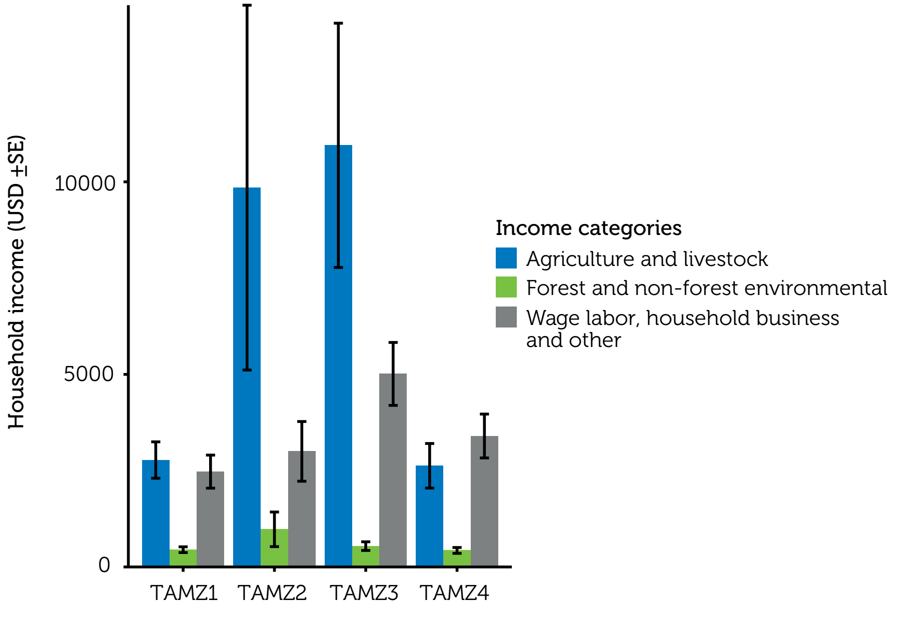

Figure 7.4 Sources of income for average household by community (or village) (+/- SE) (n = 137).

Table 7.4 summarizes information about forest dependence among the households sampled. Our data show that the collection of forest products was mostly for the households' own consumption. The product collected by the largest percentage of families in our sample was firewood (61%), which reflects the high dependence on it for cooking (Table 7.4); other products harvested by more than half of the households were fruits (55%) and bushmeat (53%). One-third of the families reported fishing. Charcoal was made by 33% of the families, and wood (logs, sawn wood and poles) was collected by 20% of families.

When asked about the change in the proportion of families involved in the collection of NTFPs and firewood, participants in the community meetings in TAMZ2 and TAMZ3 said that the proportion of families involved with this activity decreased from 2008 to 2010. In TAMZ2, the main reason given was a decline in the resource and a decreased demand for NTFPs, while in TAMZ3, many households have adopted gas instead of firewood for cooking, consistent with the higher average income in this community. Respondents in TAMZ2 and TAMZ4 reported that the proportion of families involved in timber extraction has declined due to a decrease in the resource. For most families, the consumption of forest products did not change from 2008 to 2010 – it remained a small but consistent component of household subsistence (Table 7.4).

In terms of forest cover change, three of the communities reported a decrease in community forest cover between 2008 and 2010. In TAMZ1, they attributed this decrease to new settlers who had recently moved into the settlement. In TAMZ2, small-scale logging and expansion of cattle pastures were considered the main causes. In this community, households reported that certain individuals were concentrating land through the purchase of other lots to develop extensive cattle ranching. Although the sale of lots in land reform settlements is common, it is not legal according to INCRA. Both cattle pasture and swidden agriculture were cited as causes of forest decline in TAMZ4. Only in TAMZ3 did households report that forest cover increased, attributing this to the reduction in the use of fire for agriculture, implementation of agroforestry systems and the regeneration of pasture areas.

Most households that reported clearing forest (between 2008–2010) did so for the purpose of growing crops. However, with the exception of TAMZ2, all communities mentioned that there was a reduction in the area under swidden agriculture in 2008–2010 due to families' increased focus on permanent agriculture and greater environmental consciousness. In TAMZ1, farmers said that *Proambiente* encouraged families to reduce swidden agriculture, but did not provide support for expanding perennial agriculture. In the other three communities, an increase in the area cultivated under permanent agriculture was reported.

Table 7.4 Indicators of household forest dependence based on the 2010 survey.

	TAMZ1	TAMZ2	TAMZ3	TAMZ4
Number of households sampled	33	33	36	35
Household average (SD)				
Share of income from forest	6.79 (6.00)	12.80 (30.54)	3.46 (3.96)	5.57 (8.18)
Share of income from agriculture	48.40 (25.28)	59.04 (32.09)	54.11 (28.88)	38.19 (26.97)
Area of natural forest cleared (ha)[a]	1.09 (2.83)	1.75 (2.59)	0.86 (2.13)	0.27 (0.95)
Area of secondary forest cleared (ha)[a]	2.16 (4.07)	2.73 (6.27)	3.08 (5.44)	2.40 (2.69)
Area left fallow (ha)[b]	4.41 (3.94)	2.97 (3.65)	7.93 (9.22)	4.39 (7.60)
Distance to forests (minutes walking)	5	15	5	30
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	69	76	71	76
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	1	2	1	0
Reporting increased consumption of forest products[e]	7	0	3	3
Reporting decreased consumption of forest products[e]	39	6	23	12
Obtaining cash income from forest products[f]	73	61	61	69
Reporting an increase in cash income from forest[f]	4	0	9	0
Reporting a decrease in cash income from forest[f]	33	10	14	0
Reporting fuelwood or charcoal as primary cooking source	94	79	67	89
Leaving land fallow[g]	76	45	53	71
Clearing forest[g]	70	82	86	83
Reporting decreased opportunity for clearing forest[g]	94	82	78	74
Clearing land for crops[g]	67	79	86	83
Clearing land for pasture[g]	3	3	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

7.4 Challenges facing the initiative

The proponent and households both identified a variety of challenges and concerns with implementation of the Sustainable Settlements initiative. From the proponent's point of view, the biggest challenges are associated with government policy, including delays in issuing regulations for implementation of CAR, complexities associated with land tenure regularization and modifications to the Brazilian Forest Code. According to IPAM, the amnesty for illegal deforestation offered by the revised Forest Code reduced households' motivation to conserve forest.

Although the Transamazon region has a history of land conflicts, land tenure was considered to be secure in all four communities, with boundaries of properties generally known and respected. Households reported that they were usually able to exclude unwanted loggers from their land, but they were not able to exclude hunters. Even though respondents generally felt secure due to the long time that they had lived on individual landholdings, they argued for the urgency of receiving land titles. Only 12% of households in the sample are private landowners with title, with the rest either official settlers in land reform projects with some documentation but no title, or squatters with no official recognition of their land rights. Land titles are important because they facilitate the process of acquiring credit, are required to obtain permits for the legal management of forest products, and document the clear exclusionary rights to land required for both regulatory and incentive-based REDD+ mechanisms (Duchelle et al. 2014).

To learn about the local perspectives on the REDD+ initiative, we first asked sampled households about their knowledge of the initiative. At the time of our baseline field research, less than one-third (31%) of households interviewed were able to accurately describe the REDD+ initiative, reflecting the fact that it was still in its design stage and IPAM had just started its meetings to inform people about the initiative. We asked those 43 households about their concerns and recommendations regarding the initiative. The households' main worry was that the REDD+ initiative would fail to start or continue, which reflects their disappointment with the premature ending of *Proambiente*. Farmers said that they are tired of unfulfilled promises and emphasized that while some families reduced deforestation and stopped their use of fire, this change in practices had harmed their incomes and diets. Families expressed concern that the REDD+ initiative would reduce their incomes and that they would not receive alternative sources of income. They also reflected on the potentially negative impacts on household livelihoods and food security if the initiative limited their land use and agricultural practices. Other respondents indicated that they were worried about initiative mismanagement and minimal financial resources being allocated to the communities.

Households' main recommendation focused on improving local production systems through technical assistance and improvement of basic infrastructure, such as roads and transportation. If farmers decide to invest in cash crops, they need roads in good condition for year-round transport of their products; otherwise, transportation costs remain exorbitantly high. Second, farmers emphasized the need for meaningful participation and alignment of REDD+ benefits with local needs. Third, households recommended learning from past experiences with *Proambiente* to avoid making the same mistakes. They emphasized the need for transparency and local participation in the management of initiative funds. The families also recommended that the initiative adequately compensate communities for avoided deforestation, effective protection of forests and restoration of degraded areas.

7.5 Lessons from the initiative

The Sustainable Settlement initiative is unique in that it originated from *Proambiente*, one of the first federal initiatives to apply the idea of PES in Brazil. Some of the positive aspects of *Proambiente* were reflected in the design of IPAM's REDD+ initiative, including the property management plans mentioned earlier. Given the heterogeneity of livelihood strategies and household preferences, these plans allow customized individual actions that take into account household differences. This is particularly important in the Transamazon region where not only differences in farmers' preferences, but variation in the ecological conditions of the plots (e.g. soil types) and household structure make a single approach unworkable. Farmers' concerns with their production systems and food security also highlight the need for local people to be involved in the design of customized long-term interventions that support, and avoid harming, their livelihoods.

In addition, households in the Transamazon emphasized the importance of linking specific initiatives with public policy reforms, as they were deeply dissatisfied with the interruption of *Proambiente* (Cromberg et al. 2014). They also emphasized the need for basic services, and community utilities and infrastructure, which historically had been neglected by the government and are obstacles to improving their productive systems. For this reason, subnational REDD+ initiatives must be linked to transformative policies and measures at municipal, state and national levels, such as agrarian reform and land tenure regularization, broad-based technical assistance, appropriate rural credit lines and provision of infrastructure, and basic services in rural areas. This REDD+ initiative will not be able to promote sustainable production systems if households lack the infrastructure to store and transport their goods for sale at competitive prices.

Farmer harvesting cocoa. (Marina Cromberg/CIFOR)

While IPAM is calling on the municipal and state governments to improve and expand basic infrastructure, it is beyond their mandate as an NGO to realize such an investment in infrastructure. For this reason, IPAM has tried to create partnerships at different levels of government since the initiative design stage. In an attempt to engage municipal governments in initiative implementation, IPAM led the creation of the Inter-municipal Consortium for Sustainable Development of the Transamazon and Xingu in 2011. The goal of this effort was to work with five municipal governments to create alternative production strategies that would reduce carbon emissions in the region and to discuss the infrastructure needs of rural areas. At the state level, IPAM has participated in forums to discuss the state government's strategy to reduce deforestation. Strategies for promoting sustainable production demonstrated in IPAM's REDD+ initiative have been adopted by the state program called *Municipios Verdes* (green municipalities). At the federal level, IPAM partnered with INCRA to clarify land tenure and implement registration in CAR. More broadly, IPAM has advocated for a nested approach to REDD+, which includes a low-emission strategy at the jurisdictional level. While it is extremely challenging to achieve true government commitment to low-emissions development, which often goes against BAU interests, IPAM's experiences with this initiative have shown that REDD+ must be incorporated into broader economic and land-use planning to be effective.

7.6 Acknowledgments

We are grateful to the men and women of the Transamazon for their cordiality and for sharing their time, knowledge and perceptions, and to IPAM's team members for sharing their REDD+ initiative information with us. We are also thankful to the members of our field team and data encoders for their outstanding collaboration: Andréia Silva da Luz, Carolina Souza Dias Guyot, Carolle Utrera Alarcon, Cristiano Polla, Denise Reis do Nascimento, Marcelo Ducatti, Ivaide Rodrigues dos Santos, Jaciane de Souza Guimarães, Joab de Souza Guimarães, Mário Vitorino Marques da Silva, Oseias Costa Santos and Thiago Machado Greco.

Part 2. Case Reports

Peru

Box E
REDD+ in Peru: The national context

Mary Menton, Jazmín Gonzales and Laura F Kowler

Forests cover 69 million ha in Peru, representing nearly 60% of the country (MINAM 2014). Although annual deforestation rates are relatively low (approximately 0.2%), land use and land-use change are responsible for almost half of the country's GHG emissions (MINAM 2011). Peru made a voluntary commitment to reach zero net deforestation and to conserve 54 million ha of forest by 2021 (MINAM 2011). REDD+ is expected to play an important role in national mitigation strategies. With 75% of the deforestation occurring in small plots (less than 0.5 ha), much of the focus on decreasing deforestation has been on smallholder farmers and forest-dwelling communities (CIF 2013).

Peru participates in many REDD+ readiness initiatives (Forest Carbon Partnership Facility; United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation) and receives international cooperation funds (e.g. KfW [German Development Bank]) to further support readiness activities. In addition, Peru received a commitment of USD 50 million from the Forest Investment Program (FIP) towards readiness and investment in REDD+ initiatives. In September 2014, Norway pledged USD 300 million for REDD+ performance-based payments.

REDD+ readiness activities at the national level are currently led by MINAM (Ministerio del Ambiente; Ministry of Environment, Peru). MINAM's work on REDD+ was previously isolated from the work of MINAGRI (Ministerio de Agricultura y Riego*;* Ministry of Agriculture and Irrigation, Peru) on forestry, tenure and land-use rights. However, the current version of the Readiness Preparation Proposal draft was developed in closer coordination with the forestry division of MINAGRI and MEF (Ministerio de Economía y Finanzas; Ministry of Economy and Finance, Peru), which is the focal point for FIP funding. Although official documents address intersectorial coordination, it has been relatively weak in practice. Institutions outside of the environmental/forestry sector have not been fully integrated into the planning process and subnational governments are not adequately incorporated into decision-making processes (Che Piu and Menton 2014; Menton et al. 2014). Given Peru's decentralized governance structure, regional governments (equivalent to states/provinces elsewhere) are important actors. The Amazon Interregional Council (CIAM) has sought to improve coordination and integration with regional governments.

The national legal framework has undergone significant changes that should strengthen forest governance:

- A new forestry law was passed in 2011 but approval of norms and regulations are still pending.
- The prior consultation law granted rights to FPIC for indigenous peoples in 2011.

- A compensation for ecosystem services law was approved in 2014 that clarified rights to ecosystem services (including carbon).

Despite these improvements, there are still serious challenges surrounding land tenure and overlapping land-use rights (Espinoza and Feather 2011; Chavez et al. 2012), which are not under the remit of MINAM, but are the responsibility of the regional governments and MINAGRI. In addition, in June 2014, an economic stimulus package was passed, which undermines the institutional power of MINAM and the regional governments and promotes a BAU model of development.

Early on, Peru chose to adhere to a nested approach; an estimated 41 subnational REDD+ initiatives were under development by 2012 (MINAM 2012). The need for reference scenarios for these initiatives has led to coordinated efforts in some of the Amazonian departments (e.g. San Martín, Madre de Dios) to create subnational reference scenarios that have been incorporated into project planning documents. While some subnational initiatives remain at the conceptual stages, others have advanced to receive VCS certification and even voluntary payments (e.g. Disney's deal with Conservation International's Alto Mayo Project in San Martín [Texeira 2013]). The proliferation of these initiatives is a reflection of, and contributor to, strong civil society involvement in defining the scope and direction of REDD+ in Peru. Multi-stakeholder platforms arose to promote dialogue amongst different actors and provide mechanisms for civil society and the private sector to contribute to government-led strategy development. Currently, there is a national REDD+ roundtable (Grupo REDD+ Peru), subnational roundtables, and both national and subnational indigenous roundtables.

In addition to the advances at the subnational level, progress has been made towards development of the national REDD+ strategy. MINAM recently launched a registry to oversee subnational REDD+ initiatives and support an Amazon-level jurisdictional approach to REDD+. It also circulated a draft strategy for REDD+ MRV, which includes methodologies for national-level reference levels and a stepwise approach to improving the precision of its emissions estimates (MINAM 2014; Rugnitz-Tito and Menton in press). This national strategy must be reconciled with the current reference levels established at the subnational level, which are being used by REDD+ initiative proponents and supported by regional governments.

Overall, REDD+ in Peru is still a work in progress, but there remains much optimism surrounding its potential role in promoting forest conservation and improving local livelihoods while contributing to reducing national GHG emissions.

Chapter 8

The REDD Project in Brazil Nut Concessions in Madre de Dios, Peru

Valerie Garrish, Emilio Perales, Amy E Duchelle and Peter Cronkleton

In the Peruvian Amazon, a company – community partnership is attempting to enhance the livelihood strategies of Brazil nut producers and provide incentives to maintain the forest on which they depend. The initiative, called the REDD Project in Brazil Nut Concessions in Madre de Dios, Peru, was initiated by the company Bosques Amazonicos SAC (BAM) in partnership with the Federation of Brazil nut producers of Madre de Dios (FEPROCAMD). BAM is a private, for-profit, company established in 2004 and dedicated to the conservation, protection, restoration and sustainable management of tropical forests. The company believes that private capital can play a key role in developing a sustainable world. FEPROCAMD is the principal organization representing nut collectors in the region. Brazil nut production supports forest conservation because Brazil nuts are only produced by trees that grow in native forests with an intact forest canopy (Ortiz 2002). In 2009 BAM signed a partnership contract with FEPROCAMD. Under the contract, in exchange for carbon rights to 405 Brazil nut concessions, BAM provides participating producers with technical and financial support and a share of profits from carbon offset sales. BAM is also building a Brazil nut processing plant that will be managed by staff hired by the shareholders board, which includes representatives of BAM and the producers. In 2012, the initiative was validated under the VCS and in 2014, it was certified by the CCBA. While still not fully underway, the initiative provides an innovative example of approaches to REDD+ involving the private sector and forest producers in a threatened, biodiverse region.

8.1 Basic facts: Where, who, why and when

8.1.1 Geography

This REDD+ initiative is located in the Madre de Dios region, situated in the Peruvian Amazon (Figure 8.1). Madre de Dios is the third largest region in Peru with an area of 85,300 km^2 (Hajek et al. 2011). The initiative is located in the Tahuamanu and Tambopata provinces and straddles the Inter-Oceanic Highway connecting Brazil to the Pacific coast.

Madre de Dios is hot and humid. According to the Köppen classification, the regional climate is tropical monsoon, which is characterized by a short dry season. The average annual temperature is 26°C, but can range from of 38°C to 10°C for short periods during the dry season (June–August) (Rasanen 1993; Barthem et al. 2003). Annual precipitation varies from 1600 to 2400 mm.

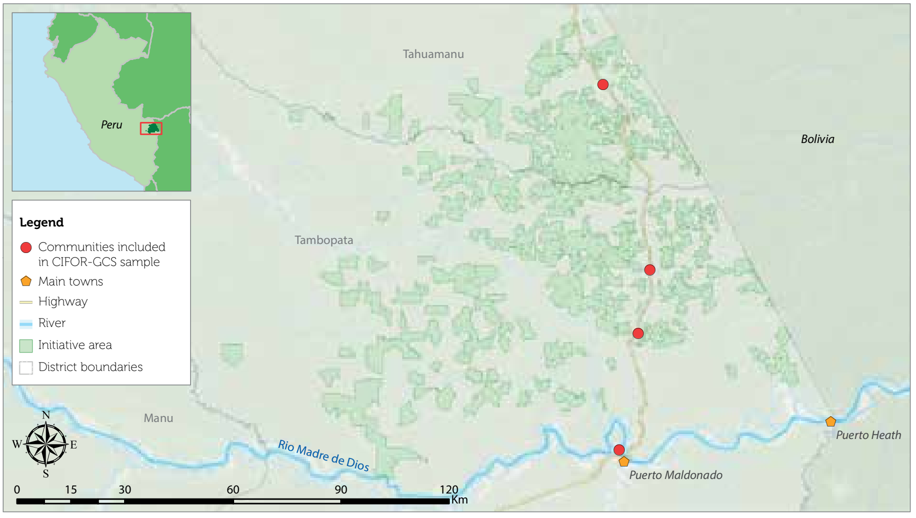

Figure 8.1 Map of the REDD+ initiative in Madre de Dios.

Data sources: Bosques Amazonicos SAC, GADM, Valerie Garrish (personal communication, 2014) and World Ocean Base.

The topography of Madre de Dios is generally characterized by undulating and moderately undulating terrain interspersed with level floodplains. Regional soils are characteristically alluvial and nutrient poor. The most widespread types of vegetation in the initiative zone are semi-deciduous dense forests on plains (58.11%), semi-deciduous dense forests on hills (14.16%) and mixed bamboo communities associated with scattered trees on plains (9.87%) (BAM 2014). The initiative focuses on forests rich in Brazil nuts (*Bertholletia excelsa*), the most important NTFP in the region (Duchelle et al. 2012). The Brazil nut fruits fall during the wet season and are collected between January and March. These forests are also rich in valuable timber species, which are harvested both legally and illegally.

The economic history of Madre de Dios has been dominated by natural resource extraction. The rubber boom in the late nineteenth century motivated early colonization of the region. However, the collapse of rubber prices in 1912 brought economic stagnation and the adoption of diversified livelihood strategies that included Brazil nuts and agriculture (Fifer 1970; Barham and Coomes 1996; Stoian 2000; Duchelle et al. 2011). Alluvial gold mining began drawing migrants in the 1930s from the highlands, a process that accelerated in the 1970s (Morcillo 1982).

The 1969 agrarian reform significantly shaped the landscape of Madre de Dios. Under President Velasco Alvarado's military populist regime (1968–1975), Peru underwent a set of structural reforms aimed at eradicating the power of the traditional elite and fostering a more cooperative society (Mar and Mejia 1980). In Madre de Dios, this meant dismantling the forest *latifundios* (estates) and the redistribution of land to workers. The redistribution process was further driven by the arrival of landless migrants using an unpaved highway constructed in the mid-1960s linking the Andean highlands to Puerto Maldonado (Dourojeanni 2006).

Despite these reforms, Madre de Dios continued to be largely ignored by the central government until the first administration of Alan Garcia (1985–1990) (Chavez 2009). Two especially notable policies implemented during this time were credit and cattle expansion policies. Thousands of colonists from the highlands were enticed to settle in Madre de Dios to clear forest and cultivate small landholdings (Alvarez and Naughton-Treves 2003; Naughton-Treves 2004). Prosperity was short-lived, however, and following the election of Fujimori in 1990, the Peruvian government closed the Agrarian Bank, halting agricultural credit and subsidies. Studies show that during this period, lands along the Interoceanic Highway were abandoned and forest clearing declined in Madre de Dios (Alvarez and Naughton-Treves 2003; Naughton-Treves 2004). Inadequate financing opportunities have remained a limiting factor to agricultural expansion and intensification in the region, resulting in low productivity and yield (INRENA 2003).

The Peruvian Forestry and Wildlife Law of 2000 (No. 27308), implemented in 2002, established 40-year concessions for timber and NTFPs (SPDA-INRENA 2003). As of 2011, Brazil nut concessions (25–4000 ha units) covered 10.5% of Madre de Dios. Although intended primarily for Brazil nut production, concessionaires can present complementary plans for other forest uses. A 2004 decree allowed timber harvests up to 5 m^3/ha in Brazil nut concessions, but was rescinded in 2007 (Peña 2010). Timber extraction continues, however, and in 2009 and 2010 the volume of wood from Brazil nut concessions exceeded that from timber concessions in the region (Cossío-Solano et al. 2011).

Madre de Dios is the least populated region of Peru with a population of 109,555 inhabitants in 2007, 27% of whom live in rural areas (INEI 2012). The capital, Puerto Maldonado, accounts for more than half of this total (67,632 inhabitants in 2007) and forms the epicenter of the region. With the recently paved (2010) Interoceanic Highway passing through Puerto Maldonado, connecting Peru to Brazil and Bolivia, the city has experienced unprecedented growth (INEI 2012). In 2007, 39.8% of the region's population was born outside Madre de Dios (GOREMAD 2013); many people born there were descendants of migrant families (INRENA 2003). The total population in the initiative zone, in terms of communities and scattered populations, was 7119 inhabitants in 2007 (BAM 2014).

Peeling Brazil nuts. (Gabriela Galindo/CIFOR)

According to BAM, the main drivers of deforestation in the initiative zone are small-scale cattle ranching (51.8%), mixed small-scale agriculture and cattle ranching (39%), mining (3.6%), subsistence agriculture (3.3%), and human settlements (2.3%). Most deforestation has occurred near roads, rivers and towns. The main driver of forest degradation is legal and illegal timber harvesting at multiple scales (AIDER 2013b).

The six most populated communities within the initiative zone are all located on or near the Interoceanic Highway; they are Planchon, Alegria, Mavila, Alerta, La Novia and Shiringayoc. In our study we focused on the Brazil nut concessions surrounding three of these communities and concessions near one intervention community only accessible by river. We sampled approximately 30 concessions at each site (MDD1=31; MDD2=31; MDD3=30; MDD4=33).

8.1.2 Stakeholders and funding

BAM was founded on the belief that high returns for investors are possible through the efficient management of forests, the development of the economic potential of the Amazon region, and integration of the Amazon region into international markets (BAM 2012a). BAM generates revenues from two main sources: the sale of carbon emission offsets under VCS guidelines and the sale of certified high-value timber (tropical hardwoods) from its reforestation projects.

Initially BAM funded the REDD+ initiative internally and all documents related to carbon certification were produced in-house. BAM hired external consultants to establish a carbon baseline, interpret satellite images and conduct carbon inventories. Once the initiative was VCS-validated in 2012, approximately 1.5 million verified carbon units (VCUs) were sold to four clients (the majority negotiated with BioCarbon Group Pte Limited for 1,116,504 VCUs) but the sale has covered costs and no direct payments have yet been received by concessionaires.

BAM initially collaborated with Conservación Ambiental y Desarrollo en el Perú (CAMDE) from 2009 to 2011. CAMDE was a key player in establishing the joint venture and strategic partnership between BAM and FEPROCAMD. CAMDE delimited the Brazil nut concessions and helped with concession documents but these responsibilities were later transferred to FEPROCAMD.

8.1.3 Motivation

While Brazil nuts have provided significant income for decades, given Madre de Dios' history of boom-bust economic cycles, economic diversification is a high priority. Alternatives that do not undercut existing forest production systems are attractive. Without adequate support, BAM projects that 107,981 ha of forest will be lost by 2040, representing 34.9% of the total intervention area (BAM 2014).

8.1.4 Timeline

The REDD Project in Brazil Nut Concessions was initiated on 24 September 2009 with the signing of the framework contract between BAM and FEPROCAMD for its joint development. Figure 8.2 summarizes key events related to the initiative.

Pre-2000					
2000					
2001	The National Institute for Natural Resources public bidding process for Brazil nut concessions				
2002					
2003					
2004					
2005					
2006					
2007					
2008					
2009	BAM meetings with key Brazil nut stakeholders to discuss REDD+ concept	Key stakeholders visit BAM Campo Verde Reforestation project in Ucayali	BAM and FEPROCAMD sign framework contract	FPIC	BAM starts technical assistance, legal advice and small loans
2010					
2011	BAM purchases land for Brazil nut processing plant	CIFOR-GCS baseline survey	BAM transfers technical responsibilities from CAMDE Peru to FEPROCAMD		
2012	CIFOR-GCS presents baseline results to study communities	VCS validation	First sale of carbon credits on the voluntary market		
2013					
2014	CCBA validation	CIFOR-GCS phase 2 survey			

REDD+ initiative active

Figure 8.2 Timeline of the REDD+ initiative in Madre de Dios.

8.2 Strategy for the initiative

The aim of the initiative is to reduce deforestation (RED), reduce degradation (second D), and promote forest conservation and management (+). BAM strives to empower Brazil nut concessionaires to protect their land and livelihoods not only through incentives derived from commercialization of carbon but also through co-benefits including stronger tenure rights, added value for timber and NTFPs through certification, and healthier, more productive forests.

The initiative is presently verified under both the VCS[1] and CCBA[2] standards, the latter having achieved a biodiversity gold level. The VCS crediting period commenced on 1 January 2010 and will continue for 31 years. Reference levels have been established over the entire initiative zone based on deforestation data from 2000 to 2008 generated in collaboration with Carbon Decision International and AIDER (Asociación para la investigación y el desarrollo integral). The deforestation model was generated with support from other institutions through the Madre de Dios REDD+ consortium and will serve as a regional baseline for all subnational REDD+ initiatives in the region.

The initiative's consultation process followed a protocol that included coordination meetings with local leaders and officials, media broadcasts, and events to distribute promotional materials. Moreover, a public dialogue was held through mainstream media to include stakeholders in the Brazil nut sector. During 2009 and 2010, BAM organized meetings in Puerto Maldonado and in communities along the Interoceanic Highway to ensure FPIC and clarify specific concerns expressed by Brazil nut concessionaires.

In 2009, BAM signed an agreement with FEPROCAMD whereby the Federation ceded to BAM the environmental services and carbon commercialization rights of the participating concessions. The main points within the agreement include BAM agreeing to invest at least USD 1 million in nut commercialization activities largely through construction of the Brazil nut processing plant and revenue distribution from the sale of carbon credits (70% to BAM, 30% to the signed concessionaires). This umbrella agreement allowed FEPROCAMD to sign individual contracts with interested Brazil nut concessionaires whereby individuals would concede their rights to sell environmental services and carbon from the concession, and FEPROCAMD then concedes these same rights to BAM.

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1 https://vcsprojectdatabase2.apx.com/myModule/Interactive.asp?Tab=Projects&a=2&i=868&lat=-11%2E4881489093766&lon=-69%2E2404201325963&bp=1

2 http://www.climate-standards.org/2013/05/13/redd-project-in-brazil-nut-concessions-in-madre-de-dios/

Participation in the initiative is open and BAM is willing to accept new Brazil nut concessionaires. Since achieving VCS validation in 2012, the initiative has grown from 377 to 405 concessionaires. The protocol to accept new concessionaires first requires proof of concession rights and full compliance with concession requirements. Further requirements include signing the REDD+ contract with FEPROCAMD; knowledge and acceptance of the long-term agreement conditions between the federation and BAM; not having signed a contract on carbon rights with other companies; and, in the case of timber extraction, agreement to abide by FSC certification requirements to continue logging.

In return for participation in the initiative, the concessionaires will receive the following benefits: (i) access to benefits from implementation of the Brazil nut processing plant; (ii) capital to cover initial costs during the nut harvesting season; (iii) assistance with submission of documents required to maintain control over their concessions; and (iv) income from the sale of carbon offsets. Incentives based on securing nut concessions and livelihoods are largely geared towards discouraging the expansion of the agricultural frontier for annual crops and/or cattle, as these were identified as the main drivers of deforestation (responsible for 98% of the projected site leakage).

Brazil nut concessionaires are legally allowed to use 1–2 ha within their concession for farming, but are not permitted to cut primary forest, only secondary regrowth. Since the nut concessions cannot be used as collateral, it is difficult for concessionaires to obtain loans and implement higher value agricultural activities (i.e. farming with machinery, investment in cash crops, intensification of cattle, etc.) within the concession and in other areas. Therefore, they are often trapped in a system of low intensity, shifting cultivation. As such, the initiative approach is to increase concessionaires' incomes by adding value through Brazil nut processing and exportation. The exact manner in which concessionaires will receive income from the nut processing plant has yet to be determined (i.e. whether there will be full reinvestment back into the plant or whether concessionaires will receive dividends from the net profit).

Apart from this initiative, the nut concessionaires receive little support from other organizations, either in cash or in kind. Candela Peru offers organic certification but rather than paying a price premium, they only provide a secure market for the product. Several governments and NGOs offer reforestation assistance, often as agroforestry systems, but typically only near to roads. Projects have also attempted to improve Brazil nut production and commercialization but these are usually limited to short training courses in the use of donated drying equipment. No initiative stakeholder mentioned that such developmental support had deterred their participation in the REDD+ initiative.

8.3 Smallholders in the initiative

The intervention area of the initiative, comprising 405 Brazil nut concessions over 308,757 ha, is within a broader initiative zone of 1,015,316 ha (BAM 2012b) that includes a leakage belt. This broader zone includes more than 600 nonparticipating Brazil nut concessions as well as adjacent agricultural land, mining areas and other forestry concessions.

Initially BAM thought that concessionaires would enter the initiative through agglomerations of smaller producer associations, which would then form part of FEPROCAMD. Not all association members, however, agreed to participate in the REDD+ initiative. Moreover, FEPROCAMD and BAM have since decided to allow independent concessionaires to sign onto the initiative without first affiliating themselves to an association. Consequently, BAM works directly with individuals who volunteer to participate in the initiative and, as such, there is no congruous implementation area.

For our study, we sampled 126 Brazil nut concessionaires from four communities participating in the REDD+ initiative. It is worth noting that concessionaires do not always live within clearly defined communities, but often maintain several residences within their concession, in a larger community near their concession, or in the regional capital of Puerto Maldonado.

To define sample communities in this context, we first selected Brazil nut producer associations with greater than 80% participation in the REDD+ initiative and affiliation with FEPROCAMD, thereby ensuring an organized core to allow for group meetings. Unfortunately, low rates of registered membership in FEPROCAMD meant that there were often less than 30 households per association. Thus, we added concessionaires from the same geographical location to the respective association lists (i.e. non-affiliated concessionaires around MDD1 were added to the member list of the MDD1 association). The selected intervention communities included three located along the Interoceanic Highway (MDD1, MDD2, MDD3) and a fourth (MDD4) along the Rio Pariamanu/Pariamarca River. MDD4 differs from the other communities in that there is no physical village within the site and the majority of concessionaries opt to live in Puerto Maldonado and travel to their concessions during the harvest season. As such, association activities are conducted in Puerto Maldonado. Study sampling was carried out between October 2011 and January 2012.

In the study communities, local institutions were present but governance was weak. Apart from Brazil nut producer associations, most communities had associations of farmers, cattle ranchers and loggers; the exception was MDD4, which only had

Table 8.1 Characteristics of the four communities studied based on the 2011 survey.

	MDD1	MDD2	MDD3	MDD4
Basic characteristics				
Total number of Brazil nut concessionaires in community[a]	76	112	61	127
Number of Brazil nut concessionaires sampled	31	31	31	33
Total land area of Brazil nut concessions (ha)	44,065	71,179	37,507	137,350
Total forested area of Brazil nut concessions[b] (ha)	40,816	70,259	34,614	137,259
Percent of forest cover within Brazil nut concessions[b] (%)	92.6	98.7	92.3	99.9
Year founded	1950	1950	1910	NA
Access to infrastructure				
Primary school	Yes	Yes	Yes	No
Secondary school	Yes	Yes	Yes	No
Health center	Yes	Yes	Yes	No
Road usable by four-wheel drive vehicles in all seasons	Yes	Yes	Yes	No
Bank or other source of formal credit	No	No	No	No
Distance to closest market by most common means of transport (km/min)	60/120	120/150	40/90	35/180
Most common means of transportation	Motorcycle	Motorcycle	Motorcycle	Motorized boat
Previous experience with conservation NGO	Yes	Yes	Yes	Yes
Agriculture				
Main staple food	Rice	Rice	Rice	Rice
Crop with highest production value per household on average	Rice	Rice	Rice	Cassava
Price per hectare of good quality agricultural land (USD)	1,761	705	705	1,057

a Community explanation is provided within the text.
b Data obtained from the 2000 Forest cover map produced by the Ministry of Agriculture.

a Brazil nut association. In all communities, the nut association was identified as the most important decision-making unit in the community with its members elected by their constituents. In three of the four communities, the majority of women were reported as being sufficiently represented in important community decision-making bodies and participated actively in meetings, but their influence on community decisions was mainly through influencing their husbands.

Nearly three-quarters of the Brazil nut concessionaires interviewed were not born in their respective community (Table 8.1). Most migrated from the Peruvian highlands around Cusco, Arequipa or Puno during either the agrarian reform or the first administration of Alan Garcia.

MDD1-3 reported year-round road access from Puerto Maldonado to the community center, but not for access to their concessions. Transportation on these smaller, unpaved roads is very difficult during the rainy season with access often restricted to motorcycles; some concessionaires opt to live permanently in their concessions during this season. The limited transportation also restricted the sale of agricultural produce, and consequently almost all production was for household consumption. Rice was the main staple in all four communities and was the crop with the highest production value except in the river community (MDD4) where cassava predominated, probably because it is less labor intensive. In three communities, Brazil nuts were reported to have become more important in the two years prior to the survey (2009–2011). Producers consistently cited an increase in nut price as the reason for its increased importance, and indeed 2011 witnessed an extremely high price for this product. Certain cash crops such as watermelon, oranges, pineapple and copoazu (*Theobroma grandiflorum*) were identified as being more important in certain communities, but these changes were almost always associated with a small-scale project being implemented by either an NGO or government agency.

The difference between MDD1-3 and MDD4 partly reflects the presence of infrastructure: MDD1-3 offered local health care services and education to secondary school level. In MDD4, since most concessionaires resided in Puerto Maldonado most of the year, they enjoyed an array of services offered by a larger city, including a university. No community had access to banks or formal credit, which concessionaires often identified as an impediment to improving their productive systems.

Household incomes were high in 2011, but this result may reflect the extremely high price offered for Brazil nuts that year (Table 8.2). Average community income is strongly related to the average concession size; larger nut concessions typically have more trees and thus generate more income. In terms of education, household members typically studied for eight years, except in MDD4 where they studied on average for an additional year. This is perhaps reflective of the better educational opportunities offered in the city as opposed to the smaller communities. In terms of health, household members (≥ 16 years old) were typically ill 6.7 to 7.2 days over the 12 months prior to the survey. The average was slightly higher in MDD2 (9.1 days) and may reflect its increased distance from the city. Most households had electricity and a private latrine in their principle residence, but typically only half of the households had piped water.

Table 8.2 Socioeconomic characteristics of households interviewed in 2011.

	MDD1	MDD2	MDD3	MDD4
Number of households sampled	31	31	31	33
Household average (SD)				
Number of adults	3.2 (1.5)	3.0 (1.3)	3.3 (2.3)	3.3 (1.5)
Number of members	4.1 (1.9)	3.4 (1.5)	4.0 (2.7)	3.9 (1.9)
Days of illness per adult	8.5 (15.5)	10.8 (14.4)	6.0 (12.3)	8.6 (16.1)
Years of education (adults ≥ 16 years old)	8.0 (4.2)	7.7 (4.0)	8.3 (4.6)	9.3 (3.5)
Total income (USD)[a]	13,834 (10,115)	14,952 (10,691)	12,925 (11,454)	23,322 (16,748)
Total value of livestock (USD)[b]	2,251 (6,961)	1,930 (5,452)	2,136 (6,719)	280 (574)
Total land controlled (ha)[c]	586.2 (307.6)	789.6 (357.3)	600.7 (504.8)	1,337.1 (752.6)
Total value of transportation assets (USD)	3,368 (3,408)	2,691 (3,136)	3,537 (5,049)	2,123 (2,668)
Percentage of households with:				
Mobile or fixed phone	74	39	77	94
Electricity	68	74	55	82
Piped water supply	45	65	42	52
Private latrine or toilet	81	97	97	91
Perceived sufficient income	68	81	61	76

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.

b Total livestock value at the time of interview.

c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

A summary of household income from different activities across all communities clearly shows that Brazil nut concessionaires' livelihoods in 2011 were largely based on forest products (Figure 8.3). Household businesses were the second most important source of income, except in MDD4 where wage labor comprised a larger share. This is perhaps because concessionaires in MDD4 had greater access to wage labor in the city compared to other communities. In all four communities, households were minimally reliant on agriculture and animal income (Figure 8.4). Concessionaires remarked that when nut productivity and prices were high, as they were in 2011, producers tended to focus more heavily on nut collection and less on agricultural production. During the community and household surveys, few respondents acknowledged receiving support from the government in the form of a pension or remittances from family members (other income, Figure 8.3).

As Brazil nut producers, local livelihoods depend largely upon the productivity of forests. Contractually, if concessionaires fail to maintain the trails within their concessions or fail to harvest their nuts, they risk having their concessionary rights revoked by the regional government. This obligation is evident in Table 8.3, where nearly 100% of households in all communities report selling forest products.

Data from 2011 also show that forest products were mostly for sale and not for household consumption. Most forest income was derived from Brazil nuts and timber. In MDD1, MDD2 and MDD3, Brazil nuts generate more than two-thirds of forest income, while in MDD4, timber was more important, generating 55% of forest income. Brazil nut concessionaires derived proportionally very little income from other NTFPs in their concessions or products such as bushmeat, fish or medicinal plants.

Households were asked about changes in their collection of NTFPs and fuelwood. Across all communities, respondents remarked that their reliance on fuelwood decreased, as concessionaires preferred to bring gas with them to their concessions. Since the nut harvest coincides with the rainy season, it complicates the use of fuelwood while in concession camps. When gas was not available, respondents preferred charcoal for its rapid ignition and easier storage. Outside of the harvest season, many nut producers lived in larger populated centers where fuelwood was scarce. This explains why typically only half of respondents in each community identified fuelwood or charcoal as a primary cooking source throughout the year. Respondents also remarked that the use of palm leaves for roof thatching had been steadily decreasing since the Interoceanic Highway was paved and the availability and price of corrugated iron roofing improved. These factors explain why the reported household consumption of forest products declined in nearly one-quarter of all households surveyed.

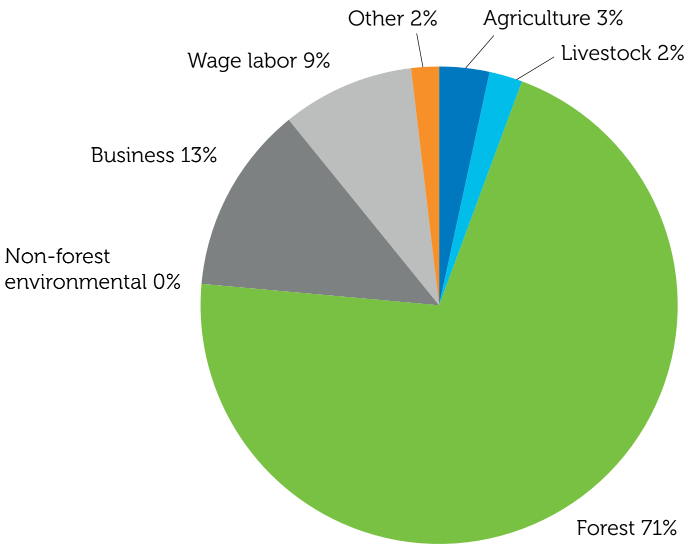

Figure 8.3 Sources of income for all households in sample (n = 126).

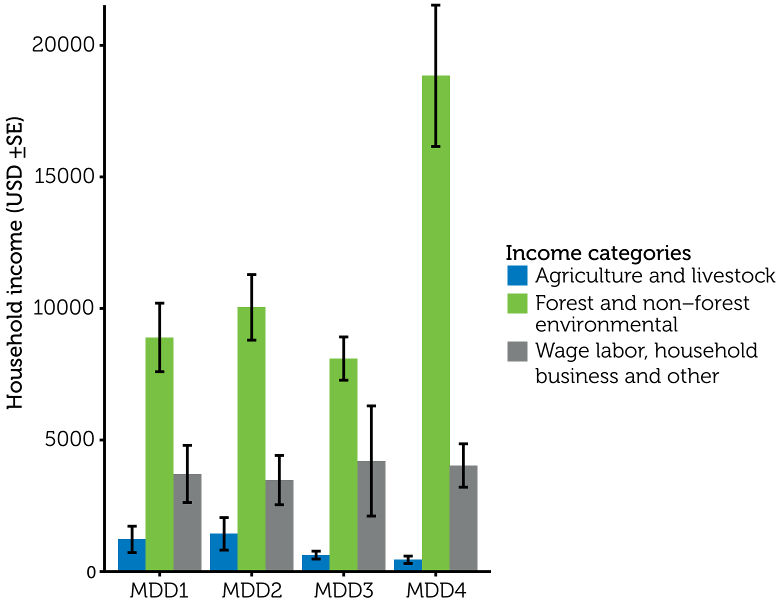

Figure 8.4 Sources of income for average household by community (or village) (+/- SE) (n = 126).

Table 8.3 Indicators of household forest dependence based on the 2011 survey.

	MDD1	MDD2	MDD3	MDD4
Number of households sampled	31	31	31	33
Household average (SD)				
Share of income from forest	70.99 (36.43)	70.47 (27.99)	73.63 (27.51)	75.79 (21.99)
Share of income from agriculture	8.07 (11.65)	9.12 (15.37)	4.34 (6.47)	2.14 (3.56)
Area of natural forest cleared (ha)[a]	0.16 (0.73)	0.39 (1.05)	0.21 (0.48)	0.14 (0.34)
Area of secondary forest cleared (ha)[a]	0.98 (1.50)	0.13 (0.43)	0.44 (1.01)	0.33 (0.88)
Area left fallow (ha)[b]	4.68 (3.26)	3.79 (3.66)	5.18 (5.34)	3.40 (3.78)
Distance to forests (minutes walking)	0	0	0	0
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	8	28	10	8
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	67	78	64	68
Reporting increased consumption of forest products[e]	6	6	10	9
Reporting decreased consumption of forest products[e]	29	23	30	25
Obtaining cash income from forest products[f]	100	100	97	100
Reporting an increase in cash income from forest[f]	65	61	40	45
Reporting a decrease in cash income from forest[f]	16	13	13	18
Reporting fuelwood or charcoal as primary cooking source	52	42	55	42
Leaving land fallow[g]	35	39	35	15
Clearing forest[g]	45	26	42	33
Reporting decreased opportunity for clearing forest[g]	14	4	8	7
Clearing land for crops[g]	45	26	39	33
Clearing land for pasture[g]	0	0	3	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

The restriction on cultivation within the concession was evident in the average area of mature and secondary forest cleared in the past two years (Table 8.3). Concessionaires generally did not deforest more than 0.5–1.0 ha in a two-year period, with clearing generally associated with cropping or pasture creation. Nevertheless, when asked whether forest cover within the concessions had changed in the past two years, participants in every community survey indicated that forest cover had decreased. Participants typically associated forest cover loss with increased immigration (three communities) or small-scale forestry (two communities). Some nut concessionaires, particularly those located near the Interoceanic Highway and with natural irrigation sources, sell parcels of land within their concession for agricultural uses. Although this practice is illegal, the government does not have the capacity to control it. All four communities identified a decrease in forest quality in the past two years and attributed this decrease to climate change (four communities) and over-exploitation of resources (two communities).

8.4 Challenges facing the initiative

We documented a variety of challenges and concerns raised by different stakeholders. One of the greatest challenges facing the initiative is unclear land tenure rights and chaotic zoning, resulting in overlapping land rights in the initiative zone.

Most concessionaires have overlapping boundaries because coordinates were registered by different entities (often NGOs or independent forest consultants), and the Regional Forestry Direction failed to verify the final boundaries. The overlaps result in conflict between neighboring concessions, occasionally with violent consequences. While this conflict does not represent a risk to the forest (and associated carbon stocks), it undermines confidence in the concession system. In addition, unclaimed gaps between concessions have allowed other actors to solicit land titles. Resolution of the problems of imprecise boundaries and overlapping claims, and the success of REDD+ in Madre de Dios, will hinge upon cooperation between the ministries to eliminate multiuse land zoning (Chavez et al. 2012). It will also depend upon better nut concession management on the part of the Regional Forestry Directive to eliminate land conflicts within the Brazil nut zone.

The recent gold rush in Madre de Dios has also spurred considerable land conflicts within the region. Although the initiative lies largely to the north of the mining zone, a fraction of the initiative zone (2.9% or 8053 ha) has overlapping rights with mining concessions. Moreover, respondents anecdotally remarked that nut concessionaires often illegally invite miners into their concessions for a percentage of their profit. Nevertheless, BAM does not consider the scale of this practice to be a considerable threat to initiative implementation.

Another concern raised by local NGOs is how to control timber extraction within the Brazil nut concessions. Data obtained from the household surveys demonstrated that nearly 60% of households surveyed in the four communities extract timber from within their Brazil nut concessions. Of those, an average of 666 m^3 was extracted per concessionaire in 2011, 98% of which was sold. The average household net income from this activity was USD 6261. To provide some perspective, the lowest paid worker in an informal mine earns USD 700/month while local agricultural wages average USD 100–150 /month (USAID 2010). Thus, timber is nearly as lucrative as mining, far less detrimental health-wise and therefore may become a potentially difficult livelihood activity for BAM to manage in the future.

The limited knowledge of the REDD+ initiative by participants in 2011 was also of concern. Prior to our surveys, BAM conducted workshops and training sessions and offered technical and legal assistance to participants, including small loans. Nevertheless, of the 126 participating households interviewed, only 62% reported that they knew about the REDD+ initiative; their main source of information about the initiative was first NGOs and then the proponent.

We asked the 62% of households (n = 78) that expressed a basic knowledge about the initiative about their concerns and recommendations. Their main concerns were that the initiative would not adequately compensate them for the loss of forest income (10 households), that it would not be implemented (9 households) and that concessionaires would lose their land rights (6 households). These concerns were largely attributable to unaddressed misunderstandings or unfounded rumors generated within communities. Unrealistic outcomes may have been communicated to the concessionaires during the preliminary phases of the initiative to encourage participation. Households' main recommendations focused on BAM upholding their contractual obligations (16 households), primarily the construction of the nut processing plant. Participants also recommended more technical workshops (12 households) as they desired greater understanding of the REDD+ initiative, as well as technical support in concession management. Finally, they recommended improving communication and transparency (9 households) by holding more workshops in the communities, visiting the concessionaires in their concessions and providing more details on the cost of initiative implementation.

8.5 Lessons from the initiative

The REDD+ Project in Brazil Nut Concessions in Madre de Dios offers unique insights for initiatives being implemented by private entities. The challenges confronted by BAM, particularly with regard to poor land tenure regularization and unclear carbon commercialization rights, are problems which are customarily only resolved by the State but which a private entity such as BAM can learn to strategically mitigate to achieve REDD+ success.

BAM has been particularly successful in collaborating with government institutions within the initiative zone and in contributing to conditions for the implementation of all REDD+ initiatives within Madre de Dios. BAM currently participates in the cross-sectoral REDD+ working group – the Mesa REDD – which has 60+ institutional members at the national level. They also work with the regional REDD+ Working Group in Madre de Dios, where public-private partners discuss and agree on technical methods. They are thereby contributing to the technical capacity of the regional government as well as cost-sharing and ensuring better consistency between various REDD+ implementing entities.

The initiative also offers a unique opportunity to examine a system where income generated from NTFPs could potentially sustain household needs and discourage conversion of these forests for other land uses. While Brazil nuts comprised a large share of household income in 2011, this may be driven by the high prices of Brazil nuts that year. Prices have greatly varied in the past and are likely to do so in the future, warning against excessive reliance on this source of income. While the Brazil nut processing plant is a popular aspect of the initiative among producers, it will be a challenge to operate and it is not clear how it will overcome price fluctuations driven by international commodity markets.

The initiative can also provide invaluable lessons on communication with local stakeholders. BAM tried to reach the widest audience possible by diffusing information through various means. Despite their best efforts, however, it emerges that outreach was not always sufficient to avoid a sense of uncertainty and confusion. Ultimately, Brazil nut producers have been the recipients of many short-term projects that brought very little sustained improvement to their overall livelihoods. They have also collaborated with many researchers who have extracted information without adequately explaining the purpose of their work. Consequently, they have become skeptical of such outside actors, and their interest in new initiatives is low. BAM expects local participation to increase once major initiative activities are underway, such as the sustained sale of carbon credits, finalization of the Brazil nut processing plant, and the implementation of the monitoring and surveillance system. It will be interesting to observe whether participants' concerns dissipate or transform into new concerns after these goals are achieved, and how BAM reacts to these local concerns in the long-term.

8.6 Acknowledgments

We are particularly indebted to the Brazil nut concessionaires of Madre de Dios and their families for sharing with us their time, knowledge and laughter.

We'd also like to thank Bosques Amazonicos for always being exceptionally forthcoming with project information and for their agreement to work with us in the intervention area. Finally, we'd like to thank the members of the Madre de Dios field team for their dedication to this research study: Veronica Huamani Briceño, Anggela Michi Quijano, Mariella Guisa, Frank Varela Tito and Ronny Fernandez Menis.

Chapter 9

Valuation of Environmental Services in the Managed Forests of Seven Indigenous Communities in Ucayali, Peru

Dawn Rodriguez-Ward and Pilar Paredes del Aguila

Valuation of Environmental Services in the Managed Forests of Seven Indigenous Communities in Ucayali, Peru, is a subnational REDD+ initiative led by the Peruvian nonprofit organization AIDER (Association for integrated development and investigation) in the Ucayali region of Peru.[1] The initiative aims to reduce deforestation and degradation, conserve biodiversity, increase forest carbon reserves and improve livelihoods through the promotion of sustainable forest management within seven Shipibo Conibo and Cacataibo indigenous communities. Since the initiative's inception in 2010, the proponent has conducted socioeconomic and deforestation baseline studies, delivered REDD+ training workshops, and promoted sustainable timber, NTFP and fisheries management practices. It has also continued to provide technical assistance for communities to attain FSC forest management certification and to monitor and

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1 AIDER stands for *Asociación para la Investigación y el Desarrollo Integral* and the initiative's Spanish name is *Puesta en valor de los servicios ambientales en bosques manejados de siete comunidades nativas de la región Ucayali*.

conduct surveillance of forested areas. Over the initiative's first ten years, the plan is to conserve 1826 ha annually and avoid emissions of 5,699,386 CO_2e (AIDER 2014). Future plans include certification by VCS and CCBA and commercialization of carbon credits. In this chapter, we describe the goals and strategies of the initiative, characterize the participating smallholders and their livelihood activities, discuss the challenges and concerns of key stakeholders, and offer insights on the lessons of this initiative. For this initiative, REDD+ is a way to support the continuation of forest management interventions by the proponent with carbon funds. This site also demonstrates the importance of prioritizing interventions and setting rules that reflect local biophysical and cultural conditions.

9.1 Basic facts: Where, who, why and when

9.1.1 Geography

The Ucayali region is located within the central eastern section of Peru, covering an area of 102,165 km^2 and representing 8% of the total national territory (AIDER 2014). In 1980, Ucayali was separated from Loreto (Law No. 23099) and became its own region. It is the second largest region in Peru with 432,159 inhabitants, including 12% of Peru's total Amazonian indigenous population with 27 different ethnicities (INEI 2007a). The seven communities participating in the REDD+ initiative are located in two of the four provinces of Ucayali: Coronel Portillo (36,815 km^2) and Padre Abad (8822 km^2).

Eighty-seven percent of the Ucayali region is covered by tropical rainforest with temperatures fluctuating between 19 and 30°C (AIDER 2014). It experiences heavy rainfall between the months of November and March and dry periods in July and August. Rainfall reaches an annual average of 1723 mm and the elevation of the communities in the intervention area ranges from 110–476 masl (Walsh Peru 2012). The project area includes communities located within *várzea* forests (seasonally flooded forests inundated by sediment-laden water from runoff from the Andes) (Prance 1979). Flooding greatly affects the access and timing of local livelihood activities within the forest. Farming occurs during the dry season when water levels are lower and farmers can plant crops in the *bajiales* (low-lying, sandy areas that can tolerate extreme waterlogging) (Junk et al. 2010). Communities also increase fishing activities for commercialization during this period, as it is easier to catch larger quantities in smaller areas. Once water levels begin to rise in the rainy season, communities usually increase their logging activities as new waterways provide access into the forest. People from outside of the region also take advantage of this period to illegally harvest timber from the forest.

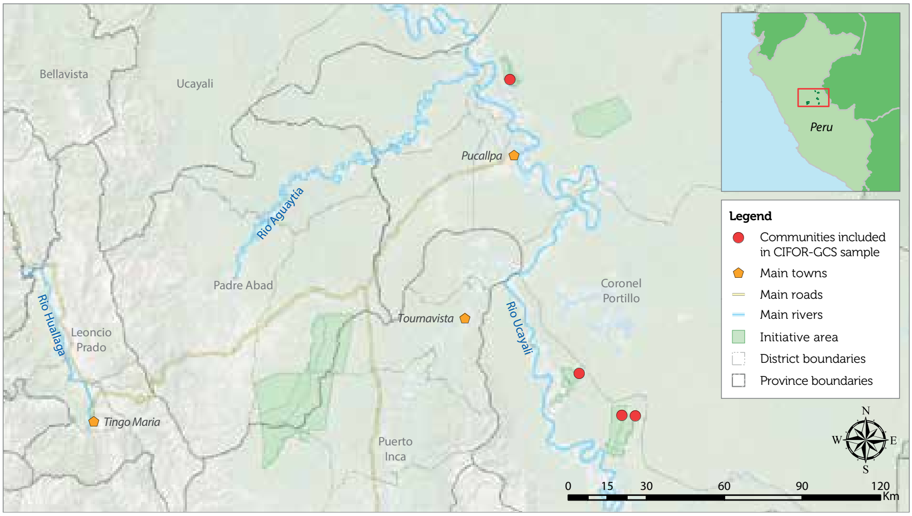

Figure 9.1 Map of the REDD+ initiative in Ucayali.

Data sources: AIDER, GADM, OpenStreetMap and World Ocean Base.

According to the latest census of 2007, the main agricultural products of the region, in order of importance, were: banana, cassava, papaya, rice, corn and palm oil, and the principal economic sectors were agriculture (18.5%), commerce (17.5%) and manufacturing (15%) (INEI 2007b). Agriculture and forest product harvesting are important livelihood activities within the participating indigenous communities.

Regional land use and forest management were greatly affected by the construction of the Federico Basadre federal highway in 1945, which connected Pucallpa (the main city of the Ucayali region) to Lima. This highway initially facilitated access to extraction of natural rubber and other forest products, and cultivation of crops. It also led to increased Andean migration to the Amazon (Coello et al. 2008). High rates of deforestation in this region were highlighted in a study by Oliveira et al. (2007), in which the authors estimate that between 1999 and 2005, 64% of all deforestation and degradation in the Peruvian Amazon occurred in Ucayali (Che Piu and Menton 2013). An additional study conducted in Ucayali by the National Ministry of the Environment (MINAM) showed that the average annual deforestation rate for 2000–2005 was 16,679 ha, rising to 22,057 ha for 2005–2009; the latter corresponds to 1.9% of the total forest area in Ucayali (2012). Two members of the regional government of Ucayali (GOREU) identified seven main drivers of regional deforestation: (i) the Federico Basadre highway; (ii) palm oil plantations; (iii) artisanal mining for gold (especially along the southern border); (iv) Andean migration (especially from Huanuco); (v) petroleum exploration; (vi) illegal logging; and (vii) coca cultivation (personal communication from P Seijas and D Hernandez, July 2013).

Hunter carrying *huangana* in Ucayali. (Leandro Gadiel Ihuaraqui/CIFOR)

To date, in addition to AIDER's initiative described here, there are two REDD+ initiatives seeking to reduce the high deforestation rates in Ucayali. One is led by Bosques Amazonicos (BAM), which focuses on forest plantations and improved forest management on private properties with the aim of attaining FSC certification (personal communication from P Romero, July 2013). (BAM is also the proponent of the REDD+ initiative in Madre de Dios, Peru, described in Chapter 8.) The other initiative, which is under development, involves the national government agency SERNANP (National Park Service or Servicio Nacional de Áreas Naturales Protegidas por el Estado) and the private company Eco-Tribal developing REDD+ in the communal reserve of El Sira (personal communication from K Rios Sanchez and M Gonzales, August 2014).

The AIDER initiative involves seven communities. Two are located within Padre Abad Province and Irazola district, and are accessible by highway (Figure 9.1). The inhabitants here are predominantly of Cacataibo ethnicity. The other five communities are located within the Coronel Portillo Province, two of which are in the Calleria district and three in the Iparia district. They are of Shipibo Conibo ethnicity. They are situated along large tributaries and can only be reached by boat. The main deforestation drivers they face include illegal logging and exploratory petroleum wells. There are 2554 inhabitants (508 families) in the seven intervention communities, which cover a total of 142,247 ha; the project area covers a total of 127,004 ha (AIDER 2013). For the CIFOR-GCS study, we surveyed four of the Shipibo Conibo communities, comprising an area of 21,505 ha and including

441 households. We interviewed a total of 123 households in these four communities (approximately 30–31 households per community).

9.1.2 Stakeholders and funding

The proponent AIDER is a nonprofit NGO founded in 1986. It is committed to sustainable development and environmental conservation through the design, formulation and implementation of projects, and through capacity building in business management and forest governance within native and rural communities (AIDER 2011). AIDER has worked with communities in Ucayali since 2000, and in April 2012 it received financing from the ITTO program for Reducing Deforestation and Forest Degradation and Enhancing Environmental Services in Tropical Forests (REDDES) (see Figure 9.2). The initial funding provided by ITTO was approximately USD 415,385. Other funders that enabled AIDER to conduct preliminary REDD+ studies included TNC's Peru consortium with Conservation International (CI), WWF, and the Inter-American Development Bank's (IDB) program, Development of Pilot Experiences to Reduce emissions Derived from Deforestation and Degradation in Community Scenarios of Three Amazonian-Andean regions.[2] In 2014, AIDER also received financing from the USAID donor program, the Initiative for Conservation in the Andean Amazon (ICAA), to create Community MRV committees.[3] According to their PDD, as of August 2014, the budget for the REDD+ project's implementation in seven communities for the first five years was estimated at USD 1,914,543 (AIDER 2014).

9.1.3 Motivation

This REDD+ initiative grew out of AIDER's previous experience with forest management in indigenous communities in Ucayali. Since 2002, AIDER had provided technical assistance in forest management, promoted sustainable economic activities, and supported forest monitoring and surveillance. AIDER identified and prioritized the seven current intervention communities based on the communities' interest and willingness to conserve their forests, as well as their participation in AIDER's earlier efforts to promote sustainable forest management in the region. According to AIDER, additional criteria used to select these communities for inclusion in this REDD+ initiative were: (i) high levels of forest carbon; (ii) high rates of deforestation; (iii) significant deforestation threats; (iv) clear land tenure; (v) clear tree tenure and carbon property rights; and (vi) high forest dependence in local livelihoods.

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2 The name in Spanish is *Desarrollo de Experiencias Piloto de Reducción de Emisiones Derivadas de la Deforestación y Degradación (REDD+) en Escenarios Comunitarios de tres Regiones de la Amazonía Andina*.

3 ICAA in Spanish is *Iniciativa para la Conservación de la Amazonia Andina*.

The main drivers of deforestation and degradation in the region, as identified by AIDER, are traditional small-scale agriculture by both community members and newly arrived households, small- and medium-scale cattle ranching, small-scale legal and illegal timber harvesting and NTFP harvesting. Although some of these deforestation threats originate with actors outside the communities, the REDD+ initiative focuses exclusively on local households. For example, AIDER has noted that weak regulations and enforcement (at the regional and national level) for controlling timber harvesting, make it difficult for legal timber to compete with illegal timber in the marketplace (personal communication from P Recavarren, February 2013). Therefore, in addition to providing technical assistance to communities for the sustainable management of their forest resources, AIDER has also helped the communities develop business management plans for NTFPs and timber. In 2014 AIDER also proposed to create formal monitoring committees within each community to monitor illegal forest activities. Recently the proponent identified the need to monitor the impacts of mining in surrounding zones, as gold mining is becoming a more important deforestation threat to the region but has not been identified as a threat to the four communities of this chapter.

9.1.4 Timeline

The timeline (Figure 9.2) summarizes the history of the initiative and interventions applied from 2002 until mid-2014. Originally AIDER identified the start date for the REDD+ initiative as April 2012, which is when they were awarded funding from ITTO's REDDES program. However, since AIDER had been promoting sustainable forest management practices for timber and NTFPs in indigenous communities in Ucayali before this date, they re-designated their start date as July 2010 to reflect that previous experience. Long before either start date, AIDER had worked with a broader set of communities to develop forest management plans in 2002, and since 2005 has assisted them throughout the FSC forest management certification process.

Prior to ITTO funding, AIDER conducted preliminary REDD+ studies with financing from the TNC consortium. These studies established a historical deforestation baseline, estimated carbon biomass, formulated timber and NTFP business plans, and conducted socioeconomic diagnoses. In October 2012 AIDER and the regional indigenous federation ORAU (Organización Regional AIDESEP Ucayali) held meetings to disseminate general information about REDD+ and the initiative to the seven participating communities. Shortly thereafter, in December 2012 until February 2013, we conducted the CIFOR-GCS baseline survey. Afterwards, AIDER continued to hold meetings and workshops with community leaders to define their benefit-sharing arrangements (July 2013), workshops on future scenarios with and without the project (February 2014), and workshops on business administration and declaration of expenses of the project (May 2014).

Pre-2000					
2000					
2001					
2002	AIDER implements PMFs and community forest surveillance teams				
2003					
2004					
2005	First communities attain FSC certification				
2006					
2007					
2008					
2009					
2010	AIDER's new designated start date of REDD+				
2011	AIDER begins preliminary REDD+ studies in four native communities	AIDER promotes *tanoni* plantations in four communities			
2012	AIDER constructs CITE Indígena timber warehouse and sawmill	AIDER received funding from ITTO's REDDES program	AIDER and ORAU disseminate information on REDD+	CIFOR-GCS baseline survey	
2013	AIDER receives financing from Movistar for *bolaina* plantations in one community	AIDER meets with community leaders to discuss benefit-sharing arrangements	AIDER identifies deforestation drivers, elaborates theoretical framework and validates data in the field	TNC funds *aguaje* palm and *paiche* fish management in one intervention community	CIFOR-GCS presents baseline results to study communities
2014	AIDER holds Future Scenario workshops	AIDER receives funding from ICAA to create MRV committees	AIDER offers workshop on business administration and project expenses	CCBA PDD completed and published online	CIFOR-GCS phase 2 survey

REDD+ initiative active

Figure 9.2 Timeline of the REDD+ initiative in Ucayali.

9.2 Strategy for the initiative

AIDER considers REDD+ as complementary to their activities already in progress with participating communities in the region. Incorporating the sale of carbon credits is seen as an additional bonus to bolster funding for improved forest management activities underway and planned for the following five years (personal communication from C Sanchez, August 2014). While AIDER aims to reduce deforestation (RED), reduce degradation (D) and to increase the reserve of carbon stock through improved forest management (+), their focus is also on promoting social and environmental co-benefits. They aim to improve the quality of life for participants and promote biodiversity conservation, as community members in participating communities are identified as highly dependent on their forests. Additionally, during a biodiversity inventory in the intervention communities, 13 flora species were found to be under threat and 190 fauna species were categorized as vulnerable in the study region (AIDER 2014).

Since the initiative's inception in 2010, the proponent has engaged in REDD+ capacity-building workshops, promoted increased monitoring and surveillance of forested areas, and continued to provide technical assistance for FSC forest management certification. AIDER deems community members' participation as vital to the development and implementation of the initiative, and strives to attain equal benefits for women, especially with regard to the distribution of benefits. Since 2012, AIDER has held meetings with community members both in their communities and in Pucallpa to discuss initiative planning. Additionally, there are REDD+ committees (*Comite Consejo Consultivo*), comprised of community leaders in each participating community, to disseminate REDD+ news and updates, and discuss benefit-sharing arrangements.

AIDER completed its CCBA PDD in April 2014 and as of August 2014, is awaiting CCBA certification; it is also seeking VCS verification.[4] The benefit-sharing arrangements for the sale of carbon credits has not yet been agreed upon. Since July 2013, the proponent has met with community leaders to discuss benefit-sharing arrangements, and the REDD+ committees have served as an important platform to discuss how carbon payments will be distributed (i.e. to community members, to REDD+ committees or through AIDER), including what portion will be spent on planned REDD+ activities and what portion will be allocated to each community.[5] AIDER is responsible for the sale of carbon credits – finding buyers and receiving payments – but no contracts or agreements have been signed as of August 2014. AIDER plans to sell carbon credits in 2015 in order to generate income to finance the initiative.

In 2012, AIDER replaced one community participating in the initiative with a new one, maintaining the same number of communities involved but increasing the forest area from 90,728 ha to 127,004 ha. From 2012 to 2014, primary interventions carried out in some of the communities and considered integral to the REDD+ strategy include: REDD+ capacity-building workshops;

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4 https://s3.amazonaws.com/CCBA/Projects/Forest_Management_to_Reduce_Deforestation_and_Degradation_in_Shipibo_Conibo_and_Cacataibo_Indigenous_Communities_of_Ucayali_Region/Summary_PDD_CCB_Ucayali_english.pdf

5 For example, according to AIDER, two of the seven communities contain 40% of the verified carbon units (VCUs) for the entire project, but it is not yet determined whether they will receive proportional and therefore higher carbon payments than those with less forest areas or less carbon stocks. As of August 2014, this has not been defined or agreed upon.

construction of a CITE Indígena (Centro de Transformación e Innovación Tecnológica Indígena) sawmill and warehouse in Pucallpa; reforestation with tanoni trees (*Thevetia peruviana*), the seeds of which are used for handicrafts; bolaina (*Guazuma crinite*) timber plantations financed by Movistar; sustainable management of aguaje palm (*Mauritia flexuosa*) financed by TNC; and sustainable fish farming of paiche (*Arapaima gigas*) financed by TNC. Not all households participate in the activities but each intervention activity involves 8 to 12 individuals, including men and women. Forest monitoring and surveillance activities are also considered an important intervention to be implemented in 2014 through community MRV committees, which will also include women.

Other organizations are also working in CIFOR-GCS's four study communities. Activities include improved agriculture and farm animal training by FONCODES (Fondo de Cooperación para el Desarrollo Sostenible), and ongoing REDD+ capacity building by the indigenous federation of ORAU, with funding from the USAID and Peru Bosques project. In addition: the national government's nutrition program, known as *Vaso de Leche*, provided food for families with children under five years of age; projects to provide electricity, potable water through communal wells and water tanks were undertaken by municipal and regional government agents; a community antenna was purchased through a local cable committee; and the construction of an office for local authorities was commissioned through the district government. One community also had a recycling program for plastic bottles with an international environmental organization and participated in workshops provided by the Red Cross on pre- and post-flooding strategies.

9.3 Smallholders in the initiative

For the CIFOR-GCS survey, we selected four of the Shipibo Conibo communities that had long-standing relationships with AIDER and were originally targeted for the initiative. Between December 2012 and February 2013, we interviewed a random sample of 123 households or 27% of the 441 households in these four communities, labeled UCAY1–4 (see Table 9.1). In each community, we also held one community meeting (with an average of 15 men and women) and one women's meeting (with an average of 12 women).

The four intervention communities are defined and legally recognized as 'native communities' in Peru. They were officially formed in the period of 1945–1975. They have their own local governance structure with leaders elected every two years. Community decision making is attained through consensus at meetings (general assemblies) and includes the participation and voting rights of all women and men who are of Shipibo Conibo descent and over the age of 16 (or who have children). Community members have access to communally managed forests and are granted rights to farm in specific areas designated for agriculture by the elected local authorities. Community members farm between 1 and 8 ha of land. In each community there are various associations, which predominantly focus on health and family issues (parents' association, mothers' club, health committee). Additionally, UCAY1 and UCAY2 have artisan committees whose members are mainly women and focus on making clothing, tapestries, ceramics and jewelry from natural forest products.

Table 9.1 summarizes the characteristics of the four study communities participating in the initiative in 2012. All communities had access to primary and secondary schools. Most teachers lived temporarily in the communities during the school year and were from other regions. Classes were taught in Spanish, as only a few teachers speak the predominant Shipibo language. Medical posts were present in three out of the four communities, but doctors and nurses visit the communities infrequently to attend patients. Two communities have roads that are usable by four-wheel drive vehicles, but few people could afford vehicles and thus the main mode of transportation in all communities was by foot or canoe.[6] People used fluvial transportation as their main mode of transportation to Pucallpa, since there were no roads to the capital city.

The main staple foods were bananas, cassava and fish. As communities are located along rivers and tributaries, many people engaged in fishing on a daily basis and depended on fish as their main source of protein. Bananas were identified as the agricultural crop with the highest production value (cash and subsistence) in all four communities (33% for UCAY1, 43% for UCAY2, and 62% for UCAY3 and UCAY4). In the 12 months prior to the study (2011), communities experienced unusually high levels of rain and flooding and many farmers complained of losing their banana stands. Communities, specifically those with more lowland forests such as UCAY1, experienced a high level of temporary out-migration during this particular farming season and decreased banana production. Members of UCAY3 mentioned a growing interest in papaya cultivation due to its high market value, and members of UCAY1 opted to focus on logging as an alternative to agricultural crops in the year following the high flooding as they were already engaging in timber harvesting activities with AIDER.

Table 9.2 summarizes the socioeconomic characteristics of households interviewed in the four communities. Primary and secondary schools were present in all four communities, and adults (≥ 16 years old) had studied for an average of 6–7 years. In terms of infrastructure, UCAY2 was the only community with access to piped water. Most households depended on water from the river or cisterns that collect rainwater during the rainy season. Most families in the study communities of UCAY2, UCAY3 and UCAY4 had access to electricity (74%–80%), while only

6 UCAY4 had road access to their forest entrance due to historical ties with a timber company that had constructed a road into their timber harvesting areas many years before but were no longer present in the community. UCAY3 had a road connecting it to neighboring communities, which was used either by bicycle or motorcycle. (Both are secondary/dirt roads.)

Table 9.1 Characteristics of the four communities studied based on the 2013 survey.

	UCAY1	UCAY2	UCAY3	UCAY4
Basic characteristics				
Total number of households[a]	71	150	90	130
Number of sampled households	31	30	31	31
Total land area[a]	4034	6166	6985	4320
Total forest area[a]	2528	4966	5836	4000
Year founded	1945	1967	1970	1975
Access to infrastructure				
Primary school	Yes	Yes	Yes	Yes
Secondary school	Yes	Yes	Yes	Yes
Health center	Yes	Yes	Yes	No
Road usable by four-wheel drive vehicles in all seasons	No	No	Yes	Yes
Bank or other source of formal credit	No	No	No	No
Distance to closest market by most common means of transport (km/hours)	34/5 (boat)	116/27 (boat)	119/26 (boat)	94/14 (boat)
Previous experience with conservation NGO	Yes	Yes	Yes	Yes
Agriculture				
Main staple food	Fish	Banana	Cassava	Banana
Crop with highest production value per household on average	Banana	Banana	Banana	Banana

Note: respondents were unable to report the current price of good quality agricultural land because they are not legally able to rent out land.

a Number of households, total land area and forest area reflect estimates by key informants, such as the presidents of community associations or community health agents.

6% of households sampled in UCAY1 had access to electricity. There were no community members with their own landlines; instead each community had one public pay phone, and only a few households (6%–26%) had their own cell phones, which they used when traveling. The value of transportation assets was low for all four communities as the main modes of transportation were by foot and canoe.

As shown in Table 9.2, UCAY4 had the highest total household income (USD 13,175) and highest percentage (39%) of people who agreed that their household income was sufficient to cover their needs in 2010–2012. Although UCAY1 had the second highest percentage (32%) of households who agreed that their income was sufficient, they had the lowest average income of the four communities (USD 3760). Households in UCAY4 derived a higher share of their income from agriculture and forest products than households in UCAY1. And as mentioned earlier, the higher percentage of income from forest products in UCAY1 was, unlike the other communities, derived predominantly from timber, while income from forest products in UCAY4 came from fish, suggesting that fishing could be more profitable than logging. One factor that could be influencing UCAY4's higher income, especially from the agricultural sector (Figure 9.3), is the larger average land area controlled by their households (8.95 ha in addition to access to communal forest) as compared to the other three communities (see Table 9.2). In all of the communities, forest products were harvested from extensive communal forests.

Table 9.2 Socioeconomic characteristics of households interviewed in 2013.

	UCAY1	UCAY2	UCAY3	UCAY4
Number of households sampled	31	30	31	31
Household average (SD)				
Number of adults	2.8 (1.5)	2.6 (0.9)	3.0 (1.4)	2.6 (1.0)
Number of members	5.1 (1.7)	5.6 (1.9)	5.9 (2.1)	5.7 (2.6)
Days of illness per adult	6.8 (16.3)	8.2 (33.3)	1.6 (4.9)	4.3 (8.6)
Years of education (adults ≥ 16 years old)	6.7 (3.4)	6.9 (4.0)	6.5 (3.7)	6.6 (4.0)
Total income (USD)[a]	3,761 (3,003)	10,062 (7,830)	9,451 (11,878)	13,175 (14,984)
Total value of livestock (USD)[b]	118 (166)	121 (163)	124 (130)	122 (145)
Total land controlled (ha)[c]	1.3 (1.0)	3.6 (2.6)	3.3 (2.9)	8.9 (7.7)
Total value of transportation assets (USD)	165 (270)	193 (310)	189 (172)	138 (189)
Percentage of households with:				
Mobile or fixed phone	26	23	6	19
Electricity	6	80	74	74
Piped water supply	0	20	0	0
Private latrine or toilet	45	53	52	42
Perceived sufficient income	32	27	13	39

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.

b Total livestock value at the time of interview.

c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

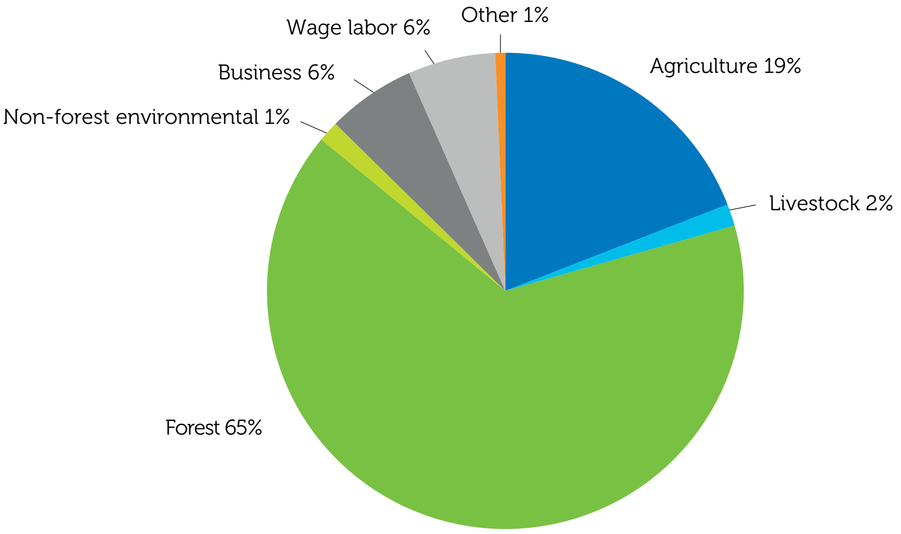

Figure 9.3 Sources of income for all households in sample (n = 123).

All four indigenous communities of the initiative were highly dependent on their forests for livelihood activities and income. Figure 9.3 shows that 65% of income in the four communities was derived from the forest, while 19% was derived from agriculture, followed by 6% from salaried work and 6% from households' own businesses. Table 9.3, which summarizes indicators of forest dependence, reinforces the importance of forest income in these communities, as it shows that 56%–68% of the average household's total income (including sales and subsistence) was derived from forest products and that 93%–97% of families interviewed reported selling forest products.

Important products derived from the forest included: timber, fuelwood, fish, wild meat, primary materials for artisanal products (e.g. seeds and tree bark for dyes), and palm fruits. These provide both cash (e.g. from sales of timber and artisanal materials) and subsistence (e.g. fish). In three of the communities (UCAY2, UCAY3 and UCAY4), the forest products that contributed the most to household income (including sales and subsistence) were fish, timber and fuelwood. UCAY2 reported an average of 79% of forest income from fish, UCAY3 reported 88%, and UCAY4 reported 84%. UCAY1 was the only community where households gleaned a higher percentage of their forest income from sawn wood (49%), which was followed by fish (37%). Almost all households across the communities (93%–100%) reported fuelwood as their primary cooking fuel (Table 9.3).

While agriculture contributed the second largest share of income, a high percentage of household members (≥ 16 years old) reported agriculture as their primary or secondary occupation rather than forest-based activities. This could be

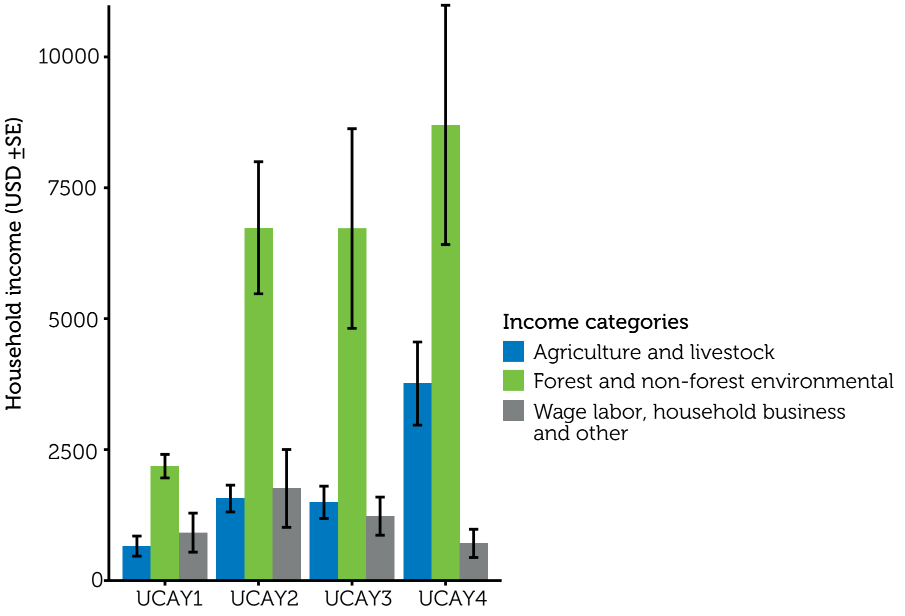

Figure 9.4 Sources of income for average household by community (or village) (+/- SE) (n = 123).

because agriculture is perceived as an activity that household members participate in on a daily basis, requiring more time than forest-based activities, although fishing is also a daily activity for many households. Very little income was derived from livestock (2%) in the four communities, as cattle-ranching was not common, but households typically had chickens and ducks.

Forest collection activities were discussed in women's meetings. According to the participants, most men and women accessed the communal forest to collect a diversity of products. Men went in familial groups for hours to days at a time to hunt wild meat (a practice that is becoming less and less frequent due to the larger distances needed to travel to find animals). Men also went to the forest to harvest timber, collect palm fruits and gather palm leaves for thatching roofs. Women entered the forest to collect fuelwood and NTFPs (i.e. seeds and bark) for their artisanal products. Fishing was an activity mostly conducted by men, although women reported fishing during the absence of their husbands, i.e. when they emigrated temporarily for salaried work.

Three of the communities reported an increase in consumption of forest products due to the increasing population of their communities. They also cited an increase in the sale of forest products partially due to women's growing interest in selling their artisanal products in Pucallpa in order to generate their own income and complement household income generated by male members of their family.

Table 9.3 Indicators of household forest dependence based on the 2013 survey.

	UCAY1	UCAY2	UCAY3	UCAY4
Number of households sampled	31	30	31	31
Household average (SD)				
Share of income from forest	67.64 (23.74)	60.75 (24.26)	58.36 (25.18)	55.73 (26.37)
Share of income from agriculture	15.62 (17.13)	19.40 (15.93)	21.71 (13.16)	36.74 (23.74)
Area of natural forest cleared (ha)[a]	0.10 (0.30)	0.05 (0.20)	0.05 (0.20)	0.00 (0.00)
Area of secondary forest cleared (ha)[a]	0.04 (0.18)	0.46 (0.67)	0.48 (1.29)	0.66 (1.33)
Area left fallow (ha)[b]	0.98 (1.35)	2.11 (1.32)	1.53 (1.34)	4.37 (4.24)
Distance to forests (minutes walking)	0	0	0	0
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	21	51	46	72
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	30	10	20	6
Reporting increased consumption of forest products[e]	38	21	17	6
Reporting decreased consumption of forest products[e]	14	17	13	10
Obtaining cash income from forest products[f]	93	97	93	94
Reporting an increase in cash income from forest[f]	30	14	11	10
Reporting a decrease in cash income from forest[f]	19	10	11	10
Reporting fuelwood or charcoal as primary cooking source	100	93	100	100
Leaving land fallow[g]	23	60	58	48
Clearing forest[g]	19	47	42	23
Reporting decreased opportunity for clearing forest[g]	15	14	14	3
Clearing land for crops[g]	16	47	42	23
Clearing land for pasture[g]	0	0	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

In UCAY1 and UCAY4, less than a quarter of households (19% and 23%, respectively) reported clearing forest areas in 2010–2012 for the purpose of growing crops, while close to half of the households in UCAY2 and UCAY3 reported clearing forest. Among households that cleared forest, the average amount of secondary forests cleared was higher (0.41 ha) than the average amount of mature forest (0.05 ha) cleared. UCAY1 and UCAY4 cited a decrease in forest clearing due to increased regulations for timber harvesting associated with FSC certification guidelines, internal community rules, and increased monitoring by the national agency OSINFOR (Organization for the Supervision of Forest Resources and Wildlife). The higher percentages shown for clearance of forests for agricultural products in UCAY2 and UCAY3 could be due to the floods of 2011 that destroyed crops and washed away farmland.

9.4 Challenges facing the initiative

We identified a variety of challenges and concerns with the planning and implementation of the REDD+ initiative based on information from the proponent, participating communities and observations from our field team. In all four communities, there was a general lack of knowledge about REDD+ and confusion about its meaning. Households continually asked our field team about the definition of REDD+.[7] In our interviews, few households had heard of or understood AIDER's initiative. This lack of knowledge could be because AIDER had only begun dissemination activities a few months earlier, as the initiative was in its initial stages of development when the team arrived. Also, since AIDER had been involved with other activities in the area, it was difficult for communities to separate the REDD+ initiative from their prior activities.

The proponent identified several challenges associated with advancing the initiative. The first problem was the slow process of PDD validation for authority to sell carbon credits. They have also faced the difficult task of defining activities and projecting their long-term costs, which according to one proponent employee makes them feel that "the price to conserve forests is eventually defined by the carbon buyer" (personal communication from P Santiago, August 2014). It has also been a slow and difficult process to explain the 'intangibility' of carbon to communities and to undo misinformation and/or negative news about REDD+ and carbon prices. For example, news of 'carbon cowboys' illegally buying and selling carbon at exorbitant prices in Peru not only circulated in the communities but also across the country in 2011 and 2012. AIDER not only had to disseminate accurate information to communities, but

7 In Spanish, there are two words that sound similar to REDD that could have added to this confusion; 'red' can mean network or fishing net.

also ensure that their staff were well trained and informed. Another challenge faced by the proponent was reaching agreements with indigenous federations (i.e. COICA and ORAU) that also represent community members. (These federations also have interests in managing carbon sales from the communities and initially saw AIDER as potential competition in the carbon marketplace.) AIDER and communities mentioned problems with illegal loggers, both outsiders and from the communities, as challenges to implement sustainable management practices. And as mentioned earlier, communal forest can be easily accessed via multiple water routes during the rainy season. Similarly, many local respondents reported conflicts with external fishermen, who entered by the same water routes, and are believed to both overfish and pollute the water. There is clearly a need for community monitoring and surveillance of these waterways.

The communities expressed a number of concerns about participating in the initiative. They were worried that they would have to change and/or restrict their livelihood activities, which could lead to a decrease in their household income without due compensation. They worried that the initiative would not provide an alternative income source and that it would not protect their forests from claims by big companies. For example, UCAY2 has had conflicts with oil companies entering their land for exploratory wells. While all communities have well-defined and legally recognized boundaries, there is still an underlying concern that the government could take their land away. They were also concerned about transparency by the proponent and full inclusion of community members. Individuals feared they would not be sufficiently informed of planned REDD+ activities, and that only a select group of community members would benefit, as had happened in previous external interventions in the communities.

The main recommendation for the initiative, offered by community members, was for the proponent to increase the quantity and improve the quality of information on REDD+ disseminated to community members, and to target younger members of the community to ensure all were well informed. Communities requested improved coordination between AIDER's technical staff and the community. There was a high level and willingness of community members to become involved in the initiative and to protect their natural resources, but they felt strongly that they should be compensated for this engagement.

9.5 Lessons from the initiative

The AIDER initiative in Ucayali is an important example of indigenous communities participating in a subnational REDD+ initiative. The four intervention communities in this study are characterized by households that rely on products from communally managed, flooded forests – although most report their primary livelihood as farming as it is the activity they dedicate the majority of their time to. The forest provides them with essential inputs for the construction of houses and canoes (their main mode of transportation), craftsmanship (growing in importance for women in many communities) and their diet (with fuelwood as their primary fuel source, and fish and wild meat as primary protein sources). The communities have secure land tenure, with well-defined and legally recognized boundaries. However, while they have secure access to their forests, community members still cite concerns that the government could revoke those rights and permit large companies to access their lands, as experienced with exploratory drilling by petroleum companies in the region, and in UCAY2 and UCAY3. Communities have also reported problems with degradation (i.e. decline in the quality of communal forests and consequently the need to travel further to find wild meat), as well as problems with over harvesting and contamination by external fishermen of their flooded forests' waterways.

The initiative has promoted sustainable forest management by community members through a variety of mechanisms including certification, reforestation, forest surveillance and monitoring, and business planning for timber and NTFP harvesting. Many components of the initiative are similar to the proponent's previous activities, with the main additions being the carbon sequestration and deforestation baseline studies conducted in 2011. Thus, in this initiative, REDD+ is seen as a way to sustain efforts to promote sustainable forest management, now and into the future, with carbon funds.

Reviewing this REDD+ initiative, it is also important to take into account the unique advantages and challenges of the flooded forest environment. Flooding supports a healthy fish population that is critical to the local diet and supports some of the highest incomes reported by local households. At the same time, it facilitates access by illegal loggers and outside fishermen. Flooding also maintains agricultural productivity by depositing additional nutrients and extinguishing pests, but excessive flooding can destroy crops and wash away arable land. In this case, the exceptional floods of 2011 led to the temporary migration of community members of UCAY1 to the nearby city of Pucallpa. It also negatively affected farmers' motivation and capital for engaging in farming activities the following year. Some households with more lowland than upland forest areas used for farming were subjected to higher levels of flooding and reported the need to use arable land outside of their communities. This led to some farmers having to travel greater distances to farm in neighboring communities, which increased their agricultural input (i.e. travel time, expenses, etc.) and lowered their output (profit). Some households reported clearing more forestland following the floods, demonstrating that events beyond the communities' or proponent's control can affect deforestation levels. Thus, this site demonstrates the importance of prioritizing interventions and setting rules that reflect the local biophysical and cultural conditions.

9.6 Acknowledgements

We are deeply indebted to all of the community authorities and families of the eight Shipibo Conibo communities visited at the Ucayali site. We thank them for sharing their valuable knowledge and time with us. A special thank you to AIDER's team in Lima and Pucallpa for sharing their REDD+ initiative information with us: Jaime Nalvarte Armas, Percy Recavarren Estares, Carlos Sanchez, Pio Santiago Puertas, Ivan Icochea Davila, Danis del Aguila Saavedra, Carlos Samaniego and Angel Egoavil Rios. We are also grateful to the phase 1 and 2 members of our field team for their outstanding dedication and continued participation in the study: Pascual Blanco Reyes, Santiago Nunta Cauper, Medardo Miranda Ruiz, Dina Gianina Reyes, Leandro Ihuaraqui Gadiel, Franco Santana Mori, Lyan Mui Campos, Katty Garcia and Maria Coda Vasquez.

Part 2. Case Reports

Cameroon

Box F
REDD+ in Cameroon: The national context

Abdon Awono

Cameroon has embarked on the process of preparing for REDD+ through issuance of its Readiness Plan Idea Note (validated in 2008) and its Readiness Preparation Proposal (R-PP) (2013), with financial assistance channeled through the Forest Carbon Partnership Facility. The latter document presents the dynamics of deforestation and forest degradation in Cameroon and its MRV system. The net annual deforestation rate in Cameroon was estimated as 0.03% between 2000 and 2005 by Ernst et al. (2013). However, this could increase due to international and national investments in agroindustry and associated expansion of cocoa and oil palm plantations, mining, and infrastructure (Megevand 2013). According to the R-PP, REDD+ should provide Cameroon with a tool for the development of various sectors of the national economy. In June 2014, Cameroon released a three-year plan for the development of the national REDD+ strategy, largely based on the experiences of pilot initiatives.

A steering committee (SC) was set up by order of the prime minister (No. 103/CAB/PM of 13 June 2012) to ensure the coordination and coherence of REDD+ activities in Cameroon. The Ministry of the Environment, Nature Protection and Sustainable Development (MINEPDED) is the focal point for climate change. The Ministry of Forestry and Wildlife (the body responsible for Cameroon's forests where REDD+ operations are carried out) is participating in this committee in an auxiliary role. The SC seeks the participation of government, civil society, indigenous peoples, the private sector and local elected officials. While such broad representation could eventually lead to a national consensus, it may have undermined the SC's ability to make progress in the short term. Many of the stakeholders in the SC working on the design and implementation of the REDD+ strategy are not effectively involved in the process as they lack capacity. Another controversial issue with regard to REDD+ implementation in Cameroon is the absence of regulation on carbon ownership. The implication is that carbon should be under the landowner's control, but that does not clarify the ownership of carbon and could pose problems for the distribution of carbon credits.

A technical secretariat under MINEPDED has established criteria for REDD+ pilot initiatives[1] in Cameroon, calling for them to effectively reduce deforestation and/or forest degradation over a clearly defined land area and to enhance understanding of the direct and indirect causes of deforestation

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1 According to the R-PP approved by Cameroon, a REDD+ pilot project must be devoted to (i) avoided deforestation, (ii) avoided degradation, (iii) conservation, (iv) sustainable forest management and (v) increases in carbon stocks.

and forest degradation in specific areas of Cameroon, leading to suggestions for ways and means to slow down or reverse the tendency. Many REDD+ initiatives have been proposed for the various agro-ecological zones of Cameroon (Bourges et al. 2014) but they focus mainly on capacity-building, research and information exchange (Alemagi et al. 2014). Thus, the proposed initiatives generally do not fulfil the criteria laid down by the SC and therefore do not yet qualify as 'pilots' (Bourges et al. 2014).

The expected outcomes of REDD+ include the dissemination of sustainable agricultural practices and rewards for landholders adopting such practices, financed by carbon markets or dedicated international funds. Effective evaluation tools will be needed to ensure conditionality and payments proportionate to accomplishments. Because of the importance of verifying performance, MRV systems have attracted international funding. However, Cameroon still has to establish an REL as set out in the R-PP recommendations. Each subnational initiative will have to introduce its own system for assessing the impacts of its activities on reducing emissions and advancing local development.

To increase the participation of civil society in Cameroon's REDD+ process, a REDD+ experts working group has been established to provide assistance to local communities and NGOs in formulating, monitoring, implementing and evaluating pilot initiatives. Cameroon's early initiatives were established when the national policy related to REDD+ was just being formulated. It is important to harvest lessons from these early initiatives in order to improve the design and implementation of REDD+.

Chapter 10

REDD+ around Mount Cameroon, southwest region of Cameroon

Abdon Awono, Akombi Andreas Tambe, Henri Owona and Elise Barreau

The Mount Cameroon REDD+ initiative is managed by GFA ENVEST under the Program for Sustainable Management of Natural Resources in the Southwest Region of Cameroon (PSMNR-SW), which has supported conservation and livelihoods in the region since 2006. Launched in 2008 as a means of securing sustainable funding after the end of official development assistance (ODA) for PSMNR-SW, the initiative focuses on 41 villages surrounding Mount Cameroon National Park (MCNP), which was officially created in 2009. The REDD+ initiative aims to reduce forest loss and increase forest carbon stock by offering support for people whose livelihoods are dependent on protecting forests in and around the park. This chapter reports findings from four villages (MTC1, MCT2, MCT3 and MTC4) targeted for REDD+ interventions. The Mount Cameroon zone has rich biodiversity and fertile soil that attracts farmers (including migrants from other regions of Cameroon and Nigeria [Akombi 2011]) and agro-industrial companies such as Cameroon Development Corporation and Palm Oil Plantations Limited, placing high conversion pressure on forests. Among the challenges faced by the initiative are conflicting perceptions of land rights and forest ownership between the state and local communities.

10.1 Basic facts: Where, who, why and when

10.1.1 Geography

The Mount Cameroon REDD+ initiative covers a total of 212,686 ha in the southwest region of Cameroon. It encompasses the Mount Cameroon National Park, the remnant Bomboko Forest Reserve (that was not included in MCNP), and a leakage belt of 164 ha outside the national park boundaries (Pawlowski 2009). The grasslands in the upper elevations of MCNP are not included. The broader coastal area where the initiative is located is rich in biodiversity, and is under threat from agricultural expansion despite the presence of several protected areas. All 41 villages included in the initiative are reliant on farming activities. They are located in Mbonge subdivision (including MTC1 and MTC4) and Buea subdivision (including MTC2 and MTC3) (Figure 10.1), close to Limbe.

The area around Mount Cameroon is characterized by high population density, rich volcanic soils and abundant precipitation, ranging from 2000 to 10,000 mm/year (GIZ 2013). Forest types include lowland forest, submontane forest, montane forest and agroforestry mosaic. The fertile soils are one of the factors that have attracted migrants from other regions of Cameroon and from as far as Nigeria. The yield of cocoa can reach 700 kg/ha/season, which is far higher than the national average (300 kg/ha). The Bomboko Forest Reserve has been invaded for cocoa farming and its restoration to natural forest is considered to be very difficult until the land tenure issue is clarified for farmers (Akombi 2011).

In the Mount Cameroon zone, agriculture is the most important economic activity for both the indigenous people and local and international immigrants. Migrants represent more than 90% of the population in some areas, e.g. in the north of the park (GFA ENVEST 2008), and they control the biggest portion of farmed land, especially within MCNP and the remnant Bomboko Reserve (Awono et al. 2014). Many agro-industries (Cameroon Development Corporation, PAMOL Plantation Limited, etc.) have entered the area to produce oil palm, rubber and banana. Many households in the intervention villages have worked for these agro-industries and some have adopted the same crops and production techniques. Better-off households have established large plantations of crops such as cocoa and oil palm. In addition to these commodities, they have recently expanded their production of crops such as tomato and pepper to supply Buea and Douala. As argued by Nkamleu et al. (2003), agriculture is an important sector for sustaining growth and reducing poverty in Cameroon, as in other developing countries. In the early 1980s, agriculture represented close to 30% of GDP, generating more than a third of the country's foreign exchange earnings and about 15% of tax revenues for the government budget (Njadji 2005).

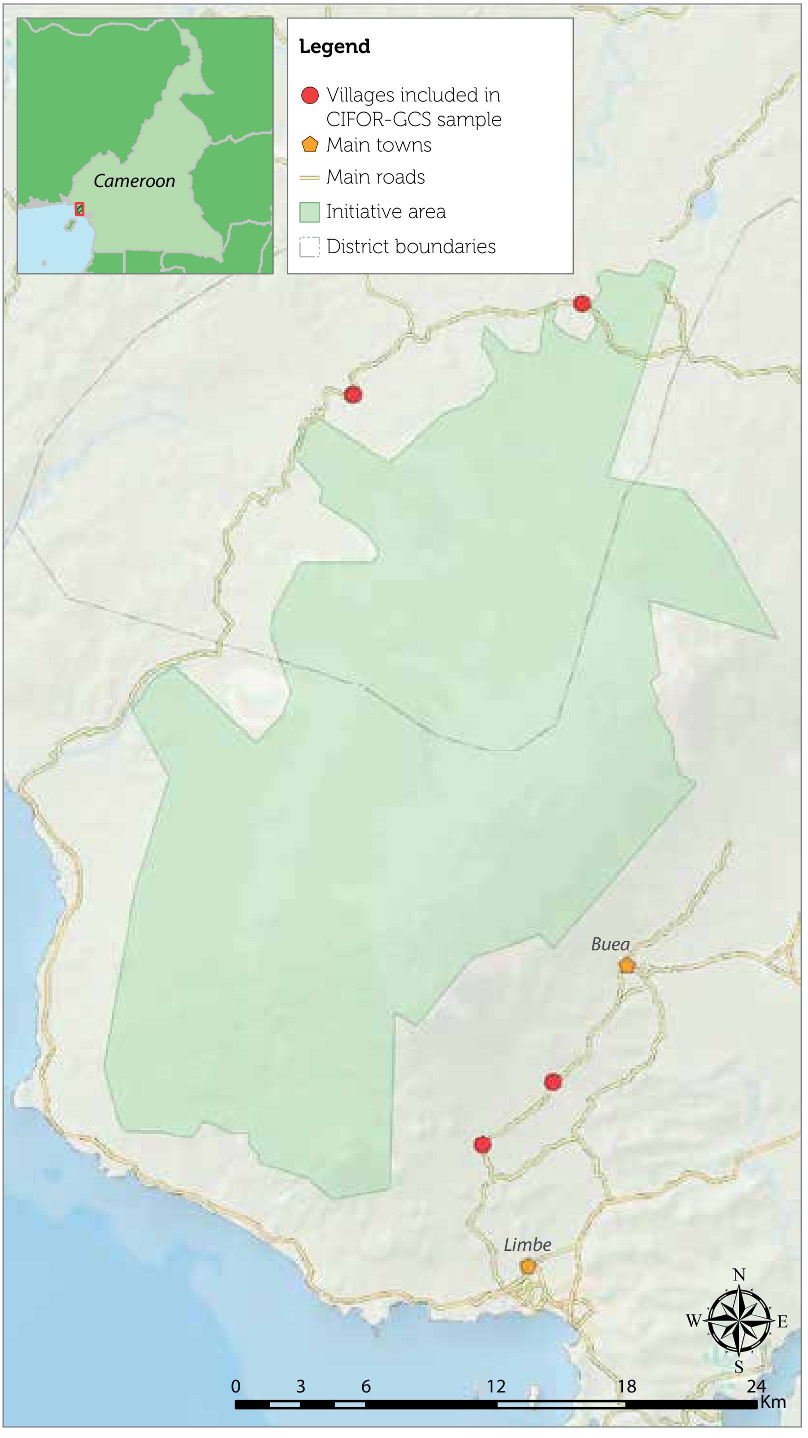

Figure 10.1 Map of the Mount Cameroon REDD+ initiative.

Data sources: GFA-ENVEST, OpenStreetMap, GADM and World Ocean Base.

The southwest region has had the highest deforestation rate in Cameroon (0.11% compared to 0.03% at national level). That rate was even higher in the initiative area; between 1987 and 2010, 46.2% of the natural forest was converted into agricultural land-use systems (de Wasseige et al. 2010). Reconciling conservation with sustainable livelihoods for local residents surrounding Mount Cameroon is perhaps the central challenge for the REDD+ initiative. The main drivers of deforestation and forest degradation in the four intervention villages studied by CIFOR are the expansion of cocoa and oil palm plantations, shifting cultivation practices for food crops, and unsustainable exploitation of NTFPs such as *Prunus africana* (Awono et al. 2014). In addition to small-scale farmers, agents of deforestation include: bush fires, elites involved in land grabbing, agro-industrial companies and illegal loggers. The conversion of forested land by elites, who own up to 3000 ha per household, is accelerated by the use of paid labor (Pawlowski 2009). In general, there is a strong correlation between farm size and the political or economic position of the owner, reflecting social inequality and poor governance.

10.1.2 Stakeholders and funding

PSMNR-SW is a joint initiative of the Cameroon and German Governments, funded by the German Government and the German Development Bank (KfW). The Southwest Delegation of the Ministry of Forestry and Wildlife is the government's implementing and coordinating agency, which has also contributed to the initiative through its support and technical staff. GFA ENVEST is the main technical implementation partner. The German International Corporation Agency (GIZ) provides oversight on behalf of the German Government. The long-term funding plan is based on both sales of carbon credits and a trust fund. The activities of PSMNR-SW have been financed through 2016 with ODA from Germany. Revenue from carbon credits could help sustain the management of MCNP. Carbon revenues would obviously increase the level of funding for the management of the national park, ensuring its long-term viability. Conversely, in the absence of income from carbon credits, the Government of Cameroon would have to support management of the national park. This would create budget uncertainties for the national park, due to the reliance on development aid money that is conditional on donor commitment over time.

The technical team of PSMNR-SW is promoting alternative options such as ecotourism, NTFP exploitation and intensive agriculture to support community members' livelihoods. GFA ENVEST has also focused on ecotourism as a co-benefit of the conservation interventions. Community based organizations are direct grassroot beneficiaries of the initiative. According to the PDD, the villages are being supported by the initiative, but they are also expected to provide 10% of the budget in kind and in cash. They have a participatory role and are involved in decision making about support for livelihoods.

Table 10.1 Interventions implemented by the Mount Cameroon REDD+ initiative.

Strategy	Brief description of the intervention	Beneficiary	Year begun
Livelihood enhancement	Training on sustainable *pygeum* (*Prunus africana*) harvesting techniques and harvesting in the park	Household	2010
	Establishment of multipurpose nurseries for trees, food crops and other	Household	2012
	Conservation credit/bonus for community reporting of illegal forest activities detected through participatory forest patrols and for destruction of poaching camps within the national park	Household	2013
Restrictions on forest access and/or conversion	Participatory demarcation of the national park by local people hired by the project	Village	2008
	Sensitizing village forest management committees on collaborative development approaches, leading to a conservation development agreement	Village	2012
Tenure clarification	Meetings for analysis and possible transfer of the remnant forest reserve to local councils for better management	Village	2011

10.1.3 Motivation

Prior to PSMNR-SW, there were other efforts to promote sustainable development in the Mount Cameroon region, including the Mount Cameroon Project, WWF programs and the Mount Cameroon Ecotourism Organization, which was funded by the German Development Service. PSMNR-SW emphasized village development and started by signing village development plans with selected villages in the southwest region (65 in total). The idea of the Mount Cameroon REDD+ initiative surfaced in 2008 (Figure 10.2) as a means of sustainable financing to replace the ODA funds. The REDD+ initiative aims to improve conservation and local livelihoods through long-term support and conditional incentives. GFA ENVEST is facilitating these activities (Table 10.1). Although carbon funds are not yet available, PSMNR-SW is providing conditional payment to land users to stimulate the involvement of local villages in the management of forest ecosystems, in contrast to many previous efforts.

10.1.4 Timeline

Figure 10.2 sketches the timeline of the REDD+ initiative in Mount Cameroon, beginning with antecedent conservation activities and including CIFOR's research activities.

Pre-2000	**1996** - First conservation interventions in Mount. Cameroon	**1998** - Start of Mount Cameroon Project with German Agency for Technical Cooperation, Ministry of Environment and Forestry, and WWF
2000		
2001		
2002		
2003	End of Mount Cameroon Project	
2004		
2005		
2006	Signing of village development plans between PSMNR-SW and communities	
2007		
2008	Mount Cameroon REDD+ feasibility studies carried out with funding from KfW	
2009	Creation of Mount Cameroon National Park	
2010	CIFOR-GCS baseline survey	
2011		
2012	First payments conditional on performance	
2013	CIFOR-GCS presents baseline results to study villages	
2014	CIFOR-GCS phase 2 survey	

REDD+ initiative active

Figure 10.2 Timeline of the Mount Cameroon REDD+ initiative.

10.2 Strategy for the initiative

The main purpose of the initiative is to reduce deforestation and protect MCNP. The initiative proposes to reduce GHG emissions from mosaic deforestation, and store carbon by re-establishing natural forests that have been replaced by small-scale cocoa plantations. Launched in 2008, REDD+ is seen as a long-term financing mechanism to support the sustainable management of the diverse ecosystems in the Mount Cameroon region.

By protecting MCNP, the initiative expects to generate high biodiversity co-benefits, as well as generating livelihood co-benefits by working with people around the park. One critical step to generating any of these benefits is to clarify land tenure. Another part of the strategy is to leverage alternative economic opportunities created by the park, such as ecotourism and NTFP collection, and to develop adequate means to enforce the legal restrictions on the use of park resources. To accomplish all of this, the initiative will rely not only on REDD+, but also seek additional sources of funding for conservation and collaborative management of natural resources.

The main strategy is to involve the villages in the management of the resources, leading to co-responsibility, and to reward villages based on their performance in conservation. Interventions such as farmer field schools, water supplies, multipurpose nurseries for NTFPs, support for beekeeping and support for livestock keeping have been provided to the involved villages. Benefit sharing related to REDD+ income is not yet fully established, but the mechanisms will build on experience from previous interventions of PSMNR-SW, as stated in a conservation development agreement signed with the communities. Additionally, clarification of land tenure is also seen as crucial to reduce pressure on Mount Cameroon forest ecosystems. The initiative aims to strengthen the technical and operational units of MCNP, whose mandate is to mitigate land-use conflicts and create appropriate conditions for development of committees of local people who can coordinate with different ministries. The proponent also aims to build MRV capacity of participating government agencies through training workshops.

10.3 Smallholders in the initiative

We surveyed four villages in the initiative area, MTC1–4, between June and August 2010. In total, we interviewed 160 households, 40 in each village, from a total of 370 households (43%) and a total population of 4300 (Table 10.2). In addition to the household survey, we also held two meetings in each village, one general and one specifically with women, in order to complete village and women's surveys.

All four villages have received many immigrants in recent years, as reflected in the large proportion of people aged 16 years or older (Table 10.3). In MTC1 and MTC4, the migrants came to invest in cocoa and to a lesser extent, in oil palm. These two villages are part of the Bomboko Forest Reserve and are situated far from administrative centers. The reserve has been invaded due to its fertile soils, and the population includes many different ethnic groups. In some cases (MTC1) the state teak plantations have been entirely destroyed and replaced by cocoa. MTC2 and MTC3 are closer to the city of Buea and thus have also received large numbers of immigrants (e.g. 20% increase in population in MTC2 in the last two years). Most migrants acquire land from the village chiefs, but these transactions

Table 10.2 Characteristics of the four villages studied based on the 2010 survey.

	MTC1	MTC2	MTC3	MTC4
Basic characterisitcs				
Year founded	1914	1810	1910	1930
Total number of households	100	80	110	80
Total land area (ha)	58,000	5,600	4,180	12,000
Total forest area (ha)	2,320	1,600	1,980	9,048
Access to infrastructure				
Elementary school	Yes	Yes	Yes	Yes
Secondary school	No	No	No	No
Health center	Yes	Yes	No	No
Road access in all seasons	Yes	Yes	Yes	Yes
Bank or other source of formal credit	No	No	No	No
Distance to closest market by motorcycle (km/min)	9/15	5/18	5/15	29/240
Agriculture				
Price of a hectare of good quality agricultural land (USD)	1,500	-	-	-
Main agricultural commodity	Cassava	Roots and tubers	Roots and tubers	Roots and tubers
Crop with highest production value per household	Cocoa	Plantain	Pepper	Cocoa

are only recorded in MTC1, with an average price of USD 1500 per hectare. Some migrants are able to acquire land with the complicity of the newcomers, without consulting the village chiefs.

As presented in Table 10.3, the level of education for adults in the Mount Cameroon area is quite high, at about eight years of schooling on average. This reflects the availability of school infrastructure around Mount Cameroon, which is probably linked to the large concentration of people in the area as a result of high cocoa production.

All of the households interviewed in the four intervention villages used fuelwood as their most common energy source, confirming the previous findings of Daurella and Foster (2009). Access to water in some villages was facilitated by PSMNR-SW as compensation for the restrictions on resource use imposed by the conservation efforts, including the creation of MCNP. All households in MTC2 and MTC4 have piped water, in contrast to only 40% in MTC3 and none in MTC1. In contrast, sanitation facilities are uniformly poor throughout the region; flush toilets are virtually nonexistent, although many households have private toilets or latrines. Poor sanitation may be related to the high average days of illness, ranging from 8 to 22 days/year in the communities. Access to electricity is variable among communities, ranging from 70% (MTC2) to 32.5% and 15% in the more remote communities of MTC1 and MTC4, respectively. Access to a phone (mainly mobiles) was reported by over half the households in all villages. The value of transportation assets owned by households varied greatly within and among communities, with MTC1 showing a substantially higher investment than the other communities (Table 10.3).

Table 10.3 Socioeconomic characteristics of households interviewed in 2010.

	MTC1	MTC2	MTC3	MTC4
Number of households sampled	40	40	40	40
Household average (SD)				
Number of adults	3.9 (2.1)	2.6 (1.5)	3.0 (1.5)	3.6 (2.3)
Number of members	6.7 (2.7)	4.6 (2.5)	5.0 (2.8)	6.2 (3.4)
Days of illness per adult	7.6 (16.8)	12.2 (26.6)	22.7 (35.1)	9.3 (16.9)
Years of education (adults ≥ 16 years old)	8.5 (3.5)	8.2 (3.6)	7.7 (3.5)	7.5 (3.4)
Total income (USD)[a]	7,233 (6,969)	2,250 (2,064)	3,897 (4,537)	4,048 (3,624)
Total value of livestock (USD)[b]	79 (114)	119 (123)	80 (123)	73 (209)
Total land controlled (ha)[c]	5.0 (4.8)	7.5 (4.8)	15.5 (39.7)	5.4 (8.1)
Total value of transportation assets (USD)	3,000 (5,014)	798 (280)	1,014 (432)	919 (586)
Percentage of households with:				
Mobile or fixed phone	85	60	68	55
Electricity	33	70	60	15
Piped water supply	0	100	40	100
Private latrine or toilet	65	95	68	63
Perceived sufficient income	48	58	30	40

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.

b Total livestock value at the time of interview.

c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

Livelihood portfolios show the diversity of income sources across all villages, and the disparities among villages in terms of both sources of income and total income. In all of the villages, more than half of adults reported agriculture as their primary or secondary occupation, while fewer than 3% cited forest-based occupations (Table 10.4). Agriculture (including crops and livestock) provided the largest share of average household income in all of the villages except for MTC2 (Figure 10.4). In MTC2, wage labor, household business and other income were the most important sources of income, probably reflecting employment in cocoa plantations (Figure 10.4). Cocoa production was a major source of income in the region, but its importance varied greatly between villages, with MTC1 in particular showing high income from cocoa production. The value of livestock income was similar across the villages (MTC4 with USD 73/year, MTC1 with USD 118/year) though far less important in terms of total income. Surprisingly, the village with the highest average amount of land controlled by a household (MTC3, 15 ha) showed just average income from agriculture. This implies that the quality of the land, in addition to the area, is a key factor for income generation, as reflected in the lower agricultural income in the two villages on the less fertile side of the mountain.

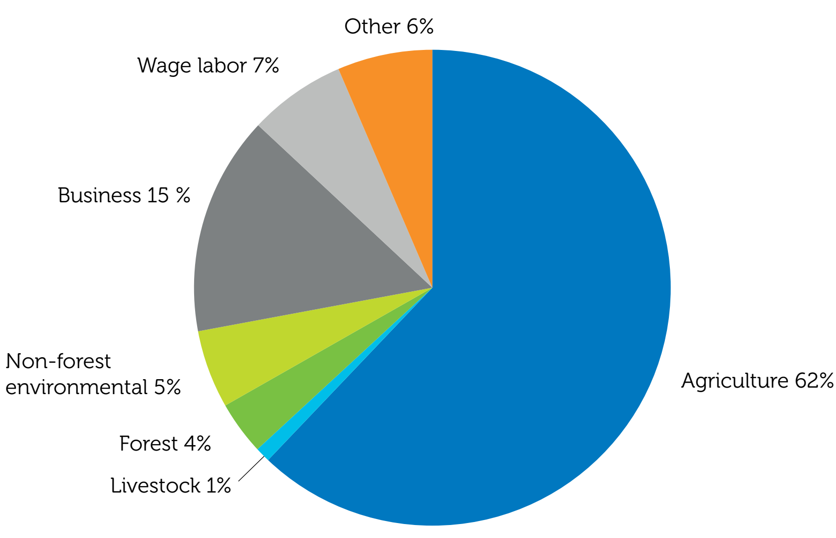

Figure 10.3 Sources of income for all households in sample (n = 160).

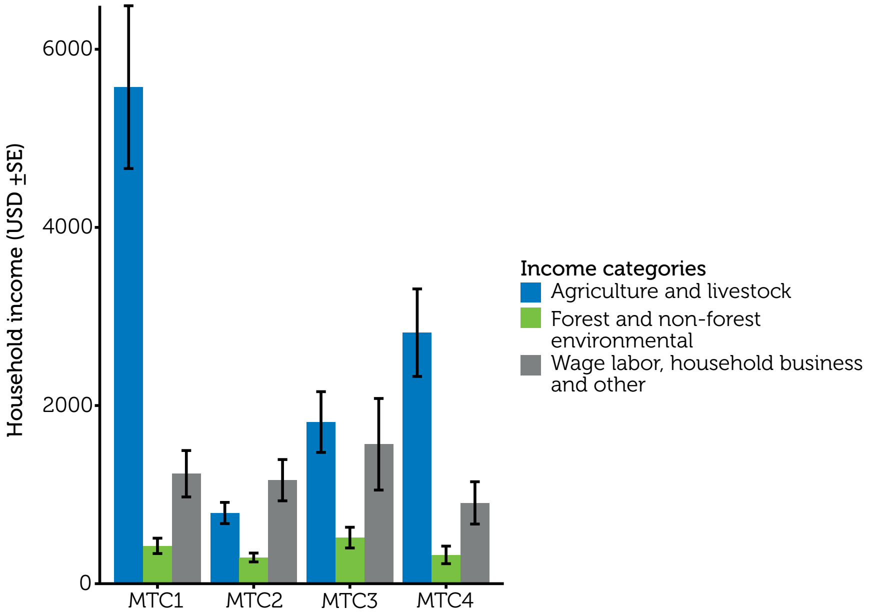

Figure 10.4 Sources of income for average household by village (+/- SE) (n = 160).

High dependence on agriculture is reflected in high rates of forest clearing. MTC2 and MTC3 had the highest percentage of households that reported clearing of forest in the two years prior to the survey, with an average of 0.9 and 0.6 ha cleared, respectively (Table 10.4). At the same time, 94% of households in MTC1 and 87% in MTC4 reported that their clearing opportunities had decreased, perhaps explaining lower clearing rates in these two villages. Forest cover in MCT2 was 29%, and MTC1, with high cocoa production, had only 4% forest cover. The higher forest cover (75%) in MTC4 is probably explained by the steep mountain terrain and crop damage by elephants, which together act as a strong deterrent to agricultural production and expansion in the area.

In general, forest and environmental incomes are low in the four villages (Figure 10.3). Household members, especially in MTC4 and MTC2, travel far (average distance of 100 to 120 minutes walking) into the forest to harvest NTFPs. In three out of four villages (MTC1, MTC2 and MTC3), most households reported a decrease in forest products consumption over the 12 months prior to the survey (Table 10.4). In all four villages, fewer than 60% of the households, and as few as 30% of households in MTC3, reported that their income was sufficient to support their family's well-being.

Table 10.4 Indicators of household forest dependence based on the 2010 survey.

	MTC1	MTC2	MTC3	MTC4
Number of households sampled	40	40	40	40
Household average (SD)				
Share of income from forest	0.73 (2.45)	13.89 (18.00)	8.03 (16.13)	0.97 (3.13)
Share of income from agriculture	69.31 (26.10)	39.81 (24.12)	43.97 (30.63)	71.11 (29.08)
Area of natural forest cleared (ha)[a]	0.56 (1.53)	0.65 (1.08)	0.90 (0.93)	0.28 (0.71)
Area of secondary forest cleared (ha)[a]	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Area left fallow (ha)[b]	0.69 (0.38)	1.48 (1.13)	2.83 (2.90)	1.27 (1.06)
Distance to forests (minutes walking)	0	100	0	120
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	51	50	58	71
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	1	3	2	1
Reporting increased consumption of forest products[e]	10	4	15	11
Reporting decreased consumption of forest products[e]	48	62	59	46
Obtaining cash income from forest products[f]	0	10	50	10
Reporting an increase in cash income from forest[f]	0	0	10	0
Reporting a decrease in cash income from forest[f]	0	100	85	50
Reporting fuelwood or charcoal as primary cooking source	100	100	100	100
Leaving land fallow[g]	10	65	98	28
Clearing forest[g]	28	55	73	18
Reporting decreased opportunity for clearing forest[g]	95	15	5	87
Clearing land for crops[g]	28	55	73	18
Clearing land for pasture[g]	0	0	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

10.4 Challenges facing the intervention

The Mount Cameroon REDD+ initiative is burdened with a number of challenges, ranging from the inability of the initiative to get a reliable source of long-term funding, to illegal deforestation, lack of tenure clarification and subsequent conflicts. The early efforts to get carbon funding have not been successful partly because the carbon content of the montane forests is limited. Carbon credit can only be gained by re-establishing natural forest inside the Bomboko Forest Reserve, which has already been converted to a mosaic of small-scale cocoa fields. However, carbon funds are considered to be critical. Without securing additional REDD+ funding before the end of the German funding in 2016 as planned (especially if another phase is not approved), it will be extremely difficult to rely on government funding.

Illegal deforestation is taking place in the project area through extensive agriculture and illegal logging. The driving force of this forest conversion is the economic benefits from such activities around (and sometimes inside) the park. In addition, the village chiefs illegally sell protected lands. The technical capacity of the local population engaged in forest protection is very low. The proponent has put in place a platform with the different actors represented, providing local people with the opportunity to take part in discussions and co-management so as to minimize the problems and reflect the interests of all parties. Continuous efforts in maintaining the platform are expected. There is widespread concern about alternative agricultural practices in the long term, especially about how communities can feed a growing population with less land. They are anxious to know if funding from REDD+ projects will provide them with adequate compensation. The interviewed farmers indicated that their exclusion from cocoa, oil palm, plantain, yam and cocoyam farms leads them to believe that there is a clear plan for compensation and definition of alternative income from REDD+. This is yet to be clarified.

The local communities perceive tenure clarification as a key governance challenge as state ownership of forests may lead to disregard of customary claims, creating uncertainties in terms of the fulfillment of REDD+ initiative objectives. There is tenure insecurity over at least a portion of intervention village lands. The demarcation of boundaries for MCNP (established in 2009) generated conflict over land tenure, because part of the villagers' farmland was included in the park (Awono et al. 2014). Given the number of claims raised by some groups of community members, there are legitimate concerns about the park's ability to implement restrictions related to farming, illegal logging and hunting. Significantly, land conflicts are emerging in some of the villages (e.g. MTC1) between indigenous peoples and immigrants who own farms in the protected area. Local people believe that their traditional rights over the land are paramount and allow them to evict any encroacher from an area by force.

Cocoa plantation mixed with other crops. (Patrice Levang/CIFOR)

It is recognized that biodiversity conservation of local forests is one of the targeted goals of the initiative, but local people believe that human activities should also be protected from wildlife invasion. Damage to crops by elephants can represent a critical challenge in some villages. Human–wildlife conflicts are substantial, and some community members from MTC4 argued that the animals are better protected than humans because villagers are not allowed to kill elephants even when the elephants are destroying crops.

10.5 Lessons from the initiative

The Mount Cameroon initiative offers an example of REDD+ in the context of protected areas surrounded by local people, although the initiative has actually been presented as a continuation of the previous conservation initiative, PSMNR-SW, rather than REDD+. Interventions aimed at reducing forest loss and increasing forest carbon stock through conditional livelihoods improvement could achieve the goals of both REDD+ and PSMNR-SW. Although the initiative has not yet attracted carbon funds, its conservation and livelihood efforts are being supported by KfW up to 2016. There are many challenges that may render the efforts unsustainable and lead to low impact in terms of reduced emissions or improved biodiversity or ecosystems conservation. The populations of the targeted villages support the initiative because they agree with the approaches used by the proponent. However, they are still waiting for government acknowledgement of their increased rights over the remnant forest reserve and the leakage belt around MCNP. In addition, there is a fundamental conflict between the core conservation mission of MCNP and the local people and migrants who have invested in small-scale cocoa plantations and other crops inside the park. Removing those people from the park will have negative consequences for local livelihoods if the alternatives offered are not sufficient. Rather than evicting farmers without any compensation, a more effective strategy would be to compensate them for their investments inside the park and give the villages official tenure rights to the remnant forest reserve that has been completely converted by farmers. This could encourage local households to cooperate with the Mount Cameroon initiative on restoration of degraded forests within MCNP. As this initiative unfolds, it will provide a test case for whether REDD+ can help provide sufficient incentives to local people to gain their support for protected areas.

10.6 Acknowledgments

We would like to acknowledge the technical support we received from the PSMNR-SW platform, including support for the fieldwork. We would also like to thank the CIFOR-GCS module 2 enumerators team: Batulu Njah Labu, Njie Louis Ndoumbe, Ewane Marcus and Nkeng Philip Fonju. We are grateful to the entire coordination team of the Mount Cameroon National Park for providing us with accommodation and information. We applaud the assistance of the village administrations of MTC1, MTC2, MTC3 and MTC4, and key community members for their useful insights.

Chapter 11

Community Payments for Ecosystem Services in the south and east regions of Cameroon

Abdon Awono, Elise Barreau and Henri Owona

The purpose of this pilot initiative is to assist local communities in Cameroon, and perhaps ultimately throughout the Congo Basin, to protect their forest resources using PES. The initiative seeks to change forest management practices and enable local communities to practice sustainable resource management and receive direct payment for their environmental performance. 'Performance' is what distinguishes REDD+ initiatives from other conservation efforts (Blom et al. 2010). Beyond having local impact, the initiative aims to nourish the debates that are influencing the development of national REDD+ policy in Cameroon, even though government support for the initiative has been lukewarm. This chapter describes the two villages (SEC1 and SEC2) that are the focus of this initiative. Households in both villages have expressed willingness to base exploitation of their forests on principles of ecosystem conservation in the hope that in return, they will receive poverty-reducing compensation. This is a pioneering step in Cameroon because all other villages with community forests have set their sights on logging. Thus, this initiative is taking up the challenge of reconciling local development and global challenges, i.e. by reducing emissions that cause global warming and thus harm economically fragile countries. This chapter illuminates this unique approach in Cameroon by describing the initial context of the study villages, the strategy for the initiative, the challenges facing it and lessons learned from its implementation.

11.1 Basic facts: Where, who, why and when

11.1.1 Geography

The two villages targeted by this initiative are located in the south and east regions of Cameroon (Figure 11.1). SEC1 is in the Dja-and-Lobo Division, south region, and is subdivided into three land types: community forests (1043 ha), the agroforestry zone and lands claimed by the community in the Kom Reserve (20,800 ha). SEC2 is in the Haut-Nyong Division, east region. It has a community forest (1759 ha) that covers the whole village (1910 ha), apart from minor claims in the nearby forest management unit.

The dominant forest type is a combination of dense, humid, evergreen forest and dense, humid, deciduous forest. In SEC1, some parts of the forest are flooded throughout the year while other parts are well drained. The forest cover is generally dense in the northern part of the community forest, except for a few areas that have been cleared to open up fields and pathways leading to the villages. SEC2

Figure 11.1 Map of the REDD+ initiative in SE Cameroon.

Data sources: CED Cameroon, GADM and World Ocean Base.

has practically no swamp forests. The community forests are divided into several sections, including relatively undisturbed forest, disturbed forest, regenerating forest, permanently flooded forest and agricultural fields (Plan Vivo 2010).

11.1.2 Stakeholders and funding

The PES initiative is the outcome of a partnership between the Centre pour l'Environnement et le Développement (CED), BioClimate Research & Development (BioClimate) and the Rainforest Foundation UK. The initiative was selected out of seven initiatives to receive funding from the UK's Department for International Development (DFID) and is part of the first round of initiatives to be financed out of the USD 100 million Congo Basin Fund (CBFF). The CBFF was set up by the governments of the UK and Norway in 2007 and is run by the African Development Bank. CED was created in 1994 and has grown to become one of the main defenders of community forests in Cameroon and more broadly throughout the Congo Basin. It is responsible for implementing and coordinating the initiative, which includes payments to communities. BioClimate participated actively in preparing the initiative, in particular by obtaining the DFID grant, and since mid-2010 it has been serving as an external advisor. Since 2009, about 12% of the total budget has been allocated to CED as the initiative facilitator. The Plan Vivo Foundation, a partner in implementing the initiative, receives 6%. The remaining 81.5% is for community projects under the PES initiative. CED monitors the process of payments to households and other activities related to land-use systems (Yemefack et al. 2013). CED works in collaboration with the Association des Femmes et Hommes Amis de Nkolenyeng (AFHAN – Association of Friends, Both Women and Men, of Nkolenyeng) for SEC1 and with the Association pour la Traduction, l'Alphabétisation et le Développement Holistique de l'Etre humain (ASTRADHE – Association for Translations, Literacy Programs and the Holistic Development of the Human Being) for SEC2.

The communities have earned Plan Vivo certification for carbon. The January 2010 Plan Vivo PDD (Plan Vivo 2010) indicates that the expected benefits in terms of carbon credits are 15,861 tC for SEC1 and 6884 tC for SEC2 for the 2012–2015 period, and 5418 tC for SEC1 and 53,119 tC for SEC2 for the 2016–2020 period, for a total of 81,282 tC over the 10-year period from 2010 to 2020. These carbon credits can be sold on the voluntary carbon credit market. CED, unlike BioClimate, is not yet convinced of the viability of selling carbon credits, because the global carbon market is characterized by risk and instability, which means that improved living conditions for the local populations cannot be guaranteed. Some people believe that the initiative cannot be implemented until the carbon funds are obtained to build up the initial funding and thus contribute to improving the living conditions of the participating populations (Awono et al. 2014).

11.1.3 Motivation

In Cameroon, as in other tropical countries, agriculture is viewed as the main cause of deforestation (Ndoye and Kaimowitz 2000). This is also true for the sites hosting the PES initiative. In SEC1, activities such as mixed farming (groundnuts, maize, banana, cassava, etc.), new cocoa plantations, the traditional timber trade and the felling of palm trees to make palm wine, cause the most deforestation and forest degradation. Villagers pointed to illegal logging by the elite as an external source of pressure on forest cover (Plan Vivo 2010). The greatest cause of deforestation in SEC2 is from external sources, especially the Bantu (an ethnic group) from other villages who clear forest lands for crop production, especially maize, cassava and groundnuts. Members of the community who gather honey sometimes cut down trees to make their work easier. They also cause bush fires by using fire to reduce bee attacks, leading to deforestation and forest degradation. Despite acceptance of the PES initiative by local stakeholders, some community members and external elites have encouraged the Baka (a second ethnic group) to fell trees for timber. All households in both villages collect fuelwood, which is a non-negligible cause of forest degradation. In Cameroon, as elsewhere throughout Central Africa, the collection of fuelwood and making of charcoal are often connected to swidden agriculture (Schure et al. 2013).

CED, a fervent defender of community forests in Cameroon, has been involved in improving living conditions and reducing deforestation since its creation in 1994 when forest management in Cameroon experienced a crisis. CED has been in contact with the two villages SEC1 and SEC2 since 1999, and helped with capacity building when community forestry was introduced. Conservation projects carried out by the villages and CED began in 2008. These projects resulted from the identification of threats to local forests such as swidden agriculture and small-scale logging (legal and illegal). These threats must be viewed in the context of community forestry, which has forest exploitation as one of its initial objectives. Income from the annual allowable cut, determined through a simple management plan, is dedicated to the needs of the community. But this contributed to the failure of conservation activities in SEC2, where pressures on forests were not just from internal forces, but also from forces and people external to the initiative area. In SEC1, pressures were mainly related to the community's farming activities, while in SEC2, pressures came mainly from logging companies and hunting. By 2017, there will be a paved road close to SEC1, extending from the town of Sangmelima to the Republic of Congo, which could make the surrounding forestland more vulnerable.

11.1.4 Timeline

The SE Cameroon initiative follows other conservation efforts in the same location, which started around 1995. The initiative was launched in 2008 and made its first conditional payments to the villages in 2012. CIFOR-GCS field studies began in 2010 and the second phase of field research concluded in late 2013 (Figure 11.2).

Pre-2000	**1995 – 1996** Forest conservation interventions
2000	
2001	
2002	
2003	
2004	
2005	
2006	
2007	
2008	First written proposal for PES initiative
2009	Participatory mapping
2010	CIFOR-GCS baseline study
2011	CIFOR-GCS presents baseline results to study villages
2012	First payment based on environmental performance
2013	CIFOR-GCS phase 2 survey
2014	

REDD+ initiative active

Figure 11.2 Timeline of the REDD+ initiative in SE Cameroon.

11.2 Strategy for the initiative

The PES initiative is designed to improve forest protection by reducing pressure exerted by the local and migrant populations, and to create alternatives for the communities whose livelihoods depend on the forest. Financial incentives, which stem from the benefits derived from forest protection measures, including carbon storage, have been introduced to support this strategy (Table 11.1). Thus, environmental protection and increased standard of living are viewed from the vantage point of carbon credits. To achieve its goals, the initiative adopted Plan Vivo, a form of certification that can be used to generate carbon credits. The Plan Vivo standards are consistent with UNFCCC REDD+ guidelines and ensure the link with the REDD+ process. To help the communities understand the political framework governing the initiative, CED has held discussions with the communities and distributed posters explaining the REDD+ concept.

The first implementation stage involved obtaining FPIC from the local communities. The next activity, conducted through a participatory approach, entailed demarcating the forestland to be protected and defining an REL to assess the quantity of carbon that would be released into the atmosphere if the initiative was not carried out. CED, together with the local communities, discussed a series of activities (Table 11.1) to lay the groundwork for REDD+ and to generate revenue. A bank account was opened for the community to receive funds generated as a result of the land management protocol. The protocol aims to define different responsibility and payment scenarios to ensure transparency and equity. The commitments of each party are stipulated in a contract between CED and the communities. Performance indicators, supported by predefined criteria such as the total land area to be cleared for agriculture, are used to evaluate the level of community compliance with their commitments to protect certain forest areas. This in turn triggers an annual payments process, with payments being made totally, partly or not at all, depending on the results. The performance assessment has factored in the communities' priority to protect zones where the forest cover is very dense (the primary forest) and relegating most of their other activities to the so-called secondary forest zones and agricultural zones (fallows). To maintain high productivity on the fallows and secondary forestland, which usually are less fertile than the primary forestland, the initiative provides training in agroforestry techniques that are expected to eliminate the aforementioned threats to forest cover. The pilot initiative has a pre-defined sum set aside for these payments, but if performance does not warrant payment, the money is not lost but is carried over to the next year. The logic underlying the pilot initiative draws on the ideas of apprenticeship and on documenting situations as they occur.

The 81.5% of the budget allocated to the local communities is for community-based sharing rather than individual payments. The forest management committees for the two villages receive the funds on behalf of the communities as stated in the agreement with the proponent. For SEC1, payments will be made to AFHAN and for SEC2 payments will be made to Bouma Bo Kpode (a legal entity that acts as a forest management committee). The 81.5% will be divided in SEC1 into 40% for a village electrification project and 41.5% for micro projects in areas such as beekeeping and NTFPs. In SEC2, 40% will be used for a water supply project and 41.5% for group initiatives such as improved agricultural practices. Participatory mapping and GPS data were used to estimate probable forest cover changes if the initiative were not implemented. The deforestation rate, calculated using a future deforestation prediction model constructed with the assistance of ECOMETRICA and BioClimate, will be used in planning the initiative and looking for a buyer. The models have to be updated every 10 years. CED will monitor forest cover changes through carbon estimation and biomass quantification. Specially trained community members have participated in the demarcation of several plots for the biomass inventory. To monitor forest cover, members of the community have organized a monthly patrolling routine.

11.3 Smallholders in the initiative

SEC1 was founded in 1914 and SEC2 in 1972. The SEC1 community is composed mainly of Bantu of the Fang ethnic group and a small number of Baka. SEC2 is made up of Baka, with some mixed Baka-Bantu households. Those mixed households are generally involved in trade and agriculture (mainly in plantain, cassava and maize). In general, there is little population movement into or out of these villages, except for seasonal migration to SEC1 to meet the needs of cocoa production. Workers come to the village from other regions of Cameroon where land is less fertile, such as the northwest, to offer their services to landowners who typically own at least 2 ha of land.

The economic profiles of the two villages are different. SEC1 is composed mainly of farmers (except for the Baka, a minority group). SEC2 is more oriented toward hunting and gathering, although it also has some agricultural income. In SEC1, cocoa is the main source of income for the Bantu; other sources are livestock, palm wine, plantain, groundnuts, cassava, wickerwork, rattan, maize, cocoyam and bushmeat. Agriculture is the economic mainstay, as it is at the national level (Ndoye and Kaimowitz 2000; Nkamleu et al. 2003). The main source of income for the Baka is through providing labor in fields belonging to the Bantu. They are sometimes paid in kind, e.g. with cassava or other tubers. The Baka also earn a living from hunting, honey gathering and collecting other NTFPs. Like their counterparts in SEC1, the main source of livelihood for the Baka in SEC2 is farming and working in fields owned by the Bantu. Other sources of income include NTFPs such as wild mangos, honey, rattan, palm wine and moabi oil.

Table 11.1 Activities organized by the communities.

Strategy	Name and description	Year begun
Restrictions on forest access and/or conversion	Restrict access of villagers to forest and wildlife	2009
Environmental education	Education program on forest protection	
Tenure clarification	Land management plan and mapping	2010
Forest enhancement	Reduced impact of logging	2011
	Setting up nurseries	
	Forest monitoring committee	
Livelihood enhancement	Civic projects (electricity, water, etc.)	
	PES	
	Optimizing NTFPs	
	Training in beekeeping	
	Improvements in farming techniques	

The CIFOR-GCS survey included 120 households, 60 in each of the two villages. The households were selected at random after a census of all households in the villages. The sample was further stratified by ethnic group in SEC1 to ensure adequate representation of each of the two groups in the village, which has a majority of Bantu and a minority of Baka. This was not the case in SEC2, which consists mainly of one ethnic group (Baka).

The remainder of this section focuses on village structure, organization and livelihoods using key socioeconomic descriptors. The proportion of all households in the village sampled by CIFOR-GCS was 74% in SEC1 and 38.5% in SEC2. In both villages the village chief leads the community and selects other village notables (with the exception of those with hereditary positions), with the assistance of a council of notables composed mainly of native residents. SEC1 has 4 women out of 17 members on the council of notables, while SEC2 has 2 women out of 10 members. Both villages generate agricultural income, though more so in SEC1 than in SEC2. For some households there has been a downturn in agricultural yields because of lack of seed, vagaries of climate and the limited area of cropland. Thus, CED decided to support community efforts to improve their agricultural production. The nearest markets are far away from both villages. Both villages have had prior contact with a conservation NGO (Table 11.2).

Table 11.2 Characteristics of the two villages studied based on the 2010 survey.

	SEC1	SEC2
Basic characteristics		
Year founded	1914	1972
Total number of households	81	156
Total land area (ha)	20,800	1,910
Total forest area (ha)	12,582	1,815
Access to infrastructure		
Elementary school	Yes	Yes
Secondary school	No	No
Health center	Yes	Yes
Road access in all seasons	Yes	Yes
Bank or other source of formal credit	No	No
Distance to closest market (km)	44	25
First experience with a conservation NGO	2008	1995–96
Agriculture		
Main agricultural commodity	Plantain	Cassava
Crop with highest added value	African plum	Cassava

Table 11.3 shows that SEC1 has better infrastructure and socioeconomic development than SEC2. The average annual household income is USD 4254 in SEC1 compared to USD 2816 in SEC2. The difference stems from higher agricultural production in SEC1, associated with greater average land area controlled by the households (19.9 ha in SEC1 and 4.9 ha in SEC2), and higher investment in livestock production. The SEC1 community has invested six times more than SEC2 in transportation, which probably makes it easier to reach the market to sell their produce. In SEC2, a road to the town of Lomié was improved to serve the needs of the mining industry in the region, an industry whose growth has provided marketing opportunities for the community of SEC2. But since SEC2 has low agricultural output, the village households spend less than villagers in SEC1 on transport.

Table 11.3 Socioeconomic characteristics of households interviewed in 2010.

	SEC1	SEC2
Number of households sampled	60	60
Household average (SD)		
Number of adults	2.5 (1.4)	2.4 (0.6)
Number of members	5.9 (3.5)	4.8 (2.3)
Days of illness per adult	58.2 (99.1)	24.0 (30.1)
Years of education (adults ≥ 16 years old)	5.9 (3.0)	3.3 (2.0)
Total income (USD)[a]	4,254 (3,695)	2,816 (3,953)
Total value of livestock (USD)[b]	71 (152)	29 (99)
Total land controlled (ha)[c]	19.9 (15.4)	4.9 (4.1)
Total value of transportation assets (USD)	819 (542)	168 (127)
Percentage of households with:		
Mobile or fixed phone	22	0
Electricity	17	0
Piped water supply	0	0
Private latrine or toilet	10	5
Perceived sufficient income	42	23

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.

b Total livestock value at the time of interview.

c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

Close to half (42%) of the SEC1 households said that their income was enough to cover their daily needs (health care, education, food, clothes, etc.), while only 2% of villagers in SEC2 reported that their income covered their needs. In SEC1 on average, the residents had two years more education than those of SEC2 (Table 11.3). At the time of the survey, 17% of the households in SEC1 had electricity (from individual generators) and 22% had a telephone, whereas in SEC2 no households had either electricity or telephones. Neither village had an improved water supply or sanitation system, with only 10% or fewer households having private toilets or latrines and none having piped drinking water (Table 11.3).

The data presented in Figure 11.3 show the contrasting cultural identities of the two communities. SEC1 focuses on agriculture and livestock production, with an average income per household exceeding USD 2500, while SEC2 focuses on forest and environmental activities, with a much lower average annual household income. However, the distinction between the two villages is becoming less pronounced as the Baka become more interested in agriculture.

Figure 11.4 shows that agriculture alone represents 53% of the two villages' income, followed by forest and environmental income (39%). The remaining 7% includes livestock, business, wage labor and other income.

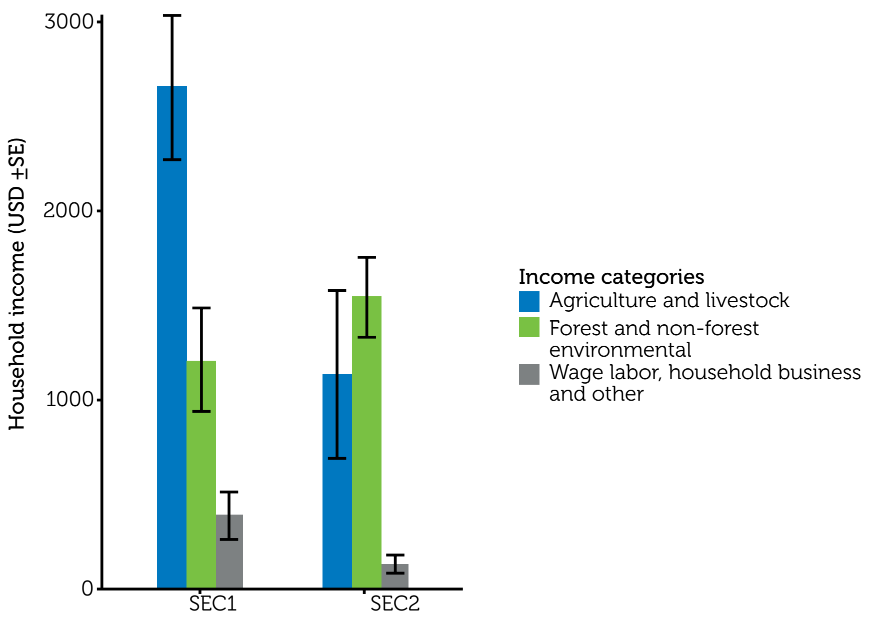

Figure 11.3 Sources of income for average household by village (+/- SE) (n = 120).

Table 11.4 presents information on the degree of household dependence on forestland and resources in the two study villages. Forest-based activities are a primary or secondary occupation in 15% of households in SEC1 and in 44% of households in SEC2. In both villages, most households get some cash income from forest products, and all households rely on fuelwood for cooking. In both villages, there was a downward trend in both the consumption and sale of forest products in the two years prior to the 2010 interview. Virtually all households in both villages reported clearing forestland for agriculture in the two years prior to the interview, and most experienced increasing constraints on opportunities to clear forestland.

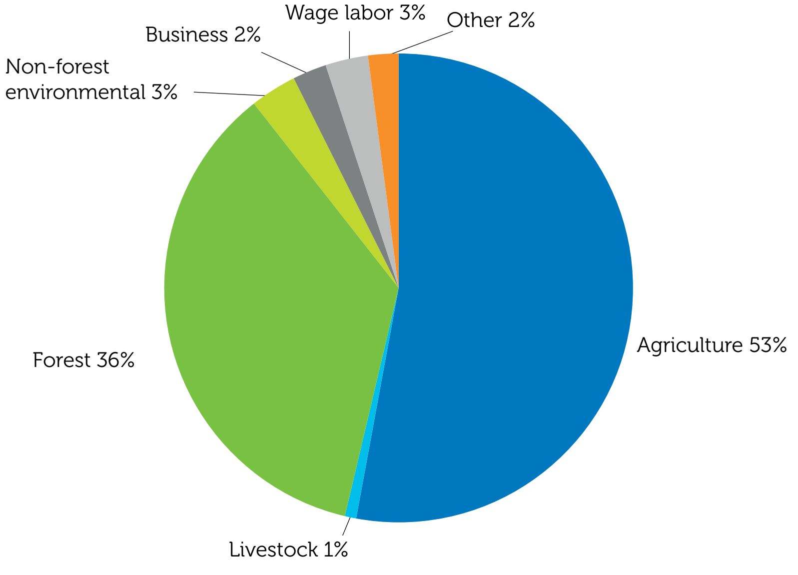

Figure 11.4 Sources of income for all households in sample (n = 120).

Table 11.4 Indicators of household forest dependence based on the 2010 survey.

	SEC1	SEC2
Number of households sampled	60	60
Household average (SD)		
Share of income from forest	21.03 (23.58)	63.30 (23.78)
Share of income from agriculture	64.87 (26.46)	26.79 (21.09)
Area of natural forest cleared (ha)[a]	2.06 (1.87)	2.15 (1.47)
Area of secondary forest cleared (ha)[a]	0.00 (0.00)	0.02 (0.13)

continued on next page

Table 11.4 (continued)

Area left fallow (ha)[b]	2.02 (1.39)	1.71 (0.99)
Distance to forests (minutes walking)	75	120
Percentage of households		
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	94	96
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	15	44
Reporting increased consumption of forest products[e]	7	2
Reporting decreased consumption of forest products[e]	64	80
Obtaining cash income from forest products[f]	78	100
Reporting an increase in cash income from forest[f]	11	24
Reporting a decrease in cash income from forest[f]	55	58
Reporting fuelwood or charcoal as primary cooking source	100	100
Leaving land fallow[g]	88	95
Clearing forest[g]	95	98
Reporting decreased opportunity for clearing forest[g]	88	93
Clearing land for crops[g]	95	98
Clearing land for pasture[g]	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

11.4 Challenges facing the initiative

The introduction of sustainable landscape management at the community level creates as many challenges as there are categories of actors who covet forest resources. In the beginning, forest communities were exploited without considering sustainable development. In particular, they were exploited by logging companies that encroached on their lands and threatened their territory. The Government of Cameroon adopted a law authorizing communities to create their own community forests by demarcating boundaries and drawing up a management plan that could contribute to community development by generating economic benefits. The CED initiative seeks to develop the potential for community forests through financial incentives linked to the mitigation of climate change (Somorin 2010). The ultimate

Baka Hut. (Patrice Levang/CIFOR)

aim of the initiative is to integrate global issues into the conduct of daily subsistence activities in such a way that villagers are more responsive to them. The initiative takes a participatory approach to adapting sustainable forest management to meet the needs of communities. The innovative character of the initiative however, has created some doubts about, for instance, the reliability of the NGO's commitment to the community, the real effects of the initiative, and the payments.

Although local leaders insist they have adopted the main principles of sustainable management, there are a few dissident voices in each village. Issues of concern include benefit sharing and equity (Awono et al. 2014), and potential restrictions on land access. There are questions about whether the new techniques promoted by the initiative will guarantee better agricultural yields. Will income levels decrease, and if so, will adequate compensation be provided? Will their efforts really contribute to protection of forests and lessen the threats posed by climate change? Will conflicts arise that could seriously threaten the rights of the local communities to their lands and resources? (Awono et al. 2014). The laws that define the status of the community forests recognized managerial rights for a period of 25 years. This includes the right of the community to sell products harvested from its forestland, but it does not confer ownership rights to those lands. Participatory mapping has cleared up the problem of boundaries and land use on the basis of forest categories and land used by the community, but the PES initiative does not include all the land being claimed by these communities, and does not include all households, thus causing an imbalance in the involvement of community members. Furthermore, in both villages, especially in SEC2, people from the neighboring villages are moving in to exploit forest resources and sometimes to farm.

The proponents, who see the initiative as a point of reference for structuring REDD+ policy at the national and the subregional level, question the capacity of the local government to introduce reforms that could guarantee tenure security for the local populations and recognize their carbon rights (Awono et al. 2014). There is also some doubt about the potential for increased revenues earned from new cropping practices to encourage the expansion of agriculture and, hence, degradation of forest cover. There is also potential for other types of leakages and for increased pressure on forest resources by villages not involved in the initiative.

Despite these challenges, the two villages have decided to bank on this initiative as a tool to make their local economies more dynamic through income diversification (beekeeping, livestock production) and the application of modern cropping techniques designed to improve yields and standards of living. If these incentives are sufficiently convincing and adapted to pave the way for the emergence of a new type of forest management, this could trigger positive, coordinated change at the grassroots level.

11.5 Lessons from the initiative

CED launched an important innovation by starting a PES initiative in community forests that were formerly limited to timber production. The acceptance of the initiative by local communities suggests that this model of forest management, based on funds for environmental performance, might be viable in other areas of Cameroon. Local acceptance was facilitated by the proponent's participatory approach from the very beginning of the process. Although the expected results are not guaranteed, the initiative is already seen at the national level as an analytical laboratory for identifying the best ways to involve local communities in efforts to make the reduction of emissions from deforestation and forest degradation part of the solution to the thorny problem of climate change. The experience of this initiative makes it clear that interventions to mitigate climate change will only be well received at the local level if the rights of the community are made clear and standards of living are improved. Capacity building at the grassroots level increases the chance that opinions expressed at that level will be respected and consequently, the benefits of new REDD+ mechanisms will be more equitably shared. Thus, there is a great need for communities to organize themselves and coordinate their efforts in order to both defend their interests and manage their forest resources sustainably.

11.6 Acknowledgments

We would like to heartily thank all the inhabitants of SEC1 and SEC2 for their positive and welcoming attitude and their willingness to participate. We are deeply grateful to CED for agreeing to work with CIFOR-GCS. We are indebted to Annie Flore Djouguep, Jean Paul Eyebe and Célestine Yvette Ebene Onana, who collected the data for this chapter with eagerness and dedication.

Part 2. Case Reports

Tanzania

Box G
REDD+ in Tanzania: The national context

Demetrius L Kweka, Sheryl Quail and Jessica Campese

REDD+ importance

Tanzania has the most subnational REDD+ initiatives of any country in Africa outside of the Congo Basin, many financed by Norway's International Climate and Forest Initiative (NICFI). This makes sense, given the country's large forest estate (35 million ha) (URT 1998); forest law allowing community forest ownership; long history of PFM (Zahabu 2008; URT n.d.); and alarming 1.1% deforestation rate – one of the 10 highest rates of net national forest area loss in the world (FAO 2010a). The annual per capita value of subsistence use of forest products in rural areas has been estimated as USD 25–50, with forests providing 90% of energy supplies, 75% of building materials and 100% of traditional medicines (World Bank 2010 *in* URT 2013b). Thus, Tanzania is well placed to demonstrate how CFM and REDD+ can be integrated to enhance PFM by giving local communities another income stream from their forests (Burgess et al. 2010; Blomley et al. 2011).

REDD+ readiness

National REDD+ readiness efforts and the policy process started in 2008 with NICFI. The Department of Environment (DoE) under the Vice President's Office oversees all climate change issues, while the Ministry of Natural Resources and Tourism (MNRT) leads MRV components (FAO 2010b). The DoE formed a national climate change steering committee (to report on deforestation and degradation indicators) and established a climate change focal point in each ministry to oversee sectoral coordination. A national REDD+ task force drafted the national REDD+ framework (URT 2009b), a national REDD+ strategy (URT 2013b) and subsequent REDD+ action plans (URT 2013a) to guide the implementation of REDD+.

Funds from the Governments of Norway (USD 58 million) and Finland (USD 5.9 million) for the first phase of REDD+ were focused on MRV capacity, national governance and institutional legal frameworks, benefit-sharing mechanisms, national standards for safeguards, strengthened stakeholder support and implementation of demonstration projects (NORAD 2014a). However, despite initial enthusiasm and fanfare, readiness efforts slowed by 2013 due to delays and political challenges in developing the national framework, the ongoing stalemate in international climate agreements, and the drawn-out technical nature of the REDD+ process that was not anticipated at the beginning (NORAD 2014b). Further, the goals of REDD+ are being overshadowed by other well-funded donor initiatives that aim to develop both small- and large-scale commercial agriculture and may encourage expansion of agriculture into forests (Hertel et al. 2014).

REDD+ subnational pilot initiatives

Concerns over the implementation capacity and fiduciary risk of the Tanzanian Government led Norway to channel most REDD+ funds to academic and civil society organizations (CSOs). Coupled with pressure to produce rapid results, this left the government reluctant to develop the institutional arrangements necessary to see REDD+ beyond the pilot phase, in particular for finance and benefit-sharing mechanisms (NORAD 2014b). This has created challenges for the nine subnational initiatives funded by Norway through a REDD+ fund managed by the RNE (NORAD 2014a). While these pilots have had important successes (as described in individual chapters), their implementation has uncovered substantial challenges, including: remaining uncertainties about land tenure,[1] carbon rights and benefit-sharing rules; insufficient technical skills for MRV; and the difficulty of effectively addressing the underlying deforestation drivers.

The current land, forest and carbon tenure arrangements simultaneously represent some of the most promising and most concerning issues for REDD+ in Tanzania. REDD+ aims to benefit the communities and individuals that bear the costs and do the work of reducing deforestation. In practice, communities with secure, recognized tenure over their land are likely to realize substantial benefits if that tenure extends to carbon. However, the Tanzania National REDD+ Strategy does not explicitly tie carbon ownership to land or forest tenure "leaving communities and other forest owners vulnerable to losing out on rightful benefits, or possibly even compromising their current legal right to use and manage recognized forest land" (TFCG and MJUMITA 2012, 2). At the same time, communities and individuals who rely upon forests to which access is restricted for REDD+ will bear costs, regardless of their tenure status. Given the technical and financial barriers to registering land and forests, such as the cost of land surveying (Barnes and Quail 2011), most villages remain unregistered. REDD+ is unlikely to benefit, and is likely to burden, local forest communities that do not obtain legal recognition of their land and forest tenure. As a result of remaining tenure uncertainties, most of the REDD+ proponents had to address boundary conflict resolution, while others facilitated acquisition of village title, effectively absorbing the cost and responsibility of what previously fell under the authority of the government.

Ensuring equitable and transparent distribution of benefits to communities whose livelihoods are intimately bound to forest resources is crucial. Within the context of REDD+, various distribution systems have been proposed by civil society and government agencies, including national, project and nested/hybrid approaches. In Tanzania, a national approach could entail linking international markets/exchanges to a national fund that could, in turn, either link directly to local communities or to district governments who would then

1 Although national laws support community forest tenure, its implementation on the ground faces barriers including poorly done land-use plans and unregistered village lands.

disburse funds to villages. A framework for a National Carbon Trust Fund has been drafted but not implemented as of 2014. Many CSOs advocate for a nested approach whereby a national payment and carbon monitoring system coexist with projects implemented by intermediary organizations that facilitate direct linkages between carbon markets and forest communities (TFWG 2010). Past experience shows that government initiatives often fail to deliver on benefit sharing with local communities, e.g. under joint forest management, hunting blocks and tourism (Milledge et al. 2007; URT 2009b). This has led to questions about the efficacy of a strictly national fund approach (NORAD 2014b), although a strictly project-based approach suffers from lack of economies of scale and possible higher implementation and transaction costs (Olsen and Bishop 2009; MNRT and UN-REDD 2012). Under a nested approach, those costs could be reduced if the national government assumed technical responsibilities for MRV, baselines and other activities. Subnational initiatives can give communities the autonomy to choose arrangements for distributing funds within villages that work best for them.

The subnational pilot initiatives funded by RNE are coming to an end, and none have sold carbon in any market. The largest of these initiatives (led by the Community Forest Conservation Network of Tanzania [MJUMITA][2] and the Tanzania Forest Conservation Group), representing almost half of the forests in Tanzania's REDD+ intervention areas, has achieved emissions reductions of 30% and identified interested buyers. Some initiatives exhausted funds before accomplishing their objectives (e.g. in Kigoma and Shinyanga), while others are struggling with the long process of meeting the requirements for selling carbon (e.g. Mpingo and Zanzibar) and/or are suffering a shortage of technical capacity to push the process forward.

REDD+ future

Compared to other countries funded by NICFI, Tanzania's progress has been slow, but a reference emissions baseline is expected to be completed by 2015, and Norway has signaled that it will release funds (albeit reduced) for Phase 2 in 2016. A performance-based approach has been decided on, and the newly built National Carbon Monitoring Centre at Sokoine University of Agriculture will continue research on the emissions baseline and MRV system. This is necessary groundwork for any REDD+ finance and benefit-sharing system, which are key remaining uncertainties in Tanzania.

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2 MJUMITA is the abbreviation for the locally known name: Mtandao wa Jamii wa Usimamizi wa Misitu Tanzania.

Chapter 12

Building REDD Readiness in the Masito Ugalla Ecosystem Pilot Area in Support of Tanzania's National REDD Strategy

Demetrius L Kweka

Building on more than a decade of conservation work in western Tanzania, the Jane Goodall Institute (JGI) brought together a broad consortium of organizations to respond to the Norwegian call for REDD+ funding proposals in 2009. Once they obtained funding for the initiative in Kigoma, known as Building REDD Readiness in the Masito Ugalla Ecosystem Pilot Area in Support of Tanzania's National REDD Strategy, they helped establish a community-based organization linked to the Kigoma District Council called *Jumuiya ya Watunza Msitu wa Masito* (JUWAMMA). The objective of the initiative was to reduce deforestation and forest degradation driven by demand for agricultural land and fuelwood. Challenges include the exceptionally low per capita income and high population growth rate in the Masito Ugalla region, where the majority of households depend on natural resources, including NTFPs. Within this region, the REDD+ initiative primarily targeted seven pilot villages along the shores of Lake Tanganyika and included another eight villages surrounding general (open-access) lands in the Masito dry forest ecosystem in order to control leakages. In order to protect these forests, the initiative established forest patrols, encouraged beekeeping as an alternative income source and enhanced capacity and governance mechanisms for local communities and government institutions to administer and benefit from REDD+. Since funding for the REDD+ initiative ended in June 2013, JUWAMMA has continued working with the seven intervention villages to build on these initial steps.

12.1 Basic facts: Where, who, why and when

12.1.1 Geography

This initiative was located primarily in Kigoma (now Uvinza) district in the Kigoma region, with a small portion in Mpanda district in the Katavi region.[1] These are among the poorest and the most heavily forested districts in Tanzania and thus an obvious place to pilot REDD+. The initiative focuses on the Masito Ugalla Ecosystem (MUE), a forested landscape of 10,827 km^2 under varied management and ownership regimes. There are two predominant types of native forest: miombo woodland (dominated by *Brachystegia* species) and lowland rain forest in the valley bottoms (Zahabu 2011). In addition to woodlands, a large proportion of the region is covered in grasslands. Rainfall is highly variable across the landscape, ranging from 600 mm to 1500 mm/year.

The REDD+ initiative is being implemented in seven pilot villages near Lake Tanganyika (Figure 12.1) in the former Kigoma district. The total population of the seven villages is 69,410 (JGI 2011). The initiative aims to protect 900 km^2 of the Masito Forest, which is under threat from population growth, an expanding road network and increasing demand for fuelwood. The population is growing and this is partly due to an influx of refugees from Burundi, DRC and Rwanda, some of whom have settled permanently in the region and some of whom are staying with relatives and friends. In either case, this influx has increased pressure on natural resources. The CIFOR-GCS research described here was conducted in a sample of four of the seven villages, with a total population of 28,454.

The initiative area has an exceptionally low income per capita and high population growth rate (URT 2009a). In their proposal to Norway, JGI noted that socioeconomic studies conducted in 2007 had diagnosed low levels of literacy, lack of income-generating options and poor understanding of national regulations of woodland use. One proximate cause of deforestation is demand for agricultural land, both for small farmers to produce local crops such as bananas, potatoes and

1 In December 2013, two districts (Kigoma and Mpanda) were divided into four. The new districts are Uvinza (Kigoma) and Nsimbo (Katavi).

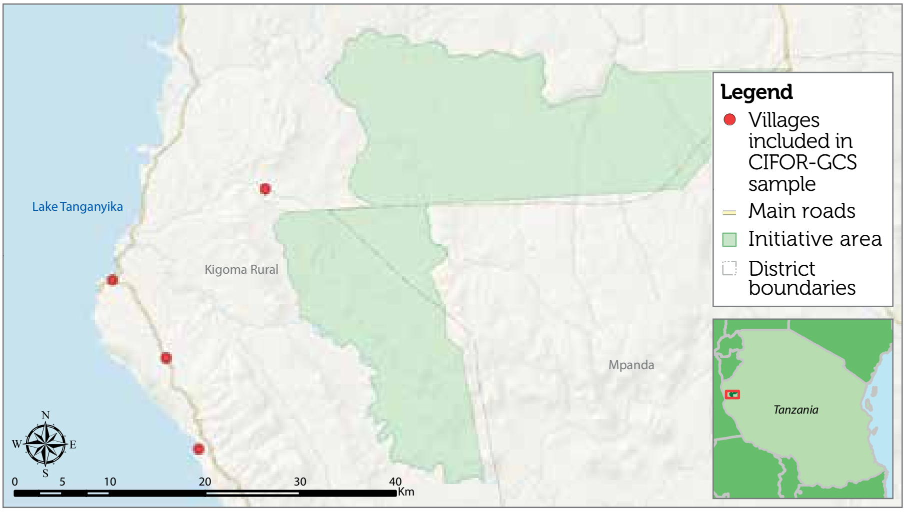

Figure 12.1 Map of the REDD+ initiative in Kigoma.

Data sources: JGI, GADM, OpenStreetMap and World Ocean Base.

maize for the local market, and for large-scale[2] agribusiness seeking to expand commodity production. The other significant livelihood in the region is fishing, which is both an important economic industry engaging most communities along the lakeshore and a key source of protein.

12.1.2 Stakeholders and funding

JGI is an international nonprofit organization founded by renowned primatologist Jane Goodall. JGI initially focused on research and conservation of chimpanzees around Gombe National Park. From 2004, JGI also sought to address rapid deforestation and degradation outside of the park. Starting in 2007, they expanded their conservation efforts south with the MUE pilot project. Building on this project, they obtained USD 2.76 million from RNE in 2009 to implement REDD+ with a consortium of organizations including the Woods Hole Research Center (WHRC), Sokoine University of Agriculture, the University of Dar es Salaam and the Kigoma District Council. During the three and a half years of funding from RNE, JGI facilitated the establishment of a community-based forest conservation organization (JUWAMMA) to manage benefit-sharing with the communities and take responsibility for the initiative in the long run.

2 Oil palm by FELISA (Farming for Energy for better Livelihoods in Southern Africa) Ltd.

JUWAMMA meets and collaborates with village leaders and the district council and has responsibility for implementing forest management plans, organizing forest patrols and distributing any REDD+ revenues earned from carbon markets or a national forest carbon fund. While the creation of a functional community based organization (CBO) is one of the initiative's main achievements, technical support from JGI and other professionals will be required for JUWAMMA to meet all of the technical requirements of REDD+ including MRV, certification and marketing of carbon credits. The proponent has not yet finalized a PDD, and its claim on carbon credits from the Massito forests remains unclear as the joint forest management (JFM) arrangement between the villages and the government is still being developed.

JGI's plan for long-term funding was to generate income from the sale of carbon credits in the voluntary market after certification by VCS and/or CCBA. However, certification and sale of carbon credits were not completed due to lack of funds to finalize the remaining activities and because of the expectation that a national REDD+ basket fund would make that unnecessary (see Box 2-4).

12.1.3 Motivation

JGI has worked since 1960 to conserve the Greater Gombe ecosystem through its research center. While deforestation of the Masito Ugalla forest has not been as severe as that in the area around Gombe National Park, JGI recognized increasing threats from a growing population and expanding road infrastructure. Thus, JGI launched the MUE project in 2007 in a large area of western Tanzania that includes portions of both Uvinza and Nsimbo districts, with a range of activities including environmental education, land-use planning, sustainable forest use and protection of biodiversity. In particular, JGI sought to improve the management of 'general lands' that officially belong to the central government but are not effectively managed by anyone. Their approach was to develop PFM systems with nearby communities.

The REDD+ initiative that was launched in 2009 continued previous efforts in seven participating villages with a new source of funding and requirements for carbon accounting. While JGI did not have the capacity to fulfill the requirements of REDD+, it organized a consortium with this capacity, e.g. with WHRC contributing expertise in MRV.

JGI considered the primary threats to forest in the participating villages to be their high population growth rate, low income and reliance on natural resources such as timber, fuelwood and land for agriculture. Fuelwood is used for curing salt (in Masito) and making charcoal (in both Masito and Ugalla areas). JGI foresees potential new threats to the forest from outside actors, e.g. large investors in agricultural land.

12.1.4 Timeline

JGI began disseminating information and carrying out the FPIC process at the beginning of 2010. In May 2010, JGI hired staff to begin implementing activities, including efforts to clarify tenure and develop forest management plans in the participating villages. In 2011, the CBO was established, and in 2012, they tested REDD+ benefit-sharing plans by allocating funds to village development projects. The original three and a half-year period (January 2010–June 2013) funded by RNE came to a close in mid-2013 and efforts to obtain additional funds to finalize activities were unsuccessful. Figure 12.2 summarizes the key events of the initiative.

Pre-2000	**1994** - Lake Tanganyika Catchment Reforestation and Education (TACARE) program starts					
2000						
2001						
2002						
2003						
2004						
2005						
2006						
2007	MUE Project starts					
2008						
2009	MUE and Great Gombe Ecosystem merge to form the Gombe Masito Ugalla initiative	REDD+ proposal developed and submitted				
2010	FPIC and REDD+ awareness and education	Staff hired and activities begin for REDD+ initiative	CIFOR-GCS baseline survey	Tenure clarification and development of village-level forest management plans begins	Income generating activities (e.g. beekeeping) begin	CBO JUWAMMA founded to manage forest and REDD+ on behalf of the villages
2011						
2012	CIFOR-GCS presents baseline results to study villages	Trial REDD+ payments to test benefit sharing mechanism				
2013	JGI ends engagement in REDD+ initiative					
2014	CIFOR-GCS phase 2 study					

REDD+ initiative active

Figure 12.2 Timeline of the REDD+ initiative in Kigoma.

12.2 Strategy for the initiative

The initiative sought to both reduce deforestation and forest degradation and to restore, rehabilitate or enhance carbon stocks in existing forests. JGI chose to pursue this work in Masito Forest because it is a biodiversity hot spot, containing rare and endemic species. Building on their previous efforts, JGI pursued a community-centered approach that engaged customary forest managers as partners through technical training in forest inventory, monitoring and management.

In the seven intervention villages in Uvinza district, the initiative formed a CBO responsible for forest management. The formation of the CBO was part of the JGI's capacity building and sustainability strategy that aimed to generate an annual net income of USD 400,000 to the villages from sale of carbon offsets. This figure was based on an average carbon stock in intact forest of 170 tCO_2e/ha and in land after conversion of 50 tCO_2e/ha.[3] The estimated annual deforestation rate between 2001 and 2007 was 1.7% (BAU scenario). The initiative estimated that the deforestation rate would be reduced to 0.86% after the first five years of REDD+ implementation and to 0.43% after another five years. Most of the revenues generated as a result of these reduced emissions would be shared at community level, through development projects proposed and managed by village governments.

In order to test this planned benefit-sharing mechanism, about USD 200,000 from RNE was paid to the seven villages as incentive funds. To be eligible for the incentive funds, a village had to: be a member of JUWAMMA; have active forest conservation efforts (usually implemented by forest monitors[4] and the CBO); and have agreed to participate in all conservation activities, while demonstrating a good relationship between the village council and the villagers. The participating villages agreed upon benefit-sharing mechanisms, and JUWAMMA distributed the funds as agreed and to the agreed schedule, as approved by each village's general assembly. Each village also identified projects to be implemented with the funding, as part of their conservation and development plans. JUWAMMA retained 10% of the funds to cover its administrative costs and the remainder was divided among the seven villages, with each receiving 7.8% to 19% of the total.

The village capacity to develop and implement these conservation and development plans was partly based on previous interventions under the Gombe Masito Ugalla initiative. This initiative had supported capacity building and training of communities, and development of land-use plans. In addition to aid from these NGOs, villages have also received aid from the government through infrastructure, education, health and agricultural services.

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3 Assuming a biomass to C ratio of 50% and a C to CO_2e ratio of 44/22.

4 Forest guards, designed to enforce by-laws and protect the REDD+ forest.

12.3 Smallholders in the initiative

The intervention area has a population of 69,410 that is growing at an annual rate of 4.8% – one of the highest population growth rates in Tanzania. There are a mixture of indigenous people (mainly Watongwe, Wabembe, Waha, Wagoma, Watulambo, Wafipa, Wanyamwez and Wamo) and refugees from neighboring countries (Burundi, Congo-Brazzaville, DRC and Rwanda). Table 12.1 characterizes the four intervention villages selected for CIFOR-GCS. Most people in these villages make their livelihoods from fishing or farming.

The villages in these regions have strong, active governments, including councils, chairmen and executive officers. Important matters in the village are decided by the village assembly in meetings held at least four times a year or as the need arises. Members of the village government are elected by the villagers. Under normal circumstances, these village governments hold power for five years before new elections are held. Women are well represented in the governments of the four study villages, although they report variable levels of influence (highest in KIGO3 and KIGO4). In meetings with the women, most reported that they participate in forest activities, rules and monitoring. While not all women opt to participate in village-level decision making, they are clearly important decision-makers about forest use and farming at the household level.

Women's meeting in a village in Kigoma. (Demetrius L Kweka/CIFOR)

Table 12.1 Characteristics of the four villages studied based on the 2010 survey.

	KIGO1	KIGO2	KIGO3	KIGO4
Total land area (ha)	14,538	5,840	86,700	7,542
Total forest area (ha)	1,000	4,672	56,355	4,902
History and demography				
Year established	1974	1972	1974	1994
Number of households	712	356	1,080	900
Total population in 2008	5,500	3,506	8,022	8,000
Number of people who migrated to village since 2008	300	40	20	65
Number of people who migrated away from village since 2008	50	27	9	0
Number of residents working away from village	110	55	26	60
Number of ethnic groups	4	3	6	5
Name of largest group	Wabembe	Wabembe	Waha	Waha
Previous experience with conservation NGO	Yes, MUE project	Yes, MUE project	No	Yes, MUE project
Infrastructure				
Distance to closest market by most common means of transport (km/min)	10/360	40/150	170/360	26/240
Elementary school	Yes	Yes	Yes	Yes
Secondary school	No	No	No	No
Health center	Yes	No	Yes	No
Road access in all seasons	No	Yes	Yes	Yes
Bank or other source of formal credit	Yes	No	No	No
Agriculture				
Main agricultural commodity (staple food)	Cassava	Cassava	Cassava	Cassava
Price of a hectare of good quality agricultural land (USD)[a]	62	53	46	32

a Exchange rate used: USD 1 = TZS 1409.27 as per the World Bank in 2010.

As shown in Table 12.2, most village households receive some income from forests; household members frequently go to the forest to collect fuelwood and other NTFPs. There is some variation, e.g. men in KIGO3 use the forest less often, perhaps because they can obtain comparable products from the nearer bushland. Both men and women rely on the forest more during the dry season when there are fewer farming activities. Respondents in two villages reported that timber had declined in importance, perhaps due to the conservation efforts of previous projects in the region.

When asked about the direction of change in forest cover during the two years prior to the interview, KIGO2 and KIGO4 villages said the net forest area had increased, while KIGO1 and KIGO3 villages said that it had decreased. However, most respondents indicated that forest quality had increased in the previous two years. Earlier conservation initiatives in the region may have contributed to these

Table 12.2 Proportion of village households who visited the forest in 2010 and direction of change in the two years prior to the survey.

	Distance to forest (average walking time in minutes)	Proportion of people who never visit the forest		Season when most people went to the forest		Activity in the forest	
		Men	Women	Men	Women	Men	Women
KIGO1	60	None or very few (0%–20%)	About half (41%–60%)	Wet season	Wet season	Collect poles and hunting/ trapping	Collect fuelwood, traditional medicine and wild fruits
KIGO2	180	None or very few (0%–20%)	None or very few (0%–20%)	Dry season	Dry season	Collect poles	Collect fuelwood, traditional medicine and wild fruits
KIGO3	60	Very many to all (81%–100%)	None or very few (0%–20%)	Dry season	Wet season	Collect poles, thatches and traditional medicine	Collect fuelwood, poles, thatches, traditional medicine and wild fruits
KIGO4	90	None or very few (0%–20%)	None or very few (0%–20%)	Dry season (collecting fuelwood for making bricks)	Wet season	Collect fuelwood, traditional medicine and wild fruits, and logging	Collect fuelwood, traditional medicine and wild fruits

trends by helping to reduce the area under shifting cultivation and stabilizing the area under permanent cultivation in all of the villages except KIGO2.

The proportion of village households collecting fuelwood and other NTFPs was reported as 81%–100% in all the villages, while none said they collected timber. When asked about the direction of change for collecting other NTFPs and fuelwood in the two years prior to the survey, KIGO1 and KIGO2 villagers said it had decreased, and KIGO3 and KIGO4 villagers said it had stayed the same.

12.4 Challenges facing the initiative

The JGI REDD+ initiative operates in a uniquely large forest block[5] (area of 900 km^2) that protects a critical wildlife habitat, and is home to a large population of chimpanzees; it also protects important watersheds for Lake Tanganyika. The interventions have been implemented in this area in collaboration with the government, leveraging the skills of district officers to work alongside the initiative. JGI collaborated with WHRC to adopt their innovative carbon mapping methodology to Tanzania, and to Kigoma specifically. WHRC also conducted biomass mapping training for national REDD+ stakeholders. However, the initiative experienced challenges in fulfilling its aim to access the voluntary carbon market. One important limitation was the short project period (three and a half years only). JGI attempted to apply for another phase that would have provided some time to complete the process but it was not successful. Three and a half years was not long enough for project implementation, in view of REDD+ protocols and expected social changes. Thus, the short implementation period and insufficient funds to continue activities resulted in several incomplete activities and other REDD+ processes. As it stands, JGI has not finalized a PDD and villagers are not yet ready to sell carbon credits.

The move to establish JUWAMMA had been planned since the inception of the REDD+ initiative. JGI created the CBO because there was a need for a local organization to coordinate REDD+ activities on the ground on behalf of the villages. The CBO is entrusted to the local government authority (Uvinza District Council) that monitors CBO conduct and provides technical support when needed. Although the CBO has strengths, such as its ability to coordinate collective action at the local level, it also has limitations, such as lack of sufficient technical skills and financial resources to obtain certification for the carbon market without significant outside assistance.

5 JGI put a part of MUE (900 km^2) into REDD+ (Masito Forest).

To address its financial deficit, villages were facilitated by JGI to develop a forest management plan that allows wood resource extraction[6] from Masito Forest in order to generate revenue to cover JUWAMMA's operational costs. Villages deem that a resource extraction approach to fund procurement is necessary until such time that the initiative can rely on the sale of carbon credits. However, tenure control of Masito Forest has not yet been transferred from the government to the villages. Until this key tenure issue is resolved, villages cannot proceed with implementation of their plan to extract timber in Masito Forest, nor can they sell forest carbon credits.

The Government of Tanzania – the formal owner of Masito Forest – entrusts its management rights to Uvinza District Council. When the REDD+ initiative started, JGI requested the government to transfer its tenure rights over Masito Forest to the surrounding communities so that they could manage it under a PFM arrangement. This is because REDD+ presupposes that those anticipated to engage in carbon trade only qualify for compensation if they have secure tenure over the forests they manage. Although the initiative facilitated JUWAMMA in the process of acquiring formal tenure rights to the forests, the process has not yet moved forward. JUWAMMA did not fully acquire the rights because a JFM agreement must be established with the government. Additional discussions are taking place with the district council, JGI and other partners on setting up JFM with villages. Failure to achieve secure tenure rights for the communities to date has been a major obstacle to moving forward with plans for REDD+. A variety of issues highlight the other key challenges. Village respondents were concerned that the REDD+ initiative would block their access to agricultural land if shifting cultivation and opening up of new agricultural land was restricted. Revenues from REDD+ are uncertain, due largely to undefined and nonfunctional international agreements and national institutions, and thus the potential for local people to capture financial benefits from REDD+ depends on factors beyond their control. There is a risk that the REDD+ initiative could increase conflicts over land and resources, with unintended consequences.

12.5 Lessons from the initiative

The JGI initiative has an innovative benefit-sharing system. The proponent designed it with input from a survey conducted in all participating communities. The mechanism is similar to the system used by the district council to allocate funding to villages for development projects. It incorporates the district executive director in the payment process, thus ensuring buy-in and supervision by the

6 This item is still under discussion with the district but JUWAMMA has been appointed the agent for fees collection from natural resource products.

district government – effectively integrating it into the national REDD+ benefit distribution system being planned by the national government. This approach saves time and resources by utilizing already existing and functioning structures.

There are other notable JGI approaches to laying the foundation for the initiative. It has used forest monitors in setting up an intervillage patrol group through CBO coordination that has proper equipment for patrolling and forest monitoring. The group is compensated through goods seized by the patrols and fees collected from natural resources products, and will eventually get a percentage of REDD+ revenue. Furthermore, the initiative has partnered with the Woods Hole Research Centre and Google Earth to conduct remote sensing analysis and forest monitoring using Google Android smartphones. This has potential to be replicated in other REDD+ initiatives and influence future conservation schemes.

The initiative provides an example of REDD+ under challenging conditions. It has high potential value for people, forest conservation and primate biodiversity, yet it faces major challenges. Although initially endowed with strong human, technical and financial resources, it needs to be a mentor and provide technical support for the CBO to ensure it can achieve its goals.

12.6 Acknowledgments

The CIFOR-GCS baseline research in this initiative was led by Susan Caplow. We would like to thank Nssoko Edwin, former REDD+ project director, and the other staff of JGI for patiently responding to our questions. We also appreciate the participation of people in the four study villages who attended our meetings and shared their perspectives on the initiative.

Chapter 13

Piloting REDD in Zanzibar Through Community Forest Management, Tanzania

Susan Caplow, Andina Auria Dwi Putri and Demetrius L Kweka

The REDD+ initiative being run in Zanzibar by CARE International is called Piloting REDD in Zanzibar Through Community Forest Management. In Swahili, the initiative is referred to as *Hifadhi misitu* Zanzibar (Conserve forests in Zanzibar) or HIMA. HIMA is using a tailor-made PFM approach based on CFM agreements[1] to reach goals that are specifically pro-poor and gender equitable, in line with CARE's mission. The initiative is building on CARE's previous work with PFM in Zanzibar, expanding their efforts on Zanzibar's largest island of Unguja and extending into Pemba, the less-developed northern islands.

1 The Government of Zanzibar gives the community a long-term lease (40 years) to land and forest therein to implement REDD+ and benefit from it. The community enjoys the ownership rights and benefits for a specified amount of time. Joint forest management is when the community splits the benefits with the government; CFM is when the community is entitled to all the benefits and ownership rights.

The predominant vegetation in Zanzibar is coral rag, a dry, shrubby, relatively nutrient-poor, but biodiversity-rich forest type growing on high calcium soils. This landscape is not carbon-rich, but HIMA was selected for funding by the RNE because of CARE's outstanding reputation and proven capacity with forestry projects in Zanzibar. The hope is that CARE can repeat its successes while carving out a unique niche for REDD+ in Zanzibar.

13.1 Basic facts: Where, who, why and when

13.1.1 Geography

Zanzibar is a unique place in Tanzania. As a set of islands off the eastern coast of the Tanzanian mainland, Zanzibar has historically been politically separate from the rest of the country (formerly Tanganyika). In mainland Tanzania, most villages were assembled during the villagization[2] period of the early 1970s, while villages in Zanzibar are long-standing community entities and thus have different structures and management. Standards of living in Zanzibar are relatively high, as tourism, fisheries and trade have brought economic prosperity and amenities not available in rural parts of mainland Tanzania.

HIMA focuses on 27,650 ha within Unguja and Pemba provinces, including 22,650 ha of upland forest and 5000 ha of mangrove forest (CARE 2010). Out of the 40 villages in this intervention area (29 in Unguja), CIFOR-GCS conducted interviews in four, all located in South (Kusini) Unguja district, at 7–35 masl (Figure 13.1). The district has annual precipitation of 1635 mm and three types of forest: coral rag forest, deep soil forest and mangrove.

In 2009, the total population of Zanzibar was estimated to be 1,206,000, based on a projection from the 2002 census assuming a 3.1% annual growth rate (NIRAS 2010). People tend to look for opportunities in Zanzibar because of its high standard of living relative to the mainland. This drives migration from villages on both the mainland and the islands to Zanzibar town, and overcrowding in town compels people to move to areas just outside of town.

The top three exports from Zanzibar in 2009 were animal products, vegetable products and base metal/articles of base metals. Tourism has also played an important role in the Zanzibar economy. In 2009, GDP per capita was double its 2005 levels at TZS 726,000 (USD 483; Socio-Economic Survey of 2009).

Natural resource management in Zanzibar is challenging because of a lack of coordination among land, water and forest policies. The ministries in charge of

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2 Tanzanian president Julius Nyerere implemented a series of socialist policies in the late 1960s and early 1970s referred to as *Ujamaa* (unity) that reorganized rural Tanzanian communities into village structures (McHenry 1979).

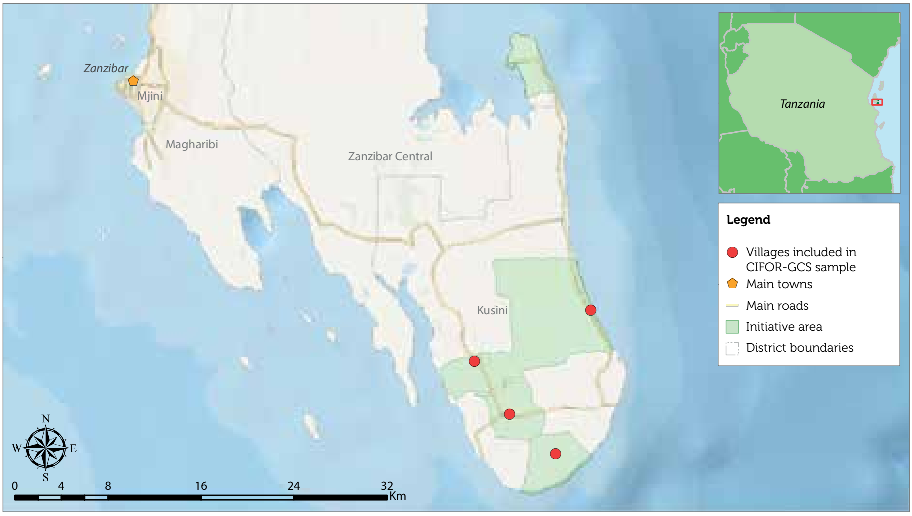

Figure 13.1 Map of the REDD+ initiative in Zanzibar.

Data sources: CARE, GADM, OpenStreetMap and World Ocean Base.

natural resource management have overlapping responsibilities and generally do not cooperate. There have also been conflicts over boundaries between villages and individual landowners, but these have been resolved through government mediation and without violence.

Women face economic disadvantages in Zanzibar; they typically do not own land or have secure employment and thus have low incomes. Moreover, they were excluded from previous development interventions. In contrast, HIMA aims to involve women in the implementation of its REDD+ activities.

13.1.2 Stakeholders and funding

The primary proponent for this initiative is CARE International in Tanzania. CARE is a private nonprofit international organization with a long-term presence in Zanzibar. The Zanzibar Government is also a key partner in HIMA, with the Department of Environment (under the Office of the First Vice President), Department of Forestry and Non-Renewable Natural Resources, and Department of Land all playing significant roles in the initiative. HIMA is also collaborating with three umbrella organizations in Zanzibar: the Jozani Environmental Conservation Association (JECA) in Central Unguja, the South Environmental and Development Conservation Association (SEDCA) in South Unguja, and the Ngezi-Vumawimbi Natural Resources Conservation Organization (NGENARECO) in Pemba. In addition, CARE works with JUMIJAZA (*Jumuiya ya Uhifadhi wa Misitu Asili-Zanzibar*), a federation for community forestry that involves 40 *shehia* (groups of villages) across Zanzibar. JUMIJAZA serves as the carbon aggregator, managing the sale of carbon credits. Finally, CARE has contracted Terra Global for carbon MRV.

HIMA was awarded USD 5.6 million from the RNE REDD+ Fund. CARE planned to sell carbon credits through voluntary carbon markets (on behalf of the community), marketing the credits as pro-poor and gender equitable.

13.1.3 Motivation

CARE has been working with the Department of Forestry, JECA, SEDCA and communities in Unguja on PFM since 1997. Previous efforts focused on establishing clear tenure, providing environmental education, protecting biodiversity, protecting and enhancing forests stocks through afforestation or reforestation, and supporting both forest-based and non-forest-based livelihoods. These efforts primarily targeted government-owned protected forests, but in 2003, CARE expanded into community forests and continued that focus in the REDD+ initiative. Previous forest conservation efforts were deemed successful because they converted free-access forests into managed forest reserves and significantly reduced illegal forest activities.

CARE chose Zanzibar for their REDD+ initiative because they had already established a solid reputation, developed relationships and built local capacity on Unguja. They were a logical candidate for funding from the RNE REDD+ Fund because those funds were earmarked for NGOs only, and CARE was the only international NGO working with PFM in Zanzibar. The activities proposed for HIMA did not differ substantively from their previous work on PFM. Specifically, HIMA has both set up new community forest management agreements (COFMA) and sought to extend existing agreements from 5 to 30 years.

HIMA is targeting high biodiversity forests within Zanzibar. The major threats to these forests come from local actors living in the intervention areas who require fuelwood for cooking. Small-scale agriculture, illegal charcoal production, NTFP harvest, seaweed farming (which requires wood products) and forest fires (caused by hunting) also threaten forest health in Zanzibar. However, CARE is also concerned about outside actors, which are expected to place more pressure on Zanzibar's forests in future years.

13.1.4 Timeline

The first proposal seeking REDD+ funding for this initiative was written in July 2009. The agreement with Norway became official on 1 April 2010, and the official launch of HIMA occurred in June 2010. The CIFOR-GCS gathered information on baseline conditions through meetings with communities and women in July 2010, just before on-the-ground activities began. Later in 2010, field activities began, included raising awareness of REDD+ and establishment of a participatory monitoring program. Figure 13.2 lists other activities implemented in 2011 through 2013. We are not aware of any new activities planned in 2014.

Pre-2000					
2000					
2001					
2002					
2003					
2004					
2005					
2006	CARE projects in Unguja				
2007					
2008					
2009	HIMA REDD+ project proposal written				
2010	Official agreement with Norway signed	Official project launch workshop	CIFOR-GCS baseline survey	Awareness raising about REDD+	
2011	Boundary demarcation, mapping, preparation of COFMA and seeking approvals	Restrictions including designation of forest zones for conservation and for utilization	Tree planting (woodlots)	Establishment and approval of COFMA	CIFOR-GCS presents baseline results to study villages
2012	Conservation agriculture and beekeeping	Development of a VCS methodology and PDD	Gender analysis and social impact study	Establishment of carbon aggregation entity (JUMIJZA)	
2013	Finalization and approval of village land-use plans	Compensation for forest protection work	CIFOR-GCS phase 2 survey		
2014					

REDD+ initiative active

Figure 13.2 Timeline of the REDD+ initiative in Zanzibar.

13.2 Strategy for the initiative

HIMA aims to avoid deforestation and forest degradation and enhance existing carbon stocks by promoting afforestation and reforestation, improved cooking stoves, and alternative livelihoods (such as beekeeping) that place less pressure on forest resources. The low carbon stocks in the existing coral rag forest influenced the initiative to focus on planting trees for fuelwood. This strategy is also intended to generate co-benefits for local communities and for biodiversity conservation.

While CARE planned to seek VCS and CCBA verification, as of July 2014, this process had not yet begun. The HIMA proposal set the reference level of deforestation at 1000 ha of forest per year in the intervention area. Project proponents are unsure if this represents an accurate assessment of deforestation rates, but it remains the best estimate available despite plans to update this number. Thus, the initiative is measuring avoided deforestation in relation to this original estimate. One important source of leakage is likely to be charcoal imported from mainland Tanzania.

CARE has already worked in the area with a previous version of HIMA; the previous project established Jozani National Park and encouraged surrounding villages to establish village conservation committees to help enforce conservation measures. That version of HIMA started in 1997, and by 2007, CARE had visited all of the villages in Unguja to set up the project. Of the 29 villages selected in the pilot project, 17 of them have worked with CARE previously. Those 17 are all on Unguja Island, and the new villages are on Pemba Island. CARE solicited recommendations from project partners operating in Pemba to identify Pemba villages to participate in the project. HIMA plans to bring benefits through selling carbon credits to approximately 16,600 rural households (estimated at 99,000 men, women and children) living adjacent to the forests in seven districts of Unguja and Pemba Islands. The project will also benefit a variety of management institutions at medium scales, including 49 village conservation committees (VCCs), 30 village savings and loan groups, 3 umbrella organizations of VCCs (JECA, SEDCA, and NGENARECO), the Department of Commercial Crops, Fruits and Forestry, and 59 *shehia*.

A variety of institutions also benefit from the project. First, CARE has a variety of partners who are working to implement PFM in Zanzibar, including the Department of Environment, Department of Forestry, Ministry of Land, JECA, SEDCA and NGENARECO. If carbon credits are sold, Terra Global will recover transaction costs and charge a fee for their help in monitoring and marketing of carbon. JUMIJAZA will share benefits from carbon credits, as they will help find buyers and negotiate prices on behalf of the villages and then deduct their administrative costs from the credit price.

After Terra Global and JUMIJAZA have covered their management costs, 100% of the benefits are intended for the communities, with the use of the carbon revenues depending on their system for benefit sharing. CARE also plans to pay communities forest conservation grants before carbon credits have been verified, as an incentive to keep community members engaged and motivated.

The study area has received many types of assistance from the national government and local and international NGOs contemporaneous with the REDD+ initiative. Local NGOs have assisted with beekeeping, micro-financing, and beach conservation and management (2008–2009). International NGOs have supplied bricks, bicycles, educational support, ecological monitoring and water well improvements (2007–2013). The national government has provided support for beach conservation, tree planting, agriculture, fisheries, seaweed cultivation, health initiatives (malaria control) and education (2006–2010).

13.3 Smallholders in the initiative

There are four intervention villages in our sample: ZANZ1 to ZANZ4, with populations ranging from 2730 (745 households in ZANZ1) to 626 (172 households in ZANZ2) (Table 13.1). All are located on Unguja Island.

Table 13.1 Characteristics of the four villages studied based on the 2010 survey.

	ZANZ1	ZANZ2	ZANZ3	ZANZ4
Total land area (ha)	6,500	1,295	1,942	1,942
Total forest area (ha)	5,200	971	1,359	1,553
History and demography				
Year established	1850	1888	1930	1913
Number of households	745	172	334	205
Increase in number of households in last two years	77	56	34	55
Total population	2,730	626	1,800	866
Population increase in last two years	80	110	335	46
Number of people who migrated to village since 2008	50	1	15	15
Number of people who migrated away from village since 2008	12	6	50	7
Number of residents working away from village	12	0	0	0
Number of ethnic groups/tribes	1	1	1	3
Name of largest group	Swahili	Swahili	Swahili	Swahili
Infrastructure				
Distance to closest market by most common means of transport (km/min)	65/90 (car)	4/15 (bicycle)	64/120 (car)	53/60 (car)
Elementary school	Yes	Yes	Yes	No
Secondary school	Yes	Yes	Yes	No
Health center	Yes	Yes	Yes	No
Road access in all seasons	Yes	Yes	Yes	Yes
Bank or other source of formal credit	No	Yes	Yes	Yes
Agriculture				
Main agricultural commodity	Rice	Rice	Rice	Rice
Price of a hectare of good quality agricultural land (USD)	5,000	3,500	350	N/A

In most of Tanzania, the village is the most important organizing structure in daily life, but in Unguja (where all of the study villages are located), villages are organized into groups of two or three that are referred to as *shehias*, which are led by a *sheha* and *sheha* committee. The regional commissioner appoints the *sheha*, and the *sheha* appoints the *sheha* committee with help from the district commissioner (Tidemand 2003). Local authorities stay in these positions until they choose to step down, at which point another individual is appointed. This is different from the tradition in mainland Tanzania, where the local government is elected by popular vote.

Women's participation varies across villages. In ZANZ1, women primarily influence decision-making through their husbands, whereas in ZANZ3 and ZANZ4 they participate directly in decision-making. Women participate in forest rule-making and monitoring in ZANZ4 only. Ethnic composition is almost entirely Swahili in all villages, as Zanzibar is the ethnic center for Swahili.

Unguja is one of the most developed regions of Tanzania and, as the island is a tourism destination, much of the area has paved roads and electricity. However, while some tourism benefits are felt in the villages via opportunities for business and wage labor, the economies of the villages in South Unguja remain mostly separate from tourism activities. Instead, most families engage in agriculture and livestock keeping. Reliance on forest products is also much lower than in other regions, primarily because coral rag does not have any large or valuable timber species. Villagers report collecting NTFPs. Some ZANZ3 and ZANZ4 villagers, many ZANZ1 villagers, and most to all ZANZ2 villagers collect NTFPs. Primary NTFPs are fuelwood and wood for charcoal making; very few households (less than 20%) harvest timber.

The relatively high levels of development on Unguja have had an impact on land-use activities and forest cover. All of the four study villages reported increases in permanent agriculture, and three of the four villages reported a decrease in forest cover and quality (ZANZ2's forests stayed the same). The biggest pressures in Zanzibar, like other regions of Tanzania, come from smallholders living inside the intervention area. Thus, the initiative relies on these smallholders to take actions to reduce carbon emissions.

13.4 Challenges facing the initiative

Several challenges threaten HIMA's ability to effectively reduce emissions from forest carbon. First, controlling leakage into nearby forests remains a substantive challenge, as villagers are accustomed to harvesting wood illegally from nearby forests. Second, community-level capacity for the technical aspects of REDD+ is low, so HIMA will need to provide training in order to engage villagers in carbon development, monitoring and marketing.

One concern about the initiative is whether its benefit-sharing arrangements are fair. It is not clear whether the funds allocated for livelihood enhancement are sufficient for distribution to all target groups. Because the initiative is seeking to protect forest on small parcels of land, there is strong competition between households' need for that land and the initiative's conservation goals. Households also reported concerns that in the absence of clear land tenure, their agricultural lands will be converted into conservation areas.

If Tanzania adopts a National REDD+ Trust Fund as the mechanism for REDD+ payments, it will have to be resolved how this relates to Zanzibar's governance structures. This will also affect how the JUMIJAZA-REDD+ aggregation entity for community carbon credits operates.

Some intervention ideas were not incorporated into the final project design, for example, promoting household use of liquid petroleum gas in order to reduce emissions from fuelwood and charcoal. It was later seen that the initiative did not have the capacity to follow through with this idea. To have an impact on forest cover, it would have required a scale of operation, specialist knowledge and resource allocation (in terms of staff numbers and time) that were simply not available.

Firewood in Zanzibar. (Demetrius L Kweka/CIFOR)

Zanzibar has a different history and different laws and governing bodies to the mainland. As REDD+ is a national strategy stemming from the bilateral agreement with Norway, the mainland government wants to coordinate all REDD+ activities, but the Zanzibar Government would like to consider the REDD+ project at the Zanzibar level. The different management structures between mainland Tanzania and Zanzibar complicate the tenure clarification process, as Zanzibar has its own Land Act with accompanying land-use policies. The project, above all else, requires multisectoral coordination, which will be difficult to achieve in both Zanzibar and mainland Tanzania. This task is further complicated by the recent separation of the Department of Environment and Department of Forestry, which were previously one entity and are now experiencing communication issues.

Finally, while HIMA proponents plan to sell carbon credits as a strategy to generate benefits, the carbon certification process has not yet begun. This represents the most formidable challenge to the project, as the entire strategy rests on gaining carbon credit certification.

13.5 Lessons from the initiative

The HIMA initiative faces a mix of conditions, from favorable to unfavorable for its success. On the favorable side, the high educational attainment and high standard of living in Zanzibar relative to the rest of Tanzania increase the chances that village participants have the capacity to understand REDD+ concepts and implement REDD+ activities. CARE has a strong reputation for successful forest conservation projects and for delivering good livelihood and gender equity outcomes.

While existing capacity is undoubtedly an asset to any organization, the lack of differentiation between previous and current HIMA activities might hinder this new initiative's ability to meet goals that are unique to REDD+. In other words, CARE has already demonstrated its capacity to work effectively in Zanzibar, but it is less clear whether the REDD+ format will be something that CARE can effectively translate into the Zanzibar context without simply repeating the same approach to PFM projects that they have pursued since 1997.

The coral rag forests of Zanzibar may present the greatest barrier to REDD+ success. Coral rag is not carbon-dense forest, and Zanzibar was included as a REDD+ site largely because of the expectation that CARE would deliver pro-poor and gender-equitable outcomes, not because there was any possibility of large reductions in emissions. In lieu of substantive carbon benefits, the proponents have suggested that the real value in the CARE HIMA project might be to build capacity for REDD+ among national-level actors, which can then be harnessed in future REDD+ efforts in Tanzania.

In summary, HIMA seems likely to realize social benefits and ease dependence on forest resources, but it is unclear if those successes would result in a measurable reduction in carbon emissions and generate carbon credits. Thus, success for HIMA is more likely to be measured in terms of its influence on the development of national REDD+ policy and other REDD+ initiatives on the mainland. The HIMA experience also speaks to the perpetual challenge of differentiating new initiatives in sustainable forest management and conservation. As the funding landscape shifts in response to trends in forest governance structures, proponents must strike a balance between honoring past approaches and forging innovative strategies.

13.6 Acknowledgments

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We could not have completed the fieldwork without the assistance of SEDCA and JECA leaders Haji Haji and Khadija Ramadhani, the support of the *shehia* leadership, and the participation of local residents.

The baseline data were collected by our field assistants, Julius Edward and Christina Justine.

Chapter 14

Making REDD Work for Communities and Forest Conservation in Tanzania

Therese Dokken, Andina Auria Dwi Putri and Demetrius L Kweka

The initiative known as Making REDD Work for Communities and Forest Conservation in Tanzania is implemented by the Tanzania Forest Conservation Group (TFCG) and the Tanzania Community Forest Conservation Network (MJUMITA). Its aim is to demonstrate how emissions from deforestation and forest degradation can be reduced through CFM (TFCG and MJUMITA 2009). While the initiative includes a suite of interventions at the community scale, it makes direct payments to individuals for the environmental services provided through reduced deforestation and forest degradation.

14.1 Basic facts: Where, who, why and when

14.1.1 Geography

The initiative includes community forests in two districts: Kilosa in the Morogoro Region and Lindi Rural in the Lindi Region (Figures 14.1 and 14.2). Kilosa District (population 488,191 in 2002) is in the Eastern Arc Mountains and has both mountain forests and miombo woodlands. Lindi Rural (population 214,882 in 2002) has miombo woodlands, coastal forest, regenerating forest and coastal scrub.

The intervention area covers 1850 km^2; it has 12 villages in Kilosa, 2 villages in the Mpwapwa District and 10 villages in Lindi Rural. The participating villages in Kilosa are at higher elevations (678 to 1209 masl) than those in Lindi Rural (125 to 295 masl). The proponent estimated a 0.7% annual deforestation rate in Kilosa during 2000–2006. Lindi Rural has a higher rate of forest loss per year at 1.9% (MJUMITA 2014).

Of the 24 villages participating in this REDD+ initiative, CIFOR selected three[1] in Kilosa and four in Lindi Rural for the CIFOR-GCS sample (Figures 14.1 and 14.2). We held meetings to implement the village survey in both districts, but only surveyed households in Kilosa. There were 993 households (3686 people) in the three selected villages in Kilosa, from which we drew a random sample of 90 households.

Agriculture, including livestock, employs about 85% of the labor force in Kilosa District (URT 2007a). The most commonly held livestock in Kilosa are chickens, followed by cattle, goats, sheep and pigs. Other important economic sectors are small businesses and natural resource extraction, such as forestry and fishing. Agriculture is also the most important economic sector in Lindi Rural, followed by forestry and tourism. Major cash crops grown are cashew nuts, sesame and coconut, while cassava, rice, sorghum, maize and yams are important subsistence crops. The most common livestock kept in Lindi Rural are poultry, ducks, goats, sheep and cattle (URT 2007b).

14.1.2 Stakeholders and funding

The two lead proponents, TFCG and MJUMITA, are both Tanzanian NGOs. MJUMITA is a network of community groups involved in PFM. Other collaborators include government agencies (e.g. Department of Environment, Forest and Beekeeping Division of the Ministry of Natural Resources and Tourism, and Agricultural Research Institute in Kilosa), universities (e.g. University of Dar es Salaam Institute of Resource Assessment, Sokoine University of Agriculture) and other NGOs and grassroots organizations (Tanzania National Resource Forum, Regional Community Forestry Training Center, Katoomba Group). The most significant stakeholders are the district administrations and the participating villages in Kilosa and Lindi Rural, including an independent MJUMITA network in each village. The primary sources of start-up funding were the RNE and the African Rainforest Conservancy. The initiative plans to sell carbon offset credits in the voluntary market.

1 Originally, we selected four villages in Kilosa, but at a later stage the proponent decided to drop one village. Thus we have only three intervention villages in our Kilosa sample.

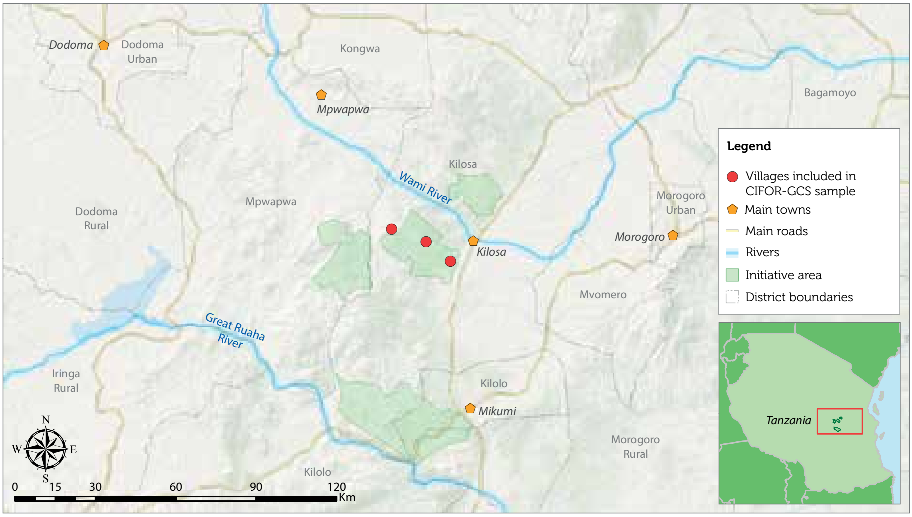

Figure 14.1 Map of the REDD+ initiative in Kilosa District.

Data sources: TFCG, GADM and World Ocean Base.

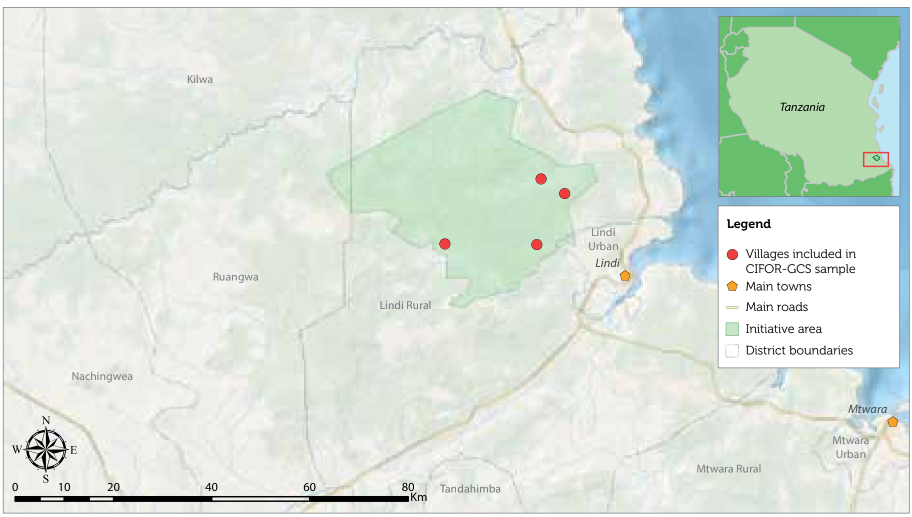

Figure 14.2 Map of the REDD+ initiative in Lindi Rural District.

Data sources: TFCG, GADM and World Ocean Base.

Swidden cultivation. (Demetrius L Kweka/CIFOR)

14.1.3 Motivation

Kilosa and Lindi Rural were selected for the initiative because they are biodiversity hotspots and face multiple sources of deforestation pressure. The primary deforestation pressures are related to local livelihoods, including small-scale traditional agriculture, small-scale illegal timber harvest, brick manufacture for local construction, and both subsistence and commercial fuelwood and charcoal collection. Weak internal institutional arrangements and collective action challenges are prevalent in both sites, and lack of compliance and enforcement are key underlying drivers of deforestation and forest degradation (Dokken et al. 2014). In addition, fires represent a threat to the forest. The proponents expect that smallholders within the intervention area will continue to be the primary agents of deforestation and degradation in these districts for the foreseeable future.

14.1.4 Timeline

The proponents were awarded funding in September 2009 but the launch of REDD+ at site level took place in 2010. In 2011, the initiative laid the groundwork for conditional incentives by engaging the villages in discussion about land-use plans and regulation of forest use, and inventorying carbon stocks. In 2012, the initiative made the first trial payments to individuals in Kilosa. Figure 14.3 summarizes key events over the course of the initiative.

Pre-2000			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007			
2008			
2009	TFCG received funding for initiative		
2010	Initiative launched in district and villages	CIFOR-GCS baseline survey	FPIC and increased enforcement including patrols in villages
2011	Laws, training, land-use plans and preparations for PES in villages	Forest inventory, carbon measurement and discussion of tenure in villages	CIFOR-GCS presents baseline results to study villages
2012	Trial payments to individuals and training in alternative livelihoods		
2013	CIFOR-GCS phase 2 survey		
2014			

REDD+ initiative active

Figure 14.3 Timeline of the REDD+ initiative in Kilosa and Lindi Rural.

14.2 Strategy for the initiative

The objective of the initiative is to reduce deforestation and forest degradation, but biodiversity co-benefits are also a high priority for the proponents. Community development is another important goal. Both biodiversity and the potential for poverty reduction were considered in the selection of villages. These can also be important attributes of carbon offsets sold in the voluntary market, and the proponents plan to seek CCBA certification. They are in the process of finalizing the VCS and CCBA validation and verification for Lindi Rural (October 2014), while Kilosa is planned to start in late 2014. For the VCS, the proponents are the villages represented by their respective village chairs.

In the PDD, the reference level for carbon emissions will be 122,965 tCO_2e/year for Kilosa. The reference level for Lindi Rural is based on a fixed deforestation rate applied to a decreasing forest area. Thus, the reference level for year one (2012 to 2013) is a loss of 126,560 tCO_2e from the project area, but by year ten, the reference level declines to 95,765 tCO_2e. The proponents are monitoring changes in forest cover using remote sensing with ground truthing. The proponents have already involved local people in the MRV work. Each village has a committee for measuring carbon stocks, and MJUMITA will serve as their communications channel to VCS.

To reduce deforestation and forest degradation, the proponents are undertaking a suite of interventions intended to restrict forest access, raise awareness about the importance of conservation and enhance livelihoods (Table 14.1). This initiative encompasses many of the different types of interventions that have been proposed for REDD+.

Most of these interventions are targeted at the village level. The five main criteria for selection of villages to participate in the initiative were: high potential for biodiversity co-benefits, high level of forest carbon, size of the forest, low profitability of deforestation (low opportunity costs) and clear land tenure. Additional factors considered included: significant threat of future deforestation/degradation, good governance and rule of law, potential for scaling up to similar areas, high poverty rates, high potential for community or poverty reduction co-benefits, strong partner organizations, and villages where the leader is willing to cooperate and carry forward the initiative.

Table 14.1 Interventions undertaken in the Kilosa and Lindi Rural districts that are considered integral to the REDD+ initiative.

Intervention	Description
Restrictions on forest access and/or conservation	Land-use plans and establishment of village land forest reserves (land certification) Development of forest management plans and by-laws
Environmental education	Education for school teachers and villagers, and environmental awareness campaign (radio, TV and newsletters)
Non-conditional livelihood enhancement	Conservation agriculture Training in improved fuelwood efficient stoves Training in village saving and loan associations Support of tree nurseries in schools and tree planting Capacity building in sustainable charcoal production Beekeeping training and equipment distribution
Conditional livelihood enhancements	REDD+ trial payments Development of benefit-sharing by-laws

While forest-use restrictions, education and training have all been organized at the village level, the initiative also offers payments at the individual level. In the pilot phase, the proponent allocated part of the funding from RNE to trial incentive payments to individuals. The funds for trial payments have been distributed as PES to individuals in the villages based on their actual reduced deforestation rate. Every household member is entitled to the payments, including up to three children – their payment is made to their mother. In village meetings, the community decides whether some of the money they have received should be paid to the community to support the construction or improvement of schools and health clinics. In 2014, these payments were paid in advance and financed by donor money. While the national framework for carbon credits is not yet clear, the proponents argue that communities should receive all of the revenues from the sale of carbon credits, except for any government tax and 5% retained by MJUMITA to cover their monitoring costs.

In addition to the proponents' support for construction of village offices and for the interventions listed in Table 14.1, the study villages included in the CIFOR-GCS sample have received external support from the government and NGOs for improvements in agriculture, fisheries, education, public health, water supply and roads. There is no indication that any external support has been diverted from these villages because they are benefiting from the REDD+ initiative.

Women's focus group meeting in Lindi Rural District. (Demetrius L Kweka/CIFOR)

14.3 Smallholders in the initiative

The administrative level that coordinates and implements REDD+ in Kilosa and Lindi Rural is the village (*kijiji*). The seven villages studied by CIFOR-GCS are characterized in Table 14.2. In all of these villages, key informants identified the village government as the most important village decision-making body and indicated that the leader of the village government is elected. In some villages, all residents are invited to attend village government meetings, while only religious leaders are invited in other villages. Other important decision-making bodies mentioned by key informants are security committees, sub village committees and village land committees. We asked the women's focus groups about their perception of women's participation in community decision making and participation in forest-use decisions, rule making and monitoring at the village level. In both Kilosa and Lindi Rural districts, women participate in village decision making, but are less involved in forest-use decision making at the village level, even though they actively participate in forest activities on a weekly or even daily basis (Larson et al. in press).

Fuelwood collection and charcoal production undertaken by villagers is an important cause of deforestation and forest degradation in the area (Kajembe et al. 2013). Five of the villages report that they experienced a decrease in the forested area within village boundaries in the two years prior to our visit in 2010. All villages reported that the villagers were the cause of this change. Other causes listed are neighbors, forest fires and drought. Underlying drivers related to the decrease are lack of rules or lack of enforcement of existing rules, and the need for agricultural land. Three of the villages experienced a decrease in the forest quality over the same period, caused by villagers and neighbors. Similar to deforestation, lack of rules and/or enforcement is listed as a key driving force.

In each of the Kilosa study villages, we interviewed a random sample of 30 households (9% of the total number of households) in July 2010. The socioeconomic status of the sampled households is described in Table 14.3.

Agricultural crops are the dominant income source in Kilosa and Lindi Rural. From the household-level data collected in Kilosa, we see that income from agriculture and livestock dominates the average household income portfolio in all three study villages (Figure 14.4). Maize is the main staple crop and the main agricultural product (ranked by gross value of annual production) in KILO1 and KILO2, while it is the second most important crop in KILO3. Both KILO1 and KILO3 reported that villagers produced noticeably more maize over the past two years prior to our visit in 2010 because of increased maize prices, while KILO2 reported that they produced noticeably less due to drought. KILO1 reported that they were producing less beans due to pests, while KILO3 produced less groundnuts due to drought. In the village meetings in Lindi Rural, it is reported that production of maize has increased while groundnut and sesame have decreased in the two years prior to the interview.

Table 14.2 Characteristics of the seven villages studied based on the 2010 survey.

	KILO1	KILO2	KILO3	LIND1	LIND2	LIND3	LIND4
Total land (ha)	NK	3,966	720	93,081	3,500	NK	NK
Total forest area (ha)	75	2,024	216	66,776	1,000	400	1,800
History and demography							
Year established	1974	1974	1999	1974	1974	1974	1974
Number of households	264	422	307	152	187	204	381
Total population	1,151	1,308	1,227	668	633	798	1,792
Number of ethnic groups	2	5	4	3	5	2	5
Infrastructure							
Distance to all-weather road (km)	30	5	32	NK	NK	8	23
Distance to closest market (km)	30	10	32	10	40	29	40
Elementary school	Yes	Yes	Yes	Yes	No	Yes	Yes
Secondary school	No	No	No	No	No	No	No
Health center	No	No	No	No	No	No	No
Bank or other source of formal credit	No	No	No	No	No	No	No
Agriculture							
Main agricultural commodity	Maize	Maize	Maize	Maize	Maize	Maize	Sorghum
Crop with highest gross value[a]	Maize	Maize	Beans	NK	NK	NK	NK
Price of a hectare of good quality agricultural land (low)	TZS 49,419/ USD 96	TZS 200,000/ USD 388	TZS 20,000/ USD 39	TZS 150,000/ USD 291	NK	TZS 50,000/ USD 97	TZS 200,000/ USD 388

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Table 14.2 (continued)

Price of a hectare of good quality agricultural land (high)	TZS 172,967/ USD 335	TZS 200,000/ USD 388	TZS 40,000/ USD 77	TZS 200,000/ USD 388	NK	TZS 100,000/ USD 193	TZS 350,000/ USD 678
Change area under swidden agriculture[b]	No change	N/A	Increased	Increased	Increased	Increased	Increased
Forest resources and use							
Distance from household to forest (minutes walking)	60–180	15–30	15–30	30–90	60–120	20–30	30–60
Share of households engaged in NTFPs[c]	81–100%	81–100%	81–100%	81–100%	61–80%	81–100%	81–100%
Share of households engaged in timber	0–20%	21–40%	0–20%	0–20%	0–20%	0–20%	0–20%
Share of women who never go to forest	0–20%	0–20%	0–20%	0–20%	0–20%	0–20%	0–20%
Share of men who never go to forest	81–100%	0–20%	0–20%	0–20%	0–20%	0–20%	0–20%
Change in forest cover[b]	No change	Decreased	Decreased	Decreased	Decreased	No change	Decreased
Change in forest quality[b]	No change	Decreased	Decreased	No change	No change	No change	Decreased

N/A=Not applicable, NK=Not known.

a Annual production. Data from household survey, available for Kilosa only.

b In the two years prior to the survey.

c NTFPs include fuelwood.

Table 14.3 Socioeconomic characteristics of households in Kilosa interviewed in 2010.

	KILO1	KILO2	KILO3
Number of households sampled	30	30	30
Household average (SD)			
Number of adults	3.3 (1.6)	2.3 (1.2)	3 (1.4)
Number of members	5.9 (2.4)	4.6 (1.9)	5.1 (2.2)
Days of illness per adult	10.1 (10.7)	9.9 (9.7)	16.2 (27.1)
Years of education (adults ≥ 16 years old)	4.7 (3.0)	4.3 (3.2)	4.4 (3.0)
Total income (USD)[a]	450 (408)	560 (480)	515 (342)
Total value of livestock (USD)[b]	46 (48)	94 (223)	89 (160)
Total land controlled (ha)[c]	1.8 (0.9)	2.4 (2.3)	1.6 (1.1)
Total value of transportation assets (USD)	53 (24)	46 (23)	54 (27)
Percentage of households with:			
Mobile or fixed phone	0	13	7
Electricity	0	0	0
Piped water supply	0	3	0
Private latrine or toilet	30	90	40
Perceived sufficient income	13	30	20

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.
b Total livestock value at the time of interview.
c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

Figure 14.4 shows that forest and environmental resources play an important role in the household economy in Kilosa. The average household in KILO2 and KILO3 derived more income from forest and environmental products (counting the value of both subsistence and cash sales) than from wage labor, household business or other income sources. Of the total income reported by respondents in Kilosa, 11% is derived from the forest and 6% from the environment (Figure 14.5), which are substantial shares, although still dwarfed by the 62% of income generated by agricultural crops.

The households collected a range of forest products. While women mainly collected fuelwood and NTFPs, men harvested poles and trees, made charcoal and hunted animals. From the household level data in Kilosa (Table 14.4), we see that all households relied on biomass as their primary cooking fuel. All but two households in the sample use the 'three-stone open fire' technology for cooking and fuelwood was by far the most important forest product, on average accounting for more than half the forest and environmental income for households in all of the villages. Fuelwood was also reported as the most important NTFP in Lindi Rural. Most of the forest income in Kilosa was subsistence income, but a few households also reported cash income from forest products (Table 14.4).

The smallholders living in the villages are considered the primary agents of forest carbon emissions in both Kilosa and Lindi Rural, and thus, are expected to make changes in order to reduce emissions. For example, once the study villages agreed on the areas to be designated as village forest reserves (VFRs), the village governments asked households living in those areas to move to areas within the village that were designated for agriculture. Depending on how this was carried out, including where and how much new agricultural land they were allocated, the relocated households may or may not consider the process to be fair. In all of the study villages, it was also reported that people in neighboring villages harvest resources from the new VFRs, and thus they will also be affected by restrictions on forest use.

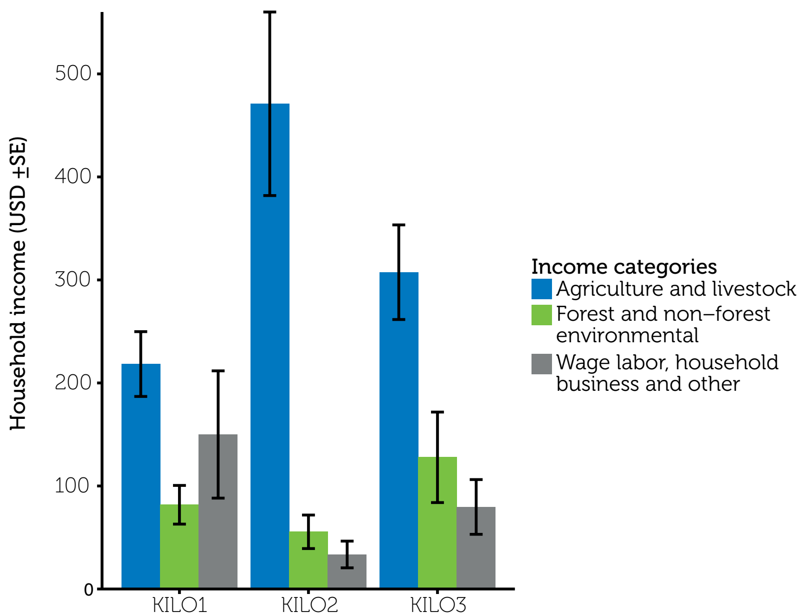

Figure 14.4 Sources of income for average household by village (+/- SE) (n = 90).

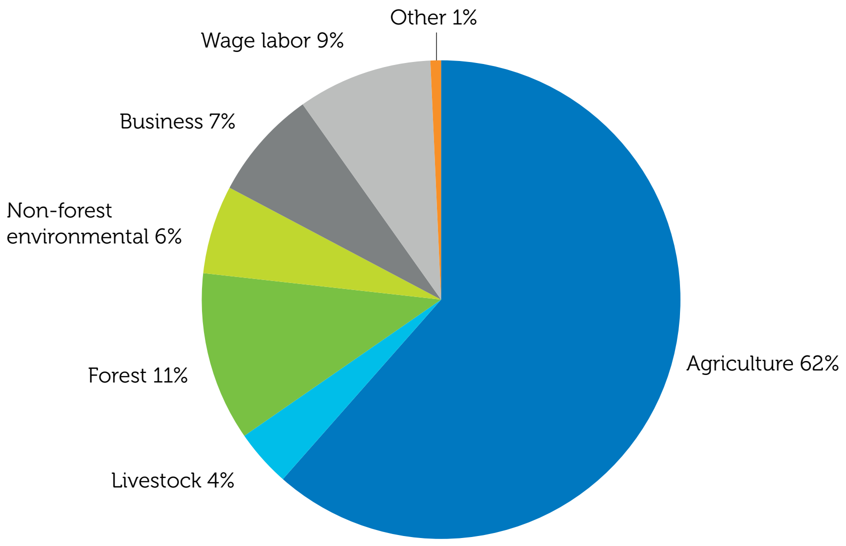

Figure 14.5 Sources of income for all households in sample (n = 90).

Table 14.4 Indicators of household forest dependence based on the 2010 survey.

	KILO1	KILO2	KILO3
Number of households sampled	30	30	30
Household average (SD)			
Share of income from forest	14.18 (15.93)	9.02 (15.58)	16.94 (22.45)
Share of income from agriculture	57.28 (22.63)	81.66 (31.24)	60.28 (26.10)
Area of natural forest cleared (ha)[a]	0.08 (0.16)	0.07 (0.28)	0.00 (0.00)
Area of secondary forest cleared (ha)[a]	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Area left fallow (ha)[b]	1.73 (0.46)	2.20 (1.73)	1.00 (1.01)
Distance to forests (minutes walking)	120	30	23
Percentage of households			
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	89	91	90
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	0	0	0
Reporting increased consumption of forest products[e]	7	14	17
Reporting decreased consumption of forest products[e]	10	4	10

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Table 14.4 (continued)

Obtaining cash income from forest products[f]	7	10	0
Reporting an increase in cash income from forest[f]	0	33	0
Reporting a decrease in cash income from forest[f]	50	33	0
Reporting fuelwood or charcoal as primary cooking source	100	100	100
Leaving land fallow[g]	10	17	20
Clearing forest[g]	20	7	0
Reporting decreased opportunity for clearing forest[g]	36	21	46
Clearing land for crops[g]	17	3	0
Clearing land for pasture[g]	0	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

14.4 Challenges facing the initiative

National REDD+ policy in Tanzania is a challenge for this initiative. To date (October 2014) the national legal framework and benefit-sharing mechanism for REDD+ has not yet been clarified. Further, community rights to forests and lands are weak in the 2012 draft of the National Strategy for REDD+ Policy, and the area within village boundaries is not recognized as village land (URT 2012). The proponents have made efforts to secure local tenure rights by addressing the issue at the national level (Sunderlin et al. 2014b), but the process of securing village land certificates in the intervention area has been both challenging and more time-consuming than planned. This might continue to have an impact on this initiative, particularly with respect to the potential for scaling up.

Among the other major challenges recognized by the proponents are national agricultural and investment policies, and general economic conditions, such as an economic recession and a weak forest carbon market. It is not clear whether REDD+ will be competitive with alternative land uses. The initiative's model of REDD+ is built around performance-based payments to individuals in the communities to incentivize them to avoid deforestation. In the event that the price of carbon credits is significantly lower than the opportunity and transaction costs, communities are likely to choose other land uses. Within the communities, individuals and households use the forest differently and to different extents, but all individuals within the same village receive a similar amount of PES. Thus, for some, the payment is likely to fall short of the opportunity cost.

In addition, weak governance at the village and district levels poses a threat to the success of the initiative. Although the proponents have had a strong focus on local capacity building, they may continue to face challenges related to rule enforcement and compliance that were present in the villages prior to implementation of the initiative (Dokken et al. 2014). Finally, there are questions about the treatment of households that moved from areas that were to become VFRs. Whether or not these households were in legal settlements before the implementation of REDD+, the proponents are likely to face friction related to what kind of rights the households have, and what kind of land they are allocated to compensate them for moving from areas that have been defined as forest reserves.

14.5 Lessons from the initiative

This initiative is demonstrating a unique approach to reducing emissions from community forests by working with communities while delivering incentive payments to individuals. It pays individuals for their contributions to the environment by reducing their rates of deforestation and forest degradation. One challenge for this model is that the amount paid to individuals does not differ depending on their opportunity cost. This reduces transaction costs related to PES but means that for some, the payment may exceed the opportunity cost, while for others the payment may be too small. In sum, this pilot of an individual REDD+ payment mechanism within the framework of CFM can potentially provide important insights, not only for REDD+ but also for how CFM schemes can be designed to provide individuals with incentives to reduce deforestation and forest degradation.

14.6 Acknowledgments

We would like to express our gratitude to a number of people. Charles Meshack, Nike Doggart and Theron Morgan Brown from TFCG have provided us with invaluable information. We would also like to acknowledge the contribution of the district and ward offices in Kilosa and Lindi Rural districts. Special thanks and appreciation also goes to village leaders, village executive officers, sub village leaders and all respondents of the various interviews conducted to make this work successful. Further, we would like to thank Susan Caplow for organizing the first round of data collection in Lindi Rural in 2010; thanks also to: George Phabian Kabado, Hawa Mushi, Thadeus Kisangi, Mohamed Mmaoga Omar, Georgina Misama, Yesaya Bendera, Nanjiva Mzunda, Aklei Albert, Julius Edward and Christina Justine for their assistance in the field as enumerators; and to Johannes Dill for data entry.

Chapter 15

Mpingo Conservation and Development Initiative

Combining REDD, PFM and FSC certification in southeastern Tanzania

Demetrius L Kweka

Mpingo Conservation and Development Initiative (MCDI)[1] has been supporting PFM in Kilwa district, southeastern Tanzania, since 2004. MCDI focuses on sustainable management of high-value hardwood timbers in the miombo woodlands on communal village lands in Kilwa district. The NGO's name comes from its flagship species, East African Blackwood (*Dalbergia melanoxylon* or *mpingo*), which is used in Europe and North America to make musical instruments. Reductions in carbon emissions are generated through community-based fire management that prevents and potentially reverses forest degradation.

1 Previously known as the Mpingo Conservation Project.

15.1 Basic facts: Where, who, why and when

15.1.1 Geography

MCDI works in Kilwa, the most northerly district in the Lindi region. Kilwa district has an estimated 36,549 households, of which 85% live in rural areas (DADPS 2009). Fishing and subsistence agriculture are the main economic activities, absorbing more than 80% of the labor force. The average annual per capita income is estimated at USD 106 (TZS 150,000)[2] (DADPS 2009; MACEMP 2009). Fishing is both an important economic activity and the main source of protein in the area. The three crops produced in largest volume are cashew nuts (302,445 kg of production in 2005/06), sesame (315,684 kg in 2005/06) and coconuts (92,800 kg in 2005/06), while maize, sorghum, cassava, rice, sweet potatoes and cowpeas are the main food crops. Other crops grown include pulses, mangoes, citrus and vegetables.

The average annual precipitation in Kilwa was approximately 929 mm from 1998 to 2012 (TRMM 2014), and the vegetation is mostly miombo woodland with patches of East African coastal forest. In recent years, logging and grazing have both increased due to two factors: (i) improvement of the road that links Kilwa with Dar es Salaam (especially the completion of the Mkapa bridge over the Rufiji River in 2003), and (ii) relocation in 2006 of livestock keepers from the Ihefu Wetland in Mbeya to Lindi.

The intervention area for this REDD+ initiative covers 103,819 ha of village forest reserves (VFRs) and 396,236 ha of other village land in 10 villages with a total population of 19,010 people (Figure 15.1). Villages (*kijiji*) are the smallest unit of administration in Tanzania, falling under the local district council. Village governments are the primary decision makers over land use within their village boundaries.

15.1.2 Stakeholders and funding

MCDI is an NGO working in collaboration with government authorities and communities to reduce poverty through PFM and other forest-related projects in Kilwa district. Founded in 2004, MCDI's work currently falls into two thematic areas: (i) timber and forest certification, and (ii) REDD+, with PFM and community benefit-sharing underlying both. In both thematic areas, MCDI works with a variety of different partners, as listed in Table 15.1. In addition, the village governments manage VFRs and implement village by-laws for forest management, as approved by the district council.

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2 Throughout the book, we use the 2010 exchange rate of TZS 1409 to USD 1.

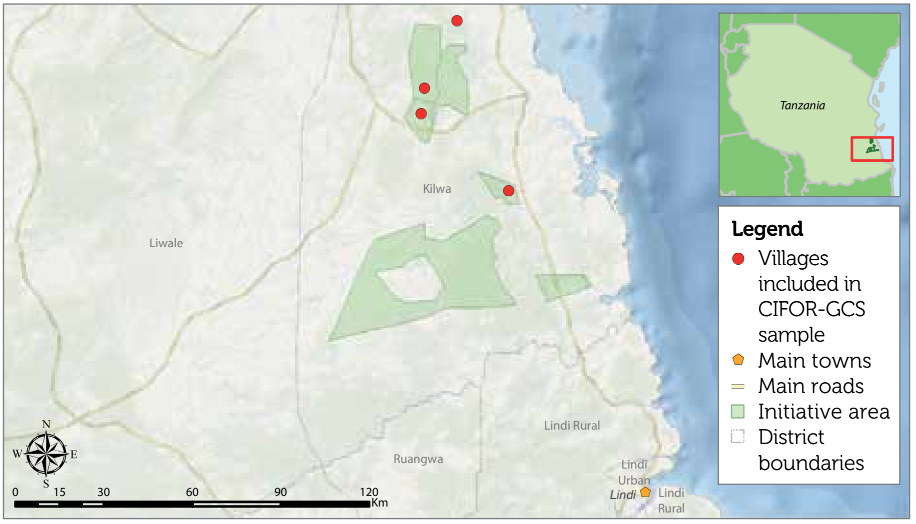

Figure 15.1 Map of the REDD+ initiative in Mpingo.

Data sources: MCDI, GADM and World Ocean Base.

Note: the initiative was planning to include Nambondo as an intervention village at the time of the CIFOR-GCS baseline survey. Nambondo was thus selected as an intervention village in the CIFOR-GCS baseline survey but it was recently excluded from the initiative's REDD+ program.

Table 15.1 MCDI partners.

Responsibility	Partners
1. Group certificate scheme	MCDI
2. Sale of carbon credits	Carbon Tanzania
3. Carbon assessment	University of Edinburgh, University College London
4. Reducing carbon emissions	MCDI
5. Benefit sharing best practice	University of East Anglia, MCDI

In December 2009, MCDI was awarded a start-up grant of USD 1.95 million from the RNE in Tanzania to develop an initiative combining certification of sustainable PFM under FSC, with access to the carbon markets through REDD+. The initial goal was to catalyze the expansion of PFM across the miombo woodlands of Kilwa (MCDI 2010), but revenue from certified timber was not sufficient to cover the full costs of expanding PFM and the declining international price of carbon led to significant doubts that REDD+ revenues would be sufficient to pay for it. Thus, MCDI now views timber and carbon as complementary revenue streams for community forestry that together, can secure the long-term future of the forests.

Tanzania's forest policy enables village councils to establish VFRs. VFRs formalize local rights to manage and benefit from forests on community lands. MCDI has developed a VCS methodology for quantifying carbon savings from community-based fire management in VFRs and plans to sell carbon offset credits in the voluntary market. (Because the carbon savings are from fire management, additionality would not be undermined by an increase in timber revenues.) The initiative also aims to get certification from CCBA to demonstrate the quality of its offsets.

15.1.3 Motivation

MCDI started conservation work in Kilwa in 2004, seeking to raise awareness about forest values and sustainable forest management. Kilwa was selected because of the high rates of loss of both miombo and coastal forest, and the opportunity to build on a bilateral Danish-funded PFM project that was phasing out. By 2010, MCDI had achieved FSC certification of 20,000 ha, and the participating communities were earning revenues from sales of certified sustainably managed timber. This generated interest from other communities, leading to the expansion of certification to a total of 100,000 ha by 2014.

MCDI's involvement in REDD+ was opportunity-led, in response to RNE's call for proposals for funding from their REDD+ fund. Their initial application focused on three key drivers of deforestation and degradation: agriculture, charcoal production and timber harvesting, by both local households and external actors. Specifically, they conceived a sustainable charcoal initiative to be subsidized by carbon offset sales. After launching the initiative, MCDI assessed these drivers of deforestation and estimated that both timber and charcoal extraction had far lower impacts on carbon stocks than previously assumed, although losses from charcoal are expected to increase substantially in the coming years. Swidden agriculture and agricultural expansion are significant drivers of deforestation in Kilwa district, but tackling them would not have fitted well with MCDI's approach to working with communities on timber management. MCDI helps communities improve management of forests that are not suitable for other uses, specifically on lands that are not suitable for farming. Because these forests are not imminently threatened with agricultural conversion, MCDI's interventions cannot be expected to reduce forest loss due to agriculture. However, MCDI did identify another major driver of forest carbon losses: frequent uncontrolled bushfires. Thus, they worked with their partners to redesign the initiative around improved fire management.

15.1.4 Timeline

The Mpingo REDD+ initiative started in November 2009, when MCDI signed a funding agreement with the RNE. Figure 15.2 lists key events both prior to and following the launch of the initiative.

Pre-2000					
2001					
2002					
2003					
2004					
2004	MCDI registered as an NGO				
2005					
2006	First VFR in Kilwa declared with support from MCDI				
2007					
2008					
2009	MCDI receives FSC certificate	First commercial timber sale from a VFR in Tanzania	MCDI application for REDD+ funds accepted by RNE		
2010	MCDI begins efforts to diversify forest revenues	CIFOR-GCS baseline survey	FPIC and awareness-raising about REDD+	Assessment of drivers of deforestation	Collaboration agreement signed between MCDI and communities
2011	Initiative redesigned	Land-use planning, including demarcation of land for different uses in new pilot villages, begins			
2012	Design of biodiversity monitoring program and biodiversity baseline survey	Forest boundaries marked, forest suitable for REDD+ identified and carbon inventory undertaken	Development and approval of forest management plans, including plans and by-laws for timber harvest		
2013	First business model for carbon offset sales developed	First prescribed burning and monitoring	Communities agree to cover MCDI's costs by sharing forest revenues		
2014	MCDI submits methodology for improved fire management to VCS	CIFOR-GCS phase 2 survey			

REDD+ initiative active

Figure 15.2 Timeline of the REDD+ initiative in Mpingo.

15.2 Strategy for the initiative

The initiative's key goals are to promote sustainable forest management and support community development. Activities designed to achieve these goals include the establishment of village forest reserves and development of livelihood alternatives in the communities. The initiative seeks to reduce emissions from forest fires by preventive early burning (also known as prescribed burning) of the miombo woodlands, thus reducing fuel load and avoiding larger wildfires. These wildfires typically occur in the middle to late dry season, and they increase tree mortality and retard regeneration, thus leading to degradation of aboveground biomass carbon stocks.

These activities are expected to be financed through the sale of carbon credits, supplementing revenues from sustainably managed timber. In the VCS methodology developed by MCDI and the University of Edinburgh (UoE), aboveground biomass stocks are measured with satellite PALSAR data combined with field data providing ground reference points. Their analysis suggests that early burning could make a difference of between 0.1–0.5 tC/ha/year. This would be very difficult to detect against a baseline of 20–30 tC/ha using simple repeat monitoring on a yearly basis. For this reason, the project uses a model developed by UoE called GapFire to predict carbon gains. These predictions will be checked against updated biomass maps derived from analysis of new radar data once every ten years.

MCDI has developed an approach to benefit sharing that leverages the existing democratic structures of the villages in which it works. Revenues – either from selling timber or from future carbon sales – are split between the village natural resources committee (VNRC), which is responsible for managing the forest and implementing the early burning, and the village council, according to a fixed formula chosen by the village and written into the management plan. The VNRC portion covers management costs, while the rest is profit that can be spent on various village development activities as voted for by the villagers and overseen by the village council. Under PFM, villages voluntarily give the district council (local government authority) a 5%–15% share of their revenues from timber sales, but it is not clear if this will also apply to revenues from REDD+.

Although MCDI is the only intervention focused on forest management, Kilwa district has simultaneously received other external development support, including for infrastructure, education, agriculture and public health from both the national government and international donors. When MCDI began, there was concern about land purchases and planned biofuel production by a company called Bioshape that has since gone bankrupt. This generated resentment in local people of investors who were seeking to acquire land for bioenergy development.

15.3 Smallholders in the initiative

The initiative is implementing REDD+ in ten villages, of which four were surveyed by CIFOR. Table 15.2 summarizes the key characteristics of these villages. REDD+ activities are coordinated by a village government authority, which includes the chairman of the village, village executive officers and members of the village council. FPIC must be granted by the village government before REDD+ can be implemented. By its definition, PFM also requires the active participation of the local community. Under the Forestry Act of 2002, responsibility for managing the VFR is delegated to the VNRC, which is elected by the village general assembly. Therefore, the quality of governance within the VNRC is critical to the success of PFM.

Members of the village government are elected, with the exception of the village executive officer who is employed by the district council. In most cases, the village council is formed by 25 members of which, by law, a minimum of 30% must be women. However, the degree to which women effectively participate in decision making varies substantially across communities, as reported in our women's meetings. Overall, KILW3 and KILW4 had a higher level of women's participation in decision making at all levels (village, forest management and household levels) compared to the other villages, although women in KILW4 reported less influence on decisions at the village level. In the other two villages, women did not participate in forest monitoring, and in KILW2, women did not actively participate in making forest rules and regulations.

In three (KILW1, KILW2 and KILW4) out of four of CIFOR-GCS's study villages, it was reported that maize is the main agricultural commodity and that it has grown in importance in recent years due to higher prices. In village meetings, there was consensus that sesame is also becoming more important, while timber, sorghum and guava have generally become less important. Several reasons were cited for the decline in sawn timber as an income source, including increases in costs and depletion of valuable tree species due to demand from outside the village. Lack of livelihood opportunities was reported as the most common reason why people had left the village in the two years prior to our survey in 2010.

The villages in the initiative area are highly forest dependent, with men typically collecting building materials (e.g. poles and thatches) and women collecting fuelwood, medicinal plants and wild fruits. While village respondents indicated that nearly all households harvest NTFPs including fuelwood, only a few households (< 20%) harvest timber (see Table 15.3). According to village respondents, forest cover had remained stable in two villages but declined in two others, at least partly due to increases in permanent and swidden agriculture.

Table 15.2 Characteristics of the four villages studied based on the 2010 survey.

	KILW1	KILW2	KILW3	KILW4
Total land area (ha)	13,656	24,225	9,656	9,547
Total forest area (ha)	1,520	5,000	2,091	2,580
Altitude (masl)	50	58	147	117
History and demography				
Year established	1996	1974	1993	1974
Number of households	150	525	500	182
Total population	5,556	4,355	2,286	540
Infrastructure				
Distance to closest market (km)	26	0	5	15
Elementary school	Yes	Yes	Yes	Yes
Secondary school	No	Yes	No	No
Health center	No	Yes	No	No
Road access in all seasons	No	No	No	Yes
Bank or other source of formal credit	No	No	No	No
Previous experience with conservation NGO	No	No	No	No
Agriculture				
Main agricultural commodity	Maize	Maize	Sorghum	Maize
Price of a hectare of good quality agricultural land (USD)	64	-	10	53

Table 15.3 Proportion of households collecting NTFPs, fuelwood and timber.

	NTFPs including fuelwood	Change in NTFPs harvest	Timber	Change in timber harvest
KILW1	Very many to all (81%–100%)	Stable	None or very few (0%–20%)	Decreased due to resource decline
KILW2	Very many to all (81%–100%)	Increased, due to increased demand	None or very few (0%–20%)	Increased due to increase in demand
KILW3	Very many to all (81%–100%)	Stable	None or very few (0%–20%)	Stable
KILW4	Very many to all (81%–100%)	Stable	None or very few (0%–20%)	Decreased due to resource decline

15.4 Challenges facing the initiative

MCDI has developed a framework for integrating REDD+ investments with existing forest governance, land tenure and local governance institutions. At the village level, the operational framework for REDD+ is therefore the same as the current governance structure for PFM. The initiative thus provides a model of how to integrate REDD+ with local governance institutions, land management systems and existing forms of forest management. However, for PFM to succeed in the long term, sufficient incentives need to be in place and real benefits need to flow to participating communities, or else they will lose interest and forest integrity will not be maintained.

Sale of carbon offsets is potentially one way to address this challenge – if it generates enough revenue. This depends on the price, which in turn depends on international demand. It also depends on the quantity of offsets generated, which is limited by the small carbon stocks in the miombo woodland and coastal forest biomes. Finally, revenues must be sufficient to compensate for the transaction costs of the intervention, which have turned out to be high in the case of PFM. These challenges led MCDI to design interventions that would generate other sources of revenue, such as sale of certified timber. Timber revenues are expected to eventually surpass carbon revenues.

Currently, one of the greatest challenges facing the initiative is recruiting enough human resources and adapting methods for local implementation. MCDI has a good track record of taking advanced forest management techniques and adapting them for use in community forestry. However, some of the science around impacts of fire on miombo woodlands is cutting edge, and MCDI staff and collaborating researchers have had to experiment to determine the best approach. As the design phase comes to an end, MCDI and its partners need to document in simple language how the interventions work, and how data collected by field workers relates to carbon offsets that can be sold.

The proponent organization perceives tenure as one of its key challenges. Although village boundaries in the intervention area have been surveyed by the Ministry of Lands, some are still under dispute. By introducing the potential to earn rents from resources located within those boundaries, PFM and REDD+ can exacerbate boundary disputes. Thus the initiative requires continued support from government bodies (especially the Kilwa District Council Land Office) to resolve tenure conflicts. Further, the communities are still working on getting village land certificates as the legal basis for PFM, although they generally consider their land tenure to be secure.


Women's meeting in one of the villages in Kilwa. (Demetrius L Kweka/CIFOR)

Perhaps more important, the lack of clarity and uncertainty about how carbon revenues will be generated and shared tends to demoralize communities who would otherwise be interested in participating. Partly because its approach is genuinely new, MCDI cannot be specific about expected revenues until the early burning has been completed and the first offsets have been sold.

15.5 Lessons from the initiative

MCDI is pioneering an approach that enables local communities to earn a living by conserving and managing their forests. This includes a new method for inventorying timber stocks that is participatory, efficient and scientifically robust. MCDI is recognized as one of the leading implementers of PFM in Tanzania; it was awarded the first certificate by FSC for community-managed natural forest in the African continent in March 2009, and carried out the first commercial timber harvest from a PFM forest in Tanzania in September 2009. It hopes to identify and access a niche market prepared to pay a significant premium for products made from timber that is demonstrably legal, sustainably produced and fairly traded. However, up to now timber revenues have been below expectations and thus the initiative is counting on carbon revenues as a complementary source of revenue, generated from complementary actions to manage wildfires, thereby protecting both carbon and timber stocks.

MCDI is the only initiative of its kind to combine PFM, FSC and REDD+ and as such, offers an important example for other REDD+ initiatives. Unless and until the price of carbon rises substantially, many of these initiatives will struggle to finance all of their costs from the sale of carbon offsets. Indeed some experts predict that a flood of forest carbon offsets arriving on the market in the next few years will further depress prices. MCDI is viable even at low carbon prices because carbon is a complementary revenue stream to other forest income sources such as FSC-certified timber. Other REDD+ initiatives could emulate this approach by exploring potential markets for a range of forest products and services, designing their forest management programs as holistically as possible, and diversifying revenue sources wherever possible.

15.6 Acknowledgments

We are grateful to the leaders, district officials and communities of Kilwa for their cordiality and for sharing their time, knowledge and perceptions; thanks to MCDI's team for sharing their REDD+ initiative information with us. We could not have completed the fieldwork without the assistance of Julius Edward and Christina Justine, and the stakeholders who were interviewed about the initiative.

Chapter 16

Pilot project on Community-Based REDD Mechanisms for Sustainable Forest Management in Semiarid Areas

The Case of *Ngitilis* in the Shinyanga Region, Tanzania

Andina Auria Dwi Putri and Demetrius L Kweka

The REDD+ initiative known as Community-Based REDD Mechanisms for Sustainable Forest Management in Semiarid Areas: The Case of *Ngitilis* in Shinyanga Region, promoted sustainable natural resource management and reduced carbon emissions from deforestation and forest degradation in *ngitilis*.[1] The initiative was implemented by the Tanzania Traditional Energy Development and Environment Organization (TaTEDO) as part of its long-term agenda of promoting access to sustainable, modern energy technologies, poverty reduction and environmental conservation in Shinyanga. The initiative operated in two districts of Shinyanga region: Kahama and Shinyanga Rural. The intervention

1 Ngitili, which means leaving an area closed to allow grass regeneration for use during the dry season, is an indigenous silvopastoral technology used to alleviate dry season fodder supply shortages, to conserve and protect soils, to reclaim degraded land, and – in the context of this initiative – to reduce carbon emissions. The term *ngitili* refers to both the silvopastoral system and the wooded areas that are closed off. *Ngitilis* are usually owned by individual households, but in the context of this initiative, owners have chosen to aggregate (combine several *ngitili*) to sell carbon offsets as a group (*ngitili* group).

area, or REDD+ forest, was defined as the aggregation of individual *ngitili*. Thus, the initiative generated lessons about the best mechanisms for engaging private forest owners in a community-based REDD+ initiative.

16.1 Basic facts: Where, who, why and when

16.1.1 Geography

The initiative operated in 11 villages in the Kahama and Shinyanga Rural districts of the Shinyanga region, in northwestern Tanzania, south of Lake Victoria (Figure 16.1). Altitude in the region varies from 1000 to 1500 masl; annual average rainfall ranges from 600 to 1200 mm (HASHI 2002); and average monthly temperatures are between 27.6˚C and 30.2˚C (maximum) and 15˚C and 18.3˚C (minimum) (Zahabu 2012). Covering 50,764 km^2, the region comprises 61% arable land, 24% grazing land and 15% forest reserves (HASHI 2002). The natural woodland vegetation of the region is characterized by various tree species including *Acacia*, *Brachystegia*, *Albizia*, *Commiphora* and *Dalbergia*. However, due to deforestation and severe forest degradation, many areas are now open bush savanna with only *Acacia* and baobab trees. Historically, deforestation was rooted in public campaigns in the 1920s and 1930s to eradicate agricultural pests such as the tsetse fly and quelea birds. Recently, extensive grazing has led to soil fertility decline and degradation with subsequent low crop yields, wind and soil erosion, and shortages of dry-season fodder, fuelwood and construction poles (HASHI 2002). Forest degradation is also driven by demand for fuelwood, both for local use and for sale as charcoal in Shinyanga towns.

16.1.2 Stakeholders and funding

The leading proponent of the initiative was TaTEDO, in partnership with Development Associates Ltd. (DASS) and the Natural Forest Resource and Agroforestry Centre (NAFRAC). TaTEDO is a private, nonprofit organization. According to their website, "the overall objective of TaTEDO is to enable the majority of the population, particularly women in rural areas, to access sustainable energy technologies and services that contribute to poverty reduction, sustainable development and climate change mitigation and adaptation" (TaTEDO 2013).

TaTEDO obtained funding from RNE to support the initiative for four years[2] (2010–2013). During that time period, TaTEDO planned to develop a local institutional framework that would allow *ngitili* owners to benefit from REDD+, either through the voluntary market or through a national REDD+ fund. The proponent planned to accomplish this by formalizing *ngitilis* into legal entities,

2 RNE initially allocated NOK 14.09 million [about USD 2 million] to the initiative, although the full amount had not been disbursed by the end of the four years.

Figure 16.1 Map of the REDD+ initiative in Shinyanga.

Data sources: TaTEDO, GADM and World Ocean Base.

and by aggregating *ngitili* owners into functional groups to facilitate carbon marketing (TaTEDO, 2009). While the proponents did start developing a PDD to sell credits through the VCS, that process had not been finalized as of 2014 due to its high cost. It remains unclear whether and how the communities will receive REDD+ benefits under Tanzania's national strategy for REDD+.

16.1.3 Motivation

TaTEDO began working in Shinyanga in 2007 in reforestation and soil restoration and in introducing alternative energy sources for cooking. After initially considering a larger area, TaTEDO decided to focus on Kahama and Shinyanga Rural districts because, compared to other districts, they had high rates of deforestation and degradation, faced severe threats to *ngitili* forests, were reasonably accessible, and had previous experience with *ngitili* restoration through a program called HASHI (Shinyanga Soil Conservation Programme). In 2009, TaTEDO seized the opportunity to tap into REDD+ funding from the RNE as a new source of support for local communities and specifically for 250 *ngitili* owners in 11 villages.

The major drivers of deforestation in the Shinyanga region are the rapid growth rates of human and livestock populations, requiring more land area for agriculture and grazing. Livestock serve a vital function in Sukuma (an ethnic group in the Shinyanga region) society as a form of insurance against periods of hardships, but the current size of the herd is believed to be far beyond the carrying capacity of the Shinyanga region (URT 2007c). Under the traditional management system, livestock are excluded from the *ngitilis* in the rainy season, thus ensuring the future provision of fodder, fuelwood and other wood products. This system has been undermined by expanding demands for pasture, fuelwood and land for agriculture. The logic of the initiative is that REDD+ could offer additional incentives to restore and reinstate traditional management of the *ngitilis*.

16.1.4 Timeline

Although this subnational initiative began in 2010, it is founded on a long history of efforts to restore and improve the management of the Shinyanga landscape. Figure 16.2 lists key interventions before this REDD+ initiative, as well as the steps undertaken by TaTEDO and partners until their REDD+ funding ended in December 2013. The initiative intended to position the communities to participate in REDD+ in the long term, but this depends on the structure that Tanzania puts in place for REDD+.

	Pre-2000	**1970** - World Bank launches Regional Development Programme (RIDEP)		**1986** - Norwegian Government initiates land rehabilitation project HASHI.	
	2000				
	2001				
	2002				
	2003				
	2004				
	2005				
	2006				
	2007	TaTEDO begins working at the initiative site to promote alternative cooking technology			
	2008				
	2009				
REDD+ initiative active	**2010**	Funding for REDD+ obtained and FPIC	CIFOR-GCS baseline survey	Environmental education and preliminary studies conducted by the proponent	Interventions launched include restrictions on forest access and conversion, support for livelihoods, and tenure clarification
	2011	Identification and mapping of *ngitili*, and registration of *ngitili* owners with village and district councils	Education and training on REDD+ governance and sustainable agriculture	CIFOR-GCS presents baseline results to study villages	The formation of *ngitili* forest groups and *ngitili* associations to defend the welfare of *ngitili* owners
	2012	Carbon baseline study	REDD+ trial incentive payments		
	2013	CIFOR-GCS phase 2 study	End of REDD+ interventions		
	2014				

Figure 16.2 Timeline of the REDD+ initiative in Shinyanga.

16.2 Strategy for the initiative

The initiative aimed to reduce carbon emissions from dry agro-pastoral systems with low carbon stocks. The basic strategy was to integrate REDD+ with the *ngitili* system by establishing an institutional framework for managing restored *ngitilis* to capture benefits arising from REDD+. Specifically, the initiative sought to mobilize and assist *ngitili* owners to form and legally establish *ngitili* carbon groups and associations.[3] Working through this institutional framework, the proponents addressed key drivers of deforestation and degradation by promoting alternative and energy efficient technologies, improved farming techniques, and reduction of overgrazing, alongside other interventions introduced as co-benefits and for combating leakages.

For MRV of carbon emissions, TaTEDO partnered with DASS (an NGO) and NAFRAC, as well as other government agencies that provided access to satellite imagery. The initiative developed topographic maps and land-cover maps (based on LandSat imagery) for three points in time before the start of the REDD+ initiative for Kahama and Shinyanga Rural districts. They also collected field data for quantifying carbon stocks in various pools, and involved the communities in the fieldwork. The carbon density of the *ngitilis* is generally low and highly variable, making it challenging to conduct quality MRV at a reasonable cost. The selection of *ngitilis* and villages to participate in the initiative was based on both willingness to participate in REDD+ and minimum size criteria. Specifically, the initiative preferred *ngitili* of at least 8 ha, with miombo woodland or acacia forests that were at least 10 years old, and canopy cover of at least 30%. The initiative also required clear ownership of the *ngitili*, thus giving preference to households with statutory or customary ownership.

In principle, all villages in Kahama have the right to decide who can access the forest by formal or statutory law, although in practice, the villages vary in terms of their level of control over forest access. According to customary law, *ngitili* owners can monitor, enforce rules and sanction outsiders. In two of our four study villages, SHIN2 and SHIN3, restrictions and by-laws on forest use are generally respected by the community and there is little pressure from outsiders. In contrast, in SHIN1, the *ngitilis* are subject to cattle grazing pressure from neighboring villages, especially during the dry season, due to poor implementation of by-laws. The customary ownership of land (without a certificate) relies on relatives, neighbors and hamlet chairs who witness transfers of land ownership, which also sometimes creates problems when there are no remaining witnesses. To address these challenges associated with customary tenure, the proponents helped local

3 These carbon groups and associations are sometimes referred to as 'carbon aggregators.' They consolidate carbon credits from *ngitili*, and market and sell it to buyers, effectively playing a middleman role.

households to formalize their land claims by getting certificates of the customary right of occupancy. This involved surveying the villages to identify the owner of each *ngitili* and registering the *ngitilis* with the village and district councils. However, challenges remain, including both encroachment by neighbors (in SHIN1 and SHIN4) and the arrival of new mining companies operating under a different legal framework in Shinyanga.

The agro-pastoralist nature of the communities in Shinyanga mean that households are always in search of better areas for grazing and cultivation. *Ngitili* by-laws do not completely restrict forest access, allowing some scope for *ngitili* owners to graze and collect dead wood inside the *ngitilis*. In village meetings, SHIN1 and SHIN4 reported that neighboring villages routinely enter their forests to graze their livestock during the dry season.

The initiative allows village governments to benefit because of their role in supporting individual households in their particular village. A benefit-sharing arrangement was proposed whereby a share of 83% goes to the individual *ngitili* (REDD+ forest) owners, 7% goes to the village government, 5% goes to the *ngitili* group in the village for operational costs and 2% goes to the *ngitili* group association. Under this proposal, the village security committee (*sungu sungu*) who are responsible for enforcing by-laws and protecting *ngitili*, would also get 3% of benefits.

In addition to TaTEDO, there are numerous other groups with development projects or one-off development activities (e.g. installation of a water source or construction of a school building) in the Shinyanga region. The government also provides infrastructure, education and social services as part of its development plan for rural areas. These development interventions were generally harmonized with the proponents' activities, but they did not directly support improved forest management.

TaTEDO is respected by the government officials and communities in Shinyanga because of its history of working there before introduction of the REDD+ initiative. The trial incentive payment and registration of the *ngitilis* with the village and district council created positive momentum for REDD+ participants and the initiative. TaTEDO has also highlighted co-benefits such as increased agricultural productivity, increased access to efficient and alternative energy, sustainable grazing, beekeeping and other income generating activities. It is likely that TaTEDO's influence on *ngitili* management and alternative energy for cooking will persist beyond REDD+. However, it ran out of REDD+ funds from the RNE before obtaining certification from VCS or CCBA. There is a draft PDD, but significant work – especially on the baseline carbon assessment data – is required for VCS certification.

16.3 Smallholders in the initiative

In the four intervention villages (locally referred to as *kijiji*) selected for the CIFOR-GCS study, we interviewed a total of 120 households, and held two focus groups in each village. Table 16.1 shows the characteristics of the villages. All of the four study villages are in the Kahama district, which has a total population of 523,802, or 1225 households, living on 80,153 ha (Zahabu 2012; NBS 2013). The total populations of the four study villages range from 1333 (169 households) in SHIN3 to 2065 (489 households) in SHIN4. The largest ethnic group in SHIN1, SHIN2 and SHIN3 is Sukuma, while Nyamwezi are the largest ethnic group in SHIN4.

The most important local institution in the study area is the village government and its council. Members of the village government are elected, with the exception of the village executive officer, who is employed by the district council. In most cases the village council is formed by 25 members of which, by law, a minimum of 30% must be women. All important matters must be discussed and agreed at the village level first. Any development project or initiative aiming to implement activities in the village must get permission through a village assembly meeting. REDD+ activities go through the same procedure as any others. Thus, reductions in forest carbon emissions depend on interventions implemented by village governments.

The participation of women in decision-making varied substantially across villages. For example, most women in SHIN3 reported that they participated in household decisions about land and forest use and use of the household's cash income, while respondents in SHIN2 reported that women were rarely consulted about these decisions, perhaps because of the heavy dependence on livestock, which is traditionally a male domain. In terms of decisions about forest use, rules and monitoring, women in SHIN2 and SHIN3 participated more than in SHIN1 and SHIN4. About 50% of the women interviewed in SHIN1, SHIN3 and SHIN4 perceived participation in forest activities and monitoring as a burden, with little benefit to women or the village. In SHIN3, more than half of the women interviewed reported that they influenced decisions at the village level in general, but mostly through their husbands. Sukuma society is traditionally patriarchal, giving little voice to women, although this is slowly changing due to national efforts to raise awareness of women's rights and encourage their participation in government.

Access to infrastructure and services such as roads, education, sanitation and health care is limited. Until 2010, only two (SHIN2 and SHIN4) out of four villages had road access. People must walk 4–18 km (30–120 min) to reach district markets. The average level of education for adults (16-years old and older) is less than five years of study in all villages (Table 16.2) due to the limited

Table 16.1 Characteristics of the four villages studied based on the 2010 survey.

	SHIN1	SHIN2	SHIN3	SHIN4
Total land area (ha)	NA	424.9	318.0	NA
Total forest area (ha)	NA	12.9	218.5	NA
History and demography				
Year established	1980	1976	1987	1974
Number of households	322	245	169	489
Total population	2,784	2,285	1,333	2,065
Previous experience with conservation NGO	HASHI	HASHI	HASHI	HASHI
Infrastructure				
Distance to closest market by walking (km/min)	13 /50	4/90	18/120	15/30
Elementary school	Yes	Yes	Yes	Yes
Secondary school	No	No	No	No
Health center	No	No	No	Yes
Road access in all seasons	No	Yes	No	Yes
Bank or other source of formal credit	No	No	No	No
Agriculture				
Main agricultural commodity (staple food)	Maize	Maize	Maize	Maize
Crop with highest production value	Rice	Rice	Rice	Cotton
Price of a hectare of good quality agricultural land (low) (USD)	87.67	70.96	70.96	70.96
Price of a hectare of good quality agricultural land (high) (USD)	140.26	141.92	106.44	141.92

Note: HASHI = Shinyanga Soil Conservation Programme

access to schools. While each village has an elementary school, there is no access to secondary school. Health centers are also unavailable in the four surveyed villages. While most households in all four villages have their own latrine, very few households in SHIN2 (3%) have a flush toilet and only a few households in SHIN3 (10%) have access to piped drinking water. This general picture of poor water supply and sanitation is associated with an average of 8 to 25 days illness per year among adults.

SHIN2 stands out for its high average household income from agriculture and livestock compared to the other study villages. At the same time, income levels from the environment and forest are much lower than in SHIN1 and SHIN4 (Figure 16.3). This might be because SHIN2 is close to major towns and has better road access than the other villages, creating trade opportunities and reducing dependency on the forest and environment for income.

Table 16.2 Socioeconomic characteristics of households interviewed in 2010.

	SHIN1	SHIN2	SHIN3	SHIN4
Number of households sampled	30	30	30	30
Household average (SD)				
Number of adults	3.5 (1.7)	3.6 (2.0)	3.6 (2.5)	3.2 (2.3)
Number of members	8.4 (4.5)	8.4 (3.8)	5.3 (3.0)	7.0 (3.5)
Days of illness per adult	16.2 (25.5)	7.6 (8.9)	12.3 (32.7)	25.4 (66.5)
Years of education (adults ≥ 16 years old)	3.6 (3.0)	4.0 (3.1)	4.5 (3.2)	4.1 (3.0)
Total income (USD)[a]	1,206 (1,473)	2,765 (2,787)	778 (1,173)	762 (719)
Total value of livestock (USD)[b]	2,096 (2,321)	2,881 (3,143)	827 (1,870)	1,472 (2,277)
Total land controlled (ha)[c]	6.4 (4.3)	11.0 (11.1)	5.9 (5.4)	9.2 (11.3)
Total value of transportation assets (USD)	100 (113)	144 (207)	87 (166)	103 (206)
Percentage of households with:				
Mobile or fixed phone	33	60	13	33
Electricity	0	3	0	0
Piped water supply	0	0	10	0
Private latrine or toilet	43	100	90	47
Perceived sufficient income	37	23	50	23

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.
b Total livestock value at the time of interview.
c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

In the study villages, maize is the most widely consumed agricultural commodity, followed by sorghum and rice, although cassava is becoming more prevalent in SHIN1. In SHIN1 and SHIN2, permanent agriculture is gaining importance, in terms of both number of households and land area. Household income in all four villages is derived primarily from crops and livestock (Figure 16.4), as with most areas in rural Tanzania (Waithaka 2013). One factor that distinguishes Shinyanga from the rest of Tanzania is its larger number of cattle, equivalent to 20%–30% of the national herd (Machanya et al. 2003). Cattle are a traditional symbol of wealth and status because they can be converted to money for food or farm implements, or be used as a bridal dowry.

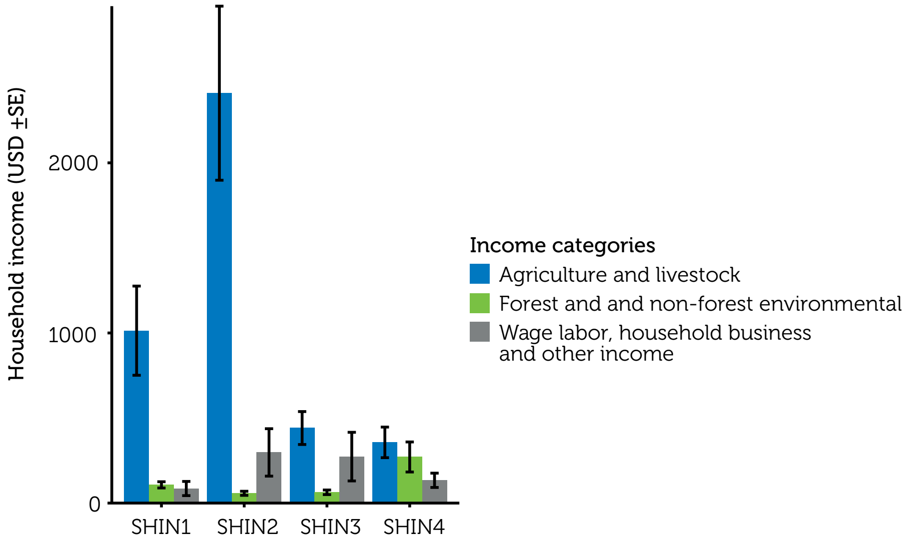

Figure 16.3 Sources of income for average household by village (+/- SE) (n = 120).

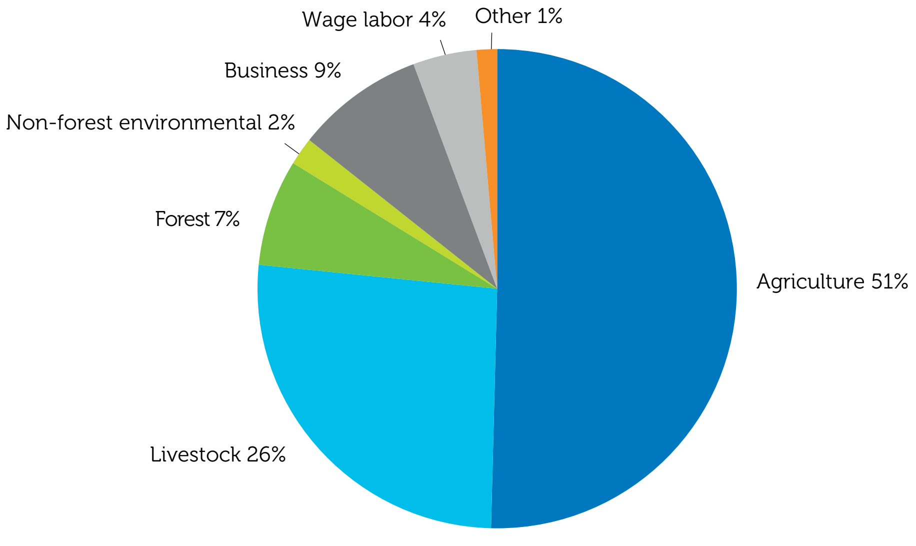

Figure 16.4 Sources of income for all households in sample (n = 120).

As seen in Table 16.3, all of the study villages are within an hour walk of forests, and most households (80%) harvest forest products, mainly in the dry season. Both men and women collect products from the forest but they specialize in different products: women collect mostly fuelwood and wild fruits while men mainly collect building poles and wood for producing charcoal. Both men and women collect NTFPs (mainly for domestic use) from the *ngitilis*. However, very few households reported forest harvesting as their primary occupation. They considered agriculture to be their primary livelihood. Half of the respondents (across all villages) reported that their income from sales of forest products had decreased over the two years prior to the survey. In all of the study villages except SHIN4, both forest area and forest quality were also reported to have declined over the two years prior to the survey due to clearing for permanent and swidden agriculture, and new settlements to accommodate the growing population. The growing scarcity of forestland was reported as one reason for the decline in swidden agriculture in SHIN3 and SHIN4. Forests are also intertwined with agriculture through grazing, which is allowed in appropriate seasons in the *ngitili* forests.

16.4 Challenges facing the initiative

TaTEDO experienced a variety of challenges in implementing its REDD+ initiative in Shinyanga. The largest challenge was financial constraints. Although some activities continue through the work of the district councils and other collaborating partners, TaTEDO suspended its work on REDD+ in Shinyanga when funding from the RNE ended; it is unclear if or when they will resume because they are not yet in a position to sell carbon credits. This is related to the difficulty of acquiring the technical skills and spatial data required to calculate a reference level and project emissions reductions. The required technical capacity is hard to find locally and costly to source from outside Tanzania.

Another important challenge is the low carbon content of Shinyanga's forests. Carbon stocks in *ngitili* (miombo woodland or acacia savannahs) are low relative to carbon-rich habitats such as rainforests. Incremental accumulation of carbon, both above and below ground, is slow with negative implications for revenue streams based on metric tons of carbon.

Yet another challenge for the initiative has been suspicion in the community. Many rural households see REDD+ as a ploy of the government to take control over their land. This mistrust has been exacerbated by households' insecurity about their land tenure. This is related to the fact that REDD+ is not yet well understood locally. Most villagers and government officials still struggle to understand how REDD+ is supposed to work and what it requires. This means they are often either not sure what to expect, or do not believe in what is proposed. Moreover, neither the proponent nor the government can guarantee how much revenue

Table 16.3 Indicators of household forest dependence based on the 2010 survey.

	SHIN1	SHIN2	SHIN3	SHIN4
Number of households sampled	30	30	30	30
Household average (SD)				
Share of income from forest	9.97 (12.45)	2.86 (3.04)	11.68 (14.07)	21.22 (27.82)
Share of income from agriculture	75.58 (20.11)	77.13 (28.13)	63.35 (30.39)	46.95 (29.87)
Area of natural forest cleared (ha)[a]	0.13 (0.47)	0.11 (0.40)	0.09 (0.25)	0.32 (0.63)
Area of secondary forest cleared (ha)[a]	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Area left fallow (ha)[b]	1.74 (0.95)	3.49 (4.51)	1.34 (1.47)	3.68 (3.37)
Distance to forests (minutes walking)	25	45	45	50
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	92	92	96	99
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	0	1	1	1
Reporting increased consumption of forest products[e]	18	21	20	21
Reporting decreased consumption of forest products[e]	7	24	27	11
Obtaining cash income from forest products[f]	7	10	30	34
Reporting an increase in cash income from forest[f]	50	0	0	10
Reporting a decrease in cash income from forest[f]	50	33	22	20
Reporting fuelwood or charcoal as primary cooking source	100	100	100	100
Leaving land fallow[g]	57	13	43	53
Clearing forest[g]	13	13	13	33
Reporting decreased opportunity for clearing forest[g]	17	67	34	52
Clearing land for crops[g]	13	10	13	20
Clearing land for pasture[g]	0	0	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

ngitili owners will receive because of uncertainty about the future existence of a carbon market, as well as the future price of carbon. This leaves the *ngitili* owners with unanswered questions that they raise repeatedly with the proponents.

16.5 Lessons from the initiative

While TaTEDO seems unlikely to turn this pilot project into an ongoing initiative sustained with revenues from the carbon market, they succeeded in piloting various aspects of REDD+ and informing the national dialogue about REDD+ in Tanzania. Most importantly, they explored mechanisms for integrating REDD+ with a customary land management system. Households with *nigitilis* have customary ownership of the land and hence relatively clear ownership status, but their lands and carbon stocks are too small for them to individually sell carbon credits. The initiative has pioneered a system of aggregating them into *nigitili* groups, which could sell carbon offsets once the initiative has developed its REL and been validated. TaTEDO helped set the rules and by-laws governing these *nigitili* groups, including a detailed benefit-sharing mechanism that bases the payment amount on the performance of the *nigitili* owners. The fact that these groups are small has facilitated the decision-making process.

Livelihood activities in Kahama. (Demetrius L Kweka/CIFOR)

The initiative does not seek to protect large tracts of forest but instead is focused on testing how REDD+ performs in a dry silvopastoral landscape with little tree cover and little carbon in the existing forest patches. The initiative is pursuing this by using REDD+ to promote *ngitili* regeneration through a strategy that includes: dissemination of improved cookstoves, agricultural extension services, land-use planning and introduction of new income generating activities. Revenues from selling carbon credits will thus be supplementary to the many other benefits associated with *ngitili* conservation and management – an important lesson for REDD+ in Tanzania and elsewhere in the dry tropics.

This initiative also illustrates an effective approach to land-use planning by working with local institutions to formalize the customary rights of smallholders and to revitalize the traditional *ngitili* system. This approach reflected a good understanding of local conditions, including the strong link between livestock husbandry and forest management. In addition to building on the *ngitili* tradition, the initiative engaged with the *sungu sungu* and the *kitongoji* (council of elders), which has encouraged uptake of new cattle management practices. However, there are tensions in the area caused by both overstocking of cattle and a growing human population that cannot be resolved within the context of a four-year REDD+ initiative. The Kigoma District Council will oversee the implementation of activities beyond 2014, and some households are continuing with improved management of their *ngitilis* and agricultural fields with no external funding. Nonetheless, one clear lesson of this initiative is the need for sustained funding, whether from donors or from a viable carbon market.

16.6 Acknowledgments

This chapter would not have been possible without valuable contributions from many people. Dr. Robert Otysina, Mary Swai and Pastore Mwesiga of TaTEDO provided invaluable information. We would also like to acknowledge the contribution of the district office in Kahama and especially community development officer Mr. Franael Ruben who participated in the survey of project implementation work in 2012. Special thanks and appreciation also go to village leaders and all the survey respondents who made this work successful. Finally, we would like to thank: George Phabian Kabado, Hawa Mushi, Thadeus Kisangi, Mohamed Mmaoga Omar, Georgina Misama, Yesaya Bendera, Nanjiva Mzunda and Aklei Albert for their assistance in the field as enumerators, and Johannes Dill for data entry.

Part 2. Case Reports

Indonesia

Box H
REDD+ in Indonesia: The national context

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Land-use change and forestry (LUCF) and peatlands are the main sources of Indonesia's GHG emissions. Between 2000 and 2005, average GHG emissions from LUCF and peat fires was estimated as 1.05 $GtCO_2e$ (gigatons CO2e) or 63% of the country's total emissions (Ministry of Environment 2010). Of that, peat fires contributed 22% (Ministry of Environment 2010). Indonesia has the largest extent of peatlands in the world: 21 to 27 million ha (Page et al. 2011), storing up to 132 $GtCO_2e$ (MoFor 2008a). Peatlands are thus an important part of REDD+ in Indonesia.

Of the 187 million ha of Indonesia's landmass, 68% is classified as forest zone (*kawasan hutan*) under the jurisdiction of MoFor (MoFor 2013a). Of this, 90 million ha (about 70%) are forested (MoFor 2013a). An additional 8 million ha of forests are outside the forest zone, under the authority of subnational governments. The forest zone is classified into: production forests (timber production), limited production forests (some areas protected), conversion forests (for future conversion), protection forests (protected for their ecological functions) and conservation forests (protected for their biodiversity).

Activities contributing to deforestation and forest degradation include conversion to agriculture, unsustainable logging and mining (e.g. Indrarto et al. 2012). There are several estimates of Indonesia's deforestation rate. MoFor reported an annual deforestation rate of 613,000 ha between 2009 and 2012 (MoFor 2014c). Margono et al. (2014) reported that intact and degraded natural forest cover loss between 2000 and 2012 was 6.02 million ha; the rate of deforestation was highest in 2012, reaching 840,000 ha.

Momentum for REDD+ and the formulation of policies and institutions

The UNFCCC COP 13, held in December 2007 in Bali, provided Indonesia the momentum to move REDD+ forward. Leading up to this event, MoFor established the Indonesian Forest Climate Alliance, which produced a study on REDD+ for the COP 13. Soon after the COP, the National Climate Change Council (DNPI) was established. Regulations providing the legal basis and guidelines for REDD+ implementation were formulated. At the local level, proponents began preparations to establish REDD+ initiatives, including our study sites (Chapters 17 to 22).

In September 2009, President Yudhoyono announced that by 2020, Indonesia will have reduced national GHG emissions by 26%, or by 41% with international support. To reach this goal, the National Planning Agency (BAPPENAS) prepared the national action plan to reduce GHG emissions (RAN GRK) (GoI 2011). Of the targeted 2.95 $GtCO_2e$ reduction in emissions, over 80% is to be achieved from forestry and peatlands.[1] REDD+ is thus a key element in realizing this commitment.

Sectorial agencies prepared the next steps and donors pledged support to assist Indonesia. By 2013, commitments of support reached USD 4.4 billion (The REDD Desk 2013). The largest single pledge was from Norway. In May 2010, the Government of Indonesia and the Government of Norway signed a letter of intent on REDD+ cooperation. This document outlines actions that Indonesia needs to take in the development and implementation of REDD+ in exchange for USD 1 billion support pledged by Norway.

A REDD+ task force, later renamed the REDD+ Agency (Badan Pengelola REDD+), was established in 2010 to coordinate, plan, manage and oversee REDD+ (GoI 2013). It completed the National REDD+ Strategy (Stranas REDD+) in September 2012 (Satgas REDD+ 2012). The Stranas sets out general guidelines for REDD+ implementation, which are elaborated in provincial REDD+ strategies (Strada REDD+). Other important REDD+ policy instruments that have been developed include frameworks for national MRV, REDD+ financing, and safeguards.

A moratorium on awarding of new concession licenses in primary forests and peatlands, first implemented in May 2011 for two years and extended to May 2015, exemplifies Indonesia's concrete commitment to REDD+. Although it excluded secondary and logged-over forests, it encouraged better transparency and sharing of spatial data across sectors (Murdiyarso et al. 2011). In particular, it brought attention to an important issue that was long overdue to be addressed – Indonesia does not have a single reference map that is referred to by ministries, local governments and other stakeholders (Karsidi 2013; Resosudarmo et al. 2014b). Various sectors have their own maps that are inconsistent with each other, creating uncertainty and confusion. This presents an enormous challenge in the planning and implementation of all land-based activities, including REDD+. Indonesia is working towards a 'one map' policy, developing a central geospatial information database for use by everyone.

Development at the subnational level

Simultaneously, REDD+ is moving at the subnational levels. The REDD+ agency aims to mainstream and integrate REDD+ in 11 pilot provinces

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1 Authors' calculations based on overall target of emission reductions of 2.95 $GtCO_2e$ (SNC 2009).

and 184 districts. Five provinces and 28 districts have signed memoranda of understanding (BP-REDD+ 2014; Wulandari 2014). Several provinces are active members of the Governors' Climate and Forests Task Force.

REDD+ at the subnational level is guided by several decrees issued by MoFor that apply within the forest zone. These include decrees on REDD+ demonstration activities (MoFor 2008c), REDD+ implementation (e.g. benefit-sharing, location, proponents) (MoFor 2009a, 2009b), the creation of a new forest concession category called ERC (MoFor 2008b, 2010, 2012b) and the processes for establishing a forest carbon project (MoFor 2012a).

Many subnational REDD+ initiatives have emerged in Indonesia (Madeira 2009; Atmadja et al. 2010; Cerbu et al. 2011; Mardiastuti 2012; Sekala 2012). However, of the 33 initiatives identified in 2010, only 17 were still active REDD+ initiatives in 2013. The rest were discontinued, completed or rebranded, or rejected the REDD+ label even though their activities reflected REDD+ (personal communication from AD Ekaputri, September 2014).[2] Thus, the landscape of subnational REDD+ initiatives in Indonesia is highly dynamic.

2 In: Ekaputri AD, Resosudarmo IAP and Aryani R. Forthcoming. REDD+ projects in Indonesia.

Chapter 17

Kalimantan Forests and Climate Partnership, Central Kalimantan, Indonesia

Stibniati S Atmadja, Yayan Indriatmoko, Nugroho Adi Utomo, Mella Komalasari and Andini Desita Ekaputri

The Kalimantan Forests and Climate Partnership (KFCP) was launched in January 2010 as one of four official REDD+ demonstration activities in Indonesia (Masyhud 2010). Its objective was to "demonstrate a credible, equitable, and effective approach to reducing GHG emissions from deforestation and forest degradation, including from the degradation of peatlands…" (IAFCP 2009, 2). It officially ended in June 2014.

Among the Indonesian REDD+ initiatives included in the CIFOR-GCS sample, KFCP was the most advanced in terms of field implementation. That was because the initiative had substantial up-front funding and did not require a concession license for the intervention area (cf. Katingan in Chapter 18 and Rimba Raya in Chapter 20). However, KFCP became highly politicized and attracted (often unfavorable) media attention at the local, national and international levels. The proponent organization stayed mostly silent as allegations about their negative impacts on indigenous peoples and ineffectiveness in reducing emissions became widespread. Our field observations suggest that some of these negative public perceptions were unfounded. Thus, this case highlights the importance of a clear communication strategy for large, high-profile REDD+ initiatives such as KFCP.

This chapter draws upon primary data from three sources. First, we conducted household and village-level surveys in four settlements, consisting of two villages (*desa*) and two hamlets (*dusun*), where 131 of 683 households were interviewed in late 2010. All tables and figures are based on these survey data. Second, we interviewed key informants in various organizations in 2011–2013. Third, we studied the ways local people use peatlands and local people's perceptions of REDD+ and KFCP, from 2010 to 2012. This study yielded deeper qualitative insights through structured and semi-structured interviews, field observations and informal dialogues in five communities, including three of the communities where we conducted household surveys.

17.1 Basic facts: Where, who, why and when

17.1.1 Geography

The KFCP initiative was located in Kapuas district, Central Kalimantan province, Indonesia (see Figure 17.1). The intervention area covered 120,000 ha, bounded by the Kapuas River (west) and Mentangai River (east). KFCP's southernmost boundary was located approximately 100 km from the coast of the Java Sea, at an altitude of 5–10 masl (Applegate et al. 2012). Average rainfall between 1991 and 2010 was 2805 mm/year (BMKG 2010). In 2009, there were 2401 households and 9007 people living in the 14 settlements (villages and hamlets) targeted by KFCP (CARE 2009). These villages were selected because their territories overlapped with the KFCP intervention area.

The KFCP intervention area was part of the Ex-Mega Rice Project (EMRP) area. This was the site of a large-scale land conversion project known as the Mega-Rice Project (MRP) or the million-hectare rice project.[1] The project was implemented in 1996–1997, covered 1,050,400 ha and built 1145 km of primary drainage canals (BAPLAN 2008). Despite its ambitious objectives, the project established only 30,000 ha of rice paddies. The EMRP area was divided into blocks. The southern part of KFCP was in EMRP Block A. There, a network of smaller canals and ditches had been built, leading to serious peatland degradation. The northern part of KFCP was in EMRP Block E, where peatlands were relatively intact because canals had not been built. From the 1970s until 1995, 15 large timber companies operated in these areas, although they ceased operations when the MRP took over (Suyanto et al. 2009; Galudra et al. 2010). They extracted timber from their own concessions and contracted local people to supply timber felled outside of their concessions. Local people extracted timber using small, hand-dug *tatas* (ditches 1–2 m wide to access the forest), which contributed to peatland degradation through drainage (Hooijer et al. 2014).

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1 Also known as the million-hectare peatland project (Proyek Lahan Gambut Sejuta Hektar).

Figure 17.1 Map of the KFCP REDD+ initiative.

Data sources: AusAID (KFCP), GADM, KFCP and World Ocean Base.

17.1.2 Stakeholders and funding

KFCP's proponent was the Indonesia–Australia Forest Carbon Partnership (IAFCP), a bilateral partnership between the Government of Indonesia, represented by Indonesia's National Planning Agency (BAPPENAS) and MoFor, and Australia, represented by AusAID and the Department of Climate Change (Barber et al. 2011). The steering committee included high-level governmental institutions such as BAPPENAS, the provincial Government of Central Kalimantan, Australia's Department of Foreign Affairs and Trade, and Australia's Department of the Environment (IAFCP 2012a). The IAFCP officially ended in June 2014, along with KFCP.

As a demonstration activity, KFCP did not have plans to sell carbon offset credits in the voluntary or any future compliance markets. KFCP received all of its financial support from Australia and in-kind contributions (staff time, political and logistical support) from the Government of Indonesia. The Australian funding was mostly from AusAID, disbursed through AusAID to IAFCP, totaling AUD 37.47 million (personal communication from Siran, 2014).[2] This is large compared to other REDD+ initiatives in Indonesia. AUD 8.4 million was set aside for a trust fund to be managed by the World Bank for a future performance-based payment mechanism (Barber et al. 2011; Purnama et al. 2014). After IAFCP ended in 2014, the fund was no longer available for performance-based payments as originally intended, because the Australian Government re-allocated it to PNPM (personal communication from Siran, 2014).

IAFCP partnered with many institutions, including CARE Indonesia (CARE), Borneo Orangutan Survival (BOS) Foundation, Universitas Palangkaraya (UnPar), Deltares, Remote Sensing Solutions and the World Agroforestry Centre (ICRAF) (IAFCP 2012a). In its first two years (2010–2011), KFCP was run mostly by staff seconded from CARE and BOS, supported by consultants. Later, IAFCP hired more staff to create a larger KFCP team. Two prior conservation and peatland rehabilitation projects were located in the KFCP site. The Central Kalimantan Peatland Project (CKPP) aimed to protect and rehabilitate peatlands. It was a partnership of the Government of Central Kalimantan, UnPar, Wetlands International, CARE, WWF-Indonesia and BOS (CKPP 2007). BOS also ran a separate orangutan conservation program called Mawas before, during and after KFCP. They managed large tracts of peatland forests for orangutan research and release within parts of the KFCP intervention area and in an adjacent area across the Mentangai River.

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2 The figure of AUD 47 million found in various reports refers to the amount pledged by the Australian government (e.g. Mongabay.com 2013; Kaspar 2012). The amount actually disbursed was AUD 37.47 million.

Farmer checks his blocks of rubber latex, preserved in the river for future sale. Local communities negotiated for more support for rubber cultivation from KFCP, an important source of cash income in the area. (Yayan Indriatmoko/CIFOR)

17.1.3 Motivation

In 2007, the Indonesian president and Australian prime minister announced a climate change agreement that later evolved into KFCP (Olbrei and Howes 2012). It was located in the EMRP because it is the largest area of degraded peatlands in Indonesia and was prioritized for rehabilitation under Presidential Instruction No.2/2007 (Australia Indonesia Partnership 2009). Like other REDD+ initiatives in Central Kalimantan that we review in this book (the Katingan project in Chapter 18 and Rimba Raya project in Chapter 20), the majority of the carbon stock is below ground in the peat soil, and the initiative covers an entire peat dome.[3] But unlike them, KFCP is located within the EMRP, where reducing ongoing GHG emissions from peatland degradation was prioritized over avoiding future degradation. The main sources of ongoing emissions were annual peat fires and continual peat decomposition on degraded and deforested peatlands (IAFCP 2009). Canals and *tatas* drain peat soils, which dry up, decompose and become prone to fire. Peat fires

3 Peatland rehabilitation requires rewetting previously drained areas by blocking/reducing the water flow in artificial waterways such as canals and *tatas*. Since peat is highly porous, blocked water can drain/leak from other parts of the landscape. Hence, the rehabilitation encompasses an entire hydrological unit, known as a peat dome, to ensure that such leaks do not occur.

inhibit natural succession, increase the probability of future fires and are almost impossible to extinguish. This leads to peatland degradation that cannot be reversed without external intervention.

While the KFCP intervention strategy focused on reducing these ongoing emissions from fires, canals and *tatas*, there were other sources of forest degradation and emissions. First, logging in the EMRP continues although it has declined due to depleted timber stocks and a ban on illegal logging (GoI 2005). Second, the local government planned to build a road from the north to the south of the KFCP area, along the Kapuas River, which was a potential future driver of carbon emissions because it would create new access to forested areas that could lead to peatland degradation. The large-scale conversion of forest to oil palm that is of central concern to other REDD+ initiatives in Central Kalimantan was also taking place around the KFCP site.

17.1.4 Timeline

IAFCP conducted a framework design mission from late 2007 until early 2008. The PDD, published in 2009, divided the implementation timeline into 'early implementation' (January–June 2009) and 'full implementation' (July 2009–December 2012) (IAFCP 2009). KFCP was subsequently extended until June 2014. In May 2009, IAFCP commissioned a baseline socioeconomic survey, implemented by CARE, ICRAF and GRM International (IAFCP 2012b). An office was established in Palangkaraya, the capital of Central Kalimantan in September 2009. In January 2010, KFCP was officially launched by MoFor as one of four official REDD+ demonstration activities in Indonesia (Masyhud 2010). We consider early 2010 as the start of KFCP field implementation, as this was when KFCP deployed community engagement specialists in the villages.

In our view, the highlight of KFCP field implementation was the signing of village agreements between each target village and KFCP. The agreements were signed from May until June 2011[4] and were valid until June 2013. In September 2013, the agreements were extended until June 2014 for all but two villages that opted out. Between the first village agreement in 2011 and the end of KFCP in 2014, AUD 2.7 million was disbursed to villagers to implement various work packages (Week et al. 2014).

As part of MRV of emissions reductions, a light detecting and ranging (LiDAR) survey was carried out from July 2010 to June 2012 (Balhorn et al. 2014). Additionally, KFCP monitored the peatland soils, hydrology, fires and ecology (Cochrane 2013; Ichsan et al. 2013; Graham and Mahyudi 2014). At the time of KFCP's closing workshop in June 2014, an REL was still being determined. Figure 17.2 outlines the initiative's key activities from framework design to finish.

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4 Source: signature dates of village agreements from seven villages. A copy of each agreement can be found at http://iafcp.or.id/publication/cat/6/Other-Reports-

	Pre-2000						
	2000						
	2001						
	2002						
	2003						
	2004						
	2005						
	2006						
	2007						
	2008	KFCP framework design mission	End of CKPP project				
	2009	Early implementation phase	Baseline socioeconomic survey	PDD published	KFCP office established in provincial capital		
REDD+ initiative active	**2010**	KFCP launched as REDD+ demonstration activity	Beginning of community engagement	Begin institutional capacity building, reforestation trial plots, participatory mapping, rubber field school	CIFOR-GCS baseline survey	CIFOR field work on local uses of peatlands begins	LiDAR survey begins
	2011	CIFOR-GCS presents baseline results to study villages	First village agreement	Participating villages implement work packages under first village agreement	FMU-C in Kapuas district was established		
	2012	Participating villages implement work packages under first village agreement					
	2013	Second village agreement	CIFOR-GCS phase 2 survey	Participating villages implement work packages under second village agreement			
	2014	Participating villages implement work packages under second village agreement	Village forest status attained in two villages in KFCP	KFCP officially ends			

Figure 17.2 Timeline of the KFCP REDD+ initiative.

17.2 Strategy for the initiative

KFCP's strategies reflect significant attention to reducing peatland degradation, which was the site's major source of emissions. There were three main interventions: (i) blocking canals and *tatas* ditches to raise the water table and rewet the peat to inhibit oxidation and spread of fire; (ii) re-establishing tree cover in highly degraded areas; and (iii) introducing livelihood interventions to provide incentives for people to adopt farming techniques or introducing other livelihood options that do not require the use of fire in peatlands or that reduce dependence on illegal logging (IAFCP 2009).

KFCP's primary objective was to provide lessons for and demonstrate the viability of REDD+ implementation. Although not explicitly expressed as a goal, in our view their activities produced co-benefits for livelihoods (e.g. supporting rubber garden/agroforestry establishment), governance (e.g. improved financial transparency), science (e.g. research on peatlands), local capacity (e.g. through training and workshops) and biodiversity (e.g. research on peatland ecology; reforestation with local species). Emission reductions from the project had not been quantified at the time of writing.

Because KFCP did not plan to sell carbon offset credits in voluntary or any future compliance markets, they did not seek certification from organizations such as CCBA or VCS. They adhered to the World Bank's safeguards policy because they put funds in the World Bank's trust fund, and were obliged to follow the financial, legal, social and environmental guidelines of the Australian and Indonesia Governments (Barber et al. 2011; Purnama et al. 2014). In addition, they were closely scrutinized by local, national and international environmental and indigenous rights groups.

KFCP's interventions to support alternative livelihoods and reduce emissions were mostly implemented with villagers. Each participating village entered into a contractual agreement ("village agreement") with KFCP. Under this agreement, KFCP provided benefits to individuals (e.g. payments for work or free materials), households (e.g. alternative livelihood programs) and communities (e.g. village retention fund for projects included in the village development plan). Benefit-sharing at the district and provincial levels was mainly non-monetary, in the form of capacity building and improved multilevel linkages.

Under the village agreements, KFCP and local communities agreed on a set of work packages. Each village formed institutions consisting of villagers, called TPK (Tim Pelaksana Kegiatan, activity implementation team) and TP (Tim Pengawas, monitoring team), to implement and monitor these work packages. Each agreement contained two types of work packages. The first type was specifically for emissions reductions, such as establishing seedling nurseries, reforestation and *tatas* blocking activities. KFCP provided technical guidelines, monitoring and financial support, while communities provided materials, labor and other services. All of the communities were engaged in establishing nurseries and producing seedlings, which were later used in reforestation. Reforestation and *tatas* blocking were conducted in deep peat soils, generally on remote lands not claimed by households, and in select villages where *tatas* and degraded peatlands were found. The second work package was centered on livelihoods, and was implemented in every village with a village agreement with KFCP. Villages negotiated to include the type of support they wanted, such as rubber cultivation, agroforestry or rearing of small livestock (e.g. chickens, fish). Households could choose among the various available livelihood packages. KFCP provided technical and financial assistance, production inputs (e.g.

seedling stock, fertilizer) and monitoring to support 1 ha per household. Each household provided unpaid labor and allocated land that they controlled.

Village agreements took months of negotiation with each village, and were the source of debate, and sometimes conflict, among community members. When work packages were being implemented, the budget for an ongoing activity was displayed in public locations in each village (e.g. village hall). Residents could then judge, for example, whether they had received the number of seedlings promised, or whether the budgeted prices were higher or lower than the market prices. Payment schedules for work packages were also widely understood, as several households complained to us when they felt they did not receive their payments on time. We also found that KFCP offered villagers prices for products and services (e.g. boat rental, guide fees) that were higher than those offered elsewhere, driving these prices up for other institutions who used the same services (e.g. CIFOR). Residents that were temporarily migrating were included in the second KFCP village agreements.[5]

Outside of the village agreements, KFCP held numerous training events in the villages, and supported villagers and local government officials to attend workshops and meetings at the subdistrict, district, provincial and national levels. Women were encouraged to attend, but it was difficult to overcome strong patriarchal tendencies in communities that discouraged them. KFCP also helped each village produce development plans required for requesting funding from government and non-governmental sources. According to the village leaders we interviewed, these would have been difficult to produce without KFCP's support as they are highly technical documents.

KFCP also facilitated the formation of *hutan desa* (village forest) in at least three villages, and supported the development of a forest management unit for conservation (FMU-C). The *hutan desa* is a type of forest management status granted to villages on state forested lands. This status has been sought by other REDD+ initiatives in Indonesia (e.g. KCCP in Chapter 19), as a way of strengthening the community's rights to manage forests. FMUs are forest management entities of MoFor. The creation of FMUs is being prioritized by MoFor as a way of improving forest management (DWPPAPKH 2014; Kepala Biro Perencanaan Kehutanan 2014).

Like many other villages in Indonesia, these communities get development support from national programs such as the Rural PNPM and a village budget (Anggaran Dana Desa/ADD). There were sector-specific programs from the ministries of agriculture (e.g. seedlings, livestock), forestry (e.g. reforestation), and public works (e.g. irrigation canals). Due to the history of environmental

5 Some households were excluded in the first KFCP village agreement because they were away when households had to decide if they wanted to participate. Since interest in participating was high, their inclusion in the second agreement was one of the negotiation points with communities.

degradation and land conflicts in the EMRP area, communities had long-term working relationships with NGOs (e.g. Yayasan Petak Danum/YPD, Walhi), which brought information and small projects into the area. We observed that many villagers, including village leaders, had initial misgivings about 'outsiders,' including foundations, NGOs and researchers, due to their long exposure to development projects in the EMRP area. They were skeptical that these initiatives could offer real and lasting benefits, and stated that they suspected they were just moneymaking schemes for each institution. As outsiders ourselves, we were also asked in village meetings and interviews about how our research could benefit the community. We observed the same questions were posed to other outsiders. The need to ensure outsiders bring benefit (or at least do no harm) was more prominent at KFCP than in other REDD+ initiatives we studied in Indonesia.

17.3 Smallholders in the initiative

This section discusses key findings from household and village-level surveys, to illustrate the livelihoods and role of local communities in REDD+ implementation. The surveys were conducted in June–August 2010, very early in KFCP's implementation phase. At the time, almost all respondents had never heard of KFCP or REDD+. We randomly sampled 131 of 683 households (19.2%) in four settlements (KAP1 to KAP4) out of 2401 households in 14 settlements in KFCP (0.5%). KAP1 and KAP2 were adjacent communities in Block E, the relatively conserved area of KFCP. KAP3 and KAP4 were adjacent communities in Block A, the degraded portion of KFCP. Estimated sizes of our study villages ranged from approximately 5000 to 23,000 ha.[6] Characteristics related to household well-being and forest dependence are summarized in Tables 17.1 and 17.2.

The KFCP area was mostly zoned as conservation forest, but – as also seen in the Rimba Raya (Chapter 20) and Katingan (Chapter 18) cases – land uses on the ground often do not respect zoning regulations. In the two years prior to our survey, the net forest area had been reduced (3 of 4 villages) or stayed the same (1 of 4 villages). Fires (in KFCP) and expansion of oil palm plantations (outside KFCP) were identified as primary causes of forest loss on common lands controlled by our study communities.[7] On individually controlled lands, the landowner's activities (e.g. land clearing for cultivation) were the primary causes of forest loss.

Communities were tightly formed around settlement (*pemukiman*) areas along the Kapuas River. Villages (*desa*) are the smallest political administrative unit in the country. A *dusun* is a permanent, yet separate settlement bound to a village. A *desa*

6 Formal village boundaries were not available.

7 Communities control areas inside and outside of the KFCP intervention area.

Table 17.1 Socioeconomic characterisitcs of households interviewed in 2010.

	KAP1	KAP2	KAP3	KAP4
Number of households sampled	33	33	32	33
Household average (SD)				
Number of adults	2.8 (1.3)	2.8 (1.0)	2.4 (0.7)	2.4 (0.9)
Number of members	4.5 (1.8)	5.0 (2.2)	4.2 (1.8)	3.8 (1.4)
Days of illness per adult	13.3 (19.1)	15.1 (25.6)	7.3 (10.8)	13.0 (22.5)
Years of education (adults ≥ 16 years old)	4.7 (2.4)	3.9 (2.7)	4.7 (2.5)	6.0 (3.2)
Total income (USD)[a]	1,963 (1,542)	2,180 (1,539)	1,419 (829)	3,329 (4,642)
Total value of livestock (USD)[b]	58 (159)	49 (108)	8 (12)	18 (32)
Total land controlled (ha)[c]	3.4 (5.1)	26.9 (86.9)	7.8 (21.8)	7.8 (11.7)
Total value of transportation assets (USD)	234 (374)	178 (323)	151 (305)	253 (680)
Percentage of households with:				
Mobile or fixed phone	64	42	63	73
Electricity	58	36	34	52
Piped water supply	0	0	0	0
Private latrine or toilet	24	52	22	15
Perceived sufficient income	97	79	66	85

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.
b Total livestock value at the time of interview.
c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

comprises a main village and can include several hamlets. Hamlets can become an independent village once they fulfill a set of criteria. In KFCP's community engagement efforts, hamlets were considered separate communal units from their home village. Formal agreements were signed by the *desa*, and they apply to all the *dusun* within the *desa*.

The study communities settled in the area at least since Indonesia's independence (1945).[8] Immigrants came as loggers during the logging boom in the 1970s–1990s, and transmigrants/laborers for MRP in the mid to late 1990s.

8 Historical artifacts found in the area suggest a much longer history of settlement and trade, but respondents had little knowledge of this.

They became part of the community, and beneficiaries of KFCP. Later migrants worked in nearby oil palm plantations and lived separately from the main village settlement. During our study, many people had temporarily migrated to gold mining communities upstream due to lack of job opportunities in their villages.

Formally, each village is led by an elected village head, who appoints several *kepala urusan* or *kaur* in charge of specific issues (e.g. economic development, social issues). The village head (*kades*) and a permanent village secretary form the village government. It is the most active decision-making institution in our study communities. Each village has a village council (*badan perwakilan desa*). Leaders in the studied communities were generally male, and women did not feel they participated actively in village-level decision making. Families form the most important informal institution in village life, networking, politics and decision making. Other non-formal institutions such as religious groups (e.g. *yasinan*/Quran reading groups), maternal health groups (*kelompok posyandu*) and farmer groups were not as influential in village-level decision making.

Table 17.2 Indicators of household forest dependence based on the 2010 survey.

	KAP1	KAP2	KAP3	KAP4
Number of households sampled	33	33	32	33
Household average (SD)				
Share of income from forest	80.06 (27.19)	33.52 (31.22)	23.27 (37.03)	6.61 (11.93)
Share of income from agriculture	2.70 (17.21)	32.96 (39.32)	39.32 (46.01)	43.95 (54.39)
Area of natural forest cleared (ha)[a]	0.09 (0.37)	0.21 (0.78)	0.10 (0.44)	0.10 (0.41)
Area of secondary forest cleared (ha)[a]	0.05 (0.24)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Area left fallow (ha)[b]	1.31 (1.93)	3.17 (1.26)	1.65 (0.93)	3.97 (2.79)
Distance to forests (minutes walking)	120	0	60	30
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	14	59	56	78
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	8	7	12	5

continued on next page

Table 17.2 (continued)

Reporting increased consumption of forest products[e]	0	3	10	3
Reporting decreased consumption of forest products[e]	22	44	10	41
Obtaining cash income from forest products[f]	94	84	13	6
Reporting an increase in cash income from forest[f]	6	11	25	0
Reporting a decrease in cash income from forest[f]	35	56	50	50
Reporting fuelwood or charcoal as primary cooking source	76	85	81	82
Leaving land fallow[g]	24	9	13	6
Clearing forest[g]	18	9	6	6
Reporting decreased opportunity for clearing forest[g]	35	64	47	93
Clearing land for crops[g]	18	9	6	6
Clearing land for pasture[g]	0	0	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

KAP1 and KAP4 were religiously mixed (Protestant, Muslim, Kaharingan), while KAP2 and KAP3 were predominantly Muslim. Dayak Ngaju was the dominant ethnic group in all intervention settlements. Each village had at least three Dayak Ngaju customary leaders (*mantir adat*), representing major religions relevant to their village. They deal with social, cultural and land tenure issues (with the village head).

In 2010, all study villages were accessible only by the Kapuas River although, by 2013, one study village could also be accessed by car. Until now, the Kapuas River serves as the main garbage disposal facility, and the source of food and water. Poor road access leads to poor delivery of health and educational services since teachers and health workers mostly come from outside of the KFCP area. Access to formal credit was not available in 2010, but became available in 2013 through a Central Kalimantan-based credit union. Mobile phones are the primary tool for communication, although the service is still limited. Most consumer goods are purchased in the village through trade boats (*kapal dagang*) that come to the village daily or weekly. Specialized goods and services (e.g. photocopying services, boat engines) are found in the subdistrict or district capitals. In 2010, most (80%) sampled households used fuelwood as their primary cooking fuel (see Table 17.2), especially since the price of kerosene increased in 2010. Generators are still the main source of electricity and are used sparingly.

The majority of sampled households felt income was just enough to cover their household needs. During our 2010 fieldwork, the main economic commodities were reported as: rubber (USD 0.72/kg), gold (USD 33/gr), fish (USD 1.65-USD 2.20/kg) and gemor bark (USD 49.50/100 kg dry weight).[9] In Block A, rice (USD 11/15 kg hulled rice) was also dominant. The price of a hectare of good quality agricultural land ranged from USD 82.51 to USD 495.05 depending on accessibility and presence of productive rubber trees.

Of the total income reported by households interviewed in the four study villages, 29% was derived from the forest and environment (Figure 17.3). However, forest dependence generally decreased across time and distance to high quality forest. KAP1 and 2 were closer to intact peat forests, and had higher forest-based income than KAP3 and 4 (see Figure 17.4), which were surrounded by degraded peatlands. In all study villages, households shifted to rubber and gold mining after logging was banned in 2005. Reliance on farm income relative to non-farm and forest/environment incomes was highest in KAP3 and 4, where rice cultivation was an additional income source not available for KAP1 and 2.

Timber was still the most important construction material in our study communities, although prices had increased due to low supply. Most households in our study communities extracted some NTFPs, including *gemor* (*Alseodaphne* sp.) bark,[10] wild rattan, wild honey, birds, fish, fruits and vegetables. In study villages located farther from forests, the concept of forest was often intertwined with the concept of rubber gardens, which look similar to forests. Products such as fuelwood, wild pigs, frogs, snakes, birds, medicinal plants, wild vegetables and fruits were collected from these gardens. Only men venture beyond rubber gardens to log, hunt or clear secondary forests for agriculture. Women and men sometimes go together to collect NTFPs such as *gemor*. In these villages, many NTFPs were also gathered in and around their rubber gardens and settlements, such as rattan, honey, fish, fruits and vegetables.

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9 USD 1 = IDR 9090 (2010 exchange rate, World Bank 2014)

10 Gemor bark is sold as raw material for mosquito repellents.

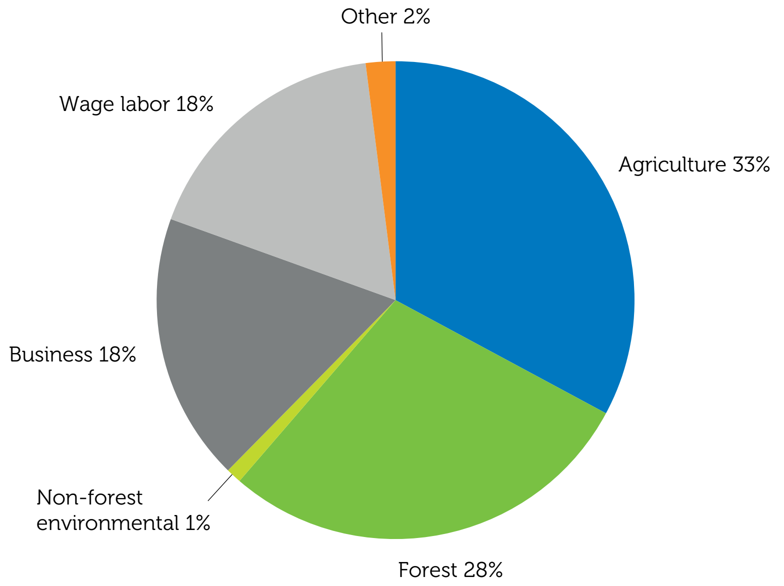

Figure 17.3 Sources of income for all households in sample (n = 131).

Note: livestock contributes a net negative 1.5% to income because of high costs in the survey year.

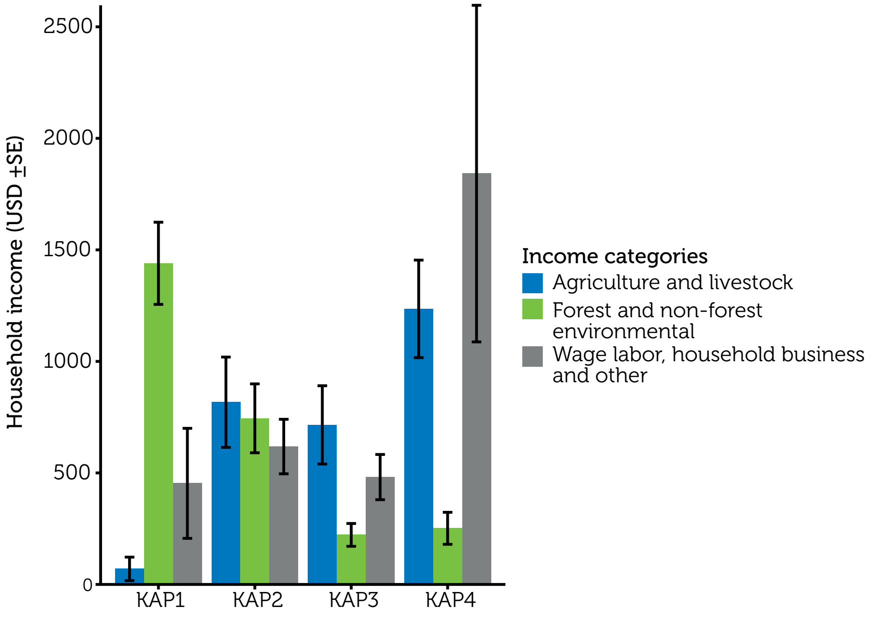

Figure 17.4 Sources of income for average household by village (+/- SE) (n = 131).

Rice and rubber latex were the main sources of agricultural income. Net income from agricultural products in the survey year, which includes subsistence and cash income, ranged from USD 1388 to 2251. Swidden agriculture for rice cultivation was practiced widely in Block A, but was not possible in Block E. In the last two years, 13 of 132 sampled households reported clearing an average of 1.5 ha of primary or secondary forest for agriculture. They claimed most agricultural lands were converted from shrublands. In Block E, land clearing for rubber was decreasing due to a shortage of suitable land for planting rubber. Across KFCP, rearing large livestock was difficult due to the lack of fodder in the area.

17.4 Challenges facing the initiative

In 2011–2012, as KFCP activities with communities continued to intensify, benefit sharing and land tenure became the main issues raised by households we talked with. Local customary tenure rules give individuals land claim when they have invested on that land (e.g. planting, clearing land). Since KFCP funded planting in village areas, there were worries the land would be claimed by KFCP. This worry dissipated after the village agreements. In 2013, many households still thought their village leaders took the lion's share of KFCP benefits, such as getting included as laborers, being (paid) members of TPK/TP, providing services (e.g. transportation), and the (speculated) possibility of appropriating leftover funds from KFCP activities.

Canal blocking was the main technical intervention that KFCP planned to implement, but it was highly criticized by a group of peatland scientists in Central Kalimantan. They pushed for an evaluation and re-evaluation of KFCP's environmental impact assessment, and argued it will alienate local people and funnel money to private contractors (APFP 2011). The criticisms were based on limited knowledge of the techniques that would have been used by KFCP, but in the end, the canal blocking was cancelled. Based on discussions with villagers and KFCP staff involved in the canal blocking negotiations and design, most of the budget and work would have been managed and implemented by villagers. Village leaders welcomed it and were confused about why it was canceled. There were efforts underway to revive it through post-KFCP initiatives (personal communication from Siran, 2014).

In the field, community engagement absorbed significant staff time and resources. There were strong and constant negotiations between village/customary leaders and KFCP to include, for example, Dayak Ngaju rituals, local ecological knowledge, customary land tenure arrangements and local labor in KFCP implementation (personal observation of negotiations and rituals; Nurhayati et al. 2014). This meant that negotiations in preparation for implementation were time-consuming and contentious, but essential and unavoidable.

In 2010–2011, concerns about KFCP among local communities were based on experience with the MRP and CKPP. During these early years, local people were worried and confused about KFCP's identity and objectives, and did not trust them. Local communities confused KFCP with previous projects (e.g. CKPP, BOS Mawas) due to overlaps in objectives, staff, partners and site (Franky 2011). By 2013, the confusion was significantly reduced because of the observable activities supported by KFCP, the ways and principles used by KFCP when implementing those activities, and public speeches given by senior government officials in support of KFCP (personal communication from S Atmadja, 2014).[11]

17.5 Lessons from the initiative

As a bilateral demonstration activity, there was tremendous pressure for KFCP to perform and share knowledge. But KFCP did not widely disseminate information about its activities until 2012, more than two years after the start of field implementation. For example, until 2012, the easiest way to access KFCP's PDD was through the website of the Ministry of Foreign Affairs of Finland (n.d.), even though they were an Indonesian and Australian bilateral program. This was unlike other REDD+ initiatives, which worked hard to showcase their work, through interviews, websites and newsletters. REDD+ initiatives that try to get carbon certification must provide an extensive initiative description, and implementation report on the carbon standards' website.

In 2012, key informants from the district government felt KFCP did not consult with them enough, and they felt left out of the decision-making process related to KFCP. Some researchers criticized KFCP for delays, under performance and lack of transparency (Olbrei and Howes 2012). In 2011–2012, KFCP was caught in a domestic Australian political climate that was becoming less supportive of Australia's climate change policies. This was related to the power struggle between then prime minister and supporter of climate change initiatives, Julia Gillard, and the foreign minister, Kevin Rudd. Negative media reports were taken up quickly in domestic Australian politics. Some members of the Australian senate took the view that KFCP was a "total failure" because, according to Senator Christine Milne of the Australian Senate, "about one-third of the AUD 100 million has been spent and only 1,000 hectares has been replanted" (Australian Senate 2012, 148). Such statements symbolize their understanding of KFCP as a REDD+ demonstration activity.

Critical news on KFCP's impact on local people often appeared in websites (e.g. reddmonitor.org, forestpeoples.org, foe.org.au, walhikalteng.org) and was reported

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11 Atmadja S, Jihadah L and Indriatmoko Y. n.d. What is REDD+? Local interpretations and communication challenges. Unpublished manuscript.

in mass media (e.g. Surbakti 2012). KFCP criticisms reached a high point when a representative from Yayasan Petak Danum, a local NGO, submitted a formal letter to the Australian delegation visiting the KFCP site in February 2011. This letter listed their concerns about KFCP, which included lack of transparency, lack of recognition of and respect for indigenous rights and knowledge, poor choice of project staff, and lack of community engagement (Lang 2011).

Some of the critical assertions about community perceptions of KFCP were inconsistent with our observations in the field. Other researchers working in KFCP have quietly hinted this as well (e.g. see comments from Alue Dohong and Medrilzam in Lang 2011). We attribute the inconsistencies to two reasons: (i) the type of people whose perceptions were elicited, and (ii) the point in time when perceptions were elicited. In the communities we studied, strongly negative feelings against KFCP highlighted by critics were expressed by a small number of vocal individuals. Yet the majority of local people we talked with, either through targeted formal interviews, or random dialogues and household surveys, ranged from being positive, indifferent/"wait and see", or unaware of KFCP. Timing of the observation also matters. Earlier in the implementation phase (2010–2011), we observed general wariness and concern about how communities could benefit from KFCP. At the time, most of KFCP's activities were still viewed by locals as not being concrete. By 2013, almost all households we randomly surveyed received some livelihood benefits from KFCP, and many people stated that they wanted KFCP to continue.

As government agencies, IAFCP's implementing agencies (AusAID and MoFor) were not quick to react to such public controversy. IAFCP remained silent, until an independent review in 2011 made it clear that they needed a communication strategy, and prompted action (See AusAID and DCCEE n.d.). A communication expert was hired, and a website was created by the end of 2012. KFCP published dozens of working papers, all village agreements, quotes and stories from community members, and their PDD online. By then, however, negative perceptions of KFCP had already taken root.

The lesson is that large, REDD+ initiatives need to actively communicate with all stakeholder groups, especially during the initial period, when uncertainty is high. Our research did not delve into the reason why this did not take place in KFCP. In donor countries, funding REDD+ activities overseas are part of existing debates on climate change. In recipient countries, local governments need to be included in the decision-making process. Information about strategies, objectives, progress and plans need to be widely available and responsive to the needs of civil society. Observers should also be aware that communities are heterogeneous and perceptions change. They should be mindful of the way inquiries about local people's perceptions are conducted.

17.6 Acknowledgments

We are grateful for the kindness and generosity of the key informants, survey respondents, guides and residents of the villages we studied and for help from the staff at IAFCP, KFCP, CARE, Walhi, YPD, the Kapuas district and Central Kalimantan provincial governments. A team of field enumerators, interns and research assistants made it possible for us to collect data and insights used in this chapter. Our appreciation is owed to: Josephine Styorini, Lena Riansy, Linggarjati, Rohana, Susanti, Lina Farida Jihadah, Angela Iban, Bimo Dwisatrio, Robiansyah and Martide. We are also grateful to Yusef F. Hadiwinata and Yeyet Suryatno for introducing us to the KFCP area during our scoping trip in 2009. Data entry and cleaning were provided through the keen eyes and endless patience of Tina Taufiqoh and Merlinta Anggilia, and we are grateful to them for their help. We would also like to thank our reviewers (Ida Aju Pradnja Resosudarmo, Tim Jessup, Achmad Pribadi and Sulistyo Siran) for their useful comments that helped to improve this chapter.

Chapter 18

Katingan Peatland Restoration and Conservation Project, Central Kalimantan, Indonesia

Yayan Indriatmoko, Stibniati S Atmadja, Nugroho Adi Utomo, Andini Desita Ekaputri and Mella Komalasari

The Katingan Peatland Restoration and Conservation Project (Katingan Project) is an ecosystem restoration initiative on a peat swamp forest in Central Kalimantan, Indonesia.[1] It is managed by an Indonesian company, PT. Rimba Makmur Utama (PT.RMU). Like the Rimba Raya initiative (Chapter 20), the Katingan Project applied for an ERC, which was granted by MoFor in late 2013. The ERC license covered only half of the proposed area, which is not consistent with the ideal approach for peatland conservation/rehabilitation of protecting the integrity of the entire peat dome. This chapter describes the initiative based on the CIFOR-GCS survey conducted in 2010 and 2011, interviews with key informants between 2011 and 2014, field observations, and other documentation.

1 Also known as the Katingan Peatland Restoration and Conservation REDD Project.

18.1 Basic facts: Where, who, why and when

18.1.1 Geography

In the initial proposal, the Katingan Project was meant to cover a project area of 203,570 ha across two districts in Central Kalimantan: Katingan and Kotawaringin Timur (Kotim). This area covers an entire peat dome and was proposed to MoFor as the ERC license area ('project zone'). It was located between Mentaya River to the west and Katingan River to the east, almost reaching the Java Sea to the south. The Katingan side is accessed mainly via the Katingan River. The Kotim side can be accessed by road and by the Mentaya River. Sampit, the district capital of Kotim, lies on the western side across the Mentaya River, while Sebangau National Park (SNP) lies on the eastern side across the Katingan River. We refer to the area between the proposed project zone and these natural borders as the buffer zone.

There are 34 village settlements in this buffer zone. Most people in these settlements make their livelihoods from activities in the buffer zone (e.g. fishing, food production, rubber tapping and rattan cultivation). Some forest-based livelihood activities such as NTFP collection (e.g. gemor,[2] songbirds[3]) and small-scale logging are located in the proposed project zone. In the north, there are small-scale gold and zircon mining concessions and oil palm concessions that put pressure on forests in the buffer zone.

The proposed project area is formally zoned as 88% production forest (*hutan produksi*) and 12% production forest for conversion (*hutan produksi yang dapat dikonversi*) (Hartono 2013). Prior to 2002, it had been managed for decades through logging concessions (*hak pengusahaan hutan*). Since then, there has been no active logging concession in the area. A small part of the proposed project area (13%) was non-forest, while the rest was forest degraded by fire or previous logging (34%), and primary or productive forest (53%) (Hartono 2011). This area has high biodiversity, with at least 144 tree species and endangered faunal species, such as orangutans and proboscis monkeys (Harrison et al. 2010; Harrison et al. 2011).

In October 2013, MoFor granted PT.RMU an ERC license in the Katingan district portion of their project zone (108,255 ha), which effectively cut the proposed project area in half (MoFor 2014a). This is denoted as the initiative area in Figure 18.1. Out of a total area of 377,428 ha under ERC licenses in Indonesia,

2 The bark of the gemor peat swamp tree (*Alseodaphne sp*) is sold for producing mosquito coils. It is harvested by cutting down the tree and removing the bark *in situ*. The bark is sold wet or dry.

3 The *cucak hijau* or the greater green leafbird (*Chloropsis sonnerati*) is captured from the wild and sold to bird enthusiasts across Indonesia. Competitions are held to judge the male birds' singing abilities.

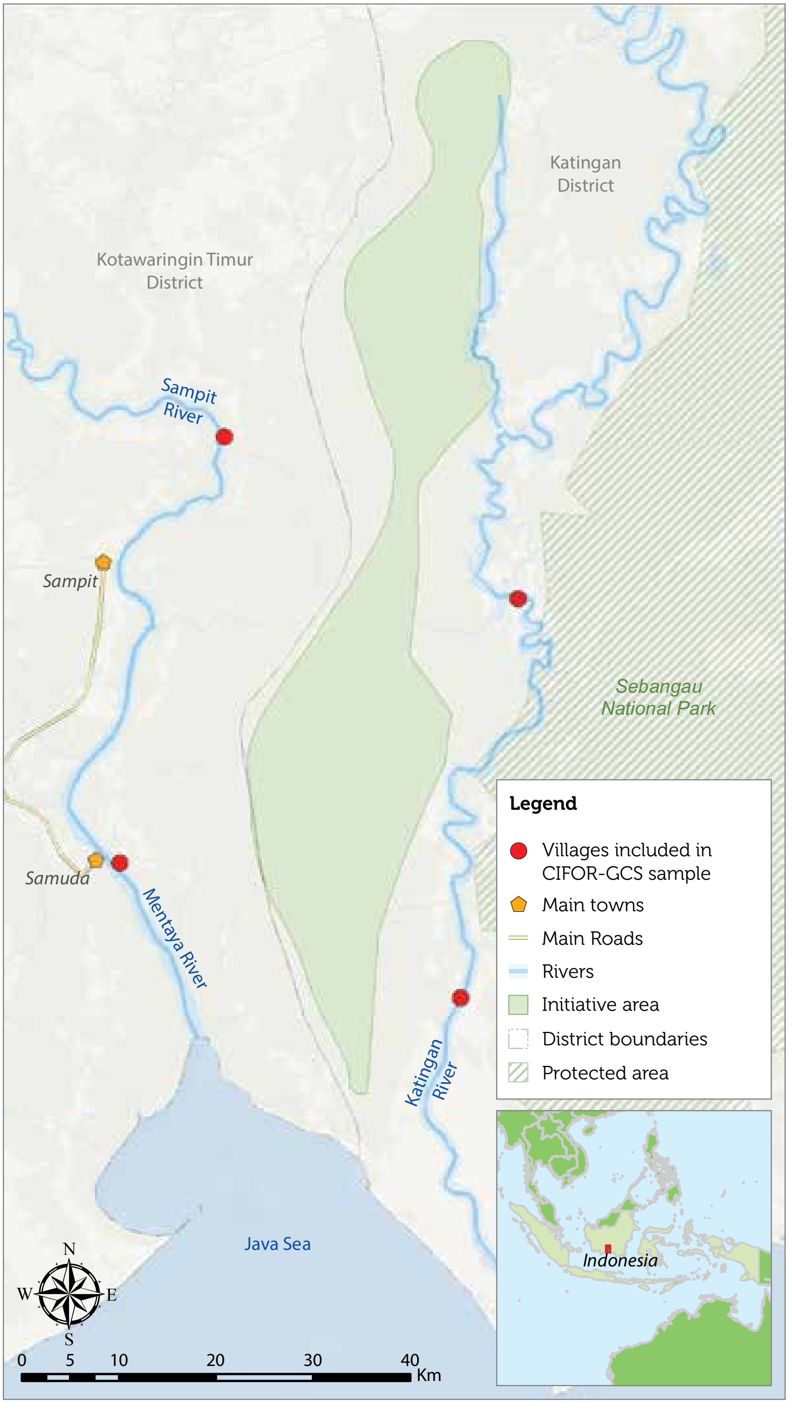

Figure 18.1 Map of the Katingan Project.

Data sources: PT.RMU, GADM, IUCN and UNEP-WCMC (2005), and World Ocean Base.

this was the largest single ERC license (Hendroyono 2013). As of 2014, PT.RMU is still seeking to acquire an ERC license for the remaining portion in Kotim district. When selecting study villages, CIFOR-GCS considered the larger project zone as initially proposed, because it represented the area that the initiative intended and is still trying to protect.

The main economic sectors of Katingan district (where the current project zone is located) are mining (e.g. coal, gold, zirconite), oil palm, rubber and fisheries. These sectors contributed approximately 38% of the district's GDP in 2012.[4] The district spans 17,800 km^2, has flat terrain at an altitude ranging from 13 to 50 masl and has an annual rainfall of 3018 mm/year (BPS Katingan 2013a). The population of Katingan district in 2013 was 152,724 (BPS Katingan 2013a). Between 2008 and 2012, population growth rate in Katingan district was between 0.96% and 1.88% per annum.[5] Some of this growth reflected in-migration related to the recent district establishment (2003) and to jobs in oil palm plantations and mining. People migrated from other parts of Central Kalimantan and from South Kalimantan, Madura and Java. In 2008, there was only 33.82 km of paved road in the district, which almost tripled by 2012 (BPS Katingan 2013a). The Katingan River remains the main access route to most settlements in the district.

18.1.2 Stakeholders and funding

The proponent of the Katingan Project is PT.RMU, a private Indonesian company based in Jakarta, Indonesia. Since 2008, Starling Resources, an environmental and sustainability consulting group based in Bali, Indonesia, has led project preparation and development on behalf of PT.RMU. Prior to gaining an ERC license, the Katingan Project conducted preparatory activities with funding from donor institutions (e.g. the Clinton Foundation) and a feasibility study to establish a bilateral offset credit mechanism between Indonesia and Japan (Japanese Ministry of Economy, Trade and Industry) (Wardell and Alimi 2010; Siran et al. 2012). Activities were carried out in partnership with, or building on the work of NGOs (e.g. Yayasan Puter, Simpul Layanan Pemetaan Partisipatif Kalimantan Tengah, Yayasan Cakrawala Indonesia, Yayasan Kopernik, Photo Voices, Pokker SHK, Orangutan Tropical Peatland Project), international/government institutions (Forestry Research and Development Agency, ITTO), universities (Palangkaraya University, Hokkaido University) and private companies (Marubeni Corporation, Terra Global Capital, Starling Resources, Posh Graffiti, Permian Global) (Siran et al. 2012; Yayasan Puter 2014; Katingan Project n.d.).

Governmental institutions relevant to the ERC licensing process became important stakeholders in the Katingan Project. This includes MoFor, which

4 Authors' calculations using data from BPS Katingan (2013b).

5 Authors' calculations using data from Table 12.1 in BPS Katingan (2012a).

processes and issues the license, and the district governments of Katingan and Kotim, which provide recommendations required for the license. In contrast to other REDD+ initiatives in Indonesia, there have not been any forest protection interventions by nongovernmental institutions in the proposed initiative area. This land zone is under the jurisdiction of MoFor and is eligible for ERC. Across the district and Central Kalimantan in general, there are many overlapping land-use licenses, because the process of synchronizing the land zoning status with the provincial spatial plan in Central Kalimantan has been extremely slow. Large actors such as oil palm and mining businesses influence land-use decisions at the district level. These dynamics have affected the Katingan initiative. For example, the district head allocated parts of the initiative area to nine mining and six oil palm companies, which delayed the ERC license process (Hartono 2011). Prior to proposing its project area, PT.RMU excluded 2000–3000 ha of land allocated to an oil palm concession at the request of the Katingan district head.

The villages in the project area were considered by a key informant in the district government to be the poorest in the district. The REDD+ initiative was seen by the key informant as an opportunity to improve their well-being. These villages have limited access to markets and livelihood options. From a legal perspective, tenure is weak because it is based on customary laws (Safitri 2010). The Katingan Project planned to specify benefit-sharing arrangements through village agreements with each village in the project area (target village). To provide clarity in benefit sharing, the initiative will conduct participatory mapping or will use previous maps (by Yayasan Puter) to clarify rights and liabilities. Conflict over land and natural resources among community members is not high because they all adhere to the same customary rules and the population density is low.

18.1.3 Motivation

The leaders of PT.RMU, Dharsono Hartono (CEO) and Rezal Kusumaatmadja (COO), come from business and environmental backgrounds. They want to develop a new business model based on forest conservation, and the idea of forest carbon trading seemed like a way of achieving this. The establishment of PT.RMU and the Katingan Project was motivated by the idea that forest conservation in Indonesia can be profitable (Butler 2013; Katingan Project n.d.). The business started from personal networks and business partnerships of the two leaders. The Katingan Project expects to sell carbon credits in the voluntary market, and follows the certification processes of CCBA and VCS. As of 2014, the Katingan Project is in the process of carbon validation, and therefore has not yet sold any carbon credits. In an interview, the proponent felt the initiative could continue even without carbon financing, but did not elaborate on how that would be accomplished.

The governor of Central Kalimantan is supportive of REDD+ activities. This province is the first pilot REDD+ province selected by the Indonesian Government, and hosts many other REDD+ initiatives (e.g. KFCP and Rimba

Men and women in a study village remove the thorny outer layer of rattan vines as part of rattan processing. They are crafted into baskets, bags and mats, or sold as semi-processed rattan. (Nugroho Adi Utomo/CIFOR)

Raya, in Chapters 17 and 20, respectively) (Butler 2010). It also contains large areas of tropical peatland, which is dense in belowground carbon. We observed that there was a network of NGOs in Central Kalimantan that were critical of REDD+ in general (e.g. WALHI- Kalimantan Tengah, Yayasan Petak Danum and Save Our Borneo). In an interview, a key informant in one of these NGOs expressed concern that local people are just spectators in the REDD+ debate because of their weak tenure status and that REDD+ is not focused on the more important drivers of deforestation such as oil palm plantations and mining.

The Katingan Project was the first REDD+ effort in Katingan or Kotim district. PT.RMU considered eight sites prior to selecting the proposed intervention area, which was chosen because it covers an entire peat dome, was only partially degraded, and was threatened with conversion and drainage.[6] Before the ERC license was issued in 2013, WWF, the Katingan district forest service and Yayasan Puter conducted forest conservation and community development activities in villages targeted by the initiative.

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6 These factors are needed to show additionality (i.e. emissions would have been higher without the initiative).

18.1.4 Timeline

The project timeline (Figure 18.2) begins with project preparation, which was done in October to December 2007 and included a feasibility study to assess biophysical, tenurial and social factors. PT.RMU submitted their ERC license application to MoFor in November 2008. In early 2009, the company started limited community engagement to introduce the Katingan Project (*sosialisasi*) by means of village meetings and posters in selected villages (Hartono 2011). PT.RMU received its SP-1 (*Surat Perintah Pertama*/First Letter of Order) from MoFor in June 2009, which stated that the company is a prospective holder of an ERC license over 217,755 ha of land in two districts (Katingan and Kotim). For the proponents, this marked the beginning of their project. Three years later (in February 2012), the second letter of order (SP-2) was received, following the approval of their environmental impact assessment. This letter is an order from the minister to the forest planning bureau (Badan Planologi/Baplan) to issue a working area map for the ERC. More than a year later, in October 2013, the initiative received its final ERC license covering 108,255 ha (MoFor 2013b).

The Katingan Project did not implement any activities to reduce emissions in the field prior to the issuance of the ERC License. They did not directly engage with communities for preparatory activities in order to avoid raising local expectations while there was a risk that the license would not be issued. Early communication with local stakeholders (e.g. at the village and subdistrict levels) was focused on their plans for ecosystem restoration, rather than REDD+ or forest carbon.

There were, however, activities related to forest conservation and community development targeted at communities in the intervention area, which were conducted by other institutions such as Yayasan Puter, WWF and the forestry agencies (*dishutbun*) in each district. Yayasan Puter implemented many activities that supported the readiness of local communities for REDD+ and were complementary to the Katingan Project. Yayasan Puter eventually became a partner of the project. In contrast, the activities of WWF and the *dishutbun* built on their prior forest conservation efforts in the region and were independent of the Katingan Project.

In early 2009, Yayasan Puter conducted participatory mapping in three villages in the Katingan Project to clarify village borders and establish village land-use plans, with funding from the Packard Foundation (Yayasan Puter 2014; Packard Foundation n.d.). From December 2012 to November 2013, additional funding from USAID enabled Yayasan Puter to expand this work to 12 villages in Katingan and Kotim districts, including our four study villages (Yayasan Puter 2014; IFACS n.d.). PT.RMU planned to overlay these maps with the maps of the ERC limits, forming the spatial basis of future village agreements.

Pre-2000			
2000			
2001			
2002			
2003			
2004			
2005			
2006			
2007	PT.RMU project preparation		
2008	PT.RMU applies to MoFor for ERC license		
2009	PT.RMU early socialization	PT.RMU received SP-1 letter from MoFor	
2010	CIFOR-GCS baseline survey: village level		
2011	CIFOR-GCS baseline survey: household level		
2012	PT.RMU received SP-2 letter from MoFor		
2013	CIFOR-GCS presents baseline results to study villages	MoFor grants ERC license to PT.RMU	
2014	Firefighting teams are established	CIFOR-GCS phase 2 survey	PT.RMU plans to start village agreement process

REDD+ initiative active

Figure 18.2 Timeline of the Katingan Project.

From 2009 to 2010, Yayasan Puter facilitated the establishment of community rubber gardens in two villages in the Katingan side, to rehabilitate degraded peatlands and provide livelihoods. From 2010 to 2011, the Global Environment Facility (GEF) funded Yayasan Puter to conduct various activities in two villages, including facilitating the establishment of a credit union type scheme (*simpan pinjam*) for women, and provide fisheries assistance (GEF 2012a). This provided around USD 5500 of seed funds for each village, funded by GEF. We observed that the credit union was dynamic, and members used funds to develop small businesses such as producing pastries, opening shops and making handicrafts. Not all women in those villages became members because of perceptions of membership limitations, resulting in jealousy among women who wanted to be members. Fisheries support was provided to ten community groups across the same two villages, consisting of 2–5 people in each group. It included providing floating fish cages (*karamba*) and hatchlings such as Nile tilapia/*nila* (*Oreochromis niloticus*) and Giant Snakehead/*toman* (*Channa micropeltes*), and establishing fishponds.

In 2012–2013, GEF funded activities to develop small-scale rattan businesses that were facilitated by Yayasan Puter (GEF 2012b). The focus was on two villages in Kotim with an existing rattan business community that could be developed. In November 2013, a shipment of rattan baskets from these villages arrived in the UK to be marketed by the eco-label Posh Graffiti. Villagers were satisfied by the relatively high price offered for rattan products. A key informant in one of those villages felt that most of the rattan was commissioned to only one village, which left a feeling of inequality in the other village. In March 2013, Yayasan Puter and Yayasan Kopernik distributed 180 compact solar lights to members of the women's credit union in one village. Due to high demand, an additional 300 lights are being distributed in this and two other villages (Kopernik n.d).

After the ERC license issuance in October 2013, PT.RMU conducted several activities in our study villages, many of which were done in collaboration with Yayasan Puter. In March 2014, they established firefighting teams, similar to those established previously by WWF in several villages adjacent to SNP. Some activities were planned for 2014, including reconciling maps from the participatory mapping exercise with the ERC license map issued by MoFor. Similar to KFCP (Chapter 17), this initiative also wanted to make village agreements, which were planned to start in mid-2014 (personal observation). The agreements are likely to include enhanced policing of forest access and use. Reforestation of degraded lands within the PT.RMU project area is planned to start at the end of 2014.

18.2 Strategy for the initiative

Most of the initiative area is still intact or partially intact peat forests. Therefore, much of the focus is on avoiding future drainage and deforestation, with some forest restoration activities planned in the southern part of the project. Like Rimba Raya (Chapter 20), the Katingan Project uses its ERC license to secure management rights over the area. By including the entire Katingan peat dome under an ERC license, it can legally block others from converting the peatlands to other land uses, thereby protecting the peatland's integrity and avoiding future emissions. To date, half of the peat dome is protected in this way, and plans are underway to incorporate the remaining areas of the dome in the near future. Until this is completed, areas outside the current ERC license remain under threat.

This partial protection could have negative impacts on the area inside the ERC. Peat soils have high hydraulic conductivity compared to inorganic soils (Wong et al. 2009). The result is a strong hydrologic link between peatland conditions 'downstream' (i.e. the edges of the peat dome, nearer to rivers) and 'upstream' (i.e. the center of the peat dome, where the project zone is located). Peatland degradation downstream (e.g. through land conversion, fires, opening canals) could negatively impact the peatland upstream by increasing the flow of water coming out of the peat dome (Holden et al. 2006). This leads to higher rates of peat oxidation, which causes carbon emissions from peatlands upstream.

Current pressures and future threats on forests and peatlands include fires, illegal logging and forest conversion to alternative land uses by smallholders, especially agriculture for food production, rubber and small-scale gold mining. The minimal law enforcement that currently exists is seen by PT.RMU as a potential challenge. More than a quarter of the proposed project area was affected by human activities. This includes ditches (*tatas*)[7] from previous and current logging found mainly in the southern part of the proposed project area.[8] These waterways drain the peatlands and increase the probability of fires. To reduce peatland drainage, the project planned to re-wet degraded peatlands.

Since our study began in 2010, several large-scale oil palm plantations operated outside of the proposed project buffer area, and were keen to expand. Small-scale swidden agriculture by communities and migrants operate in the buffer zone outside of the ERC area and are generally kept close to settlements. North of the project area, forests and vegetation have been gradually converted into barren sand by artisanal gold miners, which could potentially encroach into the project's buffer zone in the future. Fuelwood and NTFP collection did not pose substantial threat to the proposed project area because they were mostly collected from the buffer zone and did not threaten peatland integrity.

In some public documents (e.g. Terra Global Capital n.d.) the Katingan Project is explicitly called a REDD+ project. However, their website does not use "REDD" to describe itself and uses phrases such as "peatland restoration and conservation" (Katingan Project n.d.). Their main goals are obtaining carbon funding, sustainable forest management and community development. The issuance of the ERC license at the end of 2013 marks a kick-start in discussions about forest use and management with communities.

To ensure that the public knew the challenges they were encountering, gain support and manage expectations, PT.RMU's CEO Dharsono Hartono communicated extensively to a wide range of stakeholders. Stories about their trials and tribulations in getting their ERC licenses were shared through many national and international media outlets (e.g. story in the Jakarta Post

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7 Small, hand-dug 1–2 m wide ditches used to transport logs out of forest into larger waterways (e.g. secondary or primary rivers). These ditches can be a few kilometers long. They contribute to peatland drainage, which could lead to its degradation.

8 See Chapter 17 (KFCP), describing the role of canals and ditches (*tatas*) in causing peatland degradation and GHG emissions.

[Desilets 2010]). Unlike KFCP (Chapter 17), most of the media coverage was positive or neutral. Mr. Hartono spoke in and attended a wide range of events, including international conferences (e.g. Forests Asia Summit, UNFCCC COP), MoFor workshops, national REDD+ stakeholder meetings, civil society meetings (e.g. of the Indigenous People's Alliance of the Archipelago/Aliansi Masyarakat Adat Nusantara [AMAN] Kalteng[9] in 2012; a REDD+ journalist training in 2011; The Forest Dialogue's Field Dialogue on 4Fs in Indonesia in 2014), and events for the general public (e.g. spoke at a TED talk in Jakarta and to the Indonesian Heritage Society). Mr. Hartono and Mr. Kusumaatmadja spoke about their plans directly in village and subdistrict meetings. This was perceived positively by the village key informants. PT.RMU worked with the Photo Voices Program to involve nine community members in four villages (including some of our study villages), to document and report events related to people and the environment. These communication efforts were a delicate balancing act. For example, Harrison Ford, the famous actor and environmental activist visited the site in 2013 as part of a documentary TV series, putting the project in the spotlight (Lang 2014). The documentary was particularly critical of MoFor, at a sensitive time when the project was undergoing their licensing process.

Some key informants in our study villages said that they would prefer if PT.RMU become operational soon. They thought activities by NGOs such as Yayasan Puter tended to be short term and dependent on donor funding. Unlike NGOs, PT.RMU is a private company with a long-term forestry concession. Their experience with forestry concessions suggests this will have positive long-term effects on the local economy. However, they felt most people still do not understand the Katingan Project's business plan, but believed that companies like them will always find a way to make a profit. Local elites in one study village openly expressed their wariness of an ecosystem restoration company like PT.RMU, because they believed elites could get routine cash incentives (e.g. monthly payments) from oil palm concessions.

With regard to benefit sharing, a 2014 government regulation states that 10% of carbon sales will be recorded as MoFor revenue (GoI 2014). A general community development/alternative livelihoods program is planned as a benefit sharing approach, which will be made through a legal village agreement. We cannot yet determine if special attention is given to segments of the local communities that are more likely to be impacted by the project, such as illegal loggers and seasonal hunters.

As part of a feasibility study, the project assessed forest cover using remote sensing, ground truthing and community perceptions of forest change. They plan to monitor the entire project area, and are still considering ways to monitor leakage. The BAU deforestation rate is calculated using historical averages, while carbon density,

9 Kalteng is an abbreviation for Kalimantan Tengah, or Central Kalimantan.

subsidence and water levels are monitored and assessed using transects and semi-randomized plots. Carbon pools being monitored include above and belowground carbon. Estimates for forest degradation have not been developed. Prior to the ERC license being issued, carbon assessments were done by Starling Resources. An REL has not yet been published. However, PT.RMU stated that 10 million tCO_2e/year are being saved by the project (Hartono 2012).

Villages in the target area receive interventions and support from various government programs and NGO activities. Government institutions provide support for agriculture, fisheries, infrastructure, water and sanitation, food subsidies, education and health services. Among our four study villages (KKT1–KKT4), KKT1 and KKT2 received significantly more interventions for forest conservation because of proximity to the SNP. In 2013, the park management included them in the process of park zonation to clarify the village boundary in relation to the park's boundary. The provincial public works agency rehabilitated irrigation canals in KKT3. From 2012 up to now, the Katingan district forest and agriculture service (*dishutbun*) helped to establish community seedling nurseries (*kebun bibit rakyat*) in four study villages.

According to two village heads, the participatory mapping exercise helped clarify previously unclear village boundaries. They felt it was a sign that the project will acknowledge local people's rights within PT.RMU's project area. They contrasted this with other villages in Katingan district, that were often uncertain about their village boundaries. The Katingan district government has a village boundary mapping program, but it had not been implemented in villages in the Katingan Project during the time of our survey.

18.3 Smallholders in the initiative

Data for this section was taken from household, village and women's surveys in four villages (KKT1 to KKT4) targeted by the Katingan Project. These villages were selected from 13 villages that the project determined in 2010 would be affected by their activities. In each village, 33–34 randomly selected households were interviewed totaling 133 households. Two study villages are along the Katingan River in Katingan district, while the other two are along the Mentaya River in Kotim district (see Figure 18.1). These villages existed before Indonesia's independence in 1945. In KKT1, KKT2 and KKT4, we sampled the entire village (*desa*); In KKT3, our sample was limited to a few neighborhoods (Rukun Tetangga/RT) that consisted of the rural portion of a larger village that had more urbanized areas. In 2013, KKT3 split into an independent village. In this study, our sampling strategy and analysis for household-level data was focused on KKT3, and not on the larger village from which it originated.

Across the study villages, income from wage labor and household business were the most important part of household income (Figure 18.3), but there was substantial variation across villages (Figure 18.4). In study villages on the Katingan district side, forest products were important sources of livelihoods, although they were not the primary livelihood (Table 18.1). A large proportion of households in KKT1 (90%) and KKT2 (36%) earned cash income from forest products. These villages also had among the highest portion of total income from forest products among our 23 case studies (KKT1=52%, KKT2=30%) (Figure 18.4). In KKT1, much of their income was from wild-caught fish, making them more vulnerable to anomalies in rainfall patterns. In 2010, a La Niña climatic event caused river flows to be uncertain, which made catching fish difficult. Additionally, KKT1 had a big migrant community that come to live in the village for logging, which was legally banned in 2005. The effect of the ban started to be felt in 2009. The logging ban and 2010 La Niña triggered enormous out-migration; key informants estimated that 60 of 300 households moved out of the village in search of jobs between 2009 and 2011. In KKT2, forest-based incomes were less vulnerable to climatic anomalies because their incomes from forest and environment were diversified among fish, fuelwood, bamboo, birds, hunting, wild vegetables, medicines and timber. Most household incomes, however, are derived from rice, rattan and rubber production, and labor.

Table 18.1 Indicators of household forest dependence based on the 2010 survey.

	KKT1	KKT2	KKT3	KKT4
Number of households sampled	33	33	33	34
Household average (SD)				
Share of income from forest	52.48 (37.31)	29.83 (58.25)	1.57 (5.38)	6.60 (21.00)
Share of income from agriculture	1.06 (18.04)	3.92 (95.90)	8.85 (26.51)	17.78 (36.08)
Area of natural forest cleared (ha)[a]	0.03 (0.17)	0.09 (0.29)	0.13 (0.32)	0.05 (0.22)
Area of secondary forest cleared (ha)[a]	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Area left fallow (ha)[b]	2.22 (1.90)	4.29 (8.26)	0.87 (0.79)	1.56 (0.76)
Distance to forests (minutes walking)	30	60	120	60
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	20	48	51	60

continued on next page

Table 18.1 (continued)

With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	6	15	9	2
Reporting increased consumption of forest products[e]	3	5	0	7
Reporting decreased consumption of forest products[e]	30	36	33	40
Obtaining cash income from forest products[f]	91	36	3	9
Reporting an increase in cash income from forest[f]	0	8	0	0
Reporting a decrease in cash income from forest[f]	48	33	0	67
Reporting fuelwood or charcoal as primary cooking source	97	97	85	82
Leaving land fallow[g]	15	52	42	21
Clearing forest[g]	3	9	15	6
Reporting decreased opportunity for clearing forest[g]	39	48	33	28
Clearing land for crops[g]	3	9	15	6
Clearing land for pasture[g]	0	0	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

In the Kotim study villages, very few households earned any cash from forest products (KKT3=3%; KKT4=9%), but it represented an important source of income for those households. In KKT3, fuelwood was the main forest product harvested (by 38% of households), and did not generate cash income because it was not traded. Agricultural production and labor were the most important income sources for both villages, especially for rice. In terms of well-being, KKT3 was visibly the poorest village (Table 18.2). Like KKT1 and KKT2, it lacked any road access, but prices for goods were higher because unlike other study villages, there were no merchant boats that directly sold goods there. Soils were not productive for small-scale rice and rubber cultivation, and there were no stable income sources. Differences in reliance on forest and environmental incomes across study villages can be seen in Figure 18.3 and 18.4.

Table 18.2 Socioeconomic characteristics of households interviewed in 2010.

	KKT1	KKT2	KKT3	KKT4
Number of households sampled	33	33	33	34
Household average (SD)				
Number of adults	3.1 (1.6)	3.3 (1.4)	2.7 (1.1)	2.7 (1.0)
Number of members	4.7 (2.0)	4.9 (1.9)	4.3 (1.7)	4.6 (1.5)
Days of illness per adult	4.8 (6.2)	3.6 (6.1)	11.2 (24.6)	16.5 (38.7)
Years of education (adults ≥ 16 years old)	5.6 (2.9)	6.2 (3.1)	6.0 (3.5)	5.5 (2.9)
Total income (USD)[a]	2,607 (2,299)	2,448 (2,884)	1,432 (1,243)	4,207 (6,347)
Total value of livestock (USD)[b]	309 (1,325)	80 (262)	89 (279)	7 (17)
Total land controlled (ha)[c]	2.4 (3.6)	5.1 (7.2)	1.3 (1.5)	1.3 (1.3)
Total value of transportation assets (USD)	250 (409)	145 (130)	257 (363)	308 (420)
Percentage of households with:				
Mobile or fixed phone[d]	82	88	79	82
Electricity[e]	55	73	79	97
Piped water supply	0	0	9	0
Private latrine or toilet	24	21	45	6
Perceived sufficient income	91	85	70	91

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.
b Total livestock value at the time of interview.
c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.
d Only mobile phones, with limited service in KKT1 and KKT2. Landline connections did not exist in study villages.
e KKT1 and KKT2 had communally managed generators; KKT3 and KKT4 were connected to an electricity grid.

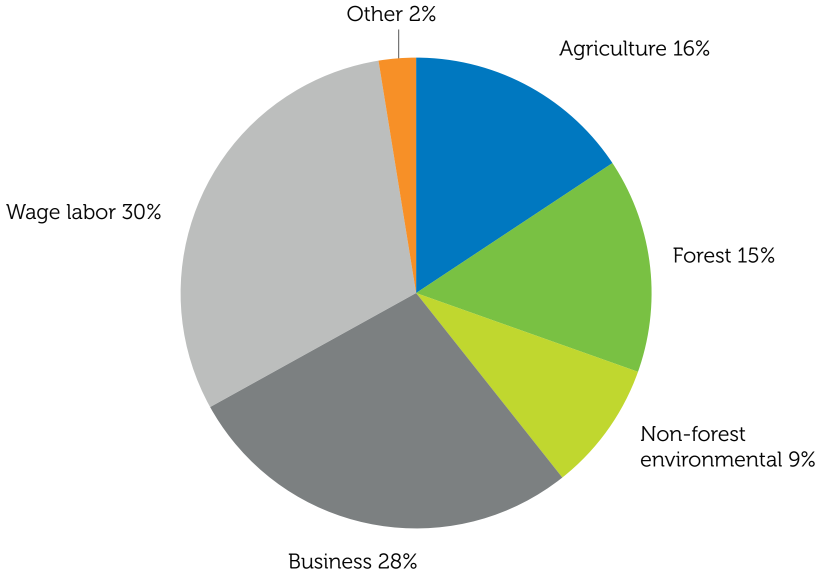

Figure 18.3 Sources of income for all households in sample (n = 133).

Note: Livestock contributes a net negative 1% to income, because of high costs in survey year.

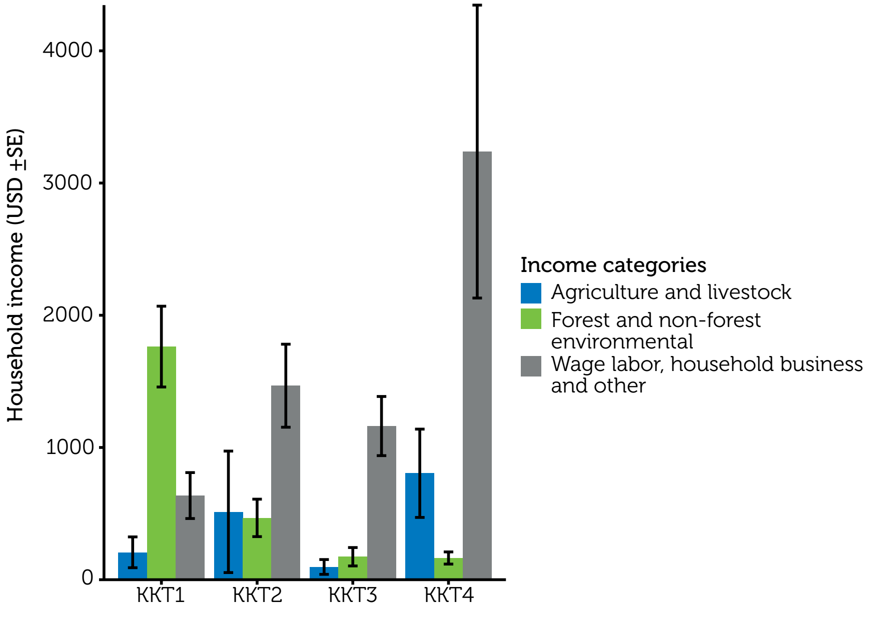

Figure 18.4 Sources of income for average household by village (+/- SE) (n = 133).

According to our village survey, forests within village boundaries have decreased compared to two years prior to the survey due to logging, conversion to agriculture and forest fires. This mostly affected the buffer zone of the Katingan Project. Some informants, however, thought that there was forest regeneration due to a logging ban enforced in 2005. Across all sampled households, consumption of forest products and cash income from forests generally decreased or stayed the same in the two years prior to the survey. Dependence on fuelwood for cooking was high, ranging from 82%–97% of sampled households in the study villages.

During times of economic difficulty, some household members in the study villages migrated north to work as laborers in oil palm plantations and small-scale gold mines. For example, the exodus of people from KKT1 in 2010 looking for work was primarily to oil palm plantations and mines in the north. In the south of the project area (e.g. KKT2 and KKT3) there were few employment options compared to other villages in the north (e.g. KKT1 and KKT4). This is because their area has deep peatlands, where the establishment of oil palm plantations is discouraged. Many community members migrate to the north to find short-term/seasonal work. Among our study villages, KKT3 had the lowest average income and the lowest proportion of sampled households that reported a sufficient level of well-being.

During our last visit in 2014, communities in KKT2–4 were approached by oil palm companies, who were interested in opening plantations in village areas within the Katingan Project's proposed project area. If the Katingan Project could secure an ERC on the Kotim side, their efforts for protecting forests could include limiting the presence of oil palm plantations in villages (e.g. KKT3 and KKT4). Key informants in the three affected study villages felt oil palm plantations could provide jobs and new economic opportunities. Local people in one study village preferred oil palm plantations to the Katingan Project; in another village they were open to both oil palm plantations and the Katingan Project; in another village, local people chose to weigh up their options while observing how the Katingan Project unfolds.

18.4 Challenges facing the initiative

As one of the 'first movers' from the private sector to implement REDD+ in Indonesia, the Katingan Project was faced with myriad challenges similar to those encountered by Rimba Raya (Chapter 20). The most well known was the five-year process of securing an ERC license, which at the end only covered half of the peat dome proposed by the initiative. Experts have argued that the boundaries of ERC licenses should be based on a different paradigm than other types of forestry concessions (Sugiharto 2013; Sigit 2014). The ERC business model is starkly different from most (extractive) forestry concessions and needs to take into account biophysical and social aspects of forest restoration activity (Sugiharto 2013; Sigit 2014). The government's reluctance to approve an ERC over a large area (> 100,000 ha) was reportedly due to its concern that the initiative will not be able to fund and manage such a large area, and – based on a previous ERC case in Jambi – may have serious problems with local communities (Noviani 2013; Sugiharto 2013). Furthermore, MoFor stated when it was awarding concession areas, it had to consider equity among companies requesting forest concessions (Noviani 2013). In the media, PT.RMU highlighted its efforts in getting a license 'by the book,' that is, without bribing, pulling strings or taking shortcuts. They argue that this 'by the book' approach partially explains the long delay in obtaining a license (TedxJaksel 2012; Butler 2013).

Timing is an issue. The delay in issuing the license combined with the slow development of voluntary carbon markets have meant that local communities have not been able to see tangible economic benefits from REDD+ to date. This contrasts unfavorably with local experience of very real employment benefits from competing land uses, such as oil palm.

High costs have been another challenge for the initiative (See Box C on REDD+ in-depth costing, which estimates the cost of this initiative). These included large up-front costs incurred for the large license fee of approximately USD 1.8 million,[10] setting up MRV systems, and creating new methodologies suitable for their REDD+ strategy and conditions (Butler 2013). Key informants who worked for the Katingan Project noted potentially large additional operating costs due to weak law enforcement against illegal land uses.

18.5 Lessons from the initiative

We draw attention to two notable features of the PT.RMU experience in establishing the Katingan Project. First, the political and economic considerations that influence boundary delineation for ERC licenses are inconsistent with the ecological desirability of protecting entire, rather than just parts of, peat domes. Despite PT.RMU's persistence, good communication approach and careful attention to the licensing process, their story highlights that acquiring an ERC license to implement REDD+ is difficult for large peat domes (>100,000 ha) in Indonesia. But currently, the ERC is the only alternative available to the private sector and NGOs for securing the right to protect forests zoned for production or conversion.

The government is reluctant to issue licenses over large areas, even if it is for forest restoration purposes. A recent ministerial decree limits the ERC to 50,000 ha

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10 Estimate based on the list of 1998 non-tax income (Penerimaan Negara Bukan Pajak/PNPB): ((IDR 50,000/ha x 100,000ha) + (IDR 62,500 x 8255 ha)) x 3 periods (life of concession) = IDR 16,547,812,500 or USD 1.82 million (1 USD = 9090 IDR). One period is 20 years (GoI 1998; Ministry of Forestry and Estate Crops 1999; and personal communication with Noah Geenberg, Starling Resources, September 2014).

per license, and up to two licenses per company (MoFor 2014b).[11] This is an impediment to Indonesia's ability to implement REDD+ effectively on peatlands, the degradation of which contributes at least 22% of Indonesia's annual GHG emissions. This regulation disadvantages peat domes larger than 50,000 ha (e.g. all the REDD+ sites we studied in Central Kalimantan), because it requires multiple licenses, which are likely to drive up transactions costs for conservation and rehabilitation initiatives. Large peatlands store more carbon and may need to be prioritized for protection and rehabilitation.

The concession model underlying MoFor's ERC regulations is traditionally focused on the timber industry model of extractive logging or timber plantations. In the typical forest concession model, the size and location of the concession determines economies of scale and harvest volume. If the concession area granted is smaller or different than the proposed area, it can reduce profits. In a similar way, the fulfillment of the purpose of an ERC can be undermined by issuing a concession area that is too small for ecological reasons, which has economic implications. The boundary size and location of an ERC relative to a peat dome is a large factor in determining the effectiveness of reducing emissions from peatlands, which in turn affects the amount of funds they can access from the carbon market.

The second feature of PT.RMU's experience relates to building REDD+ readiness and engaging with local communities. The initiative's intentions to engage and establish long-term partnerships with local communities were hindered by the delayed licensing process. Before the ERC license was issued, PT.RMU could not directly implement community-based activities and had to communicate using indirect means. Despite this, they had to maintain a presence in order to preserve their relationship with the communities. Even though activities by local communities are not the most important threat to peatlands, those communities are important allies in holding off larger threats, such as large-scale peatland conversion to oil palm plantations. One of the strategies the initiative used to launch community-based activities while waiting for the license was to work with an NGO. The NGO, Yayasan Puter, could operate independently and conduct 'no harm' activities that empower communities in the short-term and – when the time comes – facilitate the implementation of the Katingan Project.

18.6 Acknowledgments

We would like to thank a number of people and institutions, who made it possible for us to gather data and write this chapter. Thanks to our wonderful enumerators (Fatly Detris, Lenariansy, Samuel Tampung, Susanti, Jantrio Cristo,

11 Except in Papua, where a company can have at most two licenses at 100,000 ha for each license.

Erna Yuliarti, Lamretta Gultom and Afrilyadi Ekowibowo) research assistants (Selamet and Mambang Rena) and data entry technician (Mella Komalasari), for their perseverance, patience, hard work and attention to detail. We are grateful to our key informants (PT.RMU, Yayasan Puter, Katingan District Development and Planning Agency, Katingan District of Forestry Services, Katingan District Environmental Agency, Katingan District Marine and Fisheries Services, Katingan District Agricultural Services, Katingan District REDD+ Task Force, AMAN Kotawaringin Timur and the Council for Monitoring Indonesian Government Administrators/Dewan Pemantau Penyelenggara Negara Indonesia) for their willingness to share their knowledge and time with us, and to the residents of our study villages for their hospitality and generosity as hosts, key informants and survey respondents. We are also grateful to our reviewers (Ida Aju Pradnja Resosudarmo, Rezal Kusumaatmadja, Agus Djoko Ismanto and Daniel Murdiyarso), who shared their knowledge and made many helpful suggestions to improve this chapter.

Chapter 19

Ketapang Community Carbon Pools, West Kalimantan, Indonesia

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Ketapang Community Carbon Pools (KCCP) is part of the Southeast Asia Community Carbon Pools initiative managed by Fauna and Flora International (FFI) Indonesia Programme. Situated in Ketapang district of West Kalimantan, the goals of KCCP are to conserve the habitat of the endangered Bornean orangutan (*Pongo Pygmaues wurmbii*) (Rawson 2013) and to reduce GHG emissions. The core strategy is to secure community tenure rights and strengthen forest governance.

The forest landscape of Ketapang is both highly threatened and biodiversity rich (FFI–Indonesia Programme 2009). The forests are mostly managed under customary law by local Dayak and Malay communities, but are formally part of the forest zone (*kawasan hutan*), which is under the purview of the State (see Box H). The lowland and peat swamp forests within KCCP areas are primarily threatened by: illegal and unsustainable logging; conversion to oil palm plantations; the establishment of timber plantations, which often begins through clear cutting of natural forests; mining; and the development of plantation crops (sugar cane).

Threats to forests in KCCP come from large-scale external actors and from within the area, i.e. from small-scale activities such as swidden agriculture and forest fires (uncontrolled burning for land clearing) carried out by members of the community themselves (personal communication from KCCP senior staff, 2013; Wati 2014).

To fend off large-scale external actors, the initiative is seeking first to obtain *hutan desa* (HD, or village forest) tenure status for these villages, that is, community management rights over village forests situated within the forest zone (*kawasan hutan*), before advancing to REDD+. Thus, KCCP seeks to integrate a top down policy (i.e. internationally-driven REDD+ embraced by the national government) and a bottom-up initiative (i.e. the HD process initiated at the village level). Seven villages are currently participating in KCCP.

19.1 Basic facts: Where, who, why and when

19.1.1 Geography

Ketapang is the largest of the 14 districts/townships in West Kalimantan. It has a total area of 31,588 km^2 and includes 20 subdistricts (BPS Ketapang 2014). Most of KCCP's villages are found along the Pesaguan, Tayap and Pawan rivers (see Figure 19.1). The upstream settlements are inhabited by Dayaks, and Malays live in downstream villages. The upstream communities are dependent on river transportation, while roads provide the major transportation means for downstream communities.

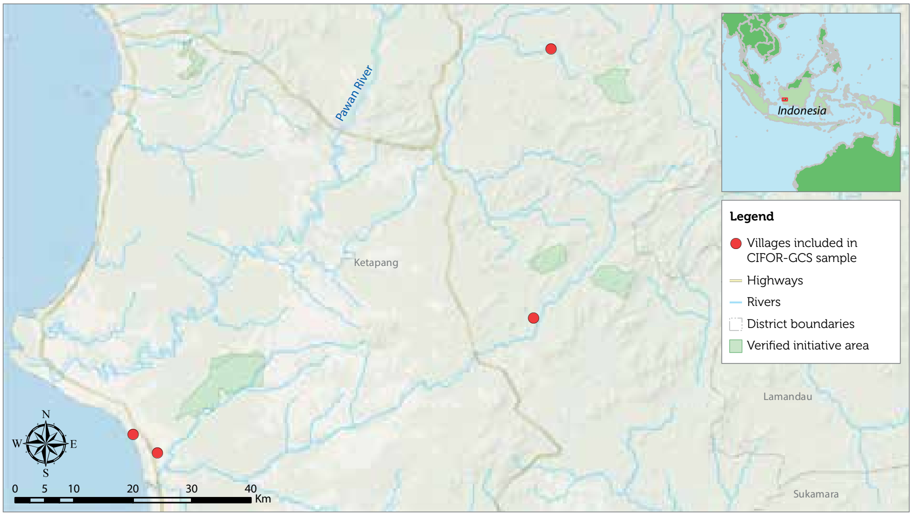

Figure 19.1 Map of the KCCP REDD+ initiative.

Data sources: FFI, CIFOR, GADM and World Ocean Base.

Nine villages were originally proposed for HD status. The proposal for two villages was turned down early on, so these two villages have been dropped from KCCP. KCCP proposed that 104,162 ha of Ketapang lands in a total of seven villages be verified and converted to HD. This includes four forest blocks ranging in area from 1083 to 61,000 ha. The areas proposed for conversion to HD are on lands covering several types of MoFor land-use classifications: production forest, conversion forests, protection forest and limited production forest (see Box H).[1] A total of three blocks, in which there are four villages (i.e. four HDs), have been approved, covering 6890 ha. One block of forests, in which there are three villages (i.e. three HDs), was only partially approved: 7435 ha encompassing 2 villages (i.e. two HDs). The HD over forests of the third village has not been approved. The largest HD area approved so far is 6825 ha.

Forest type and deforestation

Two types of forests are dominant in Ketapang. They are (i) secondary, lowland peat swamp forests downstream of the Pesaguan River (i.e. downstream villages) with deep peat soils, and (ii) dipterocarps on the mineral soils upstream of the Pesaguan and Tayap Rivers (i.e. upstream communities).

FFI assessed, monitored and recorded the change of forest and land cover in the area before focusing on forest carbon and the establishment of KCCP. They analyzed deforestation and forest degradation based on 2000, 2004 and 2008 remote sensing data. Spectral un-mixing was used to detect logging trails or removal of individual tree crowns. Communities participated in ground truthing of deforestation and surveys of high conservation value forests. The result of this analysis and of these biodiversity surveys highlighted the severity of the threat and fragmentation of forests in Ketapang. Measurement of the deforestation rate in the initiative has not been completed. KCCP uses the reported deforestation rate at the district level of 74,590 ha annually (Adhikerana and Sugardjito 2010). This figure was derived using analysis of forest cover change between 2000 and 2005.

Political and economic setting

The district's economy is primarily based on agriculture, mining and forestry. Rice (to fulfil subsistence needs) and rubber production (generating cash) are both important sources of livelihood for villagers. Oil palm and rubber are the two major traded agricultural commodities. While gold has been an important target of mining activities, there is emerging interest in bauxite. Small-scale illegal mining activities – mostly by outsiders – occur in some KCCP village areas. Until about a decade ago, there was a lot of timber extraction in Ketapang, with logs exported directly to Java and Singapore. While production appears to have

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1 Production forest can be legally used for timber extraction. Conversion forest can be legally zoned for conversion to other uses outside of forestry, such as for agricultural development.

declined since, we observed logs being transported daily out of Ketapang. Logs were being harvested from areas that will be converted to timber plantations as well as from other areas.

The peak of logging activities occurred in 1999–2001 when, due to decentralization, *bupati* (district heads) began to issue permits to cooperatives or individuals to boost district income. For communities, that period was perceived as a 'victory' as they could finally directly benefit economically from forests after serving merely as spectators on land claimed as theirs for so long. That period marked a shift, albeit temporarily, from the days of large concessions to logging activities based on small-scale licenses. However, these activities only led to temporary prosperity, as the proceeds were not reinvested into productive activities. When these licenses expired, people switched to rubber cultivation. Aside from providing a source of income, planting rubber trees showed active management and provided *de facto* proof of tenure.

Tensions over land rights sometimes occur between local communities and outside actors. They often occur due to the inconsistency between *de jure* and *de facto* tenure conditions, resulting in ambiguities of who has the right to a certain piece of land. As is common across Kalimantan, villagers of our study villages claim customary rights over their inherited lands without legal land title. Only a few people have formal land documents, and most of the forests in the study villages are formally under the purview of the State. Villagers are often unable to assert their land claims in the face of government-backed land-use changes.

The majority of villagers in one KCCP village were against the establishment of oil palm plantations and were supported by their *adat* (customary) leader and their village head. This opposition occurred even though the district government had already allocated part of their village area for conversion to oil palm. Eventually, in 2013, the *adat* leader gave consent for the establishment of oil palm in their area. Nevertheless, the village head and the majority of the villagers are still adamant that the oil palm company should not operate there. The *adat* leader was reportedly 'befriended' by the company and was told he would get a lot of money by selling his land to the company. The village head, however, kept his commitment to maintain village forests to maintain the traditional way of life, i.e. practicing swidden agriculture, gathering NTFPs and hunting. Although village communities mostly remain a tight-knit society, elite capture occurs in various forms.

Large-scale agricultural expansion (namely oil palm), timber plantation, smallholder agriculture (swidden and rubber), small-scale illegal logging and mining put pressures on the district's forests. The oil palm threat to forests was observed in another KCCP village. Logging operations occurred in this village until the mid-2000s. The entire village territory is under the jurisdiction of MoFor and was designated as production forests for conversion, making these logged-over forests available for conversion to other uses (FFI 2012b). In the draft provincial spatial plan, the area was reclassified as an area for other land use (APL) under the jurisdiction of the district. Prior to the finalization of the spatial plan, however, the district government issued permits for the establishment of oil palm plantations in areas adjacent to the KCCP initiative area.

A mining company also began to operate in the area, some of which overlapped with the area under the oil palm license. The overlapping claims led to conflict between the two companies (Fachrizal 2014). Most of the land area of that village has now become part of an oil palm concession and the company has plans to extend its area further. To block this expansion and future developments threatening forests, in 2009 FFI facilitated an HD proposal to MoFor for part of the village area. MoFor granted the HD working area license to this village in 2011.

19.1.2 Stakeholders and funding

The principal proponents of the KCCP initiative are the HD legal entities, i.e. the village communities holding the HD rights. KCCP is facilitated and managed by FFI–Indonesia, a private NGO. Since 2008, FFI has worked in collaboration with various organizations to implement KCCP. Those working on community development, capacity building or social aspects include local NGOs such as Dian Tama, Titian, RMI (Rimbawan Muda Indonesia), LATIN (Lembaga Alam Tropika Indonesia), ASRI (Alam Sehat Lestari), Yayasan Palung, PRCF (People Resources and Conservation Foundation) and the University of Indonesia. Various other entities have also assisted KCCP on technical aspects, including Tanjung Pura University, Deltares and Forest Carbon. Some of these partnerships have since ended (e.g. with Dian Tama in mid-2010), while others have continued.

The total budget amounts to roughly USD 600,000, funded by the David and Lucile Packard Foundation, Australian Aid (AusAid), CLUA (Climate and Land Use Alliance), the European Union (EU), USAID Orangutan Conservation Service Program (USAID-OCSP), and UK Foreign and Commonwealth Office (UK-FCO).

FFI also works closely with the district, provincial and national governments as they each play a critical role in the process of HD. These government entities provide in-kind support, including time spent and costs borne by district and MoFor staff involved in the process. The head of the district forestry service has been very supportive of the process.

19.1.3 Motivation

Building on its previous focus on the conservation of orangutans and biodiversity, FFI decided to combine those goals with climate change mitigation. Other co-benefits aimed for are: poverty reduction, community development, sustainable forest management, improved governance and application of the rule of law. FFI were inspired by the Bali Road Map in 2007 (UNFCCC 2007) and believed that the sale of carbon credits could finance activities to reduce the grave threats facing orangutans due to forest conversion. They developed a proposal for REDD+, including villages based mainly on their biodiversity value, the level of threat to orangutan habitat from conversion to oil palm or other land uses, and the willingness of communities to protect their forests.

Two key issues had to be resolved in order to meet these objectives. First, there is lack of clear tenure for communities. Formal state ownership of village lands prevents the communities from having a legally recognized right to manage village forests. Clear tenure is a prerequisite for the ability to exercise the right of exclusion (to manage external threats)[2] and for any PES or REDD+ undertaking (i.e. to identify the local bearers of rights to a stream of income and responsibility for fulfilling performance-based arrangements). Securing community management rights is the first step towards a community-based REDD+ initiative. MoFor Regulation 49 of 2008 regarding HD or village forest paved the way for formal designation of a village forest area (as the HD of a village community) and for that village community to subsequently secure management rights over its forests (see below). FFI seized this opportunity by facilitating the process of HD application for the KCCP villages. Formally legitimate management rights will both empower and oblige village communities to manage natural forests sustainably.

Subsequent to initiating the process of obtaining HD tenure status, FFI seeks to introduce community-based REDD+. In accordance with state ownership of forests in the forest zone, carbon tenure is held by the State. The State however, can relinquish its carbon rights by awarding licenses to entities holding the management rights of that area. In this case, the community holding the HD management rights is eligible to apply for a carbon license.

The size of HD areas are relatively small (i.e. between 600 and 6825 ha, compared with areas under ERC licenses – see Chapters 18 on Katingan and 20 on Rimba Raya). There is thus an issue of economy of scale in establishing a community-based REDD+ project over a single HD. An adequate level of carbon emission reductions would need to be generated to be traded or to attract funding, and a small area will arguably achieve limited reductions. In addition, the costs of preparing a PDD and carbon verification are substantial. Targeting a larger block of forests across several HDs and applying carbon verification for the entire block will address these issues. Clusters of HD areas will be 'pooled' together to form a REDD+ community carbon pool (i.e. KCCP). Ultimately, funds raised from carbon emissions reductions from the initiatives are expected to support the conservation goals of the area.

Local communities' motivation in pursuing the HD were influenced by their 'closeness' to forests. Dependence on forests of villages upstream of the major rivers and those downstream along the coastal areas differed, which determined

2 Interview with an FFI senior staff member based on his observations, 2013.

Young oil palm plantation. (Dian Intarini/CIFOR)

the degree of interest they had in participating in HD. The former village head of a downstream village was aware that the village's peat forests were rich in biodiversity and that self-management would bring more benefits to the village compared to the conversion to oil palm plantations. Upstream, people from non-peat villages that were more dependent on forests expressed interest in obtaining HD management rights as they feared that the forest company in their area would clear cut their forests, thereby threatening their traditional agricultural practices. Similarly, one village was keen to obtain customary management rights as a way of improving tenure for their forests. The District Forestry Service advised the village to communicate with FFI, which subsequently led to that village joining KCCP.

19.1.4 Timeline

FFI Indonesia began work in Ketapang in 2003 focusing on the conservation of the habitat of orangutan and other vulnerable species in the area (Figure 19.2). Their work in KCCP is implemented in two phases: (i) preparatory or development of the initiative for a period of five years (2009 to end of 2013 or early 2014) and (ii) implementation phase. The preparatory phase includes the two crucial steps of obtaining HD tenure through MoFor's designation of HD working areas and obtaining HD management rights from the governor. The implementation phase focuses on REDD+ intervention activities.

Pre-2000				
2000				
2001				
2002				
2003	FFI begins conservation work in Ketapang district			
2004				
2005				
2006				
2007				
2008	FFI begins work on REDD+ in Kalimantan			
2009	FPIC for HD status begins	HD license application process initiated for nine villages		
2010	Awareness raising for REDD+, emphasizing HD	Participatory mapping	CIFOR-GCS baseline survey	FFI and MoFor sign memorandum of understanding to develop HD as a REDD+ mechanism in Ketapang district
2011	MoFor grants license for HD working area in six villages	Proposal for management rights of HD submitted to governor of West Kalimantan	CIFOR-GCS presents baseline results to study villages	Training on community-based monitoring and patrolling
2012	PDD for avoided deforestation in three villages drafted	Plan Vivo Project Idea Note (PIN) for one KCCP village drafted		
2013	Village land-use planning and delineation of forest protection zones in four KCCP villages	Beginning of community-based monitoring and patrolling	Women's activities in first pilot village	CIFOR-GCS phase 2 survey
2014	Agreement on benefit sharing arrangements in first pilot village	Agreement between FFI and first village to implement REDD+		

REDD+ initiative active

Figure 19.2 Timeline of the KCCP REDD+ initiative.

A large part of the work was focused on intensive activities surrounding the HD application process, both at the national, local and subnational levels. MoFor granted HD working area licenses for six villages in the second half of 2011 (Figure 19.2), completing the first step in the process of securing HD tenure. Emphasis is now placed on the second and last step of the process, i.e. obtaining the governor's management rights approval.

A PDD covering contiguous HD areas in three KCCP villages (see below) was drafted in 2012 to meet VCS criteria. It was estimated that over the first 10 years, some 800,000 tCO_2e in emissions reductions will be achieved annually from the proposed area of some 28,000 ha (FFI 2012a). This would be equivalent to 28.5 tCO_2e/ha/year. Community members were directly involved in the data gathering of biomass data to estimate baseline carbon stocks in the area.

The baseline is calculated by modeling planned deforestation based on typical oil palm conversion practices in the region derived from environmental impact assessment data and FFI's interpretations of satellite imageries. The base year for estimating an REL for the study site is 2010. In this contiguous forest block, a conservative figure of 1000 ha/year conversion to oil palm is used (FFI 2012a). As of the writing of this chapter (October 2014), this PDD has not yet been finalized.

In 2012, a Plan Vivo project idea note (PIN) was drafted for one, non-peatland (upstream) KCCP village. Aboveground carbon stock of secondary forest and mature agroforestry in this area is estimated at 58.62 (+/- 15.52) tC/ha (FFI 2012b).

2013 marked the beginning of REDD+ implementation in four KCCP villages. Activities include land-use planning, delineation of a protection zone of forests and community-based forest monitoring. In September, FFI began interventions in the first pilot village (Figure 19.2).

19.2 Strategy for the initiative

In facilitating KCCP, FFI simultaneously embraces bottom-up and top-down approaches. The foundation of KCCP is the HD entities. Thus, community engagement is a core element, not only in the process of obtaining HD licenses but because a community-owned initiative is essential to ensuring the establishment, support and continuity of KCCP. Community commitment is also important because forest threats come from both external and internal actors. FFI and communities are also involved at the local, subnational and national institutional arena of addressing deforestation, REDD+ and forestry policy consultation processes.

FFI uses a strategy that is centered on four elements: increased clarity and security of tenure over communities' village forests; contributing to achieving Indonesia's GHG emissions reduction targets (see Box H); conserving forests for endangered orangutan and other threatened species; and securing long-term funding for these conservation efforts through carbon financing. Funds generated will be used to fund KCCP's activities and support villagers' alternative livelihoods (FFI 2012a). FFI envisions that community management rights will likely lead to improved forest management when and if they result in tangible (e.g. financial or livelihood support) benefits to communities (FFI 2012b).

In the preparatory phase, activities included: institutional development by securing HD tenure; conducting FPIC; establishing collaborative management institutions; developing a PDD; seeking potential carbon markets; measuring carbon potential; training and planning in fire prevention, canal blocking and rewetting; and securing a REDD+ permit. Implementation included: monitoring and patrolling forests; activities that reduce net carbon emission directly or indirectly (e.g. canal blocking, rewetting and reforestation in downstream villages, and a particular forest management or livelihood activity that helps communities move away from carbon-emitting activities in upstream villages); carbon trading; and dissemination of knowledge gained.

HD management rights were acquired following a two-stage approach. The first step was to obtain MoFor's approval for an HD working area, i.e. the formal designation of a particular area of forests within the forest zone as an HD of a particular village community. The process involves stakeholders from local to national levels from the start of the initiative. It began with FFI's facilitation of a series of dialogues with communities and central, provincial and district governments on HD and REDD+.[3] For each participating village, FFI facilitated the formation of an HD team, which was tasked with, among others, identification of boundaries of the proposed HD area, preparation of a work plan and protection of the area. The village head submitted the HD proposal to the *bupati* for verification of the proposed HD working area. Subsequently, the *bupati* provided a recommendation for MoFor's consideration; MoFor then either entirely or partially approved or rejected the HD working area.

The second step was to secure the HD management rights from the governor. This grants the community the authority and rights to use and manage forest resources within the HD working area. The management rights must be obtained within two years of the approval of the HD working area, but management plans and forest protection activities can be carried out immediately after the HD working area is approved.

The village can only submit a request for right of management to the governor after it formulates a village regulation on the management of the HD. The duration of the HD working area license and management rights are 35 years and can be extended.

3 For example, in 2010 FFI hosted workshops in Ketapang and in Pontianak on HD and REDD.

Once an area is designated as an HD through a ministerial decree, that particular area will remain a category in the forest zone (i.e. as a production or a protection forest) for the duration of the license and is less likely to be classified as 'land for other uses' including for the extension of oil palm permits in the area. To ensure a strong and secure status of the areas allocated for HD, FFI and the HD teams were actively involved in the district's spatial planning processes. Incorporation of HD areas into the district spatial plan means that they are on the map that is used as a reference in any land-based development in the district. Thus the initiative ensured that planned conversion to oil palm or other uses was avoided.

Six villages have been awarded HD working area status over a total of 14,325 ha of forests by MoFor.[4] The proposal for the seventh village, covering an area of 14,000 ha of forest, is still being considered. At the time of writing this chapter, all six villages with HD working area licenses are in the process of obtaining their HD management rights from the governor. CIFOR conducted field research in four of the seven villages (KET1, KET2, KET3 and KET4). Partly due to limited resources, FFI currently focuses their REDD+ intervention activities in four villages and plans to work in the remaining villages later on.

KCCP is pursuing different REDD+ approaches across villages due to their different characteristics. For example, implementation of a pilot community-based PES, the Community Forest Ecosystem Services, has just started under Plan Vivo in the HD area of one upstream village in 2014. REDD+ activities in this village are most advanced among the KCCP villages. A benefit-sharing scheme PES-trial is currently being piloted in this village, where FFI provides about USD 10,000/year to the village. The benefit-sharing agreement of this support is as follows: 10% will be used for social activities (orphanage, disabled people, religious activities), 10% for landowners/managers (farmers' groups), 5% for health services, 70% for operational management of HD (training in capacity building and income generating activities, women´s activities, forest patrols, nurseries for reforestation, the HD team), and 5% for preserving traditional culture and customary systems.

Since 2010, together with two local NGOs, FFI has been facilitating work on avoiding forest conversion from oil palm over a block of contiguous peat swamp forests situated in three other villages (see above). HD REDD+ efforts are now being intensified due to increased threats to biodiversity within these forests from potential expansion of oil palm plantations.

4 MoFor Decrees 493, 494, 495, 586, 587, 588 of 2011.

19.3 Smallholders in the initiative

We collected primary data using household and village-level surveys in four (KET1, KET2, KET3 and KET4) of the seven KCCP villages from June to August 2010. We also conducted follow-up interviews and a desk review.

Village structure of the four study villages is similar to other villages across Indonesia, although the role of informal leaders in village governance varies in intensity. Village governments comprise of the village head (*kepala desa*), village secretary (*sekdes*) and administrative heads (*kepala urusan*). There is also a village council (*badan perwakilan desa*). In KET1 and KET2 villages, the customary leadership and institutions are considered to be the most important. In KET3, the village council plays a large role in village decisions. In KET4, the village government is prominent. Our surveys found that women in all four villages felt that they were not sufficiently represented in their village decision-making bodies.

Basic educational and health services are accessible in all study villages and there has been some observed improvement during the course of the research. In 2010, elementary schools were operational in all villages. Only one village did not have a secondary (junior high) school; children attended secondary school in a neighboring village. By 2014, however, a secondary school was established in this village. The average years of school attendance in all villages was between 5 and 6 years, or elementary school (Table 19.1). Two villages did not have operational health centers, but villagers had access to health services provided by a *mantri swasta* (private health practitioner) who lives in the village. In the same year, a supporting public health clinic (*pelayanan puskemas pembantu*) was established in one of the two villages.

Several sources finance the improvement of public facilities and roads. They include district programs, PNPM, local parliament's constituency allocations (aspiration fund), the village budget and the private sector. The district mining and energy agency provided electricity support for a selected number of households with school-age children and in the home of the village head in two study villages. More than half of the households sampled had access to electricity (See Table 19.1). Clean water installation was built in these two villages by a timber plantation company and through the PNPM program, respectively. In the other two villages, households had their own well or depended on stored rainwater. Cemented pathways or village roads were seen in all study villages. In one village, a big road was built using a local parliament's aspiration fund. In another village, the establishment of a timber plantation resulted in the construction of a new road that connects the village to the Trans Kalimantan road. This timber plantation replaced an earlier timber concession that had been operating in the area. Their operations resulted in the opening of a network of logging roads. Although mainly accessible during the dry season, logging roads are useful for villagers as they provide access to the adjacent subdistrict or town. PNPM funded the building of bridges in three study villages.

Table 19.1 Socioeconomic characteristics of households interviewed in 2010.

	KET1	KET2	KET3	KET4
Number of households sampled	33	33	33	33
Household average (SD)				
Number of adults	3 (1.2)	3.2 (1.3)	3.8 (1.7)	3.6 (1.6)
Number of members	4.7 (1.9)	5.3 (2.1)	5.1 (2)	5.2 (2.4)
Days of illness per adult	12.7 (37.9)	6.5 (16.9)	11 (29.2)	9.2 (24)
Years of education (adults ≥ 16 years old)	5.5 (3.1)	5.1 (2.2)	5.5 (3.2)	6.1 (4.1)
Total income (USD)[a]	3,039 (2,115)	7,314 (18,746)	2,729 (3,103)	1,960 (1,694)
Total value of livestock (USD)[b]	182 (209)	221 (480)	1,801 (7,827)	1,057 (1,366)
Total land controlled (ha)[c]	8.9 (10.9)	28.1 (89.7)	2.9 (5.1)	1.9 (1.8)
Total value of transportation assets (USD)	550 (507)	1,593 (3,022)	829 (1,883)	484 (725)
Percentage of households with:				
Mobile or fixed phone	12	39	64	58
Electricity	67	52	79	91
Piped water supply	0	0	9	27
Private latrine or toilet	12	15	39	55
Perceived sufficient income	88	79	70	82

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.
b Total livestock value at the time of interview.
c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

Road construction has affected the livelihoods of villagers in the two upstream villages (KET1 and KET2). Until 2010, rivers were the primary means of transportation. Development of the Trans Kalimantan road has had a huge impact on the villages' economy. People from one village sold bananas, durian and other forest products to the neighboring province of Central Kalimantan and benefitted from access provided by that road. By sending rubber latexes directly to Pontianak, the capital province of West Ketapang, local middlemen from the other upstream village cut the market chain and obtained more value from their sale.

Agriculture was an important source of income in all of the four study villages (Figure 19.3, Figure 19.4 and Table 19.2). The proportion of households engaged in agriculture as a primary and secondary livelihood was quite substantial in

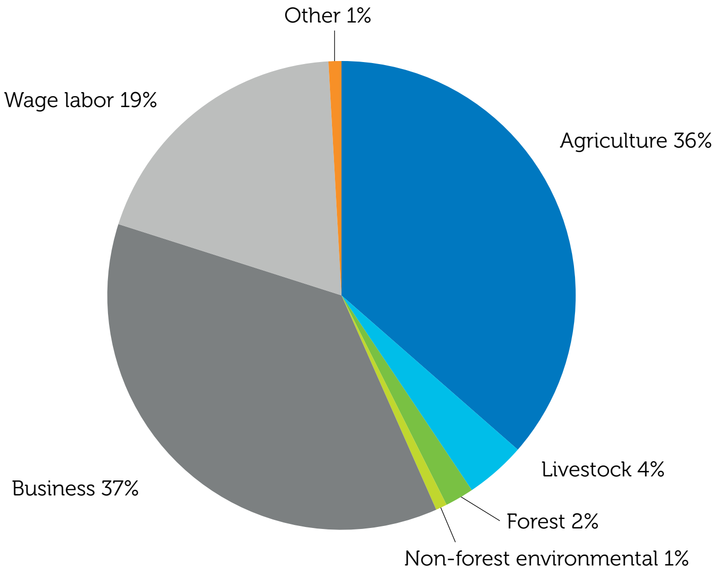

Figure 19.3 Sources of income for all households in sample (n = 132).

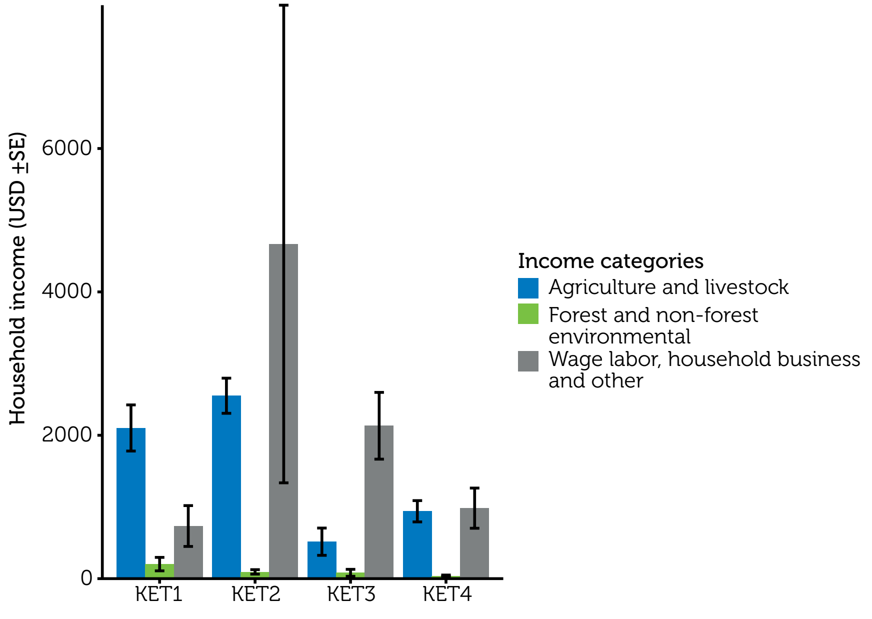

Figure 19.4 Sources of income for average household by village (+/- SE) (n = 132).

all villages, and was highest in KET2 and lowest in KET3. Rice is a major commodity in these villages; rubber is also an important commodity in KET1 and KET2 – the large income share from businesses in KET2 reflect middlemen's income from rubber trading. Villagers in KET1 adopted rubber after the timber concession ceased to operate and communities could no longer depend on income from logging activities and had to shift to other income sources. Prior to rubber they depended on swidden rice farming (*ladang*) and forest products. Villagers in KET3 and KET4 were mostly engaged in permanent rice farming, although some have recently begun to cultivate rubber.

Table 19.2 Indicators of household forest dependence based on the 2010 survey.

	KET1	KET2	KET3	KET4
Number of households sampled	33	33	33	33
Household average (SD)				
Share of income from forest	6.55 (19.08)	2.02 (5.96)	6.22 (22.60)	0.06 (0.34)
Share of income from agriculture	67.73 (36.94)	81.27 (27.38)	18.84 (38.10)	61.19 (36.26)
Area of natural forest cleared (ha)[a]	0.41 (0.90)	1.11 (1.73)	0.08 (0.25)	0.21 (0.50)
Area of secondary forest cleared (ha)[a]	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Area left fallow (ha)[b]	3.67 (2.92)	1.72 (1.62)	1.23 (0.71)	1.67 (0.88)
Distance to forests (minutes walking)	30	60	60	30
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	79	92	48	63
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	11	3	3	2
Reporting increased consumption of forest products[e]	6	24	7	0
Reporting decreased consumption of forest products[e]	56	29	14	38
Obtaining cash income from forest products[f]	41	53	26	11

continued on next page

Table 19.2 (continued)

Reporting an increase in cash income from forest[f]	15	0	0	0
Reporting a decrease in cash income from forest[f]	54	41	0	0
Reporting fuelwood or charcoal as primary cooking source	100	97	88	94
Leaving land fallow[g]	27	24	21	21
Clearing forest[g]	24	61	9	21
Reporting decreased opportunity for clearing forest[g]	48	12	26	40
Clearing land for crops[g]	24	61	6	15
Clearing land for pasture[g]	0	0	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

Oil palm and mining are contributing to the local economy. Logging activities that had started in the area of KET3 six decades ago have now ceased, and the area is now the only lowland secondary forest that provides suitable habitat for releasing orangutan in Ketapang (personal communication from Indonesia program director, International Animal Rescue, 2013). The threat to forests in the area has now shifted from logging to oil palm and (often illegal) mining. The Ketapang District Land Office (*Kantor Pertanahan Kabupaten Ketapang*) has approved initial licenses (*izin lokasi*) for oil palm establishments for two companies in the KET3 village area (FFI 2012a). Oil palm companies are also lining up to establish plantations in KET2 and KET4 villages. In addition to agricultural production, illegal gold and other mineral mining (note the high income share from wage labor in mining) are boosting the village economy of KET3. These activities attract outsiders and pose a threat to forests in the area.

Forests remain important for villagers. The two upstream villages were more reliant on forests than the downstream villages, and continued to use forests to practice swidden agriculture. A substantial percentage of households in the two villages had cleared forest in the two years prior to our fieldwork. Villagers also collected NTFPs and hunted. A substantial portion of households in these two villages earned cash income from forests. However, in all four villages, forest-derived income was small compared to non-forest income, even in the upstream villages. In the 12 months prior to data collection in 2010, NTFP harvests such as durian were relatively poor due to unusual weather. Similarly, hunting during the same period was not good.

There was significant support from local and national government programs and the private sector for communities' land-use activities and/or forest cover between 2010 and 2013. Rubber seedlings were distributed through transmigration-related and reforestation activities in one of our study villages. MoFor provided a nursery in KET1 to support community agroforestry (Kebun Bibit Rakyat, KBR). Agricultural support (hand tractor, fertilizers and seeds) and fishery support (fishing equipment, boats and fishpond establishment) were provided to KET3 and KET4. In addition, a food estate project involving rice field expansion and the development of irrigation systems are planned in KET3 and KET4. In KET3 and KET4, PNPM provided credits exclusively for women to help this particular group establish agricultural plots.

19.4 Challenges facing the initiative

KCCP has faced three major challenges. The first is land tenure uncertainty. State lands which, in reality, are used and claimed by communities, invite different interpretations of who has actual rights over them. Government issuance of licenses to use or convert forest lands on community-claimed lands can lead to conflict. This in turn can reduce incentives to protect forests. For REDD+ to be effective, clear tenure rights are a necessary, although not sufficient condition (see, for example, Resosudarmo et al. 2014a).

The second major challenge has been the protracted process of obtaining HD tenure. The HD working area license and the HD management rights are obtained through steps that involve stringent formal verifications. The entire process of obtaining the HD working area license for each of the intervention villages, with intensive facilitation and support from FFI throughout the entire process, has taken two years. At the time of writing (October 2014), however, none of the villages have yet obtained HD management rights from the governor – the next and last crucial step to secure HD tenure. Villagers are thus beginning to question whether they will actually get management rights over their village forests and subsequently receive REDD+ benefits. In the meantime, oil palm companies are promising higher financial returns to village decision makers. These dynamics can easily erode the enthusiasm of communities towards HD and REDD+, and ultimately have implications for their interest and ability to conserve their forests. Due to increasing threats to these forests and the declining confidence within communities, FFI is working hard to encourage the governor of West Kalimantan to award HD tenure status to the villages.

The third major challenge concerns the internal dynamics in the villages and the different dynamics across the villages. Despite sharing a similar culture, communities are pluralistic entities in which people do not always have similar preferences and objectives. For example, a segment of the community may support HD and REDD+, while another may prefer other forms of development. This was clear in one study village, where the community split into two polarized views. One group wanted to conserve forests, while the other wanted to have oil palm development. Those who wanted oil palm attempted to influence the conservationists and those who were unsure about HD and REDD+. Moreover, there are elites who do not always represent the majority voice of the community. Engaging with such a community requires an understanding of its internal dynamics, adequate resources and patience. Moreover, KCCP involves the pooling of villages. Different dynamics across the villages (e.g. external vs internal threats, types of threats, effective village governance) requires alignment and intensive facilitation.

19.5 Lessons from the initiative

KCCP is the product of a creative undertaking to combine opportunities arising from two policy developments. One is internationally driven REDD+ that has been adopted by the Government of Indonesia through its various REDD+ policies and regulations (See Box H) reflecting a top-down approach. The other, facilitated by the national government policy on HD, is the bottom-up, participatory approach for increased clarity and security of local communities' rights over their village forests. The participation and engagement of community is the essence of the entire HD process.

Ideally, national REDD+ policies and implementation of HD should be complementary to each other, yet the case of KCCP shows that they are not. The process of obtaining HD licenses is cumbersome, technical, time-consuming and costly so it poses mountainous obstacles to the process of enabling REDD+ on the ground. Moreover the process is complex and requires intensive communications with people at various scales in government, including in the capital city Jakarta; it is impossible to imagine how a highly motivated community could navigate this complex process on its own. The case of KCCP illustrates the indispensable role played by an organization such as FFI, and as well the urgent need for the government to streamline the process of obtaining the HD tenure status if it is truly committed to enabling the development of REDD+ on the ground. This case also shows that pressures against interests in conserving forests are strong, and thus the implementation of good policies such as HD should be guarded and supported, and if possible, made simpler and more amenable to bottom-up implementation so as not to lose the faith of communities.

FFI's success in raising local communities' awareness of the need to protect orangutans and to sustain their *adat* way of life, and in turn to affirm their willingness to protect their forests from outside interests through HD, was not achieved instantaneously. The dedicated hard work of the FFI staff, as well as their close personal relationship with people in the communities has played a crucial role in motivating them to participate in KCCP.

19.6 Acknowledgments

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Chapter 20

Rimba Raya Biodiversity Reserve Project, Central Kalimantan, Indonesia

Yayan Indriatmoko, Stibniati S Atmadja, Andini Desita Ekaputri and Mella Komalasari

Rimba Raya Biodiversity Reserve Initiative (Rimba Raya)[1] is a for-profit forest carbon initiative in Central Kalimantan, Indonesia. It is managed by InfiniteEARTH Limited, a private company based in Hong Kong. Through its registered business entity in Indonesia (PT. Rimba Raya Conservation or PT. RRC), it applied for an ERC license over a carbon accounting area (CAA) intended to protect an entire peat dome against planned conversion to oil palm plantations. MoFor granted the license over a part of the CAA, requiring the development of alternative management agreements between PT. RRC and actors such as oil palm companies and the district government. Together, the ERC license and agreements established the rights of use over the CAA, which is necessary for generating the more than 10 million carbon credits verified by VCS so far. However, there have been controversies about whether these alternative agreements are aligned with Indonesian regulations.

1 Also known as InfiniteEARTH-Rimba Raya Biodiversity Reserve Project or Rimba Raya Biodiversity Reserve REDD Project.

20.1 Basic facts: Where, who, why and when

20.1.1 Geography

Rimba Raya is located in Seruyan District, Central Kalimantan, Indonesia, bordering on Tanjung Puting National Park (TPNP) in the west, and the Seruyan River in the east (Figure 20.1). The district covers approximately 16.5 million ha divided into six subdistricts, of which 9.2% is peatland (Kabupaten Seruyan n.d.-c). Oil palm and rubber are the most important agricultural commodities in this district (Kabupaten Seruyan n.d.-a,b). The most important source of protein in the local diet is fish, which is caught from the Seruyan River, lakes, wetlands and *karamba* or caged aquaculture (Kabupaten Seruyan n.d.-d).

The Rimba Raya reserve is divided into a 47,237 ha CAA, where carbon reductions are calculated, and a larger initiative management zone (PMZ). Settlements (*pemukiman*) are located in the PMZ, but not in the CAA. When PT. RRC was established in 2008, the company initially planned for a PMZ covering 101,730 ha. Between 2009 and 2013, the proposed PMZ area was 91,215 ha, after excluding areas already developed into oil palm plantations. After the ERC license was issued in 2013, the PMZ was reduced to 64,977 ha. Throughout these boundary changes, Rimba Raya maintained the same CAA boundary, as required by the VCS methodology.[2]

The Rimba Raya initiative works with villages located at least partly inside the PMZ. The households in these villages manage land both inside and outside of this PMZ. Due to the change in the PMZ boundary in 2013, Rimba Raya added one village in the south and excluded six villages in the north, resulting in nine villages in the PMZ, all targeted for interventions. Of the four villages surveyed by CIFOR-GCS (SERU1–SERU4) (Figure 20.1), one (SERU1) was excluded by the 2013 change in the PMZ.

The current PMZ consists of the ERC license issued by MoFor (36,331 ha) and a patchwork of land management agreements with oil palm companies (8,855 ha), the Seruyan district government (95 ha) and TPNP (18,780 ha). Rimba Raya also manages 850 ha of forest zoned for conversion (*hutan produksi yang dapat dikonversi* or HPK) (Dirjen Planologi Kehutanan 2013). Prior to the ERC license being issued, the area proposed for the PMZ was 41.2% forested and 33% in peat swamps. The mean peat depth in the accounting area was 4.6 m (Lemons et al. 2011). Almost 26% of the proposed PMZ was cleared land and oil palm plantation, and 2.4% was active or abandoned cultivation (Bolick 2010).

2 The methodology requires that, "the original project boundary is fixed over the project life. Even if unforeseen circumstances arise within the project boundary such as deforestation, degradation, fire, or other land use change, the project boundary cannot be shifted." (VCS 2010, 7).

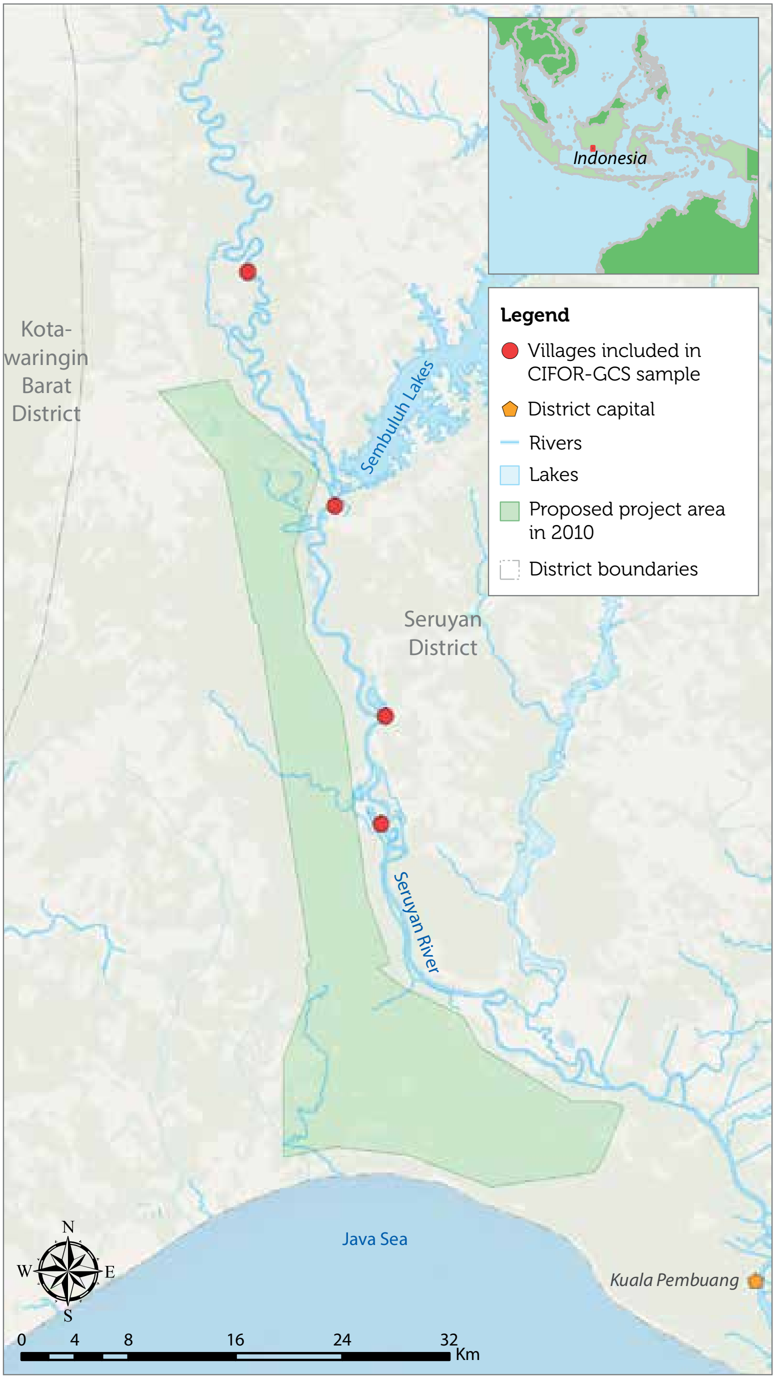

Figure 20.1 Map of the Rimba Raya REDD+ initiative.

Data sources: InfiniteEarth, Google Maps, GADM, Central Kalimantan EMRP Master Plan 2008 and World Ocean Base.

The total population of the 14 villages in the 2008 PMZ was at least 10,935 people (Lemons et al. 2011). According to interviews with key informants, the poorest people in the district live in villages along the Seruyan River, which includes all villages targeted by Rimba Raya. Average annual rainfall is approximately 2500–2700 mm (Bolick et al. 2010), and altitudes across the four study villages range from 4 m to 13 m. Access to the area is mainly via the Seruyan River.

Most lands in Central Kalimantan, including Seruyan district, are off limits to district governments because they are zoned as state forest under the jurisdiction of MoFor. Lands zoned as Area for Other Uses (*Area Penggunaan Lain* or APL) are under the jurisdiction of the districts, and are therefore considered important district assets. District governments want more state forests to be converted to APL for generating revenue, which is reflected in the provincial spatial plans (RTRW)[3] proposed by Central Kalimantan. These plans have not been approved by the central government, and there are already conflicting land uses. In the case of Rimba Raya, the area proposed by the initiative overlaps with five oil palm plantations, each with location permits issued by the district head for 12,000–19,000 ha of land.

There are frequent conflicts between oil palm companies and villagers, typically when oil palm plantations are developed in village areas without the villagers' consent. Communities have legally weak land ownership based on customary land tenure, while companies are in a relatively strong legal position with permits issued by the district head (Resosudarmo et al. 2014a). At least half of 14 villages in the original PMZ have experienced this type of conflict (Lemons et al. 2011, 61). The size of the areas in contention is often unclear but estimates range from 200–6000 ha per village (Lemons et al. 2011, 61).

20.1.2 Stakeholders and funding

InfiniteEARTH is the leading proponent that designs and implements the initiative. Its ownership is 100% foreign (personal communication from Procanik, 2014). Its registered business entity in Indonesia, PT.RRC, owns the ERC license (VCS 2011a; personal communication from Procanik 2014). Ninety percent of its startup funding was from private foreign investors. The balance was from forward credit purchases by Gazprom Marketing and Trading and grants from the Clinton Climate Initiative (personal communication from Procanik, 2014). It established its own VCS methodology with support from Shell Canada Ltd. (Lemons et al. 2011). Allianz (a German financial services giant) and Microsoft contracted to buy credits from Rimba Raya once they are available (Fogarty 2011).

3 *Rencana tata ruang dan wilayah,* or RTRW, is a participatory spatial planning process. It starts at the local level and is then proposed to the central government. The provincial spatial plan should reflect the aspiration of each district's spatial plan within the province. The latest draft for Central Kalimantan was published in a 2003 provincial regulation (Government of Central Kalimantan 2003).

TPNP is adjacent to the Rimba Raya reserve. It was established in 1982 and covers 415,040 ha (MoFor n.d.). By acting as a buffer zone, Rimba Raya hopes to reduce encroachment on TPNP. Rimba Raya has partnered with civil society organizations, consulting companies/experts, financial service providers and research institutes (Ginting 2010). Specifically for community development, it partnered with NGOs (World Education, Health in Harmony) and financial service providers (MBK Financial Services,Yayasan Mitra Dhuafa [YAMIDA]). For climate change mitigation, it partnered with Winrock International (carbon monitoring), Technofire Consulting Group (community-based fire brigades) and Camm Webb (low-impact horticulture practices). It collaborated with Orangutan Foundation International (OFI) for orangutan monitoring, research and repatriation, and Daemeter Consulting for biodiversity monitoring. Environmental Accounting Services, and Remote Sensing Solutions were consulted for carbon accounting and monitoring (InfiniteEARTH 2013).

Other institutions can also be considered stakeholders in the initiative, because of their roles in REDD+ and land-use planning. These include various agencies within MoFor (e.g. the Forestry Research and Development Agency [FORDA], the Forest Planning Agency [BAPLAN], and the Forest Protection and Nature Conservation [PHKA] under MoFOR), the Environmental Agency (BLH) and the Natural Resources Conservation Agency (BKSDA) at the provincial level, the Seruyan district government, and the National REDD+ Task Force.

20.1.3 Motivation

InfiniteEARTH saw potential to generate substantial revenues from the voluntary carbon market and chose the Rimba Raya site because of its large carbon stocks and potential to produce carbon credits. To help market the credits, it sought certification from VCS and CCBA and was verified by both in 2013. Its local partners (e.g. TPNP, OFI and World Education), had long-term experience in the area, which also helps strengthen investor appeal. The PDD projected that 105,863,425 tCO_2e in emissions from the CAA would be avoided during the 30-year initiative (SCS 2011). Of this amount, VCS has verified 2.2 million tCO_2e from July 2009 until June 2010, and 8.5 million tCO_2e from July 2010 to June 2013 (Environmental Services, Inc. 2013; SCS Global Services 2013). Satriastanti (2014) reports that half of the credits have been sold.

The provincial government of Central Kalimantan is supportive of REDD+ implementation. In September 2011, the province became the first REDD+ pilot province in Indonesia (Satgas REDD+ and Pemprov Kalteng 2011). In 2013, Central Kalimantan published its own provincial REDD+ strategy document (Rusan et al. 2013). As of 2014, Rimba Raya is the first and only REDD+ initiative in the Seruyan district.

Since 2000, planned deforestation and government policies to convert land (including peatland) and forest into oil palm plantations have been the main threats to forests in the initiative site (Lemons et al. 2011). Oil palm plantations in the district have expanded rapidly, providing jobs and attracting migrant workers. From 2008 to March 2014, the district government issued 43 oil palm concession licenses covering 598,815 ha. However, 10 of them (113,611 ha) are operating illegally from the national government's perspective because they do not have permits to operate in state forests, where their concessions are located (Borneo News 2014).

20.1.4 Timeline

We divide Rimba Raya's timeline into a preparation phase (before the ERC license was issued) and a field implementation phase (after the license was issued) (Figure 20.2). The preparation phase consisted of the establishment of Rimba Raya as an initiative, the FPIC processes, feasibility studies and the ERC licensing process, and of preparation and validation for CCBA and VCS. The field implementation phase included VCS and CCBA verification and interventions at the village level. For the purposes of our study, we consider the issuance of the ERC license as the start of field implementation, based on our observations during fieldwork in 2010, 2011 and 2013. Figure 20.2 summarizes key events across both the preparation phase and the field implementation phase.

The ERC license process took four years and passed through five milestones (Pelayanan Informasi Perizinan Kementerian Kehutanan 2012). First, PT. RRC submitted its proposal for an ERC license to MoFor in April 2009. Second, MoFor issued a First Letter of Order (Surat Perintah 1 [SP1]), which acknowledged the ecosystem restoration plans and asked the company to submit an environmental impact assessment within six months (December 2009). Third, MoFor issued a Second Letter of Order (Surat Perintah 2 [SP2]), which ordered MoFor's forest planning bureau (Badan Planologi [BAPLAN]) to issue a working area map (June 2010). This step identifies whether the proposed area is legally clean and clear for being managed as an ERC. It revealed that there were several overlaps with oil palm concessions in the area, leading to delays in the licensing process. The fourth milestone was achieved three years later, when in March 2013, MoFor issued a ministerial decree for the ERC license. The company must pay a USD 0.6 million license fee,[4] which is calculated based on the number of years and hectares the ERC license is valid, and must be paid upfront within one month of the issuance of the ministerial decree (PT.RRC and OFI 2011; Pelayanan Informasi Perizinan Kementerian Kehutanan 2012; Hendroyono 2013; Antara/ PT. RRC 2014).

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4 Authors' estimate based on the list of 1998 non-tax income (Penerimaan Negara Bukan Pajak) (See GoI 1998): IDR 50,000/ha x 36,331 ha x 3 periods (life of concession) = IDR 5,449,650,000, or USD 0.5 million (USD 1 = IDR 10,461). One period is 20 years.

The ERC license granted by MoFor was for 36,331 ha, which only partially covered Rimba Raya's CAA. To secure its user rights over the remaining CAA, Rimba Raya had to negotiate directly with actors driving deforestation in the area, such as oil palm companies. It also negotiated with the Seruyan district government so that some non-forest zone areas could be managed as ecosystem restoration areas, and could act as a buffer for TPNP. The resulting agreements enabled Rimba Raya to proceed with verification by VCS and CCBA. In May 2013, MoFor issued a letter considering Rimba Raya's proposed management area of 64,881 ha for an ecosystem restoration business. This area combines the various agreements and the ERC permit (Dirjen Planologi Kehutanan 2013).

Pre-2000				
2000				
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008	Initiative launched			
2009	Beginning of first VCS carbon crediting period	PT. RRC applies for ERC license	PT. RRC receives SP-1 letter from MoFor	
2010	PT. RCC receives SP-2 letter from MoFor	Beginning of second VCS carbon crediting period	Validated by VCS, and proposed VCS methodology accepted	CIFOR-GCS baseline survey
2011	CCBA validation	CIFOR-GCS presents baseline results to study villages		
2012				
2013	MoFor issues ERC license to PT. RRC	MoFor grants Rimba Raya's management area	VCS verification for 1st and 2nd crediting periods	CIFOR-GCS phase 2 survey
2014	CCBA verification, achieving Gold Standard	Distribution of village development funds to nine target villages		

REDD+ initiative active

Figure 20.2 Timeline of the Rimba Raya REDD+ initiative.

Our first field survey took place from August to November 2010, in the middle of a comment period for communities, as part of the CCBA FPIC process. In November 2011, we returned survey results and noted updates about Rimba Raya's implementation in our study villages. This took place during a 'quiet period' in the field, when Rimba Raya was focused on gaining management rights over the entire CAA. Village heads were informed by Rimba Raya that field activities were suspended due to licensing issues, but many other key informants thought that the initiative had been cancelled. Our second survey was done from November to December 2013, after management rights had been acquired through various agreements. The initiative was visible and active in the communities during this survey. Verified carbon credits were issued by VCS and CCBA between June 2013 and January 2014, including back-credits for two crediting periods starting in mid-2009 (Environmental Services, Inc. 2013; SCS Global Services 2013).

20.2 Strategy for the initiative

Rimba Raya's PMZ was partially designated as *Kawasan Pengembangan Produksi* (Area for Development of Production) in the 2003 spatial plan proposed by the Central Kalimantan provincial government (Government of Central Kalimantan 2003). Rimba Raya argued that this was planned conversion of forests into land uses such as oil palm (Bolick et al. 2010). However, the proposed spatial plan has not been accepted by the central government. The area officially remains zoned as state forest, where applying for an ERC is permitted and conversion to oil palm is not.

Due to these threats, Rimba Raya developed a methodology specifically targeting "corporate or governmental entities (plantation companies, national or provincial forestry departments, etc.) and not [deforestation] by community groups, community-based organizations, individuals or households" (VCS 2010, 5). This is achieved by acquiring an ERC license to prevent planned oil palm expansion into its PMZ. Potential negative leakage from displacing the companies elsewhere was expected, especially on the north and south parts of the initiative boundary (Bolick et al. 2010).

Based on a brochure distributed in villages in 2010 and interviews with key informants, Rimba Raya planned to restrict forest use such as illegal and unsustainable timber removals, fishing using illegal and unsustainable practices (e.g. electrofishing and using fire), changing land uses, buying/selling land, and hunting (unless permitted by law). Rimba Raya also planned to release 300 rehabilitated orangutans in its intervention area (Lemons et al. 2011, 23). Communities will be allowed to harvest NTFPs such as rattan and pantung (*Dyera lowii*) latex, and to fish using sustainable methods.

Villager reads a pamphlet summarizing Rimba Raya's programs, which include forest access and use restrictions, and orangutan release. They caused concerns for some villagers. (Yayan Indriatmoko/CIFOR)

In return, Rimba Raya will implement social programs to improve general income and well being. These include developing agroforestry systems, introducing a clear water program, improving early child education and increasing employment linked to forest protection (e.g. forest patrols, fire prevention, reforestation). A memo of support drafted by Rimba Raya states that communities will receive "a significant share of the economic benefits generated" (PT. RRC 2009). In 2014, Rimba Raya delivered village development grants valued at around USD 3800 to each of the nine villages targeted by Rimba Raya (Antara/PT. RRC 2014). PT. RRC envisioned some funds would be distributed to BKSDA and the TPNP, and to capacity building for district government officials. There are agreements with two oil palm companies that overlap with Rimba Raya's CAA, but it is not clear if and how benefit sharing is included. A 10% fee payable to MoFor applies to sales of carbon credits (GoI 2014).

Based on our fieldwork in 2010, Rimba Raya's forest restriction plans caused worries in our study villages and could affect customary land rights, logging activities and gemor bark collection.[5] In one study village, these plans also evoked painful memories of being evicted from one of their settlements used for logging in the forest in the 1960s, by "foreigners who cared more about orangutans than local people." The map of Rimba Raya's PMZ in its brochure included lands that key informants felt were owned and managed by villagers. Key informants in

5 Gemor bark is harvested by felling and then debarking the tree. The tree coppices after felling.

SERU1 and SERU2 were worried that restrictions against 'changing land use' and selling/trading land would be applied to these lands. Key informants in SERU1 were worried about the orangutan release because they believed orangutans could harm people working in the forests or rubber gardens, and damage agricultural plants. Some of these key informants were relieved that their village is no longer part of Rimba Raya.

Although 14 village heads signed a memo supporting Rimba Raya during the initiative preparation phase (PT. RRC 2009), we found that in the four study villages, the memos were signed only by the village head without a witness from the village government. Several informants in two study villages were still unsure about Rimba Raya and wanted to wait and see how the initiative develops. There was resistance against Rimba Raya in one study village in which people were more supportive of oil palm plantations. There, Rimba Raya was seen as a threat to oil palm plantations, and one that does not offer clear benefits to their village. Informants in two study villages mentioned that there was very little time for villagers to ask questions of Rimba Raya staff, because the staff spent only one to two days in each village to introduce the forest restriction plans (see also Fuad 2010; Pareira 2010).

During the licensing process in 2011–2012, there was very little activity at the village level. Because of the hiatus, many villagers were still unsure about what exactly Rimba Raya would do. In 2013, Rimba Raya sprang back to life after receiving its ERC license. During our visit in 2013, we found that activities related to CCBA and VCS verification processes were implemented. PT. RRC staff reviewed village development plans (RPJMDES) in the nine target villages, to see if there were activities that were already planned by the village that they could support. Negative perceptions against orangutan release and restrictions on land transfers remained.

20.3 Smallholders in the initiative

Data presented in this section is based on group surveys (village leaders and women) and key informant interviews with village leaders, community members and Rimba Raya staff. In addition, we interviewed initiative stakeholders in August–November 2010, and again in 2013 when we returned to present preliminary findings from a follow-up survey. We did not conduct a household survey. Study villages (SERU1 to SERU4) are located along the Seruyan River, which also provides the main access route as there are no roads to the villages. The study villages ranged in size from 8000 ha to 47,000 ha and at the time of data collection, there were 912 households in total. Based on key informant estimates, forest cover varied from 25% to 80%. Each study village had an elementary school and a health center, and two villages had a secondary school. Markets were located near the village center or, in the case of one village, a market was located in a neighboring village. Mobile phone signal was limited. There was no access to formal credit in 2010. Three of the four study villages were dominated by local Dayak ethnic groups, while one was dominated by the Banjarese from South Kalimantan. The main decision-making institution at the village level was the village government.[6] Most women who participated in our focus group discussions felt they were sufficiently represented in village decision-making bodies, could influence village decisions and participated actively in village meetings.

Rice is the main staple food and is cultivated mainly in SERU1 and SERU4 because arable land in SERU2 and SERU3 is limited due to frequent flooding. Villages also received subsidized rice as part of a national government program called Raskin (*Beras Miskin*/Rice for the poor). A hectare of good quality agricultural land ranges from USD 165/ha to USD 440/ha, depending on road access, agricultural productivity and risk of flooding.[7] In 2010, rice production dropped in SERU1 because of high rainfall that flooded many rice cultivation areas. The production of fish, the main source of protein, also fell in SERU2 and SERU4 in 2010. Key informants attributed this to increased pollution, loss of forests to oil palm plantations and unsustainable fishing practices (e.g. electrofishing). As a consequence, many fishermen switched livelihoods to seek work in oil palm plantations, which is considered to be less vulnerable to weather variability.

Communities had mixed feelings about oil palm plantations. All study villages had at least one oil palm company operating in their village territory but outside Rimba Raya's PMZ. According to key informants, these plantations brought important benefits such as jobs, training for forest fire awareness and handy-craft production, and donated 200 liters of fuel every three months to support the village electricity generator. Key informants in all our study villages confirmed that oil palm plantations converted mostly secondary forest lands, resulting in high rates of deforestation outside of the PMZ. In three of the four study villages, land compensation payments led to conflict among some households, and between some households and the oil palm plantations.

The majority of households in two study villages worked in wage labor in oil palm companies, and forests were not important sources of income. In one study village, the main income during our first survey in 2011 was fishing. This shifted to oil palm labor when we visited in 2013. The main source of livelihood in the remaining study village was roughly split between working in oil palm plantations on the east side of the Seruyan River and fishing on the west side (within Rimba Raya's PMZ). Rubber tapping was another important income

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6 See the chapter on KFCP (Chapter 17) for a description of village institutional structure, as it is generally the same across Central Kalimantan.

7 Throughout this section, we use the 2010 exchange rate at 2010 prices, USD 1 = IDR 9090 (World Bank 2014).

source for all study villages except SERU3, which was prone to flooding. Logging was an important source of income until a law against illegal logging was passed in 2005 (GoI 2005). Small-scale logging continued mainly to supply timber for local needs such as for house construction, fencing, fishing equipment, making boats and (in one study village) fuel wood.

20.4 Challenges facing the initiative

There is tremendous pressure in Central Kalimantan to reclassify many state forest areas into other land-use zones in which oil palm plantations are permitted. In some cases, oil palm permits have already been issued by district governments in state forest areas. Rimba Raya's CAA overlapped with planned oil palm concessions owned by four companies (Bolick et al. 2011, 13). Hence, Rimba Raya's ERC request highlighted that MoFor's authority to manage state forest lands and the district head's actions of issuing oil palm permits over the same area are at odds with each other in the field.

MoFor's decision to grant an ERC license that only partially covered the CAA was a serious blow for Rimba Raya. As required by its methodology, Rimba Raya must continue to have user rights over the entire CAA over the life of the initiative. To secure rights over the remaining CAA areas, Rimba Raya made agreements with various entities with pre-existing land management rights in those areas. For VCS and CCBA, these agreements satisfied their 'rights of use' criteria, leading to the verification of carbon credits. A letter by MoFor that acknowledged Rimba Raya's plans to implement ecosystem restoration activities across the PMZ covered by those various agreements (Badan Planologi Kehutanan 2013) was used as a basis for Rimba Raya's claim for rights of use. However, Greenomics, an Indonesian policy development institute, argued that MoFor only approved the area with the ERC license (36,331 ha) (Greenomics 2013). In Greenomics' view, the letter does not mean MoFor approved Rimba Raya's initiative throughout the 64,000 ha of the PMZ (which includes the carbon crediting zone), and questioned the legal basis for claiming rights to carbon credits generated from this area.

This case illustrates the difference between rights of use underpinning benefits and liabilities related to REDD+ implementation as defined by carbon certification bodies such as VCS, and legal rights to manage forest as defined by MoFor. Rights of use by VCS can be established through various approaches, including securing rights granted by a national authority such as MoFor (in the case of ERC) or the district head, and contractual agreements with entities with rights to emit GHGs (e.g. converting forest to oil palm) (VCS 2011b, 15). This may not be aligned with national regulations. From the perspective of national regulations, a 2012 ministerial decree (see MoFor 2012a) is the only regulation we are aware of that specifies who has the right to benefit from sales of carbon credits. It states that forest carbon proponents (*penyelenggara karbon hutan*) have rights to sell or not sell forest carbon under their management. They are defined as entities that hold a forest concession/utilization license (e.g. ERC license) or managers of conservation forests (e.g. TPNP administration). Additionally, the regulation governing whether national parks can enter into agreements with a private entity for forest carbon-related activities has not yet been formulated. Viewing these arrangements as a whole, it is unclear to us how contractual agreements with TPNP, oil palm companies and the district government fit into this regulatory framework. Hence, although Rimba Raya has secured the rights of use from VCS's perspective, whether it fits the requirements as a forest carbon proponent according to national regulations needs to be further explored.

20.5 Lessons from the initiative

The Rimba Raya initiative – more so than any other case in our sample – is strongly oriented toward excluding outside claimants (oil palm companies) on forests it aims to protect. This makes sense given the large area of land claimed by these outside actors, and the minimal pressure on forests exerted by local households. This case study illustrates the discrepancy between, on the one hand, community-level benefit sharing highlighted in carbon standards such as CCBA and international discourses on FPIC, and on the other hand, the fact that such benefit sharing is not necessary for effectively reducing emissions when large-scale actors play a much more important role than the community in driving carbon emissions.

The protracted permitting process in 2010–2013 limited Rimba Raya from engaging with communities. In 2011–2012, key informants in study communities said Rimba Raya did not implement any interventions. They were informed by PT. RRC staff that this was due to difficulties in obtaining the ERC permit. After the ERC license was issued in 2013, activities in the communities increased. But during the same period, VCS verified that 10 million tCO_2e were avoided. This is because Rimba Raya's methodology clearly states that it is applicable for preventing deforestation by large-scale actors, and not by communities.

This illustrates the possible tradeoffs between equity and efficiency in the specific VCS methodology Rimba Raya is using, and REDD+ in general. Restrictions on forest use planned by Rimba Raya may conceivably have negative livelihood implications for local people because it limits their forest access and rights to change land uses, including to oil palm. Yet, having a positive impact on community livelihoods is not necessary to generate verifiable emission reductions. Rimba Raya has argued they benefit local communities by protecting forests, which allows communities to continue their traditional way of life (Lang 2013). However, it is not evident that this is seen as a benefit in those villages, since three of our four study villages mostly relied on wage labor from oil palm. If so, PT. RRC needs to consider opportunity costs incurred by communities from foregone employment in oil palm in their benefit sharing and community engagement strategies.

20.6 Acknowledgments

We are grateful for the kindness and generosity of the key informants, survey respondents, guides and residents of the villages we studied and the staff at Seruyan District's Dewan Adat Dayak Kabupaten Seruyan (Dayak Customary Council), District Forestry Services, Badan Lingkungan Hidup (District Environmental Agency), Dinas Pertanian (District Agricultural Services), Dinas Kelautan dan Perikanan (District Marine and Fisheries Services), Balai Taman Nasional Tanjung Puting (Tanjung Puting National Park Office) and World Education. Merlinta Anggilia and Mella Komalasari ensured that data were entered correctly. We would also like to thank our reviewers (Ida Aju Pradnja Resosudarmo, Jim Procanik and Agus Djoko Ismanto) for their useful comments.

Chapter 21

TNC's initiative within the Berau Forest Carbon Program, East Kalimantan, Indonesia

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In early 2008, TNC in partnership with the Government of Berau began discussions on a low-emission program in the district, and the Berau REDD+ Task Force was established. In June 2009, the Berau Forest Carbon Program (BFCP) or *Program Karbon Hutan Berau* (PKHB) was officially declared as a district-level REDD+ program. The program serves as a model of low-emission development based on sustainable natural resource (including forest) management and as an example of the jurisdictional REDD+ approach in Indonesia. In January 2010, the Government of Indonesia recognized Berau as one of the official REDD+ demonstration activities in Indonesia, along with KFCP (Chapter 17). In its implementation, BFCP engages with various partner institutions, including TNC, which is the focus of this chapter.

21.1 Basic facts: Where, who, why and when

21.1.1 Geography

The population of Berau is 193,831 people (BPS Berau 2013), with 68,717 people living in the capital city of Tanjung Redeb. The population is growing by 1.06% annually (as of 2012), partly due to migrants from other districts and towns seeking employment opportunities in Berau. Coal mining, agriculture and other activities based on natural resources contribute significantly to the district's economy (BPS Berau 2013). Rice is an important agricultural product, used mostly for subsistence. Oil palm is an important commodity, currently attracting a flurry of investors into the district. The forestry sector is significant for Berau. There are 14 active timber concessions and three timber plantations operating in the district (Berau REDD+ Task Force 2011). Forestry sector revenue in 2010 was approximately USD 5.83 million equivalent (BPS Berau 2011).

BFCP encompasses the entire land area of Berau (Figure 21.1), including the 1.7 million ha forest zone (*kawasan hutan*), which includes production and protection forests under the jurisdiction of MoFor, as well as lands outside of the forest zone (i.e. lands designated for non-forest uses – 0.5 million ha) under the jurisdiction of the district government (Berau REDD+ Task Force 2011). Because of its vastness, TNC focuses on the forest zones in 2 of the 13 subdistricts, Kelay and Segah, which are situated within production and protection forests.

Figure 21.1 Map of the BFCP REDD+ initiative.

Data sources: TNC, Berau District Development and Planning Agency 2014, GADM 2009 and World Ocean Base.

Rivers and roads are the main means of transportation in Berau. Two major rivers (Segah and Kelay) and their tributaries are the primary river transportation routes in Berau. Roads are mostly paved and can be accessed by motorcycle and four-wheel vehicles. However, the road networks are not evenly distributed and are mostly found in the eastern part of the district. TNC's intervention areas of Kelay and Segah are accessed through poorly maintained logging roads since its forest zone status prevents the development of paved roads. Only 4WD vehicles can reach the villages, in addition to small boats via the rivers and their tributaries. Because of the poor infrastructure, it is at least 1.5 hours by car or motorcycle to the nearest market from four of the five villages included in the CIFOR-GCS sample. In the fifth village the nearest market is less than 1 hour away by motorized boat.

21.1.2 Stakeholders and funding

The status of BFCP as a REDD+ pilot district was affirmed in January 2010 by a MoFor decree designating Berau as a REDD+ demonstration area. Due to the vastness of the targeted area, the district government of Berau, in its role as key proponent in implementing BFCP, works with numerous other institutions, including entities at other levels of government, and international and local civil society organizations.

In March 2011, a steering committee for BFCP was established. This committee consists of senior district government officials. The *bupati* (district head) serves as the advisor to the steering committee, the vice *bupati* as the head and the secretary of the district as the deputy head. The steering committee is responsible for (among other responsibilities) ensuring the integration of BFCP into the district's development plan, and into provincial and national policies in the context of reduction of emissions from deforestation and degradation, coordination of stakeholders, and monitoring and overseeing BFCP activities.

Two international organizations, among others, are currently active in REDD+ interventions in BFCP: TNC and GIZ (the German International Cooperation Agency/Deutsche Gesellschaft für Internationale Zusammenarbeit).[1] Each of these major proponents work in partnership with other organizations. For example, TNC has worked with, among others, World Agroforestry Centre (ICRAF), World Education and local NGOs. Both TNC and GIZ – the latter through its Forests and Climate Change Program (FORCLIME) Financial Cooperation and its FORCLIME Technical Cooperation – are also working with district government units.

BFCP is financially supported by several governments (Australia, Germany, Indonesia, Norway and United States), as well as civil society organizations and charitable institutions (i.e. TNC, Ann Ray Charitable Trust and Grantham

1 For a list of organizations supporting BFCP, see BFCP 2014.

Foundation) (BFCP 2014). BFCP is also funded by a Debt-for-Nature Swap financing scheme between the Government of Indonesia and the United States under the Tropical Forest Conservation Act. Support from Germany is coordinated via a bilateral agreement and managed by KfW (Kreditanstalt für Wiederaufbau – German's Reconstruction Credit Institute) and GIZ. The Government of Norway has also supported TNC's activities in Berau (Hovani 2013). TNC supported the establishment and the early operations of the REDD+ Task Force.

BFCP continues to be fully supported by donor funds. No funds have yet been raised through sales of carbon credits. The current level of funding is adequate to meet the high cost of preparation for and implementation of REDD+. BFCP expects to fund future activities through the sale of carbon offsets, through either the voluntary or compliance markets. However, some key informants are pessimistic about its future given the uncertainty of the REDD+ carbon markets.

21.1.3 Motivation

TNC began working in Berau district in 2002, emphasizing forest and marine management. Although Berau's forests are extensive, they are threatened by logging, mining and oil palm plantation expansion. TNC seeks to improve forest conservation, enhance forest cover and forest management, protect biodiversity, build capacity of the district and village administration, and support the local economy through the introduction of alternative livelihoods. Of 20 villages initially identified as needing support for improved forest management and conservation (personal communication from a senior TNC official, 2014), TNC decided to focus its interventions in three pilot villages. These interventions are intended to reduce GHG emissions by shifting local production to permanent agriculture, limiting land clearing, and forest monitoring by communities as an element of community-based forest management.

Early assessment of deforestation and degradation within the intervention area was done in 2010 during the preparatory stage. In collaboration with ICRAF, the assessment used remote sensing and ground truthing to verify the actual forest condition on the ground. A historical average deforestation rate between 1990 and 2008 was used to determine the REL in Berau.

21.1.4 Timeline

In 2008, the district government began to consider implementing a low GHG emission program, partly as a means to improve forest management (Figure 21.2). TNC saw this development as an opportunity to align low emission goals with conservation objectives and helped design BFCP. The REDD+ Task Force was formed later that same year, and data collection to establish the site's REL began. In June 2009, BFCP was established.

Pre-2000				
2000				
2001				
2002	TNC starts working in Berau, focusing on biodiversity, conservation and improved forest management			
2003				
2004				
2005				
2006				
2007				
2008	Government of Berau starts considering REDD+	Berau REDD Task Force established		
2009	Official declaration of BFCP as a REDD+ pilot	TNC and World Education conduct community engagement survey on REDD+ scheme	Governor declares East Kalimantan a 'Green Province'	
2010	MoFor decree designates Berau as REDD+ Demonstration Area	MRV conducted by ICRAF	Consultation between TNC and one intervention village on 10-year development plan	MoFor decree on the FMU of Berau Barat
2011	BFCP steering committee formed			
2012	CIFOR-GCS baseline survey			
2013	CIFOR-GCS presents baseline results to study villages	Implementation of conditional livelihood enhancement in two intervention villages	Disbursement of conditional support for livelihood enhancements begins in two intervention villages	
2014	MoFor decree designates *hutan desa* working area in one intervention village	CIFOR-GCS phase 2 survey		

REDD+ initiative active

Figure 21.2 Timeline of the BFCP REDD+ initiative and TNC activities.

As part of REDD+ preparatory activities, in partnership with World Education, TNC conducted a socioeconomic study of communities in 18 villages living within the forest zone in the second quarter of 2009 (Moeliono et al. 2010). In December 2009, the governor of East Kalimantan declared the province a green province.

In January 2010, Berau district was designated as a demonstration activity district by MoFor, leading to the establishment of the BFCP Steering Committee in 2011. In November 2010, the Production Forest Management Unit (FMU) (Kesatuan Pengelolaan Hutan Produksi) of West Berau was established. The area under this FMU encompasses the main forest areas of Kelay and Segah subdistricts. The FMU is a landscape-level entity with decentralized authority to manage forests. In this case, the FMU of West Berau coordinates stakeholders within its area, including TNC, GIZ, timber concessions, mining and local communities. TNC began its early REDD+-related activities (i.e. information dissemination on climate change, the role of forests in reducing emissions and BFCP; and provision of rubber seedlings and budwood grafts) in several villages in December 2010 (personal communication from TNC official, 2013). Later, three of these villages were selected as TNC's pilot villages.

21.2 Strategy for the initiative

TNC is engaged with stakeholders at two levels. First, it is active in national and district REDD+ policy-making processes. The second strategy is to engage directly with stakeholders on the ground, including the district government of Berau, local communities, the FMU and local NGOs. For example, TNC and the district government are working with timber concessionaires to fulfill the terms of Indonesia's Timber Legality Assurance System (*Sistem Verifikasi Legalitas Kayu*, SVLK) and the FSC standards. SVLK certification is a positive incentive for timber concessionaires because this allows them to get premium prices for their products (personal communication from a concession's official, 2012). Moreover, TNC plans to expand its work to engage oil palm companies in sustainable natural resource management. Oil palm plantations are found in both Kelay and Segah subdistricts.

TNC's pre-REDD+ activities in Berau included mediating a tenure conflict between villagers and a logging company. TNC helped facilitate the partnership (*kemitraan*) between timber concessions and villages. This partnership resulted in mutual benefits. Villagers get support (e.g. electricity, cash) from timber concessions while timber concession areas are protected (through community patrol and monitoring) by villagers. TNC also facilitated the submission of a village's proposal to assign local forests as protection forests. As a result of these activities, TNC has become familiar to communities. This carefully nurtured relationship serves as social capital that assists TNC in implementing their subsequent REDD+ interventions in these areas. However, our findings in 2012 suggest that only about one-third of sampled households have heard about the carbon program.

Truck transporting logs in the BFCP initiative area. Study villages are located in and around the timber concession where this truck came from. (Cut Augusta Mindry Anandi/CIFOR)

FPIC processes are an important element of REDD+. Early findings based on research in 2012 suggested that people in TNC's intervention villages had some concerns about the initiative. Their concerns mostly stem from lack of a clear understanding and varied perceptions of the purpose and activities of REDD+. They include worries about how REDD+ will affect their agricultural activities, income, access to forests and village development; whether the initiative could successfully prevent undesirable actors from taking their land; and whether the initiative would simply become an empty promise.

TNC developed an approach called SIGAP REDD+ (Communities Inspiring Action for Change in REDD+/*Aksi Inspiratif warga untuk perubahan dalam REDD+*) (Hartanto et al. 2014). This approach rests on the premise of engaging local communities from the start to ensure their commitment in forest and natural resource management while simultaneously improving their livelihoods. SIGAP's action points consist of (i) communicating a long-term vision of village land protection and village development; (ii) formulating a socially, environmentally and economically integrated 'green' village development plan; (iii) establishing collaborative forest arrangements with companies; (iv) securing forest management rights; and (v) accessing financial support.[2] SIGAP's actions on the ground have included communicating BFCP's low-emission program and TNC's community engagement approach, village mapping and capacity building.

The SIGAP approach involves a survey in the community to inquire about their needs, preferences and desires. The results of the survey are taken into account in determining types of low emission intervention activities that will be implemented in the village. Villagers then submit a resolution stating their willingness to engage in the program. This is followed by the signing of a cooperation agreement between the community and TNC that describes the terms and conditions of the planned low-emission program interventions. Interventions that reflect communities' desires are expected to boost people's support for and commitment to the interventions. The village agreement documents that commitment and the 'rules of the game' that need to be followed.

In keeping with the SIGAP approach, two villages have signed a community resolution (commitment) and an agreement with TNC for conditional livelihood enhancement support. This commitment is evaluated each year based on the performance of the villages, assessed against an agreed scoring system. The community resolution sets out the activities or targets that the villagers have committed to accomplish, for instance, limiting household clearing of forest lands for swidden to a maximum of 1 ha/year, and clearing only on lands that have been fallowed. The goal is to prevent a net increase in the area of forest cleared. The evaluation is used to determine whether the community will continue to receive the same or a reduced level of funding in the following year. TNC has budgeted at least IDR 200 million or about USD 20,000 per village per year to implement this program.

Another set of activities within the SIGAP approach is increasing the capacity of village officials in determining future village development. This involves supporting village officials in preparing a five-year medium-term village development plan (RPJMK) and funding proposal for submission to the subdistrict government annually. The subdistrict's endorsement of the RJPMK determines activities that will be funded at the village level. The endorsement of the village's annual proposal determines the level of funding the village gets for proposed activities, including how much for forest and natural resource management, if any. Funding earmarked for forest and natural resource management has so far been nonexistent. TNC's incentive agreement aims to provide money for villages to do that.

TNC has also introduced alternative livelihoods, such as community-based rubber gardens, mixed gardens (agroforests) and empowerment of women in agricultural activities. Another major activity is facilitating village land-use planning that

2 See Hartanto et al. (2014) for TNC's specific activities following the SIGAP approach.

integrates forest and natural resource management into annual village development plans. Elements of this SIGAP approach will be replicated in another 20 villages beyond the pilot villages that TNC is currently working in, using Tropical Forest Conservation Act funds and implemented by seven local NGOs.

21.3 Smallholders in the initiative

CIFOR-GCS field research in Berau before REDD+ implementation was conducted between early March and end of May 2012. Data on smallholders was obtained through a household survey of 5 of the potential 20 target villages ('intervention villages') identified by TNC: BER1, BER2, BER3, BER4 and BER5.[3] All of our intervention villages are located in Kelay and Segah subdistricts. Of these villages, at the time of writing, TNC only works in three villages (BER2, BER3 and BER5). GIZ implements REDD+ interventions in one of these three villages and in one of the two remaining villages.

Of the 338 households in the five CIFOR-GCS study villages, we interviewed 163 households. In three villages we used random sampling to select surveyed households. The other two villages were very small, so we interviewed all households that were available at the time of the survey.

Indonesian villages typically have their own budget and governance system. A village is led by a village head (*kepala desa*) and assisted by village secretary (*sekdes*) and head of village affairs (*kepala urusan*). The village head is elected through a five-year election cycle, while the village secretary usually holds a permanent position and is a civil servant. Village officials are supported by a number of other institutions that represent the community in the village: the village representative body (*badan perwakilan desa*), youth groups, customary leaders (*tetua adat*) and women empowerment groups (*pembinaan kesejahteraan keluarga*). In all five villages, the head of the village appears to be the most important decision maker, although all village officials and representatives of village institutions participate in village decision-making processes. We find that women are involved in village decisions although about two-thirds express their opinion through their husbands.

Although much of the forest area in Berau is designated as forest zone where timber concessions operate, indigenous Dayak communities inhabit these areas. Our study villages are indigenous communities of Dayak Punan, Dayak Kenyah and Dayak Lebo. In contrast to the more sedentary Dayak Kenyah and Dayak Lebo counterparts, Punan are nomadic Dayak who settled in these villages before the timber concessions came to the area. All of these communities practice

3 We surveyed five intervention villages, as opposed to the normal four in other sites, because two are very small.

traditional agriculture and other forest activities based on customary tenure and laws in pockets of these forests. Following their Dayak rules, people are allowed to clear lands outside the village as long as the land does not belong to or is actively managed by anyone else.

Timber concessions operate in all study village territories. The existence of timber concessions has resulted in some arrangements that benefit both sides, including support for surrounding communities. This support includes scholarships for students, electricity, employment in the timber company and timber fees. Following East Kalimantan governor's policy, affected communities in concession areas are compensated with a predetermined volume-based fee. In addition, 'dust' money (*uang debu*) is a fee charged by communities to compensate them for the inconvenience (e.g. dust) produced by trucks transporting logs through their villages.

In our study villages, land conflicts among community members were rare. Villagers perceived that they have the right to control and prevent outsiders encroaching on their land, forest or village. They usually apply traditional sanctions, which have been passed on through generations (e.g. fines), when an issue with trespassers cannot be resolved through discussion. Communities in general still allow outsiders to use their lands with their consent or for an agreed-upon fee. Issues emerge when outsiders do not understand local customs and clear lands without permission within the area of these indigenous communities that by de facto belong to someone based on customary rules.

All five study villages have road access, but they are mostly non-paved logging roads in poor condition. Our findings show that the education attainment among adults is generally low, and mostly limited to primary school. Secondary schools are either situated in the neighboring village or in the subdistrict capital. In 2012, most of the study villages had poor sanitation. In three study villages, two of which where TNC works, there was no access to piped water. All villages had only limited electricity, powered by a generator, which is turned on for five hours in the evenings. Despite these limitations, most of the respondents in all villages perceived that their income was adequate to support their well-being.

Agriculture is important for all villages (Figure 21.3). Villagers produce their own rice as their staple and at least half the adults in the households are engaged in agriculture. Despite its importance, agricultural income from local production is low and is only significant in BER1 and BER4 (Figure 21.4). Income from rice and cocoa is high in BER1, while income in BER4 comes mainly from rubber. The share of income from wage labor is substantial in all of the study villages (Figure 21.3). Villagers usually work in timber concessions as a security guard or logger (felling trees) or as an agricultural laborer, mining laborer or house builder. Income from forest products was observed in all five villages and comprised a considerable share of household income in BER2 and BER3, which are both situated in heavily forested areas.

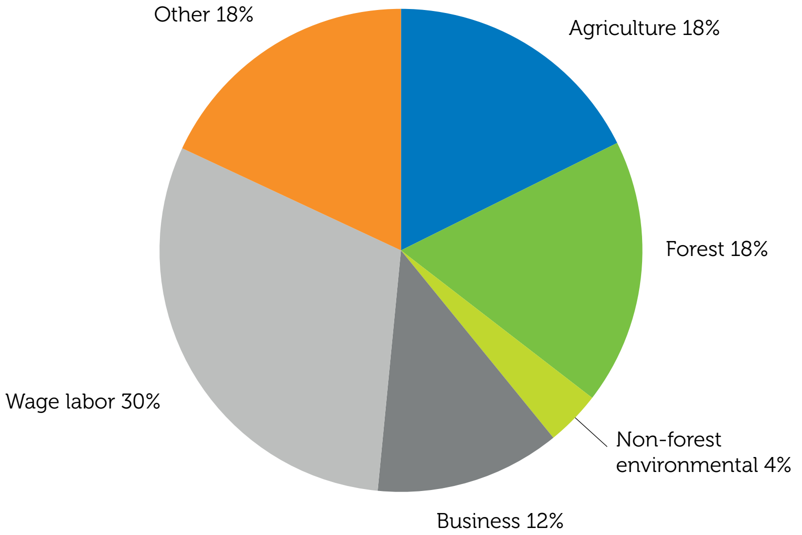

Figure 21.3 Sources of income for all households in sample (n = 163).

Note: Livestock contributes a net negative 1% to income, because of high costs in survey year.

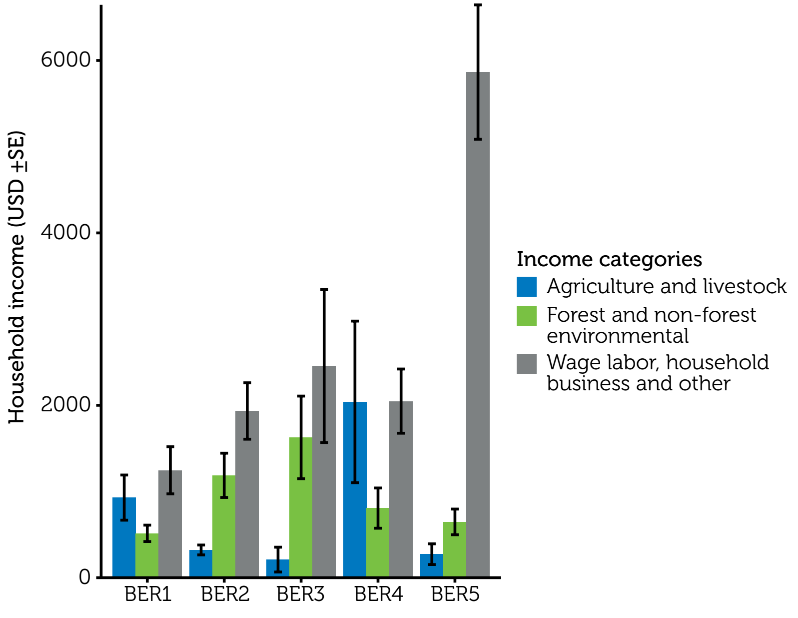

Figure 21.4 Sources of income for average household by village (+/- SE) (n = 163).

Both men and women from most of the villages enter the forests frequently. Men and women access the forest for different reasons. Women tend to go there primarily to collect fuelwood, wild fruits and honey, thatch (for traditional hats), rattan, and medicines. In one village, they cook for gold miners who mine inside the forests. Men typically enter the forests for heavier types of work, including cutting timber, hunting, gold mining, and collecting wild honey and fuelwood. Communities' need for timber is high in most villages, mostly for housing materials.

In the last two years preceding our survey, only one village (BER5) showed a high percentage of households with increased consumption of forest products (40%) (Table 21.1). In this village, production of honey was high. In general, forest products are important in fulfilling people's daily needs as forests are 'free' and are more accessible compared to markets and therefore serve as the local 'supermarket.' Distance to forests vary among the five villages. In three villages (BER1, BER2 and BER4), forests can be reached within 1 to 2.5 hours. The forest is very close to BER5. In BER3, old secondary forests are within easy reach of villagers. Our respondents in this village, however, refer to old, untouched forests when we asked them about the distance to forests, which would take 10 hours on foot to get to (Table 21.1).

Table 21.1 Indicators of household forest dependence based on the 2012 survey.

	BER1	BER2	BER3	BER4	BER5
Number of households sampled	33	33	33	31	33
Household average (SD)					
Share of income from forest	16.66 (23.41)	31.01 (31.02)	36.11 (33.94)	10.32 (16.46)	8.27 (12.38)
Share of income from agriculture	28.73 (30.16)	13.35 (18.15)	-5.06 (41.46)	31.36 (27.22)	-1.78 (45.72)
Area of natural forest cleared (ha)[a]	1.78 (1.45)	1.45 (1.25)	0.21 (0.78)	0.29 (0.68)	0.64 (1.03)
Area of secondary forest cleared (ha)[a]	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Area left fallow (ha)[b]	1.79 (1.50)	1.40 (0.92)	1.55 (0.57)	1.80 (0.45)	1.33 (0.93)
Distance to forests (minutes walking)	150	150	600	75	7.5
Percentage of households					
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	82	64	49	59	52
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	24	18	6	4	9

continued on next page

Table 21.1 (continued)

Reporting increased consumption of forest products[e]	11	7	6	10	41
Reporting decreased consumption of forest products[e]	29	50	38	35	11
Obtaining cash income from forest products[f]	55	76	70	39	61
Reporting an increase in cash income from forest[f]	17	12	9	8	45
Reporting a decrease in cash income from forest[f]	11	36	35	75	20
Reporting fuelwood or charcoal as primary cooking source	91	88	94	84	88
Leaving land fallow[g]	36	55	15	16	18
Clearing forest[g]	85	76	9	19	36
Reporting decreased opportunity for clearing forest[g]	20	16	29	33	6
Clearing land for crops[g]	85	76	9	19	36
Clearing land for pasture[g]	0	0	0	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

Almost all of our respondents plant rice (harvested once a year) by practicing swidden agriculture. In the study area, swidden involves fallow periods of at least two years. This pattern has determined natural forest clearing in three study villages. One household manages 1.5 to 2 ha of land on average.

In these three villages, the concession companies have thus far allowed villagers to clear forestland for agriculture of up to 2 ha per household. Thus, these households become the users of the land although it is owned by the State and is being leased out to timber concessionaires. However, about one-fifth of respondents in two villages stated that the opportunity to clear forests in the last two years prior to the survey had decreased. This is probably due to the imposition of restrictions by the timber concessions. In one village, the district government advocated that farmers shift from swidden to permanent agriculture and made this a requirement for the village to obtain formal village status. Our findings show that in 2012, the area of swidden agriculture in this village has stayed the same since 2010. The area of swidden agriculture in one study village decreased over the last two years of the survey. The presence of other land managers, formal classification of surrounding forest as protection forest, or settlements nearby – (inactive) timber plantation companies, oil palm plantations, protection forest and neighboring villages – is likely to influence villagers' ability to practice swidden.

Since 2008, TNC has been facilitating boundary demarcation of one intervention village and three adjacent villages. One adjacent village has warned the community in the study village not to clear new land in that village. As is common in Kalimantan, village boundaries are often unclear and can easily lead to conflict, particularly when it affects the level of compensation from timber concessions or other large-scale investors. For example, unclear boundaries of another study village with its adjacent village have affected the level of compensation received from a swallow bird's nest company operating in the village area.

Average total income of households in BER5 is highest among the five study villages (Table 21.2). A large share has been income outside of agriculture, livestock, forests, household business or wage labor. This high income appears to be associated with PNPM. During the period of fieldwork, some households received housing support to enable them to relocate from the banks of the village river that at the time had begun to erode. Our key informant suggested that the value of each house was about USD 4500 (IDR 45 million); compare this with the average annual household income of USD 6800.

Table 21.2 Socioeconomic characteristics of households interviewed in 2012.

	BER1	BER2	BER3	BER4	BER5
Number of households sampled	33	33	33	31	33
Household average (SD)					
Number of adults	2.8 (1.2)	2.4 (1.0)	3.3 (1.3)	2.9 (1.5)	2.7 (1.1)
Number of members	4.3 (1.6)	3.9 (2.0)	4.9 (1.5)	4.6 (2.1)	3.9 (1.5)
Days of illness per adult	2.6 (6.7)	10.9 (34.8)	9.1 (22.9)	4.6 (11.4)	6.5 (25.2)
Years of education (adults ≥ 16 years old)	7.0 (3.9)	6.1 (4.2)	5.8 (3.8)	6.0 (4.1)	5.4 (4.2)
Total income (USD)[a]	2,690 (2,142)	3,443 (1,728)	4,293 (6,005)	4,895 (5,366)	6,786 (4,899)
Total value of livestock (USD)[b]	167 (231)	42 (86)	275 (260)	73 (245)	92 (381)
Total land controlled (ha)[c]	5.0 (3.2)	4.4 (3.7)	4.0 (4.6)	1.9 (3.7)	5.2 (5.9)

continued on next page

Table 21.2 (continued)

Total value of transportation assets (USD)	648 (555)	530 (504)	528 (374)	454 (549)	375 (432)
Percentage of households with:					
Mobile or fixed phone	97	79	52	74	88
Electricity	100	100	94	94	55
Piped water supply	3	0	0	6	0
Private latrine or toilet	85	45	45	26	27
Perceived sufficient income	85	76	85	94	82

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.
b Total livestock value at the time of interview.
c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

Forests are important to villagers but their existence is being threatened. In addition to directly affecting deforestation, mining and large-scale oil palm plantations indirectly promote deforestation. The existence of mining and oil palm plantations has affected the motivation of forest clearing in some of our study villages. In these villages, communities clear forest for two reasons: to get compensation from potential investors or because of concerns of losing their tenure rights over a particular area. Tenureship is marked by stakes, planted trees or vegetation, proof of activity or management, or simply on the basis of word of mouth. People clear forest as proof of land ownership because large-scale developments often usurp community-claimed lands. Locals practice swidden agriculture, collect fuel wood and NTFPs for daily needs, and collect timber for building material. Nonetheless, smallholder use of forest areas for agricultural purposes and daily necessities is limited due to limited manpower and associated costs. On average, at any given time, a household's agricultural land averages about 2 ha, and likewise there is a tendency to clear, at most, about 2 ha of forest when new land is needed. With these limitations, villagers' contribution to forest pressures may not be as significant as large-scale activities.

Among the five study villages, only one village community perceived that forest cover in their village had increased during the two years prior to our 2012 survey. This positive change in forest cover is probably associated with the location of the village, which is adjacent to a protection forest.

Eyeing a potential synergy and opportunity from the national policy of awarding *hutan desa* (village forest)[4] management rights to communities, TNC has focused

4 *Hutan desa* is a form of community forestry in which villages apply for a permit to manage forests within the village.

on facilitating *hutan desa* status for a portion of the forests in two villages (also see Chapter 19 on KCCP). One village – which is located within an active timber concession site – was granted *hutan desa* working area status in January 2014 by MoFor. The designation of the *hutan desa* working area is an interim step before obtaining community management rights from the governor. Thus, obtaining *hutan desa* management rights will allow the community to manage their village forests and to avoid conversion of their forests for other uses, including, in this particular case, coal mining (Myers-Madeira 2014).

Other than TNC's livelihood enhancement support distributed using the SIGAP approach, villages also receive other livelihood enhancement support in the form of government development projects. For example, villages received fish hatchlings, cocoa and rubber seedlings, and support for honey production.

21.4 Challenges facing the initiative

BFCP is a district-scale jurisdictional REDD+ approach in Indonesia. The vastness of the area, the multitude of actors and activities that may not necessarily be aligned with each other, and lingering tenure and boundary issues present a challenge for its implementation.

The planning, management and implementation of a program over an entire district requires not only a commensurate level of resources and capacity, but also coordination and commitment of all relevant stakeholders operating within that jurisdiction. The district relies on extractive mining industries and large-scale agriculture, which both result in conversion of forests. These sectors 'compete' with REDD+ for use of forest lands and for community interest and support. Thus, revenues and employment generated from the two sectors test local governments' commitment to its own low-emission development program.

These issues are also evident in the area where TNC is working. In Segah, the *bupati* has issued oil palm licenses in areas with good forest cover. By doing so, although these areas are officially outside the forest zone and therefore can be converted to non-forest uses, the *bupati* undermines the district's BFCP emission reduction target. When available, areas without forest cover should be used for oil palm development. This shows some inconsistencies between Berau's vision as a 'green' district and its actual policies.

The prospect of mining and oil palm plantations taking place near villages promotes local land clearing. Active management of land strengthens tenure claims, improving the chances of protecting an existing property claim and ensuring compensation if land must be ceded to incoming projects. Thus, tenure uncertainty, evident in the three study villages, has implications for the management of forests and REDD+.

We find that perception of fairness over who is targeted in REDD+, and who is not, can pose a challenge in convincing communities to support REDD+. For example, some community members perceive that restrictions on forest access and conversion only apply to communities, and not to timber concessionaires. In reality, however, owners of timber concessions sometimes find it difficult to prevent communities from clearing forests within their concession if the clearing is for subsistence agriculture (personal communication from a timber operator, 2012). Concessions claim that they tolerate such clearing to avoid conflict.

The large area covered under BFCP requires division of responsibilities among the multiple stakeholders to avoid unnecessary redundancies. Furthermore, as new partners join and support BFCP, their activities should be aligned and integrated into BFCP's overall program and that of earlier partners. In practice, coordination among the various REDD+ proponents (e.g. district government, TNC, GIZ/FORCLIME), each taking different approaches and offering their own interventions, has presented another challenge to BFCP. Ineffective coordination can affect communities' perceptions of the interventions. During our visit in 2013, key informant interviews suggested that people in one village were concerned because programs were introduced by three different proponents. This affirms the importance of a concerted effort among proponents to carry out coordinated FPICs in REDD+ implementation.

21.5 Lessons from the initiative

TNC's presence as a key actor in the national REDD+ arena and in BFCP presents both a challenge and an opportunity. The vastness of BFCP means that TNC can only work in a limited number of specific target villages and expand as resources are available. TNC's experience and network has enabled it to contribute to national and district policies. Previous work in Berau has equipped TNC with the social capital and knowledge to engage effectively with communities. For example, TNC's SIGAP approach, which rests on the premise of close engagement with the community, is now replicated in other areas beyond TNC's intervention villages. The alignment of TNC's strategy with government policies appears to be effective in making progress on the ground. For example, facilitating *hutan desa* has enhanced tenure clarity over village forests, which, although not sufficient, is a prerequisite for effective implementation of REDD+ (also see Chapter 19 on KCCP).

The formal designation of Berau district as a REDD+ Demonstration Activity and its alignment with higher level policies have helped advance REDD+ in BFCP. The program is endorsed and fully supported by the national government and is consistent with the green vision of East Kalimantan province. This has helped the district and TNC attract funding from various sources to implement BFCP.

21.6 Acknowledgments

We are indebted to all of the communities and leaders of the study villages for their support, participation and friendship, without whom this research would not have been possible. We convey our appreciation to the government of Berau and Kutai Timur districts for their support and participation in the research. We thank our enumerators and encoders: Iriani Lamuha, Amir Mahmudi, Fatly Detlis, Supriadi and Mella Komalasari, for their meticulous work. We are grateful for the generous insights and time provided by informants, including TNC, GIZ (FORCLIME), Yayasan Berau Lestari, Kanopi, Yayasan Penyu Berau, West Berau FMU officials, BFCP REDD+ Task Force and other stakeholders. We would like to thank Claudio de Sassi for providing the graphs and tables, and Stibniati Atmadja, Herlina Hartanto and Agus Djoko Ismanto for reviewing the draft of this chapter.

Chapter 22

Ulu Masen REDD+ initiative, Aceh, Indonesia

Cut Augusta Mindry Anandi, Ida Aju Pradnja Resosudarmo, Andini Desita Ekaputri, Mella Komalasari, Pangestuti Astri and Riza Aryani

The Ulu Masen REDD+ initiative was developed by the Government of Aceh (GoA) during the governorship of Irwandi Yusuf (2007–2012). Irwandi's strategy (known as 'Aceh Green') aimed to improve Aceh's economy and environment (Dunlop 2009). During that period, the province of Aceh had just recovered from an extended period of armed conflict and the destructive 2004 tsunami. This REDD+ initiative was among the first established globally (Sills et al. 2009; Minang and Noordwijk 2013). It planned to develop and apply the mechanism of carbon finance in order to reduce GHG emissions, contribute to sustainable socioeconomic development, improve forest management, protect watersheds and conserve biodiversity.

Aceh experienced decades of conflict, which impacted the current context of forests and REDD+ in the province. Unsafe conditions forced centrally licensed timber concessionaires to halt their operations. Similarly, conflict greatly circumscribed Aceh's agricultural development. As a result, although illegal logging occurred during the period – partially to finance guerrilla operations – conflict largely protected the forests of Aceh, in contrast to many forested areas in other parts of Sumatra and in Kalimantan. The disastrous tsunami in 2004 ended the protracted conflict, culminating in the 2005 Peace Agreement. Peace in Aceh has enabled local people to clear forests for agriculture. Moreover, demand for timber in post-tsunami rehabilitation and reconstruction has significantly increased pressures on Aceh's forests. Illegal logging, notably by ex-combatants, also continues. Irwandi Yusuf introduced his green vision to counteract these problems in Aceh, giving environmental considerations prominence in Aceh's policies.

To some extent, the context of REDD+ in Aceh is different from that of other areas in Indonesia because of its special autonomous status (Law 18 of 2001 on Special Autonomy for the Province of Nanggroe Aceh Darussalam).[1] Aceh has the power to make its own laws, called Qanun. In 2002, for example, the Aceh Government issued a Qanun on the management of natural resources. The province has more authority over its development in comparison to most other provinces of Indonesia. The province also gets a disproportionate share of development funding and natural resource revenue from the central government. Its autonomy was further strengthened by Law 11 of 2006 on Aceh Governance. However, Aceh's augmented authority is unclear with regard to the management of forests. This is because areas within forest zones (*kawasan hutan*), including those in Aceh, are under the purview of MoFor. Furthermore, the implementing regulations for Law 11 of 2006 that would set out and clarify Aceh's authority, have not been formulated. These ambiguities arguably have implications for the implementation of any REDD+ projects/initiatives.

A recent change in leadership has placed the Ulu Masen REDD+ initiative in a state of limbo; its status as of 2014 is uncertain. It has not been formally terminated, nor is it being continued. However, REDD+ has not finished in Aceh, but has taken a different focus; it continues at the policy level.

22.1 Basic facts: Where, who, why and when

22.1.1 Geography

Located in the northern part of Sumatra (Figure 22.1), the inland zone of Aceh is dominated by the Bukit Barisan Mountain range. In Aceh, this range covers 3.3 million ha of dense forest – the Leuser and Ulu Masen ecosystems (GoA 2007). Both ecosystems are known for their rich biodiversity, in particular the endangered Sumatran orangutans (*Pongo pygmaeus abelii*) and Sumatran tigers (*Panthera tigris sumatrae*). The Leuser ecosystem covers 2.5 million ha that have been designated as conservation, protection and production forests. The 624,000 ha Gunung Leuser National Park, established in 1980, is situated in these forests.

1 Only three out of the 34 provinces have special autonomy; the two others are Papua and Papua Barat.

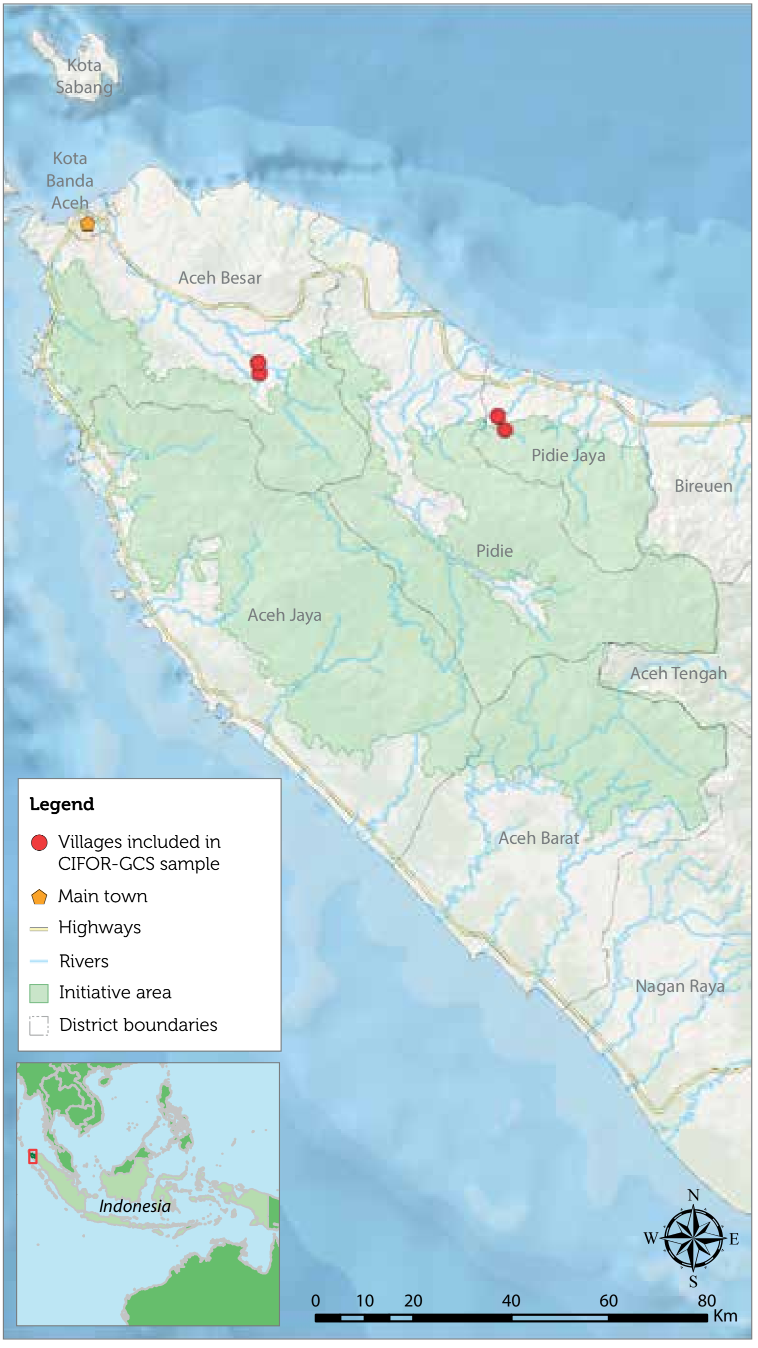

Figure 22.1 Map of the Ulu Masen REDD+ initiative.

Data sources: GoA (Task Force REDD Aceh), Aceh Geospatial Data Centre unit, Aceh Province Development and Planning Agency, Augusta Mindry Anandi (personal communication, 2014) and World Ocean Base.

Compared to the Leuser ecosystem, the Ulu Masen ecosystem, with 750,000 ha, was not as well known before the REDD+ initiative was formally declared in 2009, although it is critically important for both its biodiversity and its multiple river catchment areas (Nando 2008). The bulk of Ulu Masen is situated within the forest zone, i.e. state forestland under the purview of MoFor. Data on the formal classification of Ulu Masen forests vary. One source states that about 300,000 ha have been designated as protection and conservation forests, 400,000 ha as production forests that can be logged, and 5000 ha as areas for community development (GoA 2007).[2] Another calculation suggests that protection forests make up 570,000 ha, nature reserves 17,000 ha, production forests 84,000 ha, and areas for other uses (*Areal Penggunaan Lain* [APL] i.e. outside the forest zone) approximately 80,000 ha (personal communication from an Aceh province forestry official, 2014).[3]

About 70% of Ulu Masen's topography is hilly and mountainous and the remainder is flat and sloping. Ulu Masen's forests comprise 39% lowland broadleaf forest, 34% pine forest, 19% lower montane broadleaf and 8% montane broadleaf. Lowland forests are the most prone to deforestation and degradation (GoA 2007). The area of Ulu Masen encompasses five districts: Aceh Besar, Aceh Jaya, Pidie, Pidie Jaya and Aceh Barat (GoA 2007). More recent efforts to delineate the ecosystem suggest that Ulu Masen extends into the administrative boundaries of another district, Aceh Tengah (personal communication from an Aceh province forestry official, 2014). The Ulu Masen REDD+ initiative aimed to protect the entire contiguous ecosystem, avoiding fragmentation associated with administrative boundaries. Aceh's total population in 2010 was 4.5 million people (BPS Aceh 2010). According to the 2005 census, the population of Ulu Masen was approximately 130,000 people (GoA 2007), distributed across 65 *kemukiman*.[4] Many of Ulu Masen's people live adjacent to and are directly dependent on forests, most notably as a source of land for agriculture.

22.1.2 Stakeholders and funding

Prior to the Ulu Masen REDD+ initiative, the World Bank funded the Aceh Forest and Environment Project (AFEP). The aim of AFEP was to address deforestation and degradation caused by the post-tsunami reconstruction efforts in parts of Leuser and Ulu Masen areas (Kasia et al. 2011). The Ulu Masen REDD+ initiative extended AFEP's efforts into the entire Ulu Masen area.

2 Governor of Aceh Decree 19 of 1999 on the Guidance for Forest Function.

3 The calculations were based on planimetric delineation of maps in the appendix of Ministry of Forestry Decree 170 of 2000 on the Designation of Forests and Waters of Aceh. This decree affirmed Governor of Aceh Decree 19 of 1999 on the Guidance for Forest Function in Aceh.

4 A *kemukiman* is a traditional system of governance unique to Aceh, each consisting of a cluster of 3 to 13 villages.

Several stakeholders supported the initiative. As the lead proponent, the GoA initiated and was responsible for the overall management of the initiative. Units under the GoA specifically mandated to develop the framework of the initiative were the Aceh Green Team (comprised mostly of technical consultants) and the Aceh REDD+ Task Force (comprised of government officials). Carbon Conservation Ltd. managed the business side of REDD+, including the planning, design and identification of potential markets for future carbon credits. Fauna and Flora International (FFI), working under AFEP, supported the GoA in preparatory activities on the ground, notably those involving communities, such as FPIC.

These key players interacted with several provincial agencies: Bappeda (Badan Perencanaan Pembangunan Daerah – the provincial planning agency), Bapedalda (Badan Pengendalian Dampak Lingkungan Daerah – the provincial environmental unit), the forestry service, the agricultural service and administrative units. These agencies contributed mostly time and effort to the initiative, rather than project financing, and in return, government officials gained knowledge about topics including geographic information systems, MRV, and REDD+ and climate change.

A prized water buffalo rests after pulling a load of logs illegally harvested from protected forest in Ulu Masen. (Cut Augusta Mindry Anandi/CIFOR)

The intention from the beginning of the Ulu Masen REDD+ initiative was to start with off-budget funds (funds additional to the formally approved budget) and then tap into the forest carbon market. The initial start-up costs of the initiative were paid with official development assistance (ODA) (GoA 2007) and the flurry of donor funds that arrived for rehabilitation and reconstruction post-tsunami. FFI synchronized their activities under AFEP with the Ulu Masen REDD+ initiative, and hence most of their activities for the REDD+ initiative were funded through AFEP (Rainforest Alliance 2008). The team of consultants in Aceh Green was fully financed by the Aceh Government Transition Program (AGTP) funds and managed by the United Nations Development Programme (UNDP). The costs of the Aceh REDD+ Task Force were borne by the GoA.

Efforts to access the carbon market were led by Carbon Conservation. To secure future financing, Carbon Conservation signed an agreement with Merrill Lynch. Merrill Lynch agreed to provide USD 9 million over four years in three stages upon verified reduction of deforestation and degradation in Ulu Masen, beginning in 2007 (SSNC 2013). The status of this arrangement is unknown.

Carbon Conservation sought other funding sources. Unilaterally, Carbon Conservation, which sold some of its shares to the Canada-based gold mining company East Asia Minerals (EAM), made an agreement with the latter to 'sell' the carbon emission reductions from the Ulu Masen initiative. This purchase was to be used to offset EAM's carbon emissions associated with their mining activities within Ulu Masen and in other areas. The GoA rejected this plan, as it was contradictory to the spirit of the REDD+ initiative and their vision of forest conservation. EAM obtained access to mining areas within Ulu Masen by financing the exploration costs of three domestic companies holding the mining permits (Taylor 2011).[5] These permits were issued in 2009 by the district government to replace the previous mining concession licenses (*kuasa pertambangan*) granted three years earlier by the national government over the same area, as mandated by the new mining law. This internal wrangling occurred before any carbon credits were traded. The disagreement terminated the partnership between the GoA and Carbon Conservation.

The Aceh Green Team and REDD+ Task Force stated on several occasions that the main goal of the Ulu Masen REDD+ initiative was to improve forest management and that emission reductions would be an additional co-benefit. Any additional monies generated from carbon credits were not considered to be the main goal but a 'bonus.'

22.1.3 Motivation

Various threats to forests motivated Governor Irwandi and the GoA to undertake the Ulu Masen REDD+ initiative. Forests came under pressure from both local

5 Location of the three exploration permits: http://www.eaminerals.com/miwah-location.php

people living within the boundaries of Ulu Masen and from outsiders. Activities within Ulu Masen that threaten forests include large-scale agriculture, large-scale plantations (pulp timber, oil palm), mining (both small-and large-scale) especially in Aceh Jaya and Pidie districts, small-scale illegal timber harvesting, and land clearing for smallholder agricultural expansion and hunting (i.e. burning bushes to facilitate deer hunting, which can result in out-of-control fires).[6]

Before 2000, there were at least six concessions (GoA 2007) in Ulu Masen, but these became inactive, first due to conflict and later due to the logging moratorium in 2007 instituted across Aceh by Governor Irwandi. Parts of these areas are now being used for agriculture and parts are being logged by local communities. Demand for timber has increased due to the rebuilding and rehabilitation of Aceh post-tsunami. Lubis et al. (2008) estimated that some 500,000 m^3 of timber was needed for the reconstruction. Thus, rehabilitation and reconstruction has put more pressure on the forests.

Indonesia's supportive agricultural policies and booming commodity markets also influenced land use in Aceh. Expansion of oil palm plantations is occurring in parts of Aceh, where forestland is being converted to non-forestry uses. Various companies are actively seeking new land clearing permits to plant woody trees for pulp material and rubber trees in the area of Ulu Masen (GoA 2007).

The local transmigration program (*translok*) is also affecting land use in Aceh. This program moves local people from other parts of Aceh, notably victims of the conflict. The government provides participating households with housing and agricultural plots, which are often established by clearing forests. Households that received housing and agricultural land support will obtain an official land certificate four years after they have settled in an area.

22.1.4 Timeline

Forestry and conservation interventions started in Ulu Masen in 2006 as part of AFEP. In 2007, the governor announced Aceh Green Vision as the development strategy for the province. To realize this vision, in the same year the governor decreed a logging moratorium which banned all logging activities in Aceh. In 2008, the GoA and Carbon Conservation signed a partnership agreement, followed by the agreement between the company and Merill Lynch.

In July 2009, Ulu Masen was officially declared a REDD+ intervention area through a decree by the governor, and the REDD+ Task Force was established the following January to coordinate all activities related to REDD+ in Aceh.[7] MRV pilot surveys and FPIC both began in 2010.

6 Information from key informant interviews during May–August 2010.

7 Governor Decree 522/377/2009 on the Designation of Ulu Masen REDD+ (GoA 2009). Governor Decree 522/18/2010 on the Establishment of Aceh REDD+ Task Force (GoA 2010).

After the completion of AFEP at the end of 2011, all on-the-ground activities related to REDD+ came to a halt. In 2012, the new governor, who did not share the views of his predecessor, installed new policies and stopped implementing the previous administration's green strategy. Although the mandate of the REDD+ Task Force remains in place, the future of the Ulu Masen REDD+ initiative is unclear. Figure 22.2 summarizes the key events related to the Ulu Masen REDD+ initiative.

Pre-2000				
2000				
2001				
2002				
2003				
2004				
2005				
2006	AFEP begins in Ulu Masen			
2007	Design for REDD+ initiative developed	Moratorium logging policy issued		
2008	Ulu Masen REDD+ receives CCBA silver standard	Agreement between GoA and Carbon Conservation on carbon sale and marketing[a]		Agreement between carbon conservation and Merill Lynch on carbon purchase[b]
2009	Ulu Masen officially designated as a REDD+ intervention site			
2010	Establishment of REDD+ Task Force as the official unit for REDD+ in Aceh	MRV pilot survey	FPIC with *kemukiman* leaders	CIFOR-GCS baseline survey
2011	AFEP ends	CIFOR-GCS presents baseline results to study villages		
2012	Change of leadership in Aceh			
2013				
2014	CIFOR-GCS phase 2 survey			

REDD+ initiative active

Figure 22.2 Timeline of the Ulu Masen REDD+ initiative.

a This agreement went sour in 2012 after carbon conservation unilaterally went into a contract with East Asia Mineral.
b The implementation of this agreement is unknown.

22.2 Strategy for the initiative

The main objective of the Ulu Masen REDD+ initiative was to reduce deforestation and forest degradation, carry out reforestation, restore and enhance carbon stocks in existing forests, and improve forest management. One of its aims, for instance, was to reduce illegal logging carried out by ex-combatants through forest patrols and monitoring activities, and by providing alternative livelihoods for them. The initiative was planned to operate for 30 years and generate 3.3 million tCO_2e in emissions reductions per year, while reducing deforestation by 85% (GoA 2007; Rainforest Alliance 2008). It would be funded through ODA financing and carbon sales. The proceeds from the sale of carbon credits were expected to finance conservation and development projects for local communities within its boundaries.

The initiative was also expected to alleviate poverty and empower local communities. Several interventions or activities were planned, including introducing the use of steel material for housing as an alternative to wood. The most significant planned intervention was the reexamination of tenure rights. This intervention was expected to be carried out in areas under central government logging licenses that were no longer active and were currently being used by communities. The aim was to clarify tenure and ensure that the rent from the management of these forests accrued to the provincial government.

Irwandi's succession in 2012 has led to an uncertain future for Ulu Masen REDD+. Consequently, no activities specifically done under the initiative have been carried out since the election. Many plans have remained only plans and have not been implemented, including the promotion of non-wood alternative materials for housing and the clarification of tenure rights over ex-logging concession areas.

Between the designation of Ulu Masen REDD+ and the installment of the new governor in 2012, only a few undertakings have actually been implemented. They include livelihood enhancement activities, forest patrols, pilot MRVs and FPIC at the *kemukiman* level. Livelihood enhancement activities were carried out mostly under AFEP (see Figure 22.2). They included the development of low-impact, community-based agroforestry, and commodity crops within areas zoned for such activities and with the participation of communities. One intervention was the distribution of cocoa seedlings as an alternative livelihood to steer people away from illegal logging activities. Although AFEP has now ended, forest monitoring by forest rangers is being continued by the communities. Forest rangers also carry out other associated environmental tasks in or nearby forest areas, such as monitoring water dams. These forest rangers complement the role of the forest police. The latter report to the forestry service and are responsible for enforcing access restrictions to conservation and protection areas in Aceh, including within the boundaries of Ulu Masen.

Activities specifically attributed to REDD+ were mostly preparatory activities. These included the establishment of pilot MRV, verification for VCS and FPIC with stakeholders. Verification of the project design was validated in 2008 by Smart Wood and the initiative was granted a Silver CCBA standard (Rainforest Alliance 2008).

MRV activities were limited to pilot MRV areas. They were conducted as part of capacity building for the task force members prior to the planned MRV implementation. Nevertheless, a survey from this undertaking collected samples of belowground biomass and identified species of trees and their diversity in every stratification area. Early assessment of GHG emissions to complete the project design applied a tier 2 approach, where country specific emission factors were used as a basis for calculation.[8] Both the MRV methods and the REL for the site have not been established.

Similarly, there were not yet any specific arrangements or mechanisms for benefit-sharing among stakeholders. Although the GoA elaborated several benefit sharing mechanism options in their PDD, none of them were applied in practice because the REDD+ initiative has not been implemented beyond the preparatory phase.

22.3 Smallholders in the initiative

Local governance is described in Qanun 4 of 2003 on *Mukim* Governance and Qanun 5 of 2003 on *Gampong* (village) Governance. *Mukim* or *kemukiman* is a customary governance system consisting of a cluster of several adjacent villages (*gampong*) and is led by the head of a *kemukiman*. Each *gampong* within a *kemukiman* has its own administrative boundaries. Similar to other villages in Indonesia, a *gampong* administration includes a head of village (*geuchik*) who is elected, a village secretary (*sekdes*), and heads of affairs (*kepala urusan*). In addition, they have customary structures (*tuhapeut*, a religious or *adat* body) that govern the village collectively. *Tuhapeut* consists of five members, mostly four men and one woman where each member is responsible for one specific issue such as culture, wedding, deaths and women's issues. However, in some villages, *tuhapeut* has now become inactive. Among those institutions, the *geuchik*, village secretary and *kepala urusan* are the most important. Women participate peripherally in village decision-making processes and their input is often limited to attending meetings.

CIFOR surveyed four villages within the boundaries of Ulu Masen targeted by the proponents (intervention villages), UM1, UM2, UM3 and UM4. Thirty-three households were selected in each village using a random sampling method. A total of 132 households were interviewed from a population of 306 households. The majority (99%) of the village population was Acehnese. Most people of

8 Interviews with key informants, August 2012.

other ethnicities (e.g. the Javanese) left Aceh during the conflict period. The socioeconomic characteristics of the households that were interviewed are summarized in Table 22.1.

Public services in these villages were relatively poor. No household had piped water (Table 22.1). Households obtained water by pumping from the nearby rivers, irrigation canals and wells. None of the villages had a health center. UM1 had better sanitation facilities compared to the other three villages: about three-quarters of the sampled households had a private toilet, which was provided by a development NGO post-tsunami. In 2014, all four villages had access to electricity.

Table 22.1 Socioeconomic characteristics of households interviewed in 2010.

	UM1	UM2	UM3	UM4
Number of households sampled	33	33	33	33
Household average (SD)				
Number of adults	2.2 (1.1)	2.8 (1.4)	2.5 (1.1)	2.2 (0.7)
Number of members	3.2 (1.6)	4.3 (2.0)	3.7 (1.7)	3.6 (1.5)
Days of illness per adult	40.0 (87.1)	32.7 (74.5)	10.1 (12.1)	18.6 (20.0)
Years of education (adults ≥ 16 years old)	4.9 (3.4)	5.9 (3.7)	6.6 (3.8)	5.5 (3.6)
Total income (USD)[a]	1,484 (1,336)	1,295 (2,292)	1,580 (1,128)	2,977 (1,514)
Total value of livestock (USD)[b]	545 (1182)	428 (528)	292 (500)	186 (457)
Total land controlled (ha)[c]	0.7 (1.1)	2.0 (2.3)	1.3 (1.0)	1.2 (0.9)
Total value of transportation assets (USD)	694 (838)	783 (933)	374 (378)	535 (1006)
Percentage of households with:				
Mobile or fixed phone	30	42	48	36
Electricity	70	91	73	18
Piped water supply	0	0	0	0
Private latrine or toilet	79	12	3	3
Perceived sufficient income	48	39	58	70

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.

b Total livestock value at the time of interview.

c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

The average years of education among villagers was low. In UM1, UM2 and UM4, the mean education attainment was primary school. All villages except UM4 had an elementary school; a secondary school was only found in UM3, reflected in a higher mean education level of seven years of study (secondary school).

Household annual incomes were similar in UM1, UM2 and UM3, ranging from USD 1300 to 1500, while UM4 had a considerably higher average of about USD 3000. In this village, many villagers reworked their previously productive gardens, which they had abandoned during conflict, and cleared new agricultural land. More than half of households sampled perceived that their income was adequate to cover household needs. Across all households in the sample, income was mainly generated by wages or through other avenues (Figure 22.3).

Agriculture was an important source of income for all study villages. However, in UM1 and UM4, the largest income share came from other sources, such as the flurry of work during Aceh's rehabilitation and reconstruction aid, and alms and inheritance. In UM2 and UM3, wage labor reached the highest income share of the total household income (Figure 22.4). In these two villages, many households took agricultural labor work – working for other smallholders – in neighboring villages. On average, each household in UM1, UM3 and UM4 controlled less than 1.5 ha of land; in UM2 each household controlled 2 ha (Table 22.1).

Forest is less significant as a source of income compared to agriculture. Among the four villages, a larger proportion of households in UM3 and UM4 compared to UM1 and UM2 obtained cash income from forests during the two years prior to the survey (Table 22.2). In UM4, a large proportion of the village area was forest; about 40% of the households in UM4 were making cash from forests. UM3 had little forest but villagers' cash income from forest was high; UM3 households often access the forests of neighboring UM4. Cash income from these two villages appears to be associated with illegal logging activities in the area. Very few villagers in our sites collected NTFPs, fuelwood and timber; villagers can get to the nearest forests in 1–2 hours on foot. Our survey shows that fuelwood was harvested by more than 60% of women in the villages. In the near future, the use of fuelwood is expected to decline because of the effect of the government program on the introduction of liquid petroleum gas.

Between 21% and 33% of households in all of the villages, except for UM2, had cleared forest in the two years prior to the 2010 survey, and clearing was exclusively for agricultural purposes. Those who cleared forests, cleared on average 3 ha in UM1, but this was much lower in UM3 and UM4 (i.e. less than 0.1 and 0.05 ha, respectively). In UM1 and UM2, more than half of respondents stated that they had less opportunity to clear forest in the two years prior to the survey because of: government restrictions, increased distance to forests, preference for sedentary farming and lack of capital. In UM2, forest rangers forbade villagers to clear forests. In UM3 and UM4, about one-third of respondents said that they had more opportunity to clear forests, due to lack of armed conflict and a growing interest in agricultural cultivation.

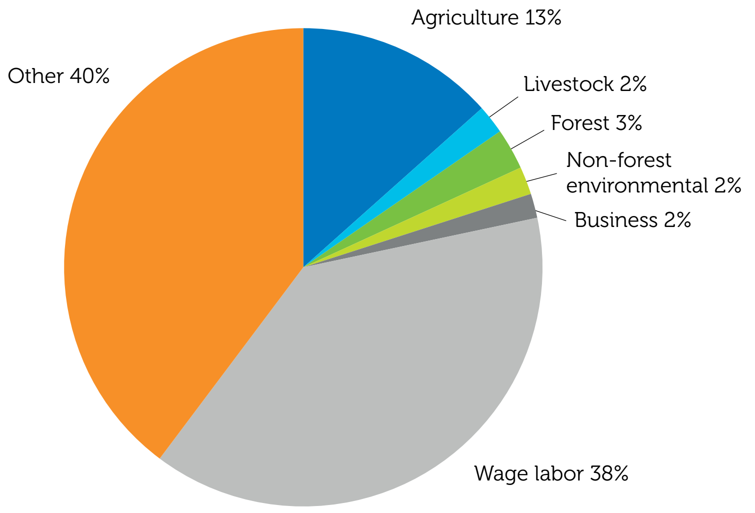

Figure 22.3 Sources of income for all households in sample (n = 132).

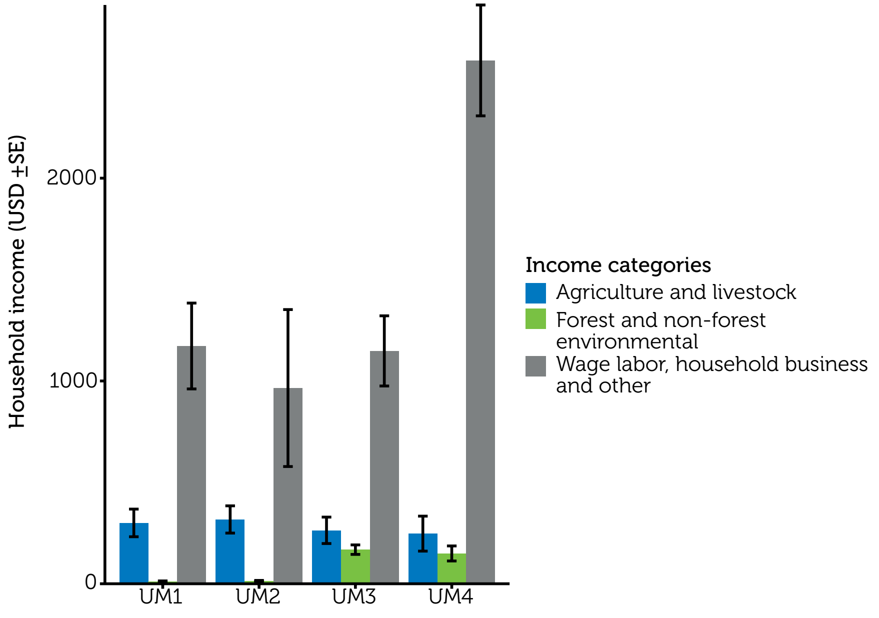

Figure 22.4 Sources of income for average household by village (+/- SE) (n = 132).

UM4 has recently been designated as a 'transition village'; it is part of a government program to build new houses for conflict victims. This *translok* program relocated households from neighboring villages to UM4. About one hundred houses were built for this purpose; this has resulted in the expansion of cocoa cultivation and has placed increased pressure on surrounding forests.

Table 22.2 Indicators of household forest dependence based on the 2011 survey.

	UM1	UM2	UM3	UM4
Number of households sampled	33	33	33	33
Household average (SD)				
Share of income from forest	0.00 (0.00)	0.00 (0.00)	8.57 (10.75)	5.85 (13.91)
Share of income from agriculture	28.45 (32.84)	45.09 (37.44)	18.80 (27.09)	9.32 (25.09)
Area of natural forest cleared (ha)[a]	2.92 (15.64)	0.00 (0.00)	0.12 (0.42)	0.05 (0.15)
Area of secondary forest cleared (ha)[a]	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Area left fallow (ha)[b]	1.83 (1.04)	7.00 (9.59)	1.08 (0.49)	1.00 (0.00)
Distance to forests (minutes walking)	60	120	90	60
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	81	71	65	64
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	0	0	6	0
Reporting increased consumption of forest products[e]	50	0	0	5
Reporting decreased consumption of forest products[e]	0	0	5	0
Obtaining cash income from forest products[f]	9	3	55	42
Reporting an increase in cash income from forest[f]	0	0	0	0
Reporting a decrease in cash income from forest[f]	33	0	12	7

continued on next page

Table 22.2 (continued)

Reporting fuelwood or charcoal as primary cooking source	100	85	82	85
Leaving land fallow[g]	9	15	18	9
Clearing forest[g]	21	0	33	30
Reporting decreased opportunity for clearing forest[g]	58	78	7	0
Clearing land for crops[g]	21	0	33	30
Clearing land for pasture[g]	0	0	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. of hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

22.4 Challenges facing the initiative

Ulu Masen REDD+ has faced several challenges. One challenge has been the lack of support from the general public in Aceh. Public acceptance towards REDD+ is low (and there is a sense of ambivalence) because other activities such as oil palm and mining are perceived to be more attractive in terms of the revenue and income streams that they generate. According to the proponent, communities are increasingly aware of the risks of deforestation but are questioning the benefits of REDD+. This skepticism was amplified by the lack of tangible benefits flowing into villages from REDD+. Local communities are more likely to opt for short-term benefit, such as planting agricultural commodities, instead of long-term benefits from forests (e.g. by establishing tree plantations). REDD+ has to compete with these activities, as agro-industrial crops are perceived to be far more profitable per unit of forest area than keeping the forests standing.

The threat to the integrity of the Ulu Masen forest ecosystems also comes from beneath the forests. High and commercial value ore and minerals – gold, copper, iron and coal – are found in protected forests of Aceh Besar, Pidie, Aceh Barat, Aceh Jaya and Aceh Tengah. These deposits pose a challenge for conservation efforts post-conflict as pressures to exploit natural resources increase due to demands for development (McCulloch 2010).

The invigorated traditional governance system, where important decisions and information inflows concentrate at the *kemukiman* level, is unique to Aceh and has implications for REDD+ implementation. The process of FPIC stopped at this level, involving mostly *kemukiman* leaders and some village representatives. REDD+ involves managing land use at the lowest level, so both information flows and FPIC processes would be more effective if carried out at village level as the lowest unit of settlements. However, as Ulu Masen is such a large area comprising around 200 villages (Forest Peoples Programme 2011), this would not be an easy task.

Lack of understanding about climate change and REDD+ among local communities and other stakeholders (including units within the local government) pose another challenge in implementing REDD+. Awareness about REDD+ and climate change was facilitated by NGOs. Because the REDD+ concept was fairly new, the expertise of NGO field staff was also limited. Hence, information that trickled down to communities varied, was often incomplete and easily created confusion. For example, there was a perception that the carbon project would take over people's land and as a result, landowners would lose their rights to their land. The way in which information is communicated and what is communicated to the community is important in shaping the public perception of REDD+. This is critical in particular because Aceh is currently at a turning point in terms of the future of the Ulu Masen REDD+ initiative.

As in other areas in Indonesia, a significant challenge emerges from the ambiguity of tenure rights. In all four intervention villages, the ownership of land is mostly inherited. Idle lands abandoned by timber concessions – state lands – are claimed by local communities as theirs. This occurred in UM4. In UM2 and UM3 villages, local people took over lands left by transmigrants who fled Aceh because of conflict. Most of the current users thus do not have official land certificates because these lands *de jure* belong to the transmigrants. These unclear tenure arrangements can have implications when REDD+ is implemented, in particular with regard to benefit sharing.

The 'euphoria' of REDD+ at the global level has largely ceased due to the endless negotiations to achieve an international climate agreement. The resulting uncertainty with regard to funding streams and REDD+ architecture has affected the progress of REDD+ on the ground. Issues associated with dependence on short-term availability of external funding (AFEP and UNDP), unsustainable political support, and perceived unattractiveness of REDD+, have halted the momentum for Ulu Masen REDD+ in Aceh.

The special autonomy status means that the GoA has authority over land-use decisions, including forest management or REDD+. Inconsistencies and ambiguities in the legal regulatory framework make it a challenge in practice. For example, the forest zone – within which most of Ulu Masen is classified – is legally under the purview of MoFor. Although the national government can act as a check for the GoA's inappropriate policies over areas within the forest zone, it can also circumscribe the GoA's appropriate forestry policies that are not consistent with national policy.

22.5 Lessons from the initiative

The case of Ulu Masen illustrates well the vulnerability of jurisdictional REDD+ to electoral politics. The REDD+ initiative was proposed by Irwandi, who had a 'green' vision. The current leader, however, does not place environmental goals as high on his agenda as his predecessor. Some environmentally friendly decisions nevertheless are being continued under his term, including a logging moratorium. According to a key informant, the new governor's actions are more about distancing himself from his predecessor, rather than being inattentive to environmental issues. As a consequence, the fate of the Ulu Masen initiative is now uncertain. While no formal decisions have been made to end the initiative, no REDD+ activities are being carried out either. Political commitment, therefore, has been an important determinant for the trajectory of Ulu Masen REDD+. To help ensure continuity, climate change mitigation initiatives such as REDD+ need to be mainstreamed in the GoA's short-, medium- and long-term development plans. Despite its importance, the Ulu Masen area has not been formally recognized (and designated) as an integrated and distinct ecosystem. Former Governor Irwandi had proposed that the area be designated as a Strategic Ecosystem Area in the province's Long Term Plan 2012–2025, but it was rejected by Aceh's legislature.

As of the time of writing (October 2014), there are no signs that the new governor will support the continuation of Ulu Masen REDD+ and thus no REDD+ activities are being carried out at the local level. However, Aceh is engaged in REDD+ at another level. The province has recently completed its Strategy and Action Plan for REDD+ (SRAP REDD+) (Bappeda 2013) and its Action Plan for the Reduction of GHG emissions (RAD-GRK) (BAPPENAS 2011). The SRAP REDD+ was prepared as part of the REDD+ Agency's program, as an elaboration of the National REDD+ Strategy at the provincial level. The RAD-GRK was prepared as part of the BAPPENAS (Ministry of National Development Planning) program to elaborate the RAN-GRK. Aceh is about to sign a memorandum of understanding with the national REDD+ agency on cooperation in climate change mitigation. Aceh also continues to be a member of the Governors' Climate and Forests Task Force.

One important lesson from the experience of Ulu Masen REDD+ is the need for an adequate preparatory phase, including a clearly defined workable strategy and design. Ulu Masen was one of the first REDD+ initiatives that made the headlines in the international media following the COP 13 in Bali. Lack of capacity and resources has meant that the GoA had to depend on external actors during the entire process of REDD+ establishment, including the planning, designing, implementing and marketing phases. This 'fast-track' process and high expectations, among others, have led to a bitter disagreement between the GoA and its partner, Carbon Conservation. Similarly, with the completion of AFEP, the funding that had supported FFI to implement community engagement activities was also exhausted. The partnership with these actors – either in terms of continued funding support or working relationship – partially defines the fate of the initiative.

22.6 Acknowledgments

We would like to convey our utmost thanks to all members and leaders of the communities of the study villages for all their time, support and friendship during our study. We are indebted to Fadmi Ridwan (Aceh REDD+ Task Force), Yakob Ishadamy (Aceh Green), Dedek Hadi (Aceh REDD+ Task Force) and all of the other resource persons working for the GoA for their valuable insights and support. We thank the local government of Aceh for its support of this research. We are very grateful for the dedication and perseverance of our field team members and data encoders: Aan, Abdul Mahmud, Mahlizar, Merlinta Anggilia, Putra, Jhon Roy Sirait and Mella Komalasari. We would like to thank Claudio de Sassi for providing the graphs and tables, and Stibniati Atmadja, Dedek Hadi and Agus Djoko Ismanto for reviewing the draft of this chapter.

Part 2. Case Reports

Vietnam

Box J
REDD+ in Vietnam: The national context

Thu Ba Huynh

A development success story vulnerable to climate change

Vietnam is undergoing rapid changes in the social, economic and even climate domains. Although its population growth rate has fallen by half over the past two decades, Vietnam is already the 13th most populous nation with up to 1000 people/km^2 in the Red River Delta (Townshend et al. 2011).

Vietnam's poverty reduction story is well known. Political and economic reforms (*Doi Moi*), launched in 1986, transformed Vietnam from one of the poorest countries in the world to a lower middle income country by the end of 2010 (World Bank 2014). The country's rate of poverty reduction ranks sixth globally for both absolute and relative progress toward achieving Millennium Development Goals (Dilley et al. 2005; Steer et al. 2010). However, according to Bojo (2011), much of the spectacular economic growth has been fueled by intense exploitation of natural resources.

Over the past 50 years in Vietnam, the average annual temperature has risen by 0.5°C–0.7°C (Government of Vietnam 2011). The average annual temperature is projected to increase by another 0.8°C–3.4°C by 2050 (IMHEN and CSIRO 2013). A World Bank study claimed that Vietnam is in the top five countries most threatened by sea level rise (Dasgupta et al. 2007). Dilley et al. (2005) also classified Vietnam as one of the top 10 most vulnerable countries in the world, due to the number of people exposed to natural hazards. The Working Group II of the IPCC included Vietnam in the map of "Hotspot of key future climate impacts and vulnerabilities in Asia," given its high population density and two mega deltas, the Mekong River and the Red River (Cruz et al. 2007, 481).
In recognition of this reality, Vietnam's 2008 National Target Programme to Respond to Climate Change and the National Strategy on Climate Change in 2011, set out strategic goals and a roadmap for both adaptation and mitigation actions.

A pioneering country for REDD+

Vietnam's forest cover declined from 43% to 27% between 1943 and 1990 (Quy and Can 1994). Since then, Vietnam has made considerable efforts to increase its overall forest cover, including setting a target of 45% forest cover by 2020 in the National Strategy on Green Growth. By the end of 2012, Vietnam had increased forest cover to 39.7%, or 13.8 million ha of forest on 16 million ha of officially designated forestland (MARD 2013). The increase was mainly due to new plantations (MARD 2010), while the quality of natural forests has continued to decline due to fragmentation and degradation. Over two-thirds of Vietnam's natural forests are considered poor or regenerating, while mature forest constitutes only 4.6% of the total (UN-REDD 2013).

Since 2009, Vietnam has taken significant steps toward establishing REDD+. In late 2009, UN-REDD started piloting REDD+ readiness activities in the province of Lam Dong. The current REDD+ portfolio consists of 20 REDD+ initiatives funded both bilaterally and multilaterally. The National REDD+ Action Program (NRAP) was approved in 2012. A few provinces have recently embarked on the formulation process for Provincial REDD+ Action Programs (PRAPs). Dien Bien was the first province to approve its PRAP in May 2014.

The Government of Vietnam plays a central decision-making role in REDD+. The Socialist Republic of Vietnam is a one-party state. The Vietnam Communist Party provides leadership and guides national policy making. The Prime Minister runs the government and has ultimate decision-making power over the operations and implementations of the Party's resolutions. Reflecting this central structure, there is a National REDD+ Steering Committee, the ultimate policy-making body, chaired by the Ministry of Agriculture and Rural Development and constituted by members from various ministries. The Vietnam REDD+ Office (VRO), based in the Vietnam Administration of Forestry, coordinates REDD+ implementation activities.

The REDD+ Network, now comprised of over 200 individuals from 56 organizations, became active in 2010. The Network has six subtechnical working groups (STWGs), each chaired by two representatives from government and UN agencies or NGOs. The six STWGs address the areas of: governance, private sector engagement, MRV, local implementation, benefit distribution systems and safeguards. Over the past few years, the STWGs have made important recommendations for the development of REDD+ in Vietnam. However, the VRO's capacity to coordinate and lead the implementation of the NRAP is limited, and in 2014, many of the STWGs became inactive due to lack of motivation and leadership from key actors.

Chapter 23

Cat Loc Landscape – Cat Tien National Park Pro-Poor REDD+ Project, Vietnam

Thu Ba Huynh

This chapter discusses implementation of one of the first REDD+ initiatives in Vietnam, designed and implemented by SNV (the Netherlands Development Organisation).[1] This case is framed in the broader context of dynamics between international NGOs and the government of Vietnam (GOV) in the REDD+ arena.

The Cat Loc Landscape – Cat Tien National Park Pro-Poor REDD+ Project[2] (2009–2012) was funded by the UK Government Darwin Initiative, and implemented in partnership with the International Institute for Environment and Development (IIED) and national and local authorities in Vietnam. This initiative aimed to (i) examine the potential for accessing the voluntary carbon market in order to reduce deforestation and (ii) support the establishment of a forest carbon facility to make direct payments to local villagers for arresting degradation and

1 SNV is a nonprofit, international development organization, established in the Netherlands in 1965.

2 This initiative will be referred to as the Cat Tien initiative in this chapter.

deforestation in and around the Cat Tien National Park, Lam Dong Province. Although the initiative did not end up making payments to local villagers as initially planned, a number of useful lessons were learned.

23.1 Basic facts: Where, who, why and when

23.1.1 Geography

Cat Tien District is located in Lam Dong Province in the Central Highlands of Vietnam (Figure 23.1). Deforestation has been a serious problem in the Central Highlands. Agricultural expansion has long been a driver of deforestation in Lam Dong Province, with records dating back to 1958 suggesting trends toward land conversion in several districts. Comparisons of land-use maps in 1979 also suggest that areas such as the Cat Tien District, which did not have permanently cultivated fields, saw significant changes in agricultural cultivation techniques during the early 1980s. Maps for 1992 also show the retreat of large forests (excluding bamboo) and the continued expansion of cultivated land (Koninck 1999).

Established in 1987, the Cat Tien District is the ancestral home to the Chau Ma and Xtieng ethnic groups. It is a 'special land' where the ancient kingdom of the South was founded. Cat Tien National Park (CTNP) is one of Vietnam's most important and largest national parks, covering 71,920 ha of lowland forest and swamp. The park is well known for once being the habitat of the Javan rhinoceros (officially declared extinct in Vietnam in 2010).

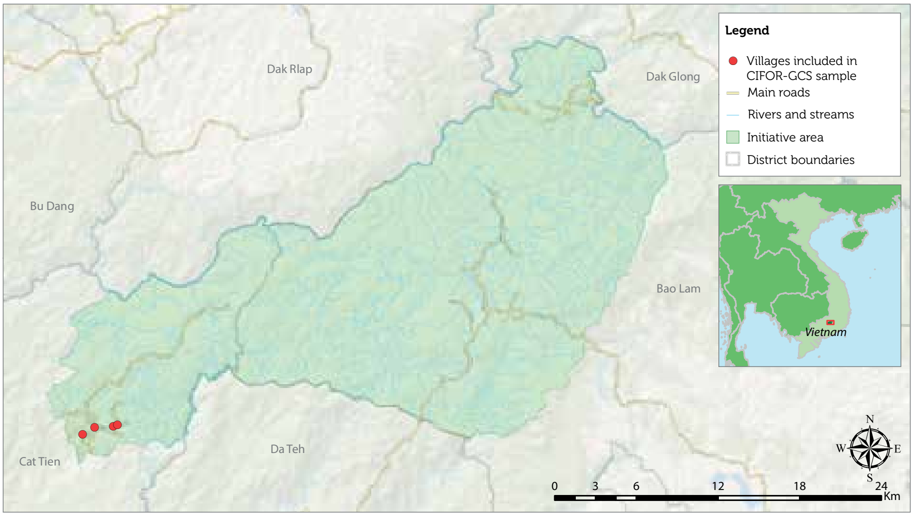

Figure 23.1 Map of the REDD+ initiative in Cat Tien.

Data sources: SNV, GADM, OpenStreetMap and World Ocean Base.

23.1.2 Stakeholders and funding

In 2009, SNV conceptualized a pilot REDD+ initiative, targeting the voluntary carbon market and seeking sustainable financing mechanisms for communities, as an effort to curb forest degradation and contribute to the conservation of the Javan rhino in Cat Tien. The initiative received a Darwin grant of GBP 188,624 for a period of three years, 2009–2012. It was carried out in close partnership with IIED, the Ministry of Agriculture and Rural Development, and Lam Dong provincial and district authorities in Vietnam.

23.1.3 Motivation

SNV's success with biogas projects[3] and its involvement in setting up CDM methodologies has been widely recognized in Vietnam. In 2004, SNV found that through the use of the CDM, reforestation would become a source of income for communities.[4] The Cat Tien initiative aimed to examine the potential for avoided deforestation through accessing the voluntary carbon market and to support the establishment of a forest carbon facility to compensate local villagers for arresting degradation and deforestation in and around CTNP. It also intended to support pro-poor REDD+ polices and measures to enable communities to receive support from carbon markets through participatory village-level emissions reduction planning.

23.1.4 Timeline

The initiative's key activities, as outlined in Figure 23.2, were primarily in the realm of 'readiness,' including development of methods for participatory forest carbon measurement and design of benefit-sharing systems.

As seen in Figure 23.2, after the project was approved in 2009, a technical working group on REDD+ at the provincial level was established and immediately became active. The activities in early 2010 revolved around developing baseline data, including maps, key drivers of deforestation and socioeconomic profiles of the villages within the boundary of the initiative. Later in 2010, the first field activities that involved local villagers took place: training and piloting participatory forest carbon measurement. In 2011, SNV joined forces with UN-REDD to study benefit distribution systems (BDS), carrying out extensive consultations with communities and suggesting the establishment of a community management board for any REDD+ funds. The initiative was completed in 2012 with a number of key policy recommendations on REDD+ financing of a BDS and participatory forest carbon measurement.

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3 Currently, there are over 12,000 biogas digesters replicated all over the country.

4 *The Golden Forest: Reforestation CDM case study from North Central Vietnam* was published in 2007 (see Doet 2007).

Pre-2000					
2000					
2001					
2002					
2003					
2004					
2005					
2006					
2007					
2008					
2009					
2010	Technical working group on REDD+ at subnational level established	CIFOR-GCS baseline survey	Collection of baseline data including maps, drivers of deforestation and socioeconomic profiles	Training and piloting participatory forest carbon measurement. Manual for participatory forest monitoring prepared and distributed	Proponent offers policy recommendations on REDD+ financing of BDS and participatory forest monitoring methods
2011	Design of benefit-sharing system (with UN-REDD) including consultations with communities and suggestions on establishment of community management board for REDD+ funds		CIFOR-GCS presents baseline results to study villages		
2012	End of initiative				
2013					
2014	CIFOR-GCS phase 2 survey				

REDD+ initiative active

Figure 23.2 Timeline of the REDD+ initiative in Cat Tien.

23.2 Strategy for the initiative

The Cat Tien initiative was endorsed in 2009 by the Lam Dong provincial People's Committee with a local government partner, the provincial Department of Agriculture and Rural Development (DARD). To facilitate broader participation, DARD established a provincial REDD+ technical working group, which served as a forum for local government stakeholders to develop technical capacities for and strengthen political ownership of initiative implementation and outputs. SNV's field activities were carried out in two areas of the Cat Tien and Bao Lam Districts.

In 2010, among a number of studies commissioned by SNV, an in-depth financial and technical analysis indicated that the project approach was unsustainable because of factors such as technical challenges, uncertainty over market maturity and high implementation and opportunity costs. Consequently, the initiative was reoriented to focus on developing models to inform potential future public sector funding for REDD+ in Vietnam. SNV decided to discontinue pursuit of the voluntary market and switched to target interim public financing as a source of forest carbon revenue to compensate local communities for their participation and performance in REDD+ activities.

The Cat Tien initiative benefited from a technical partnership with the United States Forest Service in the field of participatory forest monitoring, operational system design and participatory carbon monitoring (PCM) methods and protocols via the Lowering Emissions in Asia's Forests (LEAF) project, funded by USAID. A few training courses and participatory forest monitoring activities were carried out in Tien Hoang commune. However, the final project report stated that due to "inaccessible or non-existent REDD+ markets and funds", there were no flows of financing to communities, and that participatory village-level emissions reduction planning was "deemed an unviable and high-risk activity, which had potential to unreasonably raise local expectations from putative REDD+ schemes" (SNV 2012, 8).

In their report, An Approach to Designing Pro-Poor Local REDD+ Benefit Distribution Systems: Lessons from Vietnam, SNV highlighted the need to examine the legal frameworks both at national and subnational levels to identify areas of complementarity or conflicts with customary laws (Enright et al. 2012). Based on this notion, they developed a proposed process for the determination of REDD+ beneficiaries. The report makes a policy suggestion on forestland tenure and urges the GOV to consider both the REDD+ BDS landscape approach and the carbon rights approach, with great emphasis on participation, transparency and equity.

Apart from SNV's interventions, the WWF Indochina Program has also been active in CTNP's core and buffer zones since 1997. The organization implemented a conservation project (1997–2006) focusing on protection of CTNP, reducing human impacts and considering landscape-level strategies to support the management of CTNP. In Cat Tien District, WWF executed a project (2008–2012) with the goal of diversifying landscapes, improving the livelihoods of communities, and contributing to sustainable development in poor rural areas around CTNP through optimized production of cashew, and the introduction of diversified farming and cocoa production. Thus, SNV and WWF shared a common goal to curb deforestation and conserve Cat Tien rhinos.

Cat Tien National Park – "Last refuge for a lost animal"[5]

In April 2010, a dead Javan rhino was found with a single bullet in its leg and its horn removed. In October 2011, WWF confirmed that the species became extinct in Vietnam. The extinction of the Javan rhino in Vietnam was "definitely a blow" to the conservation communities around the world (BBC News 2011).

5 WWF calls CTNP the "Last refuge for a lost animal."

Moving away from livelihood improvement and REDD+ payments as initially planned, the Cat Tien initiative served as a way to test new mechanisms and approaches for REDD+ policy formulation. Since the Cat Tien initiative ended in 2012, SNV's involvement in REDD+ has remained strong in Lam Dong via other REDD+ initiatives. Currently, together with UN-REDD, they are the main supporters in formulating the provincial REDD+ action plan.

23.3 Smallholders in the initiative

23.3.1 Socioeconomic and land-use data

The Cat Tien initiative was implemented in Tien Hoang Commune, Cat Tien District. The commune has six villages with a total of 3245 people, comprised of 70% Kinh[6] people and 30% other ethnic minority groups (both local and immigrant). The Kinh and other ethnic minorities were resettled[7] in Cat Tien from the northern uplands and the Red River Delta. Of these six villages, four were selected for the CIFOR-GCS sample. A total of 120 households (30 in each village) were interviewed, and surveys of the village and specifically of women in the village were also conducted. The four surveyed villages are located along main roads and in the buffer zone of CTNP. Figure 23.1 shows the locations of the study villages (the red dots) in Cat Tien.

All villagers had access to schools and health centers within the commune. As seen in Table 23.1, most villagers received between seven and nine years of schooling. While none of the villagers had access to piped water and instead used wells for water supply, electricity was accessed by 100% of the surveyed population. The average size of land holding (including agriculture, forestry and residential land) was different among the villages. LDCT1 had the largest land area, with almost four times the average landholding in LDCT3. The survey results also indicate that LDCT1 had the largest secondary forest area. It is interesting to note that approximately 92% of the villagers in LDCT1 thought that their incomes were sufficient, while only 53% of their neighbors in LDCT3 and LDCT4 shared the same opinion. More discussion on incomes is provided in Section 23.3.2.

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6 In Vietnam, there are 54 ethnic groups, with 87% of the population belonging to the largest group: the Kinh ethnicity.

7 There was both planned and spontaneous migration. The planned migration took place within the framework of the government's New Economic Zones in the 1960s. The program aimed to (i) redistribute population and resources, (ii) strengthen national solidarity and defense, and (iii) reduce environmental degradation in densely populated areas. The strategy was to encourage lowlanders and ethnic minorities from mountain areas in the north and from crowded urban areas in the south to settle in the Central Highlands with support from the government.

Table 23.1 Socioeconomic characteristics of households interviewed in 2010.

	LDCT1	LDCT2	LDCT3	LDCT4
Number of households sampled	30	30	30	30
Household average (SD)				
Number of adults	3.4 (1.4)	3.9 (1.5)	3.7 (1.5)	3.7 (1.8)
Number of members	4.7 (1.5)	4.8 (1.7)	5.0 (1.4)	4.6 (1.7)
Days of illness per adult	9.1 (12.7)	11.2 (16.2)	13.6 (29.3)	18.8 (33.5)
Years of education (adults ≥ 16 years old)	7.4 (3.7)	8.4 (3.6)	8.1 (3.4)	8.9 (3.9)
Total income (USD)[a]	5,971 (9,629)	2,823 (2,771)	1,920 (2,292)	3,067 (3,645)
Total value of livestock (USD)[b]	1,413 (820)	1,976 (4,083)	800 (1,518)	665 (684)
Total land controlled (ha)[c]	9.5 (10.0)	5.4 (5.3)	2.5 (2.7)	5.0 (5.1)
Total value of transportation assets (USD)	617 (740)	380 (512)	441 (662)	458 (614)
Percentage of households with:				
Mobile or fixed phone	100	100	100	100
Electricity	100	100	100	100
Piped water supply	0	0	0	0
Private latrine or toilet	100	93	100	93
Perceived sufficient income	93	63	53	53

a Total annual income (12 months prior to survey) from agriculture, livestock, business, wage labor and other sources (remittances, subsidies, pensions), net of costs, in USD; currency converted using yearly average provided by the World Bank.
b Total livestock value at the time of interview.
c Total area of agricultural, forest, other natural habitat and residential areas controlled by the household, either used or rented out.

According to the 2012 commune statistics, more than 95% of the Tien Hoang population earn their living from agricultural and forestry activities. Our survey results (Table 23.2) show that 58%–71% of villagers considered agriculture as their primary or secondary occupation. In contrast, forestry was the primary or secondary occupation of only 9% of villagers in LDCT1, almost 2% in LDCT2 and none of the villagers in LDCT3 and LDCT4, despite their greater proximity to the forests. This is partly explained by the fact that natural forests are owned by the government. The state forest organizations that own the forest sign forest protection contracts with villagers and pay them an annual fee. Natural forest resource extraction or clearing is illegal.

Tien Hoang Commune covers a total area of 5237 ha. Forestry land accounts for 60% of the total area. According to SNV's land-use maps over the two periods 1995–2004 and 2004–2009, it is evident that there was a large increase in the area converted from forest to non-forested land in Tien Hoang (SNV 2010). In 2007, Tien Hoang Commune developed a Master Land-use Plan for the period up to 2010. The document highlights the need to map out a plan to convert poor forests into high-value plantation forests, targeting a reduction in forestland area by 130 ha by the end of this period. Due to the GOV's strict ban on shifting cultivation, large-scale clearing of forestland has been significantly curbed over the past decade. As seen in Table 23.2, at least some households in all villages reported a decrease in the opportunity for clearing forest during the two-year period prior to the CIFOR-GCS survey (2008-2010).

23.3.2 Sources of income

According to the 2009 commune statistics, 20% of all households are classified as poor (Tien Hoang CPC 2009). Data on percentage shares of household income in the four sample villages are displayed in Figure 23.3. This section will limit the discussion to the top three sources: crops, wage labor and forests.

Accounting for 35% of the total income, the two major agricultural crops (rice and cashew nuts) were the most significant source of income in the study area. While rice was the key subsistence crop for most households, cashew nuts were valued for their cash income. This perennial crop is grown on degraded forestland that has been converted for agricultural purposes and allocated to households. Between 2005 and 2008, cashew was the most lucrative cash crop, following a rapid expansion in plantation area. In 2009, the total cashew area was 5345 ha, comprising 37% forestland and 63% of forestland converted for agricultural purposes. Converted forestland has been allocated to households via forestland-use certificates (Red Book) for 50 years. Households are allowed to use the land allocated, following the government's land-use plans/projects, and are entitled to receive initial support in the form of seedlings, fertilizer and agricultural extension services.

The second largest source of income (approximately 22%) was from wage labor. Within this category, the largest share was from forestry work. While the total income from cashew may be more significant, it is not a monthly revenue. Wage labor with a steady flow of cash was important in local livelihoods, especially during pre-harvest periods when a shortage of cash is more marked. Families without this source of steady cash income tended to take out loans, either cash or in-kind from local lenders or merchants, with steep interest rates. This was one of the reasons for illegal hunting and logging activities in the study villages. Those who were unable to repay the loans in cash, could do so in-kind, which includes paying with wildlife and timber products.

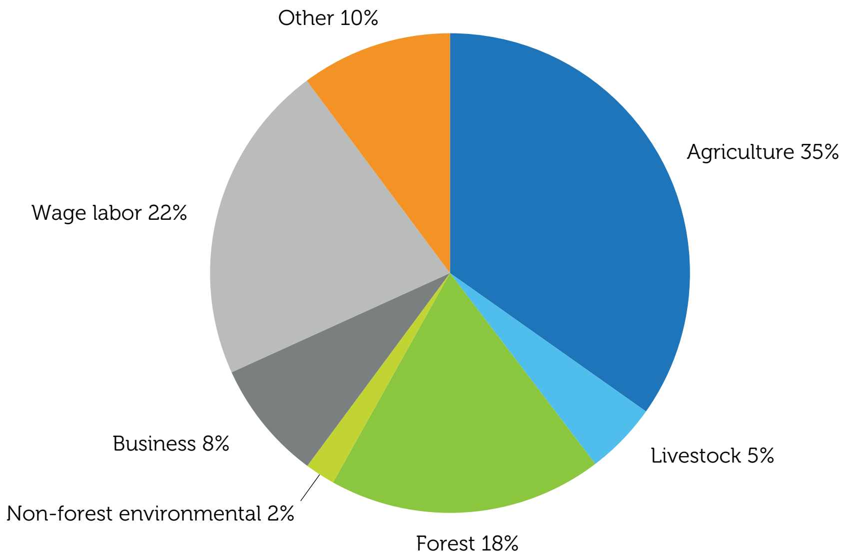

Figure 23.3 Sources of income for all households in sample (n = 120).

As seen in Figure 23.4, average household income from wage labor was substantially higher in LDCT1 than in the other three villages. Furthermore, approximately 30% of income under this category came from forestry-related wages earned by LDCT1 households. Table 23.2 shows that 47% of LDCT1 households earned cash income from forests, nearly double that of households in the other three villages. This may be explained by the fact that LDCT1 is a shorter distance from and has easier access to natural forests (as seen in Table 23.2). In addition, the average size of forest areas allocated to LDCT1 households is almost double the area allocated to households in the other three villages.

Cash income from forests may be derived from two types of wage labor: (i) forest protection fees paid by the government, and (ii) work as illegal loggers or hunters. In the case of LDCT1, the significant amount of income from wage labor cannot come from forest protection fees because the government's fee under the Program 661 is minimal[8] and PES was not available in LDCT1 at the time of this study. Approximately 36% of LDCT1 villagers reported a reduction in cash income from forestry during the two years prior to the survey, whereas villagers in LDCT3 and LDCT4 did not observe this trend (Table 23.2).

8 Under the National Five Million Hectare Reforestation Programme, households sign forest protection contracts with forest owners (i.e. national parks, state-owned companies, people's committees) and receive VND 100,000/ha/year, equivalent to USD 5 and less than the value of a kilogram of cashew in the local market.

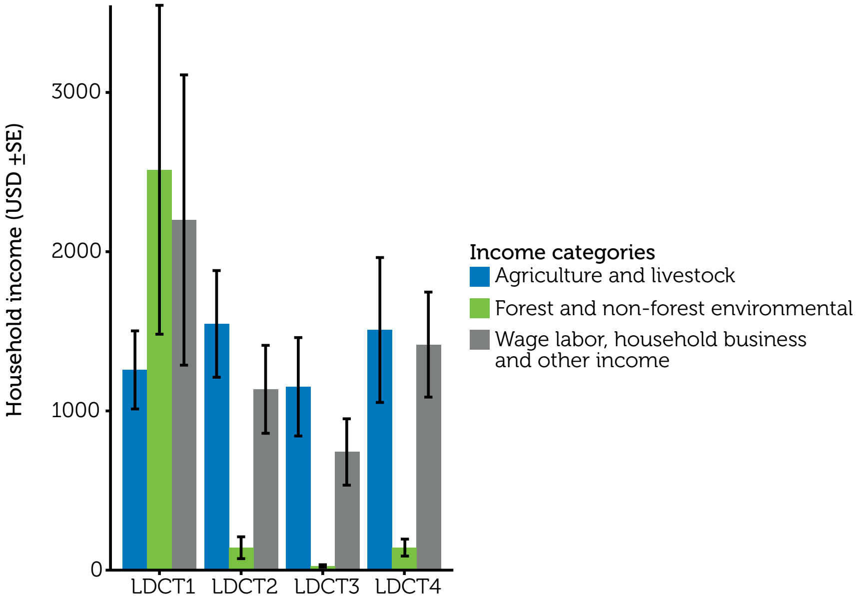

Figure 23.4 Sources of income for average household by village (+/- SE) (n = 120).

The third largest source of income was from forests, accounting for 18% of the total household income. Figure 23.4 shows a significantly higher income from forests in LDCT1 compared with that of the other three villages. LDCT1 is notorious for illegal forest extraction activities in Cat Tien, and it was difficult to obtain data on the timber and wildlife trade.[9] In 2009, Tien Hoang Commune confiscated 18 m^3 of illegally logged timber. This figure increased to 30 m^3 in 2012. Furthermore, local forest protection officials believe the actual amount of timber extracted illegally is a lot higher. Data from this study seems to confirm their observations. While not many households engaged in illegal logging, among those practicing this business, the average volume of timber harvested per household was 23 m^3/year.

As seen in Table 23.2, almost all villagers used fuelwood as the primary cooking fuel and were engaged in fuelwood collection. Results from village and gender group discussions revealed that villagers did not collect NTFPs for commercial purposes,[10] but a wide variety of forest vegetables and root plants continued to be the major part

9 Immediately prior to CIFOR-GCS field work, intense investigations took place in the study area because of the death of the last Javan rhino in CTNP.

10 This excludes bamboo shoots, which are collected when a shortage of cash is keenly felt during preharvesting seasons or when there is an emergency need for cash (e.g. bamboo shoots are readily available in markets and along the roadsides before schools open in early September. This is when children and families try to earn cash to pay for school fees).

of their diet. Villagers from the local ethnic group (both men and women) viewed access to this resource as vital. However, as seen in Table 23.2, between 14% and 43% of villagers reported a decrease in consumption of forest products. This is partly due to the government forest access restrictions and to the decline of forest resources. More than half of all respondent households (56%) cited government restrictions as the top reason for the decline in opportunities to clear land.

Table 23.2 Indicators of household forest dependence based on the 2010 survey.

	LDCT1	LDCT2	LDCT3	LDCT4
Number of households sampled	30	30	30	30
Household average (SD)				
Share of income from forest	27.04 (41.26)	2.00 (7.42)	0.03 (0.15)	2.52 (11.55)
Share of income from agriculture	44.09 (41.44)	43.50 (9.45)	48.06 (14.99)	52.14 (37.58)
Area of natural forest cleared (ha)[a]	0.27 (1.28)	0.22 (0.83)	0.00 (0.00)	0.45 (1.31)
Area of secondary forest cleared (ha)[a]	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Area left fallow (ha)[b]	14.67 (9.24)	13 (0.00)	0.10 (0.00)	1.00 (0.00)
Distance to forests (minutes walking)	30	90	180	120
Percentage of households				
With agriculture as a primary or secondary occupation (adults ≥ 16 years old)[c]	71	63	61	58
With a forest-based primary or secondary occupation (adults ≥ 16 years old)[d]	9	2	0	0
Reporting increased consumption of forest products[e]	0	0	0	0
Reporting decreased consumption of forest products[e]	43	29	14	25
Obtaining cash income from forest products[f]	47	27	27	13
Reporting an increase in cash income from forest[f]	0	0	0	0
Reporting a decrease in cash income from forest[f]	36	13	0	0
Reporting fuelwood or charcoal as primary cooking source	97	100	87	93

continued on next page

Table 23.2 (continued)

Leaving land fallow[g]	10	3	3	3
Clearing forest[g]	10	7	0	13
Reporting decreased opportunity for clearing forest[g]	50	37	38	22
Clearing land for crops[g]	3	0	0	10
Clearing land for pasture[g]	0	0	0	0

a Average no. of hectares cleared over the past two years among households that reported clearing of any forest.
b Average no. hectares left fallow among households that reported leaving any land fallow.
c Percentage of households with at least one adult reporting cropping as a primary or secondary livelihood.
d Percentage of households with at least one adult reporting forestry as a primary or secondary livelihood.
e Percentage of households among those that reported any consumption of forest products over the past two years.
f Percentage of households among those that reported any cash income from forest products over the past two years.
g In the two years prior to the survey.

In conclusion, in monetary terms, forest incomes may not be the top livelihood strategy in the study area (except for a number of households in LDCT1). However, access to forestland to grow perennial crops was important in the local household economy. Fuelwood from both natural forests and degraded forestland was essential for all four villages. NTFPs continued to be an important part of people's livelihoods, and were particularly appreciated by the local ethnic groups. There has been a general reduction in consumption of and opportunities to access forest resources.

23.3.3 The Cat Tien initiative in Tien Hoang

The only field-based activity that the Cat Tien initiative carried out in Tien Hoang Commune was the training and piloting of participatory forest monitoring. SNV subcontracted Tay Nguyen University to design and deliver the training courses. A number of village heads and male villagers received the training, participated in the activity and received payment for their involvement.

The CIFOR-GCS survey results showed that by early 2010, interviewed villagers had no knowledge about the initiative or about REDD+ in general. Due to the absence of appropriate methodologies and concerns about raising communities' expectations, SNV did not carry out any awareness-raising activities on REDD+ or FPIC. By mid-2011, most villagers had heard about climate change via radio and government television broadcasts, and only some village heads were exposed to the REDD+ concept through their participation in the participatory forest monitoring activities. These village heads mentioned the SNV initiative but were unable to explain it beyond the participatory forest monitoring activities. One village head explained to fellow villagers: "REDD+ means millions of Vietnam dong[11] to protect forests, and we won't have to worry about land-use change." In early 2014, a couple of years after the initiative was completed, the villagers continued to express their eagerness to learn more about REDD+.

23.4 Challenges facing the initiative

SNV believes that the success of any REDD+ scheme will ultimately depend on how effectively it is designed and introduced. Setting the goal to conserve rhino through a pilot REDD+ initiative could arguably be a shortcoming in its design. The forces driving rhino poaching are not the same as those driving deforestation and forest degradation. As the first pilot REDD+ initiative in Vietnam, Cat Tien posed another set of challenges for SNV. As an evolving concept with much uncertainty, there was a certain level of initial resistance to REDD+ both internally within SNV and externally from the government. In 2009, SNV did not see REDD+ as an effective means to achieve their pro-poor agenda. However, the REDD+ team managed to get their portfolio noticed by SNV senior management by tailoring their products, integrating REDD+ with other programs and building on the existing expertise at SNV. During its implementation, the initiative encountered multiple challenges including the complexity of methodologies, and the difficulty of both getting REDD+ off the ground and penetrating higher levels of decision making in Vietnam. This prevented SNV from achieving the scale and replicability that the organization had initially aimed for, thus jeopardizing its members' ability to communicate and effectively influence policy making.

Results from a survey interview with SNV on proponent challenges showed that more than half of the 62 factors possibly influencing implementation were viewed by the proponent as large challenges.[12] Among the factors related to REDD+, political economy (BAU interests)[13] and policies (international, regional and national) were dominant. SNV considered the most overwhelming challenge to be the 'economics of REDD+.' If REDD+ initiatives are not able to compete with other land uses, including rubber and coffee, their success rates will be low.

11 Vietnamese currency.

12 CIFOR-GCS conducted its proponent challenges survey interview with SNV on 10 December 2012.

13 In the proponent challenges survey, BAU interests were defined as "the constellation of political and economic actors who have or will derive economic benefit from continued legal conversion of forests to non-forest uses and/or continued degradation of forests." (Sunderlin et al. 2014, 13).

Chau Ma ethnic minority villager, Cat Tien district. (Thu Ba Huynh/CIFOR)

Another challenge that seems to impede SNV's policy agenda is the coordination and collaboration among different government agencies. SNV is particularly concerned with unclear forestland ownership/rights and improvements needed in terms of coordination between the two GOV ministries dealing with land (the Ministry of Agriculture and Rural Development and the Ministry of Natural Resources and Environment). SNV has taken actions at the subnational level via their land-use planning activities with provincial and district authorities. Yet, in this context, the organization does not anticipate any radical reforms to the current tenure arrangements. Despite their extensive REDD+ involvement, SNV's influence on the tenure discussions at the national level is somewhat limited.

23.5 Lessons from the initiative

SNV has helped to blaze a trail for REDD+ in Vietnam. After attempting to lay the groundwork for funding the Cat Tien initiative through the forest carbon market, it discovered the limitations of the project approach and switched to working on REDD+ at a higher scale. Lessons learned through the Cat Tien experience have enabled SNV to contribute to provincial and national REDD+

development. At the national level, SNV has been playing a leading role in the Sub-technical Working groups on Local Implementation, BDS and Safeguards. Their REDD+ portfolio grew from one to six projects in Lam Dong Province, adopting a landscape approach and aiming to support the formulation and implementation of Provincial REDD+ Action Programs.

REDD+ has successfully penetrated the highest level of political spheres in Vietnam with the National REDD+ Action Program's approval in 2012. It was observed at the national level that REDD+ created a foundation to move toward more interactive policy making via experimentation of new ideas and mechanisms with contributions from new actors. The GOV made the initial effort to bring various forces and actors together to discuss issues, and to find and execute solutions (i.e. via the operations of Sub-technical Working groups and the national REDD+ network). Thus, in a structured manner, REDD+ policy processes in Vietnam have provided a platform for non-state actors to explore their underpinning values and to interact with each other. However, organizations such as SNV have been hampered from having a more substantial influence on positive policy outcomes, partly due to the institutional inertia that is embedded in both state and non-state agencies.

Development of international NGOs in Vietnam has occurred under cumbersome registration and approval procedures, and relatively strict surveillance and control (Hannah 2007). This has influenced the focus/mandate of their programs and led to a more pragmatic approach toward policy making, and ultimately created a type of institutional inertia. In a country such as Vietnam, it is important for policy actors to know how to strategically handle the policy process. In addition, they must recognize the country's unique political structure and the complex nature of the political landscape, infused as it is with protected values of stability and social order. Pushing for ambitious technical progress on REDD+ prior to establishing strong political support and consensus for it could be a recipe for failure.

External pressures and global trends may facilitate the introduction of new ideas but could also pose risks of 'push-back,' thereby slowing down change and widening ideological schisms. Thayer (2010) remarked that, despite its "soft-authoritarian" and one-party regime, Vietnam seeks its political legitimacy from multiple sources, including speeding up the scope and pace of political change. An open-mindedness in political approach will allow for space and opportunities to enhance legitimacy and collaboration, open up 'freedom to maneuver' and bring about changes.

Vietnam is considered a pioneering REDD+ country, where the GOV and REDD+ practitioners are under much pressure and expectations to deliver. This chapter suggests that the time, resources and approach required to catalyze change should not be underestimated and must be considered carefully in the design of REDD+ initiatives and policy processes.

The World Economic Forum (2013) claims, "civil society's time has come." Professor Dang Huu, president of the Vietnam Institute of Development Studies said in 2006: "As the reform process moves forward, unique opportunities are created for Vietnamese policy and lawmakers to promote an enabling environment for the establishment and growth of non-state organizations." This chapter argues that the enabling environment should be created and facilitated, not only by the Vietnamese policy makers but also by other non-state policy actors. In the context of REDD+, these actors should envision their influence beyond a limited thematic focus and aim for a broader view of social change. Building political intelligence with a broad alliance via collective actions, while creating a social learning process where actors could share and hold each other accountable, are useful starting points.

23.6 Acknowledgments

I would like to acknowledge the support of my colleagues in SNV: Richard McNally, Adrian Enright, Tim Holland, Steve Swan, Ms Ly Minh Hai and Nguyen Trung Thong. It would not have been possible to obtain such a body of empirical data and insights without their assistance. I am indebted to the communities in Cat Tien, who shared their shelter, food and beautiful stories. I would like to extend my warmest thanks to the CIFOR-GCS team and the Vietnamese enumerators Le Minh Dang, Le Kieu Oanh and Pham Ngoc Nam.

Cashew, coffee and fish ponds, Tien Hoang commune.
(Thu Ba Huynh/CIFOR)

Part 3

Synthesis

Chapter 24

REDD+ on the ground

Global insights from local contexts

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24.1 Introduction

When the idea of REDD+ was consolidated at the UNFCCC COP in Bali in 2007, there were high expectations that it would be a path-breaking approach to reducing tropical deforestation and GHG emissions from the forest sector. The core of the idea was to pay for the forgone benefits of forestland conversion with a substantial flow of funding, rewarding forest stakeholders who measurably slowed deforestation and forest degradation against a baseline. Public sector funding would initiate the process, to be eventually supplanted by a robust market in carbon credits. In the introduction of this book, we observed that the idea of REDD+ has evolved and diversified over time, and that there are now equal measures of hope and discouragement concerning its capacity to fulfill its multiple goals.

This mix of hope and discouragement comes in part from the experiences of subnational initiatives such as those described in this book. These initiatives were called for in the 2007 Bali Action Plan, as one type of 'demonstration activity,' to support the development of REDD+ by carefully documenting and disseminating their efforts to reduce emissions by addressing nationally relevant drivers of deforestation. Numerous initiatives have been launched in at least 47 developing countries (Simonet et al. 2014), some drawing international attention for their pioneering efforts or controversies associated with their financial and legal status, and many others making incremental and generally unremarked progress. Funding for these initiatives has been part of the vast expansion of funds for tropical forest conservation motivated by REDD+, but is still generally considered insufficient to make a significant dent in global carbon emissions.

In some countries, the launch of these initiatives has helped: (i) spur research and capacity building for MRV; (ii) strengthen ongoing efforts to clarify forest tenure; (iii) encourage the development of national regulations on the rights to and distribution of carbon revenues; and (iv) contribute to the public dialogue about low-carbon development pathways. The initiatives have drawn political and scientific attention to the diverse tropical forest ecosystems where they are located, from the peat swamps of Kalimantan to the coral rag of Zanzibar. And they have moved REDD+ funds into the field, creating a set of 'field experiments' with different types and combinations of interventions ranging from conditional monetary payments, to FSC certification of community forests, and to training and monitoring of improved fire management. In several cases, REDD+ funds have sustained ongoing forest conservation interventions that otherwise would have been suspended. In most cases, the proponents of initiatives have sought to build and improve upon previous efforts to conserve forest. Likewise, moving forward, their experiences could help inform forest conservation efforts across multiple dimensions, not limited to REDD+.

While the initiatives have largely fulfilled their role as pilot programs designed to explore and evaluate alternatives for implementing REDD+, most are struggling to make the transition from pilots to sustained REDD+ interventions. This is partly because of the lessons that they have uncovered: there are multiple challenges related to both REDD+ specifically (MRV) and to forest conservation in general (financing, tenure, institutional/scale issues and safeguards). In particular, proponents have found it challenging to implement the original core idea of REDD+ because of, for example, entrance barriers to the international carbon market and difficulty managing local expectations about significant carbon revenues. Responses have varied, from treating initiatives as time-limited pilots that generate lessons for national policy development; to transforming the initiatives into broader low-carbon development efforts; continuing with conservation efforts that preceded and are now succeeding REDD+; and actively seeking carbon revenues in order to continue as REDD+ interventions.

In this chapter, we synthesize what these diverse experiences tell us about the capability of REDD+ to deliver on its goals, including the role of subnational initiatives and how they integrate with national REDD+ through their choice of (i) scale and (ii) MRV systems. Our research on these initiatives also gives us insights into the challenges of (i) financing interventions, (ii) clarifying tenure, and (iii) designing social safeguards. In particular, our rich data on household livelihoods and village conditions allow us to identify common patterns as well as heterogeneity that must be taken into account in the design of social safeguards. For each of these five issues, we first note some of the key insights from the literature and then summarize what we have learned from the case studies. We close with a section assessing whether REDD+ still has the potential to be the path-breaking solution to deforestation that generated so much hope and enthusiasm seven years ago.

24.2 Key challenges facing REDD+

24.2.1 Finances

Following the Bali COP in 2007, international funding for REDD+ quickly ramped up, with large pledges from governments and the development of voluntary markets. Since 2010, however, the flow of funds has been smaller, and this is reflected in the experience of the 23 initiatives described in this book. According to Norman and Nakhooda (2014), USD 8.7 billion was pledged or invested in REDD+ from the public and private sectors from 2006 through March of 2014. Of that total, 65% was pledged between 2006 and 2010, 61% was for readiness activities not conditioned on performance, 88% was pledged by the public sector through multilateral and bilateral channels (nearly all as grants), 41% was pledged by Norway, and 40% was allocated to Brazil and Indonesia. Pascual et al. (2013, 19) note that this represents “a dramatic and unprecedented increase in foreign aid for the forestry sector,” although Watson et al. (2014, 12) caution that “a significant volume of the bilateral finance that has been counted as support for REDD+, includes longstanding programs to support forest conservation and biodiversity, and sustainable land management.”

Norway has played a particularly important role in REDD+ finance as the largest donor, with a strategy focused primarily on climate mitigation, multiyear investments that have raised the domestic profile of REDD+ in key countries and a willingness to test performance-based funding mechanisms. Other significant donors globally include the United States, Germany and the United Kingdom, with Japan also making substantial contributions to MRV capacity, Australia to REDD+ in Indonesia and France to Francophone Africa. In terms of the countries in our study, Norway has provided 70% of the funding for REDD+ in Indonesia and 60% for Tanzania (including support for most of the initiatives in our sample), as well as being the most important donor to Brazil's Amazon Fund (Norman and Nakhooda 2014). While Norway's donations to the Amazon Fund have been performance based, Brazil has not passed that conditionality on to recipients of the funds, including several initiatives in our sample.

Pascual et al. (2013, 13) argue that the success of REDD+ will depend "on the scale and reliability of its financing, the mechanism's ability to financially compete with alternate land uses, and the fair and wide distribution of financial benefits." There are clearly challenges on all three fronts. Donor funding was initially intended to support the start-up of REDD+ and to be quickly supplanted by carbon markets. REDD+ did represent the largest volume (22.6 million tCO_2e) and value (USD 94 million) in voluntary carbon offset markets in 2013 (Peters-Stanley et al. 2014), but this was partly because of bilateral funding intended to bolster a flagging market. Donor funding is notoriously unstable and also raises concerns about REDD+ competing with other development needs. Peters-Stanley and Gonzalez (2014) report that the price of carbon credits from REDD+ fell significantly in 2013, which means that generating offsets became less competitive relative to clearing forest for commodity production. Thus, both the total demand and the per-unit value of carbon in voluntary markets remain insufficient to compete with the opportunity costs of clearing forest, and there is still significant controversy and uncertainty about whether REDD+ offsets will be accepted into compliance markets, such as the California cap-and-trade program. Finally, many of the initiatives in our sample have had difficulty meeting all of the requirements for entry into the voluntary carbon markets, most notably in terms of MRV.

Twelve of the 14 initiatives in our sample that continue as REDD+ efforts have definite plans to sell carbon credits. However, only four initiatives have actually sold credits as of mid-2014. Whether or not they were planning to sell carbon credits, the proponents of these initiatives required start-up funding to launch their activities, which they obtained mostly from international donors. However, 10 of the initiatives have received significant financial support from domestic institutions (including four that have received in-kind support from governments), and two of the initiatives (Madre de Dios and Jari/Amapá) are led and financed primarily by domestic institutions. Of the initiatives depending on international aid, 10 have been supported by Norway directly through Norway's International Climate and Forest Initiative or the bilateral REDD+ Fund in Tanzania, or indirectly through contributions to the Brazilian Amazon Fund. Twelve have been supported by philanthropies or NGOs, including foundations such as Clinton, Moore, and Packard, and NGOs such as Fauna and Flora International, TNC and WWF. Only six of the initiatives have received financial support from the private for-profit sector.

The proponents in our sample have pursued several different strategies in response to the reduced flow of REDD+ funds since 2010. Several, including all with private sector investors, have continued to pursue markets for carbon credits, using strategies such as CCBA certification to differentiate themselves in the market. At the other extreme, several have decided to treat their initiatives as time-limited pilots, producing lessons for national REDD+ development but not continuing their own REDD+ interventions. A third strategy has been to seek complementary sources of funding and incentives for sustainable forest management, such as FSC certification. Finally, some proponents have transformed and aligned their REDD+ initiatives with broader policy agendas for low-carbon development.

One question raised by this multiplicity of strategies is whether and which represent failures of REDD+. If REDD+ is defined as conditional cash payments to landholders, then clearly most initiatives have failed. This vision of REDD+ is only viable with a secure market or fund for carbon offsets to support a contract guaranteeing that landholders will definitely be paid if they reduce emissions and will definitely not be paid if they do not reduce emissions. Other types of funding make it hard to comply with both principles (cf. Wunder et al. 2008).

REDD+ could also be defined more broadly as a set of positive incentives for landholders to change behavior in order to reduce emissions. This could theoretically be achieved through short-term funding for training and subsidized inputs to start complementary activities that compete with forest clearing and/or require standing forest as input, or for developing institutions that give co-benefits of forest conservation more consideration in local decision making. This is essentially the well-worn ICDP approach, which has been found to be largely unsuccessful (Sunderlin et al. 2014a), contributing to interest in REDD+ as a potential source of long-term, conditional payments that could ensure durable reductions in emissions while safeguarding biodiversity and local livelihoods.

24.2.2 Tenure

There are three general reasons why tenure is important in REDD+. The first concerns the tenure of local stakeholders within the boundaries of the initiative in relation to REDD+'s performance-based mechanism. REDD+ needs to provide enduring and secure rights-based capability and motivation to those entrusted with the role of protecting and restoring forests. As noted above, the core idea of REDD+ is to motivate stakeholders to protect forests through the provision of conditional, performance-based rewards. This mechanism requires that the appropriate right-holders to that future stream of benefits are identified, because these right-holders are the same people who will be held responsible for ensuring that forest protection goals have been met. It is a characteristic feature of most forests in developing countries that tenure is contested and therefore insecure.

This outcome results from state appropriation of rights to forests long ago, as well as a long legacy of powerful actors exploiting forestlands and resources at the expense of their inhabitants (Larson et al. 2013; Sunderlin et al. 2014b). Beyond identifying the appropriate right-holders and responsibility bearers, it is important to clarify local tenure over forests and carbon in order to prevent or minimize the effects of a resource rush and protect existing livelihoods in the event that the stream of REDD+ income attracts competitors (Sunderlin et al. 2014b).

Second, tenure security for local stakeholders within the boundaries of an initiative is important for various reasons that go beyond REDD+'s performance-based mechanism. Among the main threats to forest in REDD+ initiatives is outside claimants on local forests – whether they are smallholders or large landholders – so it is important to empower local stakeholders with legally enforceable rights of exclusion (Sunderlin et al. 2014b). Moreover, some degree of forest-based climate change mitigation can be achieved through the provision of tenure rights alone, which is to say, without financial compensation to local stakeholders (Stevens et al. 2014). This can conceivably occur under conditions where traditional right-holders derive higher direct benefits from forests (e.g. due to cultural values), where forest management is a profitable alternative if placed on a level playing field (e.g. with the same access to credit) and where deforestation is a strategy used to secure tenure rights.

The third reason – and closely related to those above – why tenure is important in REDD+ is that existing forest tenure arrangements at the level of the landscape (i.e. including not just the initiative but also a wider area) have tended historically to favor the interests of actors that convert forests to non-forest uses, and are therefore in need of review and change for reasons of forest conservation, climate change mitigation and also equity. Tenure arrangements in many countries reflect a long legacy of providing privileged access to forestland and resources to powerful actors such as logging, agro-industrial, livestock and mining companies, and of fulfilling state imperatives for economic and infrastructural development (Sunderlin 2011). Various countries are beginning to come to terms with the damaging environmental consequences of this legacy, for example, through Brazil's Forest Code (Tollefson 2011) and CAR (Duchelle et al. 2014), and Indonesia's One Map Policy (UKP4 2013) and the Indonesia Forest Moratorium (Murdiyarso et al. 2011).

CIFOR-GCS research at the case study sites has shown that proponents have given dedicated attention to tenure clarification at the local level, but in many cases have not yet succeeded in creating a secure tenure foundation for REDD+ activities. Strong attention to tenure is justified because more than half the 71 villages at 19 sites are experiencing tenure insecurity over a portion of their lands, almost two-thirds are experiencing external use of local forests, a quarter have external uses that are prohibited, and in one-sixth, villagers have tried but failed to exclude external users (Sunderlin et al. 2014b, 43). At four CIFOR-GCS study sites in Brazil, there are various challenges to be surmounted in spite of proponents being able to collaborate directly with government on tenure regularization (Duchelle et al. 2014). At five sites in Indonesia, existing tenure conditions are inadequate for the effective implementation of REDD+ (Resosudarmo et al. 2014a). At six sites in Tanzania, proponents have focused on external pressures on tenure, but ought to give more attention to issues of internal institutions and rules compliance (Dokken et al. 2014). At the two sites in Cameroon, some progress has been made on tenure clarification but initiative participants are frustrated by the lack of progress toward implementing compensation and benefit-sharing systems (Awono et al. 2014). A survey of difficulties encountered in setting up REDD+ at the 23 sites revealed that tenure is viewed by proponents as the paramount challenge (Sunderlin et al. 2014a).

The case chapters in this book enrich our understanding of the challenges that tenure poses to the fulfillment of REDD+'s goals. At 19 of the 23 sites, tenure is one among a number of challenges. At 11 of the 23 sites, tenure is among the most important challenges (Jari/Amapá, SFX, Transamazon, Madre de Dios, Kigoma, Mpingo, KCCP, KFCP, Rimba Raya, Katingan and TNC within BFCP). At six of the 23 sites, tenure issues bring into question whether the initiative can fulfill its objectives. At Jari/Amapá, there is local stakeholder disillusionment because of insecure tenure, and to date the proponent has been unable to resolve the issue through a land exchange (Chapter 5). At Madre de Dios, the success of REDD+ could depend on the government eliminating multi-use zoning (Chapter 8). At Kigoma, Jumuiya ya Watunza Msitu wa Masito, the new proponent organization, has sought tenure over the forest in order to fund itself through timber management rights, but the government is so far unwilling to award tenure (Chapter 12). At both Katingan and Rimba Raya, awarding of an ERC over only a part of the forest targeted for protection threatens to undermine success (Chapters 18 and 20).

24.2.3 Scale of REDD+

The creation of national REDD+ architectures involves harmonizing the efforts of subnational REDD+ projects and programs into national frameworks. Regardless of whether or not a nested or subnational jurisdictional approach[1] is adopted, REDD+ is an inherently multilevel process, requiring coordination between activities on the ground and policies at higher levels.

1 In the context of multilevel coordination, the terms 'jurisdictional' and 'nested' REDD+ have taken on different meanings for different actors. The VCS refers to *nested* as the integration of project-level carbon credits into broader-scale (jurisdictional) accounting mechanisms. *Jurisdictional* means that carbon monitoring will occur over an entire political administrative region, which could be subnational or national in scale (VCS 2013).

A theoretical advantage of jurisdictional REDD+ programs is that they house the purviews of economic development and environmental stewardship, along with mechanisms of downward accountability, in one place – government. Jurisdictional approaches to low emissions rural development also provide a way to link to REDD+ via sustainable supply chains, domestic policies and finance through a shared performance metric (Nepstad et al. 2013). Interest in subnational jurisdictional programs has also been motivated by the lack of progress in international climate negotiations toward binding agreements. Subnational jurisdictional programs can move forward with actions that leverage forests for climate change mitigation even as international negotiations continue at a slow pace. Innovative discussions that aim to advance subnational jurisdictional programs to secure these advantages are emerging in this context. Perhaps the strongest example of these innovations is the Governor's Climate and Forests Task Force (GCF), a unique platform that facilitates the interchange of information and lessons learned among subnational governments, and also aims to pursue funding opportunities for subnational jurisdictional programs (Asner 2011; GCF 2014b). GCF member states recently signed a declaration to reduce deforestation in their subnational jurisdictions by 80% by 2020 if performance-based financing can be secured (GCF 2014b).

Given these advantages, we hypothesized that the proponents of jurisdictional REDD+ programs perceive subnational policies to be less challenging than do the proponents of local REDD+ projects. Yet, evidence from interviews with proponents of the 23 subnational initiatives shows that this is not necessarily the case. We asked the 23 proponents to evaluate a wide range of policies related to REDD+ and asked them to rate the size of the challenge posed by those policies on a Likert scale. When we compared the answers of the six jurisdictional respondents with the answers of the non-jurisdictional project staff, we found no significant difference in the perceived magnitude of challenge presented by any international policy or national policy. However, subnational agriculture, trade, investment, tenure and land-use policies were perceived as significantly more challenging by the six respondents linked to jurisdictional REDD+ programs than by other proponents (paper being prepared by Ravikumar et al.).[2]

These results fail to support the hypothesis that bringing REDD+ under the control of subnational governments is more likely to lead to subnational policies that are consonant with the needs of REDD+. While it is difficult to derive causal inferences based on responses from just six jurisdictional REDD+ initiatives, plausible explanations for the observed results are discussed in Ravikumar et al.'s forthcoming paper.

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2 Ravikumar A, Larson AM, Myers R, Gonzales Tovar J and Duchelle AE. (In prep). Multilevel Governance Challenges and opportunities in transitioning towards a national approach for REDD+: Evidence from 23 subnational REDD+ initiatives.

There are additional challenges associated with jurisdictional REDD+ approaches. First, jurisdictional REDD+ can suffer from electoral liability. For instance, in Brazil, while the states of Acre and Mato Grosso have passed state REDD+ laws, and the municipalities of São Félix do Xingu and Cotriguaçu are pursuing innovative local governance models for green development, changes in political leadership could adversely affect these advances if not sufficiently institutionalized. Second, the involvement of multiple stakeholders in large-scale jurisdictional initiatives requires navigating conflict and collaboration among actors with very different interests and degrees of power. For example, the leadership of REDD+ remains uncertain in Indonesia, with the REDD+ Agency, the President's special taskforce (UKP4), and Ministries of Environment, Finance, Forestry, and Agriculture all potentially playing important roles. Complicating the picture further, different sectorial ministries may be decentralized to different degrees; MoFor maintains substantial control of forestland, for example, while for other sectors, powers have been decentralized to the districts. These issues of coordination may be especially salient for jurisdictional programs compared with other initiatives because jurisdictional programs may have stronger and more formal relationships with other levels and sectors of government, precluding the possibility of 'bypassing' these complications or liaising directly with the international community. Other issues that subnational jurisdictional approaches may face include leakage across state borders (Atmadja and Verchot 2012), inadequate devolution of relevant powers over land use and other policy instruments to subnational governments, and an increased potential for corruption at the local level (McCarthy 2004; Palmer 2001).

Despite these challenges, the move to jurisdictional approaches by many proponents of subnational REDD+ initiatives holds promise given the slow progress of the international climate change negotiations, the substantial advances made by many tropical states and provinces, and the need to place REDD+ within a broader framework of low emissions rural development.

24.2.4 MRV

Measuring and monitoring forest carbon emissions at the national level essentially involves estimating and monitoring changes for two key variables: (i) activity data (area of deforestation and degradation); and (ii) changes in terrestrial carbon stock densities per unit area (emission factors; Verchot et al. 2012; GOFC-GOLD 2013). The objectives and reporting rules for carbon monitoring in REDD+ are defined in UNFCCC decisions and the Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidelines (GPGs). Many REDD+ countries are starting with large gaps in capacity for carbon monitoring and have concrete plans to improve this capacity as part of REDD+ readiness activities (Romijn et al. 2013). Despite these advances, there are still numerous challenges to MRV for subnational initiatives.

One of the main challenges relates to scale. The IPCC GPGs have been developed for generating national GHG inventories, as they provide the framework and tools for countries to report internationally. At the subnational level, proponents may find the guidelines of carbon certifiers, such as the VCS and Plan Vivo, to be more relevant, especially when they hope to access the voluntary market. The problem is that reporting to the different accounting frameworks, even when based on similar data, can lead to very different results. The sum of claimed emission reductions by subnational initiatives should not exceed the total claimed at the national scale and should demonstrate consistency with national GHG inventories (Dutschke 2013). Addressing omissions, leakage, double counting and overlapping claims over carbon rights may require nesting of local initiatives into larger jurisdictional monitoring efforts. The potential use of national and global data and datasets for application at subnational levels must be further tested to support the proponents of subnational REDD+ initiatives in their efforts.

Another challenge relates to MRV capacity by the proponents of subnational REDD+ initiatives. In our sample of 23 initiatives, MRV development varied widely, with capabilities generally high in Latin America and not as advanced in Africa and Asia (Joseph et al. 2013). Methods are readily available for evaluating the impacts of forest clearing over larger areas, such as by commercial agriculture expansion, leading to large-scale permanent conversion that can be accurately measured. In contrast, detecting deforestation associated with subsistence agriculture poses a greater challenge, since the disturbances are smaller and the long-term net carbon outcomes less certain (Ziegler et al. 2012). Small-scale deforestation and degradation therefore requires investigation at a finer scale, such as through the use of very high resolution imagery (Herold et al. 2011). Forest degradation processes and their specific drivers are more difficult to detect through remote sensing and suffer from lack of reference levels (Skutsch et al. 2011).

Despite MRV challenges across our sample, there are notable instances of progress. Among the Brazilian initiatives, Acre's government established a state-level geoprocessing center (UCEGEO) to map and monitor deforestation and forest degradation at finer scales (more detailed minimum mapping unit) than even the well-developed Amazon-wide monitoring system, and is continuing developing its methodologies for monitoring and evaluating forest fires.
In Tanzania, proponents reported that the unavailability of historical data related to forest monitoring complicated building the site-level MRV capacity, a challenge compounded by the lack of local capacity and by the costs of external expertise. However, in both Indonesia and Tanzania, some initiatives have MRV support from international conservation organizations with which they are affiliated. This is the case with TNC within BFCP and SFX (both operated in the name of TNC), and KCCP (implemented by Flora and Fauna International). The importance of customized, locally relevant solutions is demonstrated by the Mpingo initiative, where forest fires contribute to 60% of emissions

(Chapter 15). Fire frequency and the change in biomass are monitored through the GapFire model, developed in collaboration with the University of Edinburgh. The experience of the Tanzania Forest Conservation Group in the Kilosa and Lindi sites illustrates the fact that committed individuals in an organization can make significant progress in developing successful MRV systems. Both national and subnational initiatives aim for similar results, and synergies for monitoring and win-win situations need to be created to make monitoring efficient and effective on the different scales that REDD+ operates (Pratihast et al. 2013).

24.2.5 Social safeguards

Financing for REDD+ under any future climate change mitigation agreement will be conditional on the implementation of national Safeguard Information Systems to address social and environmental criteria that go beyond carbon. Countries are required to comply with the seven safeguards articulated in the UNFCCC Cancun Agreement (Decision 1/CP.16): (i) complement national forest programs and international conventions and agreements; (ii) maintain transparent governance; (iii) respect knowledge and rights of indigenous peoples and local communities; (iv) obtain effective participation in REDD+ design and implementation; (v) promote forest conservation and other environmental and social co-benefits; (vi) address risks of reversals; and (vii) reduce leakage (UNFCCC 2011). Furthermore, jurisdictions and initiatives already engaged with multi- and bilateral donors and third-party certifiers must consider additional standards for demonstrating high social and environmental performance, such as those of the Forest Carbon Partnership Fund (FCPF), the UN-REDD Programme, the CCBA and the REDD+ Social & Environmental Standards Initiative (REDD+ SES).

It has been widely accepted that REDD+ must minimize social risks ('do no harm') and promote social co-benefits ('do good') where possible in order to be effective and equitable. In this section, we highlight evidence from the 23 subnational REDD+ initiatives as it relates to full and effective participation of local stakeholders, and explore the challenge of promoting social co-benefits in a way that is efficient and equitable given the heterogeneity of livelihood portfolios and varying patterns of forest use and dependence among local stakeholders.

Full and effective participation requires high levels of engagement by local stakeholders throughout REDD+ design and implementation. It begins with access to information, which is reflected in the requirement of FPIC as communities choose whether to participate in REDD+. Local people must understand the importance of forests in the context of climate change, how subnational REDD+ initiatives will be organized and administered, and how planned interventions could affect them (Resosudarmo et al. 2012). Results from interviews with the REDD+ proponent organizations show that most planned to obtain certification through CCBA or REDD+ SES (Jagger et al. 2014). Most had also obtained or planned to obtain FPIC with local stakeholders (Jagger et al. 2014).

At the village and household levels, we asked respondents about their knowledge of REDD+ in general, and the REDD+ initiative in particular. Villagers' familiarity with REDD+ and/or the REDD+ initiative was generally low. Of the 2182 intervention households interviewed, only 492 (22.5%) had heard about the concept of REDD+ and 743 (34%) had heard about the REDD+ initiative operating in their region. These low numbers partly reflect the early stage of REDD+ implementation when we posed the questions. In some cases, proponents had not yet fully conducted their outreach work. In other cases, where outreach had been conducted, individuals who said they had not heard of REDD+ may not have been reached or understood the information that was conveyed to them.

Income-related outcomes stood out as the most frequently cited hope and worry in all sites where respondents had heard of the local initiatives and where they showed basic understanding of REDD+ or the initiative (paper being prepared by Resosudarmo et al.).[3] The high expectation of receiving tangible (income-related) benefits and related worries that they would not benefit, or even have their incomes harmed by REDD+ interventions, is in stark contrast to the low incidence of worries related to governance questions, such as their low involvement/participation in the process. Only about a quarter of total respondents who understood the REDD+ initiative were involved in its implementation, which was largely limited to passive or consultative participation, such as attending meetings about the initiative and sometimes being asked for feedback.

Social co-benefits can be conceptualized as improving human well-being, assuring equitable benefit sharing and increasing the adaptive capacity of local people (Lawlor et al. 2013). Promoting social co-benefits for local people involved in REDD+ so as to devise positive and negative incentives for behavior change requires sufficient information and understanding of how they will be affected. A recent survey of the proponents' understanding of threats to forests showed small-scale agriculture as a key driver of deforestation at many sites (Sunderlin et al. 2014a). Consequently, a common intervention across many of the 23 sites is prohibition or restrictions on clearing land for crops or livestock (negative incentive) linked to promotion of more sustainable agricultural practices (positive incentive).

The relevance of the above is highlighted by our data, showing that smallholders at our study sites are indeed highly reliant on agricultural income. Households at 14 of the 17 sites for which we have detailed income data derive their largest income share from crops and livestock (Figure 24.1). The combined shares amount to over 50% of total household income in most sites in Brazil, Cameroon, Tanzania and Vietnam, and less in Peru where our sites are characterized by high reliance on two main forest products: Brazil nuts (*Bertholletia excelsa*) in Madre de Dios and timber in Ucayali.

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3 Resosudarmo IAP, Duchelle AE, Ekaputri AD, Komalasari M, Awono A and Hyunh T. (In prep). Local perspectives of REDD+: Insights from subnational initiatives in Africa, Asia, and Latin America.

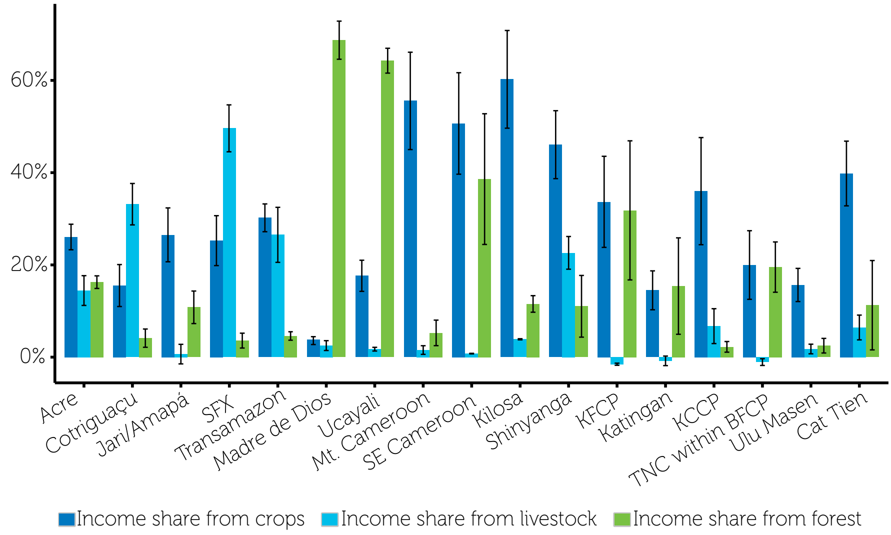

Figure 24.1 The average household income share (+/- SE) derived from crops, livestock and forest in study sites.

High agricultural income dependent on forest clearing, and high income share from forest products represent two extremes in the value of forest and forestland. However, there are also more nuanced sources of both income and pressure on forests. Degradation through charcoal production is a widespread pressure in the low-carbon forests in Tanzania while, in Cameroon, both degradation from unsustainable NTFP harvesting, and land clearing by smallholders and commercial interests are concomitant and form a complex scenario for intervention. Nevertheless, the primary value of forests for many smallholders globally is in the form of land for agricultural expansion, despite the important direct contribution of forests to livelihoods (Angelsen et al. 2014). An average of 41% of the households interviewed across all sites had cleared forest within the previous two years, primarily for crop cultivation (92.3% of households clearing any land did so primarily for cropping, Figure 24.2). Forest access and conversion restrictions are therefore the main potential threat of REDD+ to social safeguards, by either failing to protect (no-harm principle) or enhance livelihoods, or failing to do so in an equitable manner.

Compensation of opportunity costs becomes even more complex when such costs are not related only to conversion by local stakeholders but are also due to external forces such as industrial agricultural expansion. Most of the case study initiatives in Indonesia operate on the principle of preventing conversion by palm oil industry expansion, which is often based on legal claims (i.e. concessions granted by the government). Here, REDD+ proponents also need to convince participants that benefits from REDD+ are higher than the opportunity of employment and other downstream revenue sources derived from the establishment of commercial agriculture.

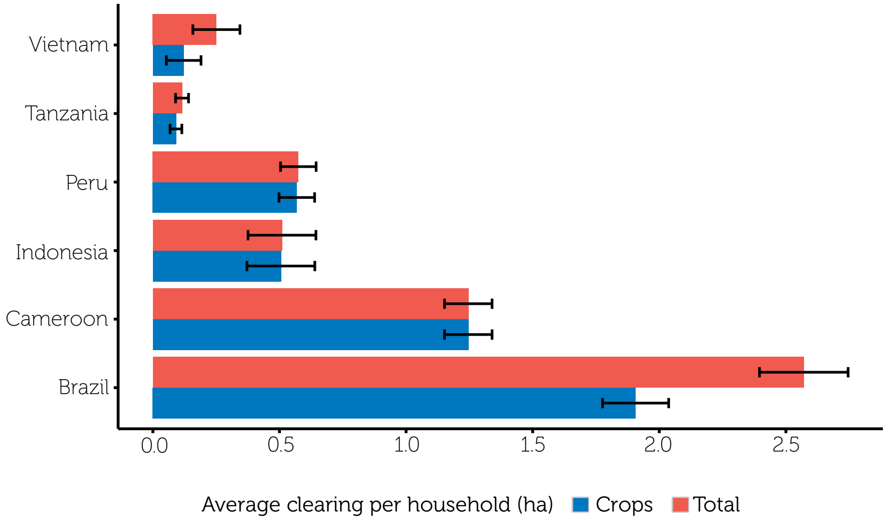

Figure 24.2 Average area (by country) cleared by households that engaged in any clearing activity over the two years before the interview. Total area (including crops) and area specifically cleared for cropping are reported in hectares (+/– SE).

Heterogeneity of livelihood portfolios of smallholders at the site level, and villages within sites, poses additional challenges in designing interventions that are both effective and equitable, even when holding external factors constant. Contrasting the community-level Gini coefficient to livelihood activities, we found that a high share of crop income is correlated with lower inequality (t = –2.71, p = 0.008), while the opposite is true for livestock (t = 2.06, p = 0.04), and share from forest income has no relationship (t = –1.6, p >0.05). As a consequence, interventions that are aimed at improving cattle ranching could, if successful, exacerbate inequality within the community unless stakeholders not engaged in this activity are offered an equally successful intervention targeting other behaviors and livelihoods. The same could hold true for other combinations of economic activities that have a particular distribution in the community structure, suggesting the necessity for a local if not individual focus of interventions.

Evidence from our case studies suggests that a wide array of benefit-sharing mechanisms are being explored, with compensations targeted at the individual, household and community levels, both directly and indirectly through existing institutional structures (Luttrell et al. 2013). Involving local people in the design and implementation of REDD+ interventions is key to establish the right mix of positive and negative incentives toward genuinely promoting social co-benefits.

These considerations highlight not only the inherent challenge of bringing equitable benefits to a community, but also imply the need for effective monitoring and evaluation over time. Livelihood co-benefits are complex and difficult to design, implement and monitor, as they encompass different scales, a large and varied body of stakeholders and heterogeneous conditions on the ground. This calls for a delicate balancing of pragmatism and rigor in monitoring human well-being and carbon outcomes of REDD+, and highlights the need for research to assist the development and assessment of methods and indicators of well-being that are both cost effective and reliable.

24.3 How are REDD+ initiatives responding to the challenges?

The case studies in this book provide a clear picture that REDD+ at the subnational level is facing formidable challenges. Each of the five challenges that we describe is complex and with no obvious single solution. They are a combination of old challenges (funding of conservation and development, tenure, scale of implementation, social safeguards) and one new challenge specific to REDD+ (carbon MRV). There are other barriers at play, including: the coordination of REDD+ and variable commitment to forest-based climate change mitigation at the international and national levels; and institutional interests, agendas and capacity. While these issues merit separate treatment, they are touched on indirectly as cross-cutting themes in the book's examination of the five challenges.

The challenges facing REDD+ have resulted in a series of adaptations and innovations on the ground that were not anticipated in 2007. Financial opportunities and constraints have been a strong conditioning factor. REDD+ readiness programs and the availability of seed funding for pilots motivated a burst of creative energy directed at establishing REDD+. Emerging funding constraints (whether because of the failure of a strong forest carbon market to emerge or for other reasons) have motivated a search for ways to survive in the most difficult cases, and for creative new directions in the best of cases. We have found six indicative ways that initiatives have responded to the interplay of opportunities and constraints. We classify them as *adaptations* (in the sense of an adjustment to a constraint or anticipated vulnerability) or *innovations* (in the sense of creative and forward-looking improvement in reaction to an opportunity). We list them as follows:

Adaptations:

- Maintain an ICDP approach while waiting for more favorable conditions for REDD+ to take shape, including the emergence of a robust international carbon market.

- Abandon or postpone a plan to introduce a performance-based, conditional reward system because of concern there will not be a long-term sustainable source of funding.
- Delay communication about conditional REDD+ rewards to local stakeholders in order to avoid raising expectations unnecessarily – given the uncertainty of future funding.

Innovations:

- Seek collaboration with practitioners of jurisdictional REDD+, notably, involvement in GCF (e.g. Acre, Ulu Masen). GCF is a partnership aiming for REDD+-based emission offsets through state-level climate change programs (e.g. California's compliance market) in order to overcome the international impasse.
- Scale up to a higher level because of the unviability of project-scale implementation, such as Acre adopting a statewide approach, or the Netherlands Development Organization (SNV, the proponent of Cat Tien) shifting its attention from the project level to the provincial level.
- Partner with organizations that have compatible objectives (such as Kilosa collaborating with the Sustainable Charcoal initiative in Tanzania) or with organizations that have complementary capacity, such as research institutions or agencies with MRV capability.

An innovative feature of REDD+ was the concept of carbon credits for sale. In the following we review how the initiatives relate to the carbon market, recognizing that this was envisioned as a key opportunity and potentially serves to address most other challenges. We have classified the 23 cases into three categories: (i) the four that are currently selling forest carbon credits (Bolsa Floresta, Jari/Amapá, Madre de Dios, Rimba Raya); (ii) the 11 initiatives for which selling forest carbon credits is still a possibility (Acre, Ucayali, SE Cameroon, Mt. Cameroon, Mpingo, Shinyanga, Kilosa, Lindi, KCCP, Katingan, TNC within BFCP); and (iii) the eight that either will not or are unlikely to sell credits any time soon (Cotriguaçu, SFX, Transamazon, Kigoma, Zanzibar, Ulu Masen, KFCP, Cat Tien). We elaborate on these categories as follows.

i) *Currently selling credits.* Three of the four initiatives selling credits include three (out of four) private for-profit initiatives in our sample (Jari/Amapá, Madre de Dios, Rimba Raya). Bolsa Floresta, the fourth initiative selling carbon credits, is private nonprofit. Among the 19 initiatives in categories ii and iii, only one (Katingan) is private for-profit. The disproportionate concentration of private for-profit initiatives in this category raises the question of whether these initiatives have benefited from a higher capital endowment and/or higher risk tolerance to overcome the financial challenge. It is possible the drive to recoup investment in a profit orientation has enabled Jari/Amapá, Madre de Dios and Rimba Raya to be among the first initiatives in our sample to access the forest carbon market.

ii) *Might sell credits.* This category spans a wide range. It includes six initiatives (Acre, Ucayali, Kilosa, Lindi, Katingan, TNC within BFCP) that appear to be confident they can eventually access the carbon market. For the rest, there is a range of significant hesitations and hurdles. For example, SE Cameroon is not currently interested in selling carbon credits as it is concerned about market instability and its consequences for livelihoods. At Mpingo, the low carbon content of the forest and correspondingly low income is an ongoing concern. KCCP needs to surmount a tenure obstacle before it can continue efforts to access the market.

iii) *Will not or probably will not sell credits.* Cotriguaçu, SFX and Transamazon in Brazil were initially interested in the carbon market but are now steering a different course. Cotriguaçu and SFX have evolved into low-carbon development programs. Kigoma has failed to access the carbon market during the last three and a half years and judged that this was too short a period to do so. It applied for a new phase of start-up funding but was unsuccessful. Zanzibar has experienced a variety of difficulties including low carbon content of its forest, and will cease operations at the end of 2014. Ulu Masen is in hiatus due to a change in governorship. KFCP experienced a range of troubles, including a political controversy, and came to an end in 2014 without having made performance-based incentive payments linked to emissions reductions. Cat Tien initially aimed for the voluntary market, but a 2010 study found this approach was not viable. It ceased to operate in 2012.

Women and men in a village work together to plant rice in one household's agricultural plot, on thin peat soils in Kapuas district, Central Kalimantan. (Stibniati S Atmadja/CIFOR)

When the concept of REDD+ took shape after the Bali COP in 2007, there were inspirational calls for experimentation, testing and innovation in the pilot phase with the aim of establishing a reliable approach to slowing tropical forest conversion. Our cases show that, more often than not, initiatives are oriented to adapting to constraints rather than innovation in a situation where the enabling conditions for REDD+ (e.g. clear and stable international architecture including financing, national policy frameworks) have not fallen into place fast enough. And even in cases where innovation has been undertaken, it sometimes has an adaptive character, as in the case of GCF being formed in part to compensate for policy inertia at the international level. The forest carbon market was to have been the core funding mechanism for REDD+, but seven years on, it has barely gotten off the ground. Some proponents remain determined and hopeful that REDD+ will play out as originally envisioned, while others have drifted in a different direction. REDD+ appears to be at a pivotal crossroads. It is unclear whether proponents can or cannot surmount the core challenges they are facing.

24.4 Conclusions

REDD+ launched the latest round of global efforts to slow tropical deforestation, but so far does not appear to have contributed much towards that goal. There is growing urgency to stop treating forests as a sacrificial biome, among other reasons because in the era of climate change, the stability of Earth's climate and ecological processes – and all the social and economic processes linked to them – are at risk. Nevertheless, there is much political, economic and cultural momentum from the past inhibiting a breakthrough on forest-based climate change mitigation. The interests of those deriving a benefit from conversion of forests to non-forest uses are still dominant in land-use decisions in much of the tropical world.

The cases in this book illustrate the broader indecisiveness at the level of the globe, the economy and its institutions on how to carry forward with the forest conservation agenda. On the one hand, proponents are on the whole highly motivated to fulfill not just environmental but also social goals, yet they have limited means to go beyond their current level of achievement. In spite of the innovations discussed above, by and large REDD+ is still operating mostly in the mode of ICDP, an approach to curbing tropical deforestation which is known to have fallen short of expectations.

Given these circumstances, what is to be done? Transformational change related to institutions, interests, ideas and information remains a high priority (Brockhaus and Angelsen 2012). Beyond that, we offer several recommendations related to the current state of climate diplomacy and the five challenges discussed in this chapter.

In the best of all possible worlds, a climate change treaty will be ratified at COP 21 in Paris in December 2015. This could conceivably open up opportunities for funding at the level needed, stimulate state incentives to resolve tenure difficulties, lower some of the hurdles to collaborating with government and conducting jurisdictional REDD+, accelerate the process of MRV, and pave the way to putting safeguards in place. Although a binding global treaty is necessary for a climate mitigation breakthrough, it is likely not sufficient given that it would take time to implement. Even with a binding global treaty (and especially without), it is necessary to forge ahead with various challenge-specific actions as specified below.

Finances. Our case studies make it clear at the micro level that there is an urgent need to cover the costs of avoided smallholder forestland conversion. We are agnostic on what the best possible type of reward mechanism would be, given the experimental nature of the forest carbon market (both voluntary and compliance), as well as other modes of delivery, including result-based aid.

Tenure. For reasons explained in this chapter, efforts to clarify tenure will be a key dimension of preparations for forest-based climate change mitigation whether or not a performance-based mechanism occupies a central role. Among the key areas needing continued attention are: forest tenure reform; linkage of forest tenure and environmental compliance mechanisms as in Brazil; institutionalization of participatory mapping in national land-use decision making; resolution of longstanding contestation between customary and statutory forestland claims; review of existing and planned industrial forestland concessions in light of concurrent plans for forest conservation, afforestation, reforestation and REDD+; and clarification of rights to forest carbon.

Scale. It is necessary to embed climate change mitigation actions in state laws, regulations, protocols, practices and other institutions of the state to ensure continuity in contexts often characterized by electoral uncertainty. Only in this way can jurisdictional and nested REDD+ rest on a durable institutional foundation necessary for a forest-based climate change mitigation mechanism to unfold in a stable and durable way.

MRV. It is necessary to raise MRV capacity in countries where it is deficient, not just to maximize the scope of REDD+ but also to include emission sources that are important in particular landscapes, such as forest degradation and wild fire, and also for reasons of equity. It would be at least a partial failure of REDD+ if it could only be implemented successfully in middle-income tropical countries that are already well endowed financially and technologically. It is also necessary to continue building community-based MRV, not just for reasons of equity, but also to complement with local knowledge what even the most sophisticated technology cannot accomplish on its own.

Social safeguards. Attention to social safeguards needs to be increased and accelerated in view of the substantial lead time necessary for elaborating and putting in place guidelines that reflect the great heterogeneity in local livelihoods and reliance on natural resources. Governments and civil society groups have shown tremendous enthusiasm for REDD+ safeguards, which could wane if not supported by adequate funding. Additionally, fulfillment of environmental safeguards (i.e. success in protecting natural forests) must not entail compromises in fulfilling social safeguards.

The eyes of the world are on tropical forests in a way they have never been before in human history. More than being the home of indigenous peoples, the seat of irreplaceable biological diversity and the source of an abundance of renewable natural resources for forest and non-forest people alike – they are beginning to be valued for their crucial role in the global carbon cycle and climate stability. Our cases show it remains unclear whether REDD+ on the ground can play a meaningful role in safeguarding these indispensable functions of tropical forests. The experiences of subnational initiatives could serve as the building blocks for effective forest-based climate change mitigation if, and only if, their efforts are matched by an upsurge in financial support, collective action and political will around the world.

Box K
The role of women in early REDD+ implementation

Anne M Larson, Therese Dokken and Amy E Duchelle

Researchers and practitioners have amply discussed the potential effects of REDD+ on forest-based communities, but less attention has been paid to its gender dimensions. Ensuring that REDD+ helps rather than harms women requires understanding the gendered processes and variation that exist on the ground. The results presented here are based on data from 69 villages in 18 REDD+ sites across five countries (Brazil, Cameroon, Indonesia, Tanzania and Vietnam). This box highlights three findings: that overall, when responses are compared between mixed (male-dominated) and women's groups, the women's groups are less knowledgeable about REDD+ project interventions; that when women are involved, the type of involvement is less substantial than in the mixed groups; and that the women's groups are less knowledgeable even when other key variables suggest that women might participate more fully (see Larson et al. in press).

Knowledge of REDD+

Overall, the data demonstrate that the women's focus groups (100% female) appear less informed about REDD+ than the mixed (69% male) groups (Table K.1). Given the early phase of the initiatives, however, it is important to compare across groups within the same villages. For example, in Brazil, the women's group demonstrated a basic understanding of REDD+ in all the villages where the mixed group did as well, whereas in Cameroon, Tanzania and Indonesia, the women's group demonstrated a basic understanding in fewer villages when compared with the mixed group.

Of those groups that demonstrated a basic understanding of REDD+, the proportion of mixed and women's groups that participated in the decision to implement (50–58%) or were involved in the design or implementation of REDD+ (35–37%) was similar. Nevertheless, the type of involvement among mixed groups included not only attending meetings and training events, as was the case for the women's groups, but also clarifying tenure arrangements, monitoring forests and improving rule enforcement.

Understanding women's participation

We hypothesized that, relative to the mixed groups, women would demonstrate similar knowledge of REDD+ initiatives if one or more of the following held true: (i) women have a strong voice in village decision making, (ii) women have a strong role in forest rule making, (iii) women use forest resources as much or more than men, or (iv) projects take an explicit gendered approach to REDD+.

The analysis found that women's knowledge of REDD+ is not related to women's perceptions of their influence in village decisions in general, or to

Table K.1 Knowledge of and involvement in REDD+ in women's and village groups.

	Demonstrated basic understanding (n = 65) (# and %)	Involved in decision to implement (# and %)	Involved in design or implementation (# and %)	Type of involvement
Women's focus group	26 (40)	13 of 26 (50)	9 of 26 (35)	Attending meetings or training events
Village/ mixed focus group	43 (66)	25 of 43 (58)	16 of 43 (37)	Attending meetings or training events, clarifying tenure arrangements, monitoring and rule enforcement

women's use of forest relative to their perception of men's or to proponents' official concerns about gender. Only women's perceived level of participation in *forest rule making* is clearly higher among the villages where the two groups demonstrate the same basic understanding of REDD+ (although this correlation does not hold in all sites).

In summary, overall, the data demonstrate that fewer women have a basic understanding of REDD+ relative to the mixed groups, even for women assumed to have a vested interest in forests – a result with potentially significant implications. Important gender gaps in information, knowledge and decision making are likely to affect the distribution of future benefits and burdens. The findings suggest that 'participation,' while a central demand of indigenous and other local communities more generally, is only a partial solution to addressing women's strategic needs in ways that could strengthen their position in REDD+. Rather, gender-responsive analyses are needed to understand real and perceived gender differences in interests and needs, and to anticipate threats or risks. Interventions that do not seek to address imbalances at the outset may be doomed to perpetuate them.

Box L
Can REDD+ deliver biodiversity co-benefits in Indonesia?

Josil P Murray, Richard Grenyer, Sven Wunder, Niels Raes and Julia PG Jones

Loss of tropical forests is a major driver of biodiversity loss (Wilcove et al. 2013). The REDD+ mechanism can therefore, in principle, play an important role in tackling biodiversity loss by incentivizing the reduction of deforestation and forest degradation (Busch and Grantham 2013). However, concerns that REDD+ could potentially harm biodiversity if it is not properly regulated, led to the proposition of biodiversity safeguards and co-benefits at the UNFCCC negotiation in Copenhagen at COP15 in 2009 (Visseren-Hamakers et al. 2012). A key concern is that preferential targeting of REDD+ in high carbon areas could lead to the displacement of land-use pressure (leakage) into high biodiversity but low carbon areas (Harrison and Paoli 2012) or divert funds for conservation away from high biodiversity areas with lower carbon (Phelps et al. 2012). The degree to which carbon and biodiversity are co-located in the landscape will influence the potential for REDD+ to deliver biodiversity benefits (Strassburg et al. 2010). However, additional gains for both will depend on the degree to which REDD+ focuses on areas under the threat of deforestation and forest degradation (Busch and Grantham 2013; Venter 2014).

Here, we explore the spatial overlaps between carbon stocks (Baccini et al. 2012; Hiederer and Köchy 2012), biodiversity richness, deforestation pressure (Busch et al. 2010), and the location of REDD+ initiatives relative to protected areas (PAs) and nonprotected forest. We focused on Indonesia because it has the highest deforestation rate globally (Margono et al. 2014), and it is a mega-biodiversity country (Sodhi et al. 2004) and a key player in the international REDD+ arena (Brockhaus et al. 2012). For biodiversity, we assembled data on the distribution of terrestrial vertebrates (ranges of amphibians, mammals, birds, reptiles) (BirdLife International and NatureServe 2012; IUCN 2012) and plants (species distribution models for eight major plant families) (Raes et al. 2013). We investigated congruence between carbon and different measures of biodiversity richness at the national and subnational scales. We then mapped the location of active REDD+ initiatives, investigated their carbon density and potential biodiversity richness, and modeled deforestation pressures to investigate their potential to deliver win–win carbon-biodiversity outcomes.

The results show that congruence between carbon and biodiversity varies greatly, depending on scale and the measure of biodiversity used (total, threatened or restricted range species richness). A total of 37 active REDD+ initiatives were identified, half of which were led by conservation NGOs, 35% by private for-profit organizations and 16% were collaborations with the Indonesian government. REDD+ forests tend to have, on average, lower carbon densities (mean = 419.8 tCO_2/ha) than PAs (mean = 479.0 tCO_2/ha) and unprotected forests (mean = 447.4 tCO_2/ha) in Indonesia (Figure L.1). The mean carbon density differed significantly between groups ($F = 16.17$ on 2822 df, $p < 0.0001$). However, REDD+ initiatives have significantly higher potential total vertebrate species richness ($F = 116.2$ on 2836 df, $p = < 0.0001$) and threatened species richness ($F = 181.8$ on 2916 df, $p = < 0.0001$). This relationship is also true when plants are included as a measure of potential species richness ($F = 13.5$ on 1816 df, $p < 0.0001$). With regard to deforestation threats, we found that 23% (or 2.9 million ha) of REDD+ initiative areas fall within medium to very high deforestation threat forest; this compares to 11% (or 2 million ha) of PA and 21% (or 20 million ha) of non-protected forest. Forests currently not protected by REDD+ or PAs have a much larger area exposed to high threats to deforestation perhaps highlighting the potential for REDD+ expansion in Indonesia.

The lack of a clear and consistent relationship between carbon and any of our proxy measures of biodiversity could be linked to the fundamental ecological differences between carbon and biodiversity (Potts et al. 2013), thus cautioning against overly simplistic assumptions of the biodiversity benefits associated with carbon. Our study also found that while REDD+ initiatives are not targeting areas with the highest carbon stocks, they seem well positioned to deliver additional biodiversity gains. Perhaps this is because remaining forests outside PAs are degraded (Margono et al. 2014), leaving those available for REDD+ development with lower than average carbon stock. This explains why we also found many REDD+ initiatives in our sample including reforestation and restoration as part of their key activities. High biodiversity in REDD+ initiatives could be attributed to the role of conservation NGOs in seeing REDD+ as a novel funding stream for their spatially prioritized actions.

This analysis suggests that biodiversity co-benefits could indeed be achieved through REDD+ in Indonesia – maybe in some cases more prominently so than those of carbon. National- and subnational-level REDD+ design could gain from including overlay analyses to inform site selection based on high deforestation threat and relations between carbon and biodiversity, to achieve win–win situations and minimize trade-offs.

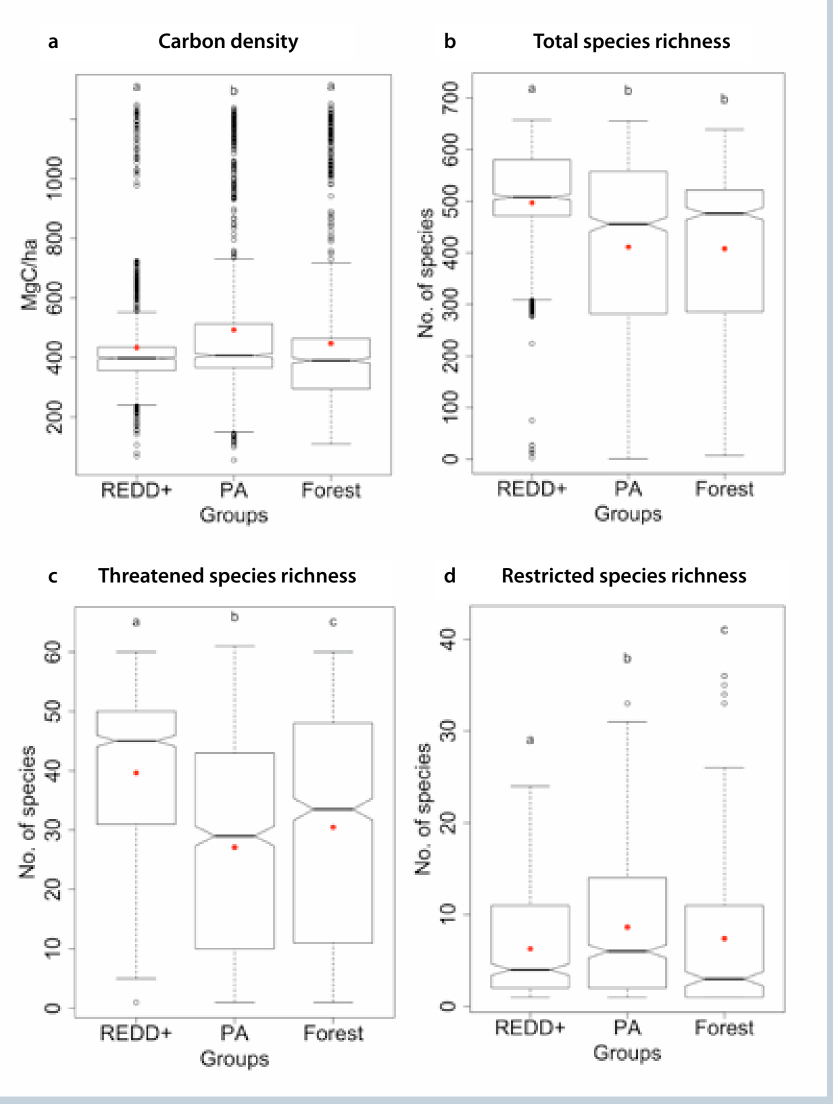

Figure L.1 Boxplots show the distribution of (a) carbon and three measures of vertebrate species richness: (b) total species, (c) threatened species and (d) restricted range species richness, in REDD+ initiatives (REDD), protected area (PA) and non-protected forests (Forest).

Note: notches approximate 95% confidence around the median value. Solid red dots represent the mean. The letters above each box indicate significant groupings after applying Tukey's HSD test.

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Terms and abbreviations

BAU	business as usual
BPS	Badan Pusat Statistik (Central Bureau of Statistics, Indonesia)
(t)C	(tons of) carbon
CAR	Cadastro Ambiental Rural (Rural Environmental Registry, Brazil)
CCBA	Climate, Community and Biodiversity Alliance
CDM	Clean Development Mechanism
CFM	community forest management
CIFOR	Center for International Forestry Research
CIFOR-GCS	CIFOR's Global Comparative Study on REDD+
(t)CO_2	(tons of) carbon dioxide
(t)CO_2e	(tons of) carbon dioxide equivalent
COP	Conference of the Parties
ERC	ecosystem restoration concession (Indonesia)
FPIC	free, prior and informed consent
FSC	Forest Stewardship Council
GDP	gross domestic product
GHG	greenhouse gas
ha	hectare
IBAMA	Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (Brazilian Institute of Environment and Renewable Natural Resources)
ICDP	integrated conservation and development project
INCRA	Instituto Nacional de Colonização e Reforma Agrária (National Institute of Colonization and Land Reform, Brazil)
ITTO	International Tropical Timber Organization
LIPI	Lembaga Ilmu Pengetahuan Indonesia (Indonesian Institute of Science)
masl	meters above sea level
MoFor	Ministry of Forestry (Indonesia)

MRV	measurement, reporting and verification
NGO	nongovernmental organization
NTFP	non-timber forest product
PDD	project design document
PES	payment for environmental (or ecosystem) services
PFM	participatory forest management
PNPM	Program Nasional Pemberdayaan Masyarakat (National Program for Community Empowerment, Indonesia)
REDD+	reducing emissions from deforestation and forest degradation, and enhancing forest carbon stocks
REL	reference emission level
RNE	Royal Norwegian Embassy (Tanzania)
SBSTA	Subsidiary Body for Scientific and Technological Advice
SEMA	Secretaria de Estado do Meio Ambiente (State Environmental Secretariat, Brazil)
TNC	The Nature Conservancy
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard (formerly known as Voluntary Carbon Standard)
WWF	World Wildlife Fund/World Wide Fund for Nature

Note: all currencies are referred to using ISO4217:2008 currency codes.

Glossary

3E+

The 3E+ criteria refer to effectiveness, efficiency, equity and co-benefits and are used in the climate debate to assess proposed options and their expected outcomes or to evaluate actual outcomes.

Afforestation

Afforestation is the direct human-induced conversion of land that has not been forested for a period of at least 50 years to forested land, through planting, seeding and/or the human-induced promotion of natural seed sources.

Additionality

Additionality is the requirement that a REDD+ activity or project should generate benefits, such as reduced emissions or increased removals that would not have happened without the activity (i.e. the BAU scenario).

Baseline

This term is used in different ways. In REDD+, it typically represents the projected anthropogenic changes in forest carbon stock that would occur in the absence of the proposed project activity or policy intervention. See also BAU and reference level. In project evaluations, baseline can refer to pre-project conditions (e.g. a baseline study involves collecting socioeconomic and ecological data before a project starts, implicitly assuming that any change is due to the project).

Benefit sharing

The distribution of direct and indirect net gains (monetary and nonmonetary benefits) from the implementation of REDD+.

Business as usual (BAU)

A policy neutral reference to future emissions or removals, estimated using projections of future emission or removal levels without any REDD+ activity. The term is also used in a political economy sense to mean the continuation of policies and practices consistent with the *status quo* in the pre-REDD+ political economy of a country.

Carbon market

A market in which carbon emission reductions are traded, usually in the form of carbon credits (verified or certified emission reductions). Carbon markets take the form of: (i) a voluntary market (where emission reduction targets are not regulated), or (ii) a compliance market (where carbon credits are traded to meet regulated emission reduction targets). The largest carbon market is the EU's Emissions Trading System (ETS).

Carbon offset

A reduction in emissions or an increase in removals made to compensate for an emission made elsewhere. Carbon offsets are measured in metric tons (t) of CO2e.

Climate, Community and Biodiversity Alliance (CCBA)

Partnership of international NGOs with a mission to stimulate and promote land management activities that mitigate global climate change, improve the well-being and reduce the poverty of local communities, and conserve biodiversity.

Co-benefit

Benefits arising from REDD+ in addition to climate mitigation benefits, such as enhancing biodiversity, enhancing adaptation to climate change, alleviating poverty, improving local livelihoods, improving forest governance and protecting rights.

Compulsory/compliance/mandatory markets

Markets created and regulated by mandatory national or international climate regimes. They allocate or auction GHG emission limits (quotas or caps) to countries, subnational units or companies and allow them to buy carbon credits to meet their cap, or sell them if they emit less than their cap (i.e. trade, also known as cap and trade).

Conference of Parties (COP) to the UNFCCC

The governing body of the UNFCCC. It meets once a year.

Deforestation

The permanent conversion of land from forest to non-forest. In the Marrakesh Accords, deforestation is defined as "the direct human induced conversion of forested land to non-forested land." FAO defines deforestation as "the conversion of forest to another land use or the long-term reduction of the tree canopy cover below the minimum 10% threshold."

Degradation

Degradation refers to changes within the forest that negatively affect the structure or function of the forest stand or site, and thereby lower its capacity to supply products and services. In the context of REDD+, degradation can be measured in terms of reduced carbon stocks in forests that remain as forests. No formal definition of degradation has yet been adopted, because many forest carbon stocks fluctuate due to natural cyclical causes or management practices.

Forest

The Food and Agriculture Organization of the United Nations defines forest as having minimum canopy cover of 10%, minimum tree height *in situ* of 5 m, minimum area of 0.5 ha, and where agriculture is not the dominant land-use. The UNFCCC allows for a more flexible forest definition: minimum canopy cover 10–30%, minimum tree height 2–5 m and minimum area 0.1 ha. Individual countries have their own definitions.

Free, prior and informed consent (FPIC)

The United Nations Declaration on the Rights of Indigenous Peoples (2007) upholds the rights of indigenous people to grant or withhold their FPIC for: activities affecting the lands they have traditionally owned, occupied, or used; any proposed relocation and; any legal or administrative measures affecting them. FPIC implies that consent has been obtained without coercion in advance of project authorization and commencement, and that the affected parties fully understand the scope, duration and potential impacts of the activities. In the context of REDD+, proponents seek the consent of all local stakeholders, not just indigenous peoples.

Implementation costs

The costs of setting up a system and putting into place the necessary policies and actions to achieve REDD+

Indigenous peoples

There is no universally agreed definition of indigenous people, although some international legal instruments provide definitions. According to the United Nations, rather than define indigenous people, the most useful approach is for them to identify themselves according to the fundamental right to self-identification set out in declarations of human rights.

Jurisdictional REDD+

REDD+ initiative encompassing a government administrative unit at the district level or higher.

Leakage

In the context of climate change, carbon leakage happens when interventions to reduce emissions in one area (subnational or national) lead to an increase in emissions in another area. The official UNFCCC term is 'displaced emissions.'

Measuring, reporting and verifying (MRV)

MRV is a series of procedures associated with the communication of all mitigation actions of developing countries. Measurement refers to the quantification of (i) anthropogenic forest-related emissions by sources and removals by sinks; (ii) forest carbon stocks; and (iii) changes in forest carbon stocks and forest area resulting from the implementation of REDD+ activities. Reporting refers to communication to the international community following the Intergovernmental Panel on Climate Change best practices guidelines. Verifying refers to checks on the accuracy of the estimation by UNFCCC designated entities.

Opportunity cost

In the context of REDD+, this refers to forgone profits from the most profitable alternative use of forest land.

Payment for ecosystem/environmental services (PES)

A buyer who values environmental services pays the provider or manager of the land use that supplies those services; in return, the seller continues to deliver them. In REDD+, PES refers to a results-based system in which payments are made for reduced emissions or increased removals relative to an agreed reference level.

Policies and measures (PAMs)

In REDD+, PAMs are nationally enacted policies and actions that countries undertake to reduce carbon emissions or increase removals.

Readiness

REDD+ country actions – including capacity building, policy design, consultation and consensus building, and testing and evaluation of a REDD+ national strategy – that are taken prior to the comprehensive implementation of REDD+.

REDD+ SES

The REDD+ Social & Environmental Standards initiative aims to build support for government-led REDD+ programs that make a significant contribution to human rights, poverty alleviation and biodiversity conservation.

Reducing emissions from deforestation and forest degradation (REDD) and enhancing forest carbon stock in developing countries (REDD+)

The term 'REDD+' is used in many ways. A *broad* definition, based on the official COP13 terminology, holds that REDD+ comprises local, subnational, national and global actions whose primary aim is to reduce emissions from deforestation and forest degradation and enhance forest carbon stocks (increase removals) in developing countries. A *narrower* definition is that REDD+ *also* includes results-based or conditional payments, which was a core idea when REDD+ was first launched. From another perspective, REDD+ may not only refer to actions: it may refer to the overall *idea*, the *objective* of reduced emissions and increased removals, the set of *policies or actions* necessary to achieve that objective, the *outcome* as measured in reduced emissions and increased removals or the *process* involving all of these elements. REDD (without the plus) is used to refer only to reduced emissions from deforestation and forest degradation, and does not include forest carbon stock enhancement.

Reference level (REL)

Two distinct meanings and different uses may be distinguished for reference levels. First, the reference level is used for the *BAU scenario* or *baseline* for changes in carbon stocks, which is used as a benchmark for measuring the impact of REDD+ policies and actions and to define emission reductions. In this sense, reference level can refer to gross emission levels from deforestation and forest degradation, and to net emission levels from all emissions and removals from deforestation, forest degradation, conservation, sustainable management of forests and enhancement of forest carbon stocks. Second, in a result-based system, the reference level is used as a benchmark for estimating payments to countries, subnational units or projects for emissions reductions.

Reforestation

Reforestation is the direct human-induced conversion of non-forested land to forested land, through planting, seeding and/or the human-induced promotion of natural seed sources on land that was forested, but that has been converted to non-forested land.

Shifting cultivation

An agricultural system in which plots of land are cultivated temporarily, then abandoned when the soil loses its fertility or weeds become dominant. The plot of land is then left to be reclaimed by natural vegetation.

Smallholder

A farmer of a relatively small plot of land (a smallholding), where he or she produces in relatively small volumes, either for subsistence alone or subsistence and sale, often depending wholly or largely on family labor. The size of smallholdings varies significantly across regions, but their defining characteristic is that they are small relative to the land area used by commercial producers in the same region.

Swidden agriculture

An agricultural practice that involves cutting and burning of forests or woodlands to create fields, typically part of a shifting cultivation system (also referred to as slash and burn agriculture).

Ton (t)

One ton is equivalent to 1000 kg (also referred to as a metric ton).

Transaction costs

A cost that is incurred when making an economic exchange. It includes costs related to search and information, enforcement and monitoring. Transaction costs sometimes refer to all costs of REDD+ except opportunity costs.

Validation

Independent third-party assessment of a project plan or design against defined standards, e.g. to determine eligibility for CDM or certify by VCS.

Verification

Independent third-party assessment of the actual emissions reductions and co-benefits of a particular mitigation activity.

Voluntary market

Markets that function alongside compliance markets. Buyers are companies, governments, NGOs and individuals who are voluntarily buying verified emissions reductions, e.g. to offset their own emissions.

Verified Carbon Standard (VCS)

This is one of the world's most widely used carbon standards for voluntary carbon offset industry. Carbon emission reductions generated in line with VCS are called VERerified Emission Reductions (VERs).

Appendices

Appendix 1. Organizational characteristics of subnational REDD+ initiatives researched in CIFOR-GCS.

Country	Abbreviated initiative name	Lead proponent organization	Type of proponent	Scope	Main sources of funding	Current status
Brazil	Acre	Instituto de Mudanças Climaticas (IMC)	Government	Jurisdictional (state)	Amazon Fund, KfW Development Bank	Ongoing REDD+ initiative
Brazil	Bolsa Floresta	Fundação Amazonas Sustentável (FAS)	Private nonprofit	Project	Amazon Fund, Marriott International, Bradesco Bank, Amazonas Government, Coca-Cola Brasil, Samsung	Ongoing REDD+ initiative
Brazil	Cotriguaçu	Instituto Centro de Vida (ICV)	Private nonprofit–government	Jurisdictional (municipality)	Packard Foundation, Amazon Fund	Ongoing but not using REDD+ label
Brazil	Jari/Amapá	Biofílica	Private for-profit	Project	Biofílica, Jari Group, sale of carbon credits	Ongoing REDD+ initiative
Brazil	SFX	The Nature Conservancy Brazil	Private nonprofit–government	Jurisdictional (municipality)	Moore Foundation, USAID, Amazon Fund, British Embassy	Ongoing but not using REDD+ label
Brazil	Transamazon	Instituto de Pesquisa Ambiental da Amazônia (IPAM)	Private nonprofit	Project	Amazon Fund	Ongoing REDD+ initiative

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Appendix 1 (continued)

Peru	Madre de Dios	Bosques Amazonicos (BAM)	Private for-profit	Project	BAM, Asterix, BioCarbon, Land Economics Management Consultants (LEMCO), Peruvian and Chilean investors	Ongoing REDD+ initiative
Peru	Ucayali	Asociación para la Investigación y Desarrollo Integral (AIDER)	Private nonprofit	Project	AIDER, International Tropical Timber Organization (ITTO), Reducing Deforestation and Forest Degradation and Enhancing Environmental Services in Tropical Forests (REDDES), Initiative for Conservation in the Andean Amazon (ICAA), and Consortium of TNC Peru, Conservation International, WWF and Banco Interamericano de Desarrollo (BID)	Ongoing REDD+ initiative
Cameroon	Mt. Cameroon	GFA-Envest	Public bilateral	Project	KfW Development Bank	Ongoing REDD+ initiative
Cameroon	SE Cameroon	Centre pour l'Environnement et le Développement (CED)	Private nonprofit	Project	Department for International Development (DFID)	Ongoing but not using REDD+ label
Tanzania	Kigoma	Jane Goodall Institute	Private nonprofit	Project	Royal Norwegian Embassy	Ceased operation in June 2013
Tanzania	Zanzibar	CARE International in Tanzania	Private nonprofit	Project	Royal Norwegian Embassy	Ceased operation in December 2014

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Appendix 1 (continued)

Tanzania	Kilosa	Tanzania Forest Conservation Group (TFCG)	Private nonprofit	Project	Royal Norwegian Embassy	Ongoing REDD+ initiative
Tanzania	Lindi	Tanzania Forest Conservation Group (TFCG)	Private nonprofit	Project	Royal Norwegian Embassy	Ongoing REDD+ initiative
Tanzania	Mpingo	Mpingo Conservation and Development Initiative (MCDI)	Private nonprofit	Project	Royal Norwegian Embassy	Ongoing REDD+ initiative
Tanzania	Shinyanga	Tanzania Traditional Energy Development and Environment Organization (TaTEDO)	Private nonprofit	Project	Royal Norwegian Embassy	Ceased operation as a REDD+ initiative in early 2013
Indonesia	KFCP	Australian Aid/ Kalimantan Forest and Climate Partnership (KFCP)	Government-to-government partnership	Project	Australian Aid	Ceased operation in 2014

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Appendix 1 (continued)

Indonesia	Katingan	PT. Rimba Makmur Utama (RMU)	Private for-profit	Project	PT. Rimba Makmur Utama (RMU)	Ongoing REDD+ initiative
Indonesia	KCCP	Fauna and Flora International Indonesia (FFI)	Private nonprofit	Project	The David & Lucille Packard Foundation, Australian Aid, Climate and Land Use Alliance (CLUA), European Union (EU)	Ongoing REDD+ initiative
Indonesia	Rimba Raya	InfiniteEARTH (PT. Rimba Raya Conservation)	Private for-profit	Project	Private investors	Ongoing REDD+ initiative
Indonesia	TNC within BFCP	The Nature Conservancy (TNC)	Private nonprofit	Jurisdictional (district)	Govt. of Indonesia, Norwegian Agency for Development Cooperation (Norad), USAID, Australian Department of Agriculture, Fisheries and Food (DAFF), Tropical Forest Conservation Act (TFCA), Govt. of Germany	Ongoing REDD+ initiative
Indonesia	Ulu Masen	Government of Aceh (Task Force REDD Aceh)	Government	Jurisdictional (multi-district)	Activities related to reducing deforestation and forest degradation, but not specific to REDD+, are funded through provincial budgets	Operation on pause pending future decisions
Vietnam	Cat Tien	The Netherlands Development Organization (SNV)	Private nonprofit	Jurisdictional (district)	Darwin Initiative, which is funded by United Kingdom Department for Environment, Food and Rural Affairs (UK DEFRA), DFID, and the Foreign and Commonwealth Office (FCO)	Ceased operation in 2012

Sources: Proponent Challenges survey data; documents of initiatives

Appendix 2. Geographical and biophysical characteristics of subnational REDD+ initiatives.

Country	Abbreviated initiative name	Province or state	Area of initiative (km2)[a]	Total population within boundaries of initiative	Mean elevation or range (masl)[b]	Predominant forest type	Ecological zone Source: FAO (2001)	Climate region Source: IPCC (2006)
Brazil	Acre	Acre	157,490	35,000 (2007)	100–255	Evergreen forest	Tropical rainforest	Tropical wet
Brazil	Bolsa Floresta	Amazonas	105,371	40,037 (2014)	90	Evergreen forest	Tropical rainforest	Tropical wet
Brazil	Cotriguaçu	Mato Grosso	9,123	14,965 (2006)	100–460	Evergreen forest	Tropical rainforest	Tropical wet
Brazil	Jari/Amapá	Amapá	660	52,370 (2010)	250	Evergreen forest	Tropical rainforest	Tropical wet
Brazil	SFX	Pará	80,441	64,223 (2008)	80–750	Evergreen forest	Tropical rainforest	Tropical wet
Brazil	Transamazon	Pará	260	73,543 (2010)	30–380	Evergreen forest	Tropical rainforest	Tropical wet
Peru	Madre de Dios	Madre de Dios	3,088	7,260	183–500	Evergreen forest	Tropical rainforest	Tropical wet
Peru	Ucayali	Ucayali	1,270	2,554	110–476	Evergreen forest	Tropical rainforest	Tropical wet
Cameroon	Mt. Cameroon	South West Region	611	n.a.	125–4025	Evergreen forest	Tropical mountain system (58%) Tropical rainforest (42%)	Tropical wet
Cameroon	SE Cameroon	South and East Region	28	1,451	650–700	Evergreen forest	Tropical rainforest	Tropical wet
Tanzania	Kigoma	Kigoma	910	69,410	782–1,609	Miombo woodlands	Tropical dry forest	Tropical dry

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Appendix 2 (continued)

Tanzania	Zanzibar	Unguja/ Zanzibar	828	113,845	0–100	Mix of evergreen, deciduous trees and scrub, woodlands	Tropical dry forest	Tropical dry
Tanzania	Kilosa	Morogoro	1,850	34,180	448–2,226	Miombo woodlands	Tropical dry forest (66%) Tropical shrubland (25%) Tropical mountain system (9%)	Tropical dry
Tanzania	Lindi	Lindi	661	16,051	66–593	Miombo woodlands	Tropical moist deciduous forest (81%) Tropical dry forest (19%)	Tropical dry
Tanzania	Mpingo	Lindi	1,890	17,157	0–400	Miombo woodlands	Tropical dry forest (57%) Tropical moist deciduous forest (43%)	Tropical dry
Tanzania	Shinyanga	Shinyanga	399	766,012	1200–1249	Miombo woodlands, Acacia bushlands	Tropical shrubland	Tropical dry
Indonesia	KFCP	Central Kalimantan	1,200	9,000	0–40	Peatland forest	Tropical rainforest	Tropical wet
Indonesia	Katingan	Central Kalimantan	1,083	11,463 (2013)	1–20	Peatland forest	Tropical rainforest	Tropical wet
Indonesia	KCCP	West Kalimantan	144	n.a.	0–630	Peatland forest	Tropical rainforest	Tropical wet

continued on next page

Appendix 2 (continued)

Indonesia	Rimba Raya	Central Kalimantan	650	10,935 (2011)	0–70	Peatland forest	Tropical rainforest	Tropical wet
Indonesia	TNC within BFCP	East Kalimantan	22,000	193,831 (2013)	45–97	Dipterocarp forest	Tropical rainforest	Tropical wet
Indonesia	Ulu Masen	Aceh	7,500	145,391	500–2,500	Evergreen forest	Tropical rainforest (85%) Tropical mountain system (15%)	Tropical wet
Vietnam	Cat Tien	Lam Dong	669	7,823	120–200	Mix of conifer, bamboo, young forest and shrubland	Tropical moist deciduous forest (81%) Tropical rainforest (19%)	Tropical wet

Source: Village Survey data; Proponent Site Narratives data; documents of initiatives.

a The figures in Table 1.1 are calculated from the shape files or polygons of the initiative area for the purpose of forest cover loss and emission calculations, while the figures in Appendix 2 are official figures given by the proponents. This may cause discrepancies between figures in Table 1.1 and Appendix 2.

b Elevation for Acre, Cotriguaçu, SFX, Transamazon, Mt. Cameroon, Zanzibar, KFCP, KCCP and Rimba Raya are based on: USGS (2006). Meanwhile, elevation for the rest of the initiatives are official figures from the respective proponents.

Appendix 3. CIFOR-GCS case study initiatives by study design, date research was begun, and number of sample villages and households.

Study design	Country	Initiative abbreviation	Month/Year Phase 1 research begun	Interventions		Controls		Total villages	Total households
				Villages	Households	Villages	Households		
Intensive	Brazil	Acre	June 2010	4	127	4	117	8	244
		Cotriguaçu	July 2010	4	122	4	121	8	243
		Jari/Amapá	August 2012	5	122	0	0	5	122
		SFX	September 2010	4	124	4	122	8	246
		Transamazon	July 2010	4	137	4	126	8	263
	Peru	Madre de Dios	July 2012	4	126	4	124	8	250
		Ucayali	December 2012	4	123	4	124	8	247
	Cameroon	Mt. Cameroon	April 2010	4	160	3	90	7	250
		SE Cameroon	April 2010	2	120	4	160	6	280
	Tanzania	Kilosa	July 2010	3	90	3	90	6	180
		Shinyanga	June 2010	4	120	5	150	9	270
	Indonesia	Katingan	March 2010	4	133	4	132	8	265
		KCCP	August 2010	4	132	4	132	8	264
		KFCP	April 2010	4	131	4	130	8	261
		TNC within BFCP	August 2011	5	163	4	132	9	295
		Ulu Masen	May 2010	4	132	4	132	8	264
	Vietnam	Cat Tien	June 2010	4	120	4	120	8	240

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Appendix 3 (continued)

Extensive	Tanzania	Kigoma	July 2010	4	0	0	0	4	0
		Lindi	June 2010	4	0	0	0	4	0
		Mpingo	June 2010	4	0	0	0	4	0
		Zanzibar	July 2010	4	0	0	0	4	0
	Indonesia	Rimba Raya	August 2010	4	0	0	0	4	0
Non-BACI	Brazil	Bolsa Floresta	February 2011	34	244	6	96	40	340
Total				121	2,426	69	2,098	190	4,524

Appendix 4. Definitions of variables used in CIFOR-GCS field research.

Variable[a]	Definition
Socioeconomic status of households in study villages.	
Household average	
Number of adults	Count of individuals in the household aged 16 years and older
Number of members	Count of all individuals in the household
Days of illness per adult	Days of illness in the 12 months prior to the interview for those aged 16 years and older. Days of illness are those when household member is unable to work
Years of education (adults ≥16 years)	Number of years attending school (formal education) – average per adult
Total income (USD)	Total income from all sectors listed below, net of costs. 'Net of costs' means that costs of purchased inputs including hired labor are subtracted. Costs of family labor, land, and inputs collected or produced by the households are not subtracted.
Total value of livestock (USD)	Total value of livestock including large and small animals and poultry
Total land controlled (ha)	Total area of agricultural, pasture, forest, other natural habitat and residential areas controlled by the household, either used or rented out.
Total value of transportation assets (USD)	Total value of all transportation items owned by the household including motor vehicles, boats and bicycles
Percent of households with	
Mobile or fixed phone	Proportion of households in the village owning at least one phone, mobile or fixed
Electricity	Proportion of households in the village having access to electricity through: unpaid or paid connection, grid, village system, own generator, other
Piped water supply	Proportion of households in the village having access to piped water from: own well or rain-fed reservoir, groundwater, municipal or company system
Private latrine or toilet	Proportion of households in the village having access to improved sanitation, defined as private latrine or toilet
Perceived sufficient income	Proportion of households answering "yes" or "reasonable" to the question: "Has your household's income over the past two years been sufficient to cover the needs of the household?"

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Appendix 4 (continued)

Forest dependence of households in study villages.	
Household average	
Share of income from forest	Forest income: income (cash or in-kind) obtained in the 12-month period prior to the interview from harvesting resources from forests that are not intensively managed, net of production costs. (See also definitions of forest and non-forest environmental income below, under Figures.)
Share of income from agriculture	Agricultural income: value of agricultural production in the 12-month period prior to the interview, net of production costs. (Note that average share of income from agriculture can be negative if there are households with small total income and negative agricultural income in a given year due to high input costs.)
Distance to forests (minutes walking)	Distance from the houses in the village to the forest, in minutes spent walking
Percent of households	
Fuelwood or charcoal as primary cooking source	Proportion of households in the village using either fuelwood or charcoal as their primary cooking fuel
Figures: (barplot) Income distribution per sector for the communities studied, and (pie chart) Household income share.[b]	
Agriculture	Household average income derived from agricultural (crop) production, net of production costs, in the 12-month period prior to the interview, including both subsistence and cash
Livestock	Household average income derived from animal husbandry, net of production costs, in the 12-month period prior to the interview, including both subsistence and cash. Note that we report here values of sales and consumption of animals and animals products, but not animal stock values
Forest and non-forest environment	Household average forest and non-forest environmental income in the 12-month period prior to the interview. In this study we define "environmental income" as "income (cash or in-kind) obtained from the harvesting of resources provided through natural processes not requiring intensive management" (Sunderlin et al. 2010, 53). Environmental income can be sourced from both forest and non-forest locations. In the charts and in the case chapters, we refer to these (respectively) as "forest" income and "non-forest environmental" income

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Appendix 4 (continued)

Wage labor	Household average income from wage or salary income in the 12-month period prior to the interview
Household business	Household average income from household business in the 12-month period prior to the interview
Other income	Household average income from activities falling outside the above categories in the 12-month period prior to the interview. Categories include: land rent; remittances; gifts; inheritance; pension; support from government, politicians, or NGOs; compensation for lost income; dividends; PES; as well as others

a This list excludes variables defined in the case chapters.
b All monetary values reported in these two figures have been converted to USD using the 2010 (year of fieldwork) yearly average as reported by the World Bank (World Bank 2014).

Appendix 5. Sources of pressure causing deforestation and forest degradation within site boundaries at 23 CIFOR-GCS sites.

Country	Abbreviated initiative name	Sources of pressures on forests															
		Large-scale agriculture	Large-scale ranching	Large plantations	Small-scale traditional agriculture	Small-scale frontier agriculture	Small or medium rancher	Large-scale legal timber harvest	Large-scale illegal timber harvest	Small-scale legal timber harvest	Small-scale illegal timber harvest	Subsistence fuelwood/ charcoal collection	Commercial fuelwood/ charcoal collection	Non-wood forest product harvesting	Forest fire	Mining	Other
Brazil	Acre				x	x	x	x						x	x		
Brazil	Bolsa Floresta					x	x				x						
Brazil	Cotriguaçu	x	x		x	x	x	x	x		x	x			x	x	
Brazil	Jari/Amapá				x	x	x				x						
Brazil	SFX		x		x	x	x		x	x					x	x	
Brazil	Transamazon		x			x	x				x				x	x	x
Peru	Madre de Dios				x	x	x			x	x	x			x	x	
Peru	Ucayali				x	x	x			x	x			x			
Cameroon	Mt. Cameroon	x		x	x	x					x	x	x	x		x	
Cameroon	SE Cameroon				x	x				x	x				x		
Tanzania	Kigoma				x	x	x					x	x		x		x
Tanzania	Zanzibar				x	x					x	x	x	x	x		x

continued on next page

Appendix 5 (continued)

Tanzania	Kilosa				x						x	x	x			x	
Tanzania	Lindi				x	x				x	x	x	x	x		x	
Tanzania	Mpingo				x				x		x		x		x		
Tanzania	Shinyanga				x	x	x			x	x	x	x	x		x	
Indonesia	KFCP			x	x	x					x	x		x	x		
Indonesia	Katingan			x	x	x					x						x
Indonesia	KCCP			x	x	x				x	x						
Indonesia	Rimba Raya	x		x							x	x		x	x		
Indonesia	TNC within BFCP			x	x	x		x							x		x
Indonesia	Ulu Masen	x		x							x				x	x	
Vietnam	Cat Tien				x					x	x	x		x			x

Source: Proponent Challenges Survey data

Appendix 6. Types and timing of interventions in study villages by REDD+ initiatives and affiliated organizations.

Country	Abbreviated initiative name	Year REDD+ initiative began[b]	First year of implementation of intervention during period of REDD+ initiative[a]						
			RFAC[c]	FE[d]	NCLE[e]	CLE[f]	EE[g]	TC[h]	Other[i]
Brazil	Acre	2009	2009	2012	2009	2009	-	2009	2009
Brazil	Bolsa Floresta	2007	2008	2008	2008	2008	-	-	-
Brazil	Cotriguaçu	2011	2011	-	2011	-	2012	-	-
Brazil	Jari/Amapá	2011	2011	-	2013	-	2012	2013	-
Brazil	SFX	2009	2009	2012	2012	2013	2013	-	-
Brazil	Transamazon	2013	2013	-	-	2014	2013	-	-
Peru	Madre de Dios	2009	-	-	-	-	2009	2009	-
Peru	Ucayali	2010	2014	2011	2011	-	2012	-	-
Cameroon	Mt. Cameroon	2008	2008	2012	2011	2010	2012	2011	2012
Cameroon	SE Cameroon	2009	2010	2010	-	2010	2009	2010	2010
Tanzania	Kigoma	2010	2010	-	2010	2012	2010	-	2010
Tanzania	Zanzibar	2010	-	2011	2012	2013	2010	2011	-
Tanzania	Kilosa	2010	2011	-	2011	2012	2011	-	-
Tanzania	Lindi	2009	2010	-	2011	2012	2010	2011	-
Tanzania	Mpingo	2009	2011	-	2011	2013	2010	-	-
Tanzania	Shinyanga	2010	2010	2011	2011	2012	2011	2010	2010
Indonesia	KFCP	2009	2011	2010	2010	2011	2010	2012	2012
Indonesia	Katingan	2009	2009	2009	2009		2009	-	-

continued on next page

Appendix 6 (continued)

Indonesia	KCCP	2009	2010	2010	-	-	2010	2010	-
Indonesia	Rimba Raya	2009	2009	-	2010	-	2009	-	2014 (plan)
Indonesia	TNC within BFCP	2009	2011	2013 (plan)	2010	2013 (plan)	2010	2011	2011
Indonesia	Ulu Masen	2010	2011	-	2011	-	2011	-	-
Vietnam	Cat Tien	2009	-	-	-	-	2010	-	2012

Source: Survey of Village Interventions database

a In many cases the initiative is a continuation of a pre-existing forest protection effort at the same site. In these cases, many of the interventions at the site were actually begun before the REDD+ initiative was established, and are carry-overs into the period of REDD+ activity.

b In some cases there are inconsistencies between the year the initiative began as noted in this appendix and in the case chapters. This is explained by different perspectives on the most relevant milestone to define the start date of an initiative. For example, the formal start date of Acre is 2010, but we chose 2009 in order to analyze the impact of key initiative-related interventions that otherwise would have gone unmeasured.

Intervention abbreviations and their meanings:

c RFAC = Restriction on forest access and/or conversion. Activities (such as monitoring, policing, imposition of fines) aimed at protecting forests from local and external actors.
d FE = Forest enhancement. Activities such as afforestation and reforestation, and practices aimed at improving forest management (e.g. reduced-impact logging).
e NCLE = Nonconditional livelihood enhancement. Livelihood support of any kind that does not require local stakeholders to change their forest use behavior.
f CLE = Conditional livelihood enhancement. Livelihood support of any kind that requires the participants to protect or improve local forests in exchange for getting this support.
g EE = Environmental education. Information dissemination to persuade stakeholders that there are tangible benefits to protecting and/or enhancing local forests.
h TC = Tenure clarification. Activities aimed at resolving unclear or contested ownership and access rights over local forestlands, trees and carbon.
i Other = Forest interventions other than those listed above.

Available in full text, PDF, e-pub for free download at
cifor.org/REDD-case-book

REDD+ is one of the leading near-term options for global climate change mitigation. More than 300 subnational REDD+ initiatives have been launched across the tropics, responding to both the call for demonstration activities in the Bali Action Plan and the market for voluntary carbon offset credits.

This book describes 23 initiatives in six different countries, including their:

- *diverse biogeographic and socioeconomic contexts*
- *strategies to reduce emissions over the three or more years that they have been in operation*
- *local populations of smallholders, whose agricultural activities are important drivers of deforestation in most sites and who are thus key stakeholders in these initiatives*
- *efforts to overcome or work around challenges in financing, implementing and monitoring REDD+.*

Early expectations of significant funding for REDD+ encouraged proponent organizations to test a wide range of strategies to reduce emissions while also delivering co-benefits. Only some have chosen the strategy of direct payments conditional on actions to reduce deforestation or degradation, and only a very few have sold carbon credits, demonstrating how REDD+ on the ground is actually a mix of old and new strategies.

Faced with enormous challenges, proponents have developed a menu of ways to: secure financial support; clarify forest tenure; cooperate and act across scales; measure, report and verify emissions; and respond to the imperative of safeguarding local livelihoods.

While subnational initiatives have successfully piloted and generated lessons for REDD+, many now face the choice of either ending or transforming into something else, due to the political uncertainty and funding constraints stemming from the failure to reach a global climate change agreement. This book highlights both the critical importance of such an agreement and in its absence, the creative ways that subnational initiatives are operating on the ground.

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