COMMUNITY FORESTS FOR FOREST COMMUNITIES: AN EXAMINATION OF POWER IMBALANCES, CHALLENGES AND GOALS IN BRAZIL AND MEXICO

by

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY
in

The Faculty of Graduate Studies
(Forestry)

THE UNIVERSITY OF BRITISH COLUMBIA
(Vancouver)

April 2011

ABSTRACT

Community forestry can deliver economic, socio-cultural and ecological benefits to local communities. Case studies from around the world have shown this, yet results have also been mixed, as many initiatives have failed to deliver their promises. Criticisms have arisen that community forestry remains dominated by decision-making by offsite experts, replication of models deemed successful in other contexts, and the spread of forestry practices that have been developed for the large-scale forest industry.

This research provides further insights into community forestry from the perspective of the local forest user. A case study approach was used for an in-depth examination of six community forestry initiatives in Brazil and Mexico, assessing the current status of community forestry and suggesting a path forward based on local needs and wants. Qualitative content analysis of semi-structured interviews with community members, and elements of grounded theory methodology, were used to: assess the amount of forest management authority communities currently have; create a framework outlining the challenges facing communities in managing their forests; and, identify community-defined goals and processes for community forestry initiatives.

Results showed that, despite the rhetoric of decentralization, communities continue to work within tightly regulated frameworks of forest management with limited decision-making power for forest product commercialization. Within this limited power structure, communities face interrelated challenges in both the development and operationalization phases of forestry initiatives, requiring a holistic strategy of intervention to encourage the maintenance of a profitable and self-sufficient enterprise. In identifying community-defined goals, this research found that other livelihood strategies, particularly agricultural practices, need to be considered when designing forestry interventions that are overly focused on timber production. This

exercise also underlined the need to promote site-specific models of intervention that take into account the variety of contexts and community interests.

A better understanding of local perspectives can aid in the design of community forestry interventions brought by conservation and development agencies, by adding an important and understudied perspective to the problems that face community forestry. Without the community member playing an essential and empowered role, the success of community forestry will be limited.

PREFACE

Three original manuscripts are presented in this dissertation. A version of Chapter 3 has been accepted for publication (*Hajjar, R., McGrath, D.G., Kozak, R.A. and Innes, J.L. Framing community forestry challenges with a broader lens: Case studies from the Brazilian Amazon. Journal of Environmental Management. Accepted: 31 March 2011)*. Versions of Chapters 2, and 4 have been submitted for publication in scientific journals (*Hajjar, R., Kozak, R.A. and Innes, J.L. Are forest-dependent communities securing legitimate management authority over their forests? Case studies from Brazil and Mexico* and *Hajjar, R., Kozak, R.A., El-Lakany, H. and Innes, J.L. Community forests for forest communities: Integrating community-defined goals and practices in the design of community forestry initiatives*). They were all written by Reem Hajjar, in collaboration with her supervisory committee, Dr. John L. Innes, Professor at the Faculty of Forestry, University of British Columbia, Dr. Robert A. Kozak, Professor at the Faculty of Forestry, University of British Columbia, and Dr. Hosny El-Lakany, Adjunct Professor at the Faculty of Forestry, University of British Columbia. Chapter 3 was also written in collaboration with Dr. David G. McGrath, Associate Scientist at the Woods Hole Research Centre and Instituto de Pesquisa Ambiental da Amazonia (IPAM).

Reem Hajjar identified the research problem and methodologies and developed the research design under the guidance of Dr. Innes. Dr. Innes suggested the use of grounded theory methodology early in the research. Reem made the field contacts and identified collaborating organizations, collected the data and conducted the data analyses for the three manuscripts. She also prepared all manuscripts. Dr. Kozak provided guidance on what elements of the manuscripts should be brought out as most important, in particular for Chapters 2 and 3, and made suggestions on how to better organize and present the information in all manuscripts. In revising and editing the manuscripts, Drs. Innes, Kozak, and El-Lakany made valuable contributions that improved the quality of the manuscripts. Dr. McGrath helped with the arrangement of two of the three case studies in Brazil. For Chapter 3, he provided additional background information on the *Oficinas Caboclas* case study, contributed to the design of the challenges framework by dividing it into development and implementation phases, reviewed and edited the manuscript, and suggested the addition of text on the role of the government in impeding community forestry.

This research was approved by the UBC Behavioural Research Ethics Board (Certificate Number H07-00956).

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ACKNOWLEDGEMENTS

First and foremost, I would like to deeply thank my advisor Dr. John Innes. I am indebted to him for giving me the opportunity to study at UBC, and am profoundly appreciative of his mentorship these past years. I also thank him for having faith in me to carry out such a project, and giving me the space to formulate my own ideas while providing the right adjustments to my path along the way. I would like to express my immense gratitude to Dr. Robert Kozak for his help with this dissertation. He was always available to discuss ideas and results, and provided invaluable advice, solutions to my problems, and endless words of encouragement. I would also like to thank Dr. Hosny El-Lakany for constantly challenging me to think about the implications of my work and repeatedly making me answer the question, "so what?"

Several people made it possible for me to conduct my field work successfully, from official collaborators, old and new colleagues, and several field assistants. In Brazil, I would like to thank: Miguel Pinedo-Vasquez for "rescuing" my field work in the Amazon; Lucas Fortini for making field work in Mazagão possible; Toby McGrath for providing me with the opportunity to visit *Oficinas Caboclas* and the *assentamentos*, as well as for collaborating with me on Chapter 3; Nícia Coutinho for her help with logistics; and Elias and Ailton for accompanying me in the field and their help with introductions to the communities. In Mexico, I would like to thank: Heliot Zarza Villanueva for facilitating my work in Caobas; Luis Manuel Arias Reyes for introducing me to traditional forest management in the Yucatán and helping me to visit Yaxcabá; Victoria Santos for introducing me to the *ejidatarios* of Naranjal Poniente; and Vitorino, Benito and Alfonso for all their help with introductions to their respective communities and accompanying me during my interviews. I would also like to thank Dona Rosaria, Chicão and Suelem, Seu Bigode, Alfonso and their families for graciously hosting me during my field visits to their communities. Finally, I express my deep gratitude to all the interviewees who took the time to share their experiences and thoughts with me.

This research was made possible by a number of grants, awards and fellowships: Social Sciences and Humanities Research Council (SSHRC) Doctoral Fellowship; Forest Sciences Program of British Columbia; John G. Bene Fellowship for Community Forestry from the International Development Research Centre; British Columbia's Pacific Century Graduate Scholarship; and, the University of British Columbia's University Graduate Fellowship, Donald S. McPhee Fellowship, Peter N. Affleck Memorial Scholarship, CANFOR Corporation Fellowship in Forest Ecosystem Management, TimberWest Forest Limited Fellowship in Forest Resources Management, and PhD Tuition Award.

I would also like to acknowledge my family for their unending support from the other side of the continent. To the New York ladies, friends in Montreal, and others scattered around the globe – your long-distance friendships have meant the world to me. And to the amazing people I've met in the last years in Vancouver, I would not have emerged from this dissertation with my sanity intact if it weren't for your encouragement, advice and camaraderie. I sincerely thank you.

1 INTRODUCTION

In the past few decades, community forestry has been promoted as a way to enhance the conservation and sustainable use of forests, consolidate rights over traditional lands and resources, and reduce rural poverty. Indeed, increased decentralization of forest governance has been a noticeable global trend since the 1980s and 1990s, particularly in developing countries. Case studies from around the world show that community forestry can deliver many economic, socio-cultural and ecological benefits to local communities, and several examples of profitable community forest enterprises have appeared, particularly in Mexico and Central America. However, global results have been mixed, as many initiatives have failed to deliver their promised expectations, and many community enterprises have collapsed once external support systems are withdrawn. Promises of empowering communities by placing in their hands the means for their own economic development have led to disappointing outcomes, as the transfer of management responsibility of forests to them has only been partial. Implementation of community forestry as a conservation and/or development intervention remains an exercise delivered from the top down.

The primary questions that frame the research presented in this dissertation are: why are community forestry initiatives still struggling in many places and what can be done to improve their chances of success? Criticisms that community forestry remains a top-down exercise inspired the underlying approach of this research: viewing the problem through the lens of the local forest user. This research addresses the above questions and criticisms by taking a bottom-up approach to assessing the status quo and suggesting a path forward for community forestry initiatives. From the perspective of the local forest user, it asks the questions, how much decision-making power do communities actually end up having given these popular decentralization processes? Within this frame of the current power structure,

what are the challenges still facing communities in managing their forests? And lastly, how can the local forest user's perspective be used to better design community forestry initiatives? This dissertation addresses these questions using a case study approach for an in-depth examination of selected community forestry initiatives in Brazil and Mexico.

In this introductory chapter, I place this research in its theoretical context by first providing a short review of the theoretical and actual benefits and challenges of community forestry as a subset of community-based natural resource management. I then discuss the community forestry experience in Latin America, to situate the case study choices. Following this, I list the study's objectives, present an argument for the approach taken, and outline the research methods used. The structure of the thesis and an overview of the chapters are then explained.

1.1 Local communities and forest resources management – a brief review of community forestry

1.1.1 What is community forestry?

Community forestry is open to multiple definitions and interpretations (Glasmeier and Farrigan, 2005), but broadly refers to community[1] or local control and management of forest resources. Many terms are associated with community forestry: social forestry, communal forestry, agroforestry, farm forestry, participatory forestry, community-based forest management, to name a few (Glasmeier and Farrigan, 2005). Charnley and Poe (2007) refer to community forestry not only as communities having some degree of responsibility and authority for forest management so that forests provide local communities with social and economic benefits, they also imply that ecologically sustainable forest use is a central management goal (p. 303). Arnold (1992, as cited in Sunderlin*, et al.*, 2007) defines

[1] "Community" has been defined in the literature as a small spatial unit, a social structure, and a set of shared norms (Agrawal and Gibson, 1999, p. 633). However, Agrawal and Gibson (*ibid*) argue that we should pay greater attention in community-based conservation to the heterogeneity of interests and actors within communities, the processes with which these actors interrelate and structure and the institutional arrangements that structure these interactions.

community forestry as a wide range of activities linking rural people with forests and trees, and the products and benefits to be derived from them (p. 28). Similar to this definition is that of locally controlled forestry, as defined by the Growing Forest Partnerships[2]: "the sustainable management of forests for wood, non-timber forest products and other social or environmental service values, carried out by forest-dependent families or smallholders, community groups and indigenous peoples" (Growing Forest Partnerships, 2010). This definition looks beyond the often used notion that equates community forestry to communal ownership or management of forest resources, which would exclude smallholder and family forestry, where a mixture of household and communal decisions are made in natural resource management. In this thesis I use this broader meaning of community forestry, which is also consistent with the definitions of community outlined above by Agrawal and Gibson (1999).

Sunderlin (2007) further makes the distinction between traditional community forestry and introduced models of community forestry. Traditional community forestry refers to local systems of forest management that can date back many years, decades or centuries. These management systems were created spontaneously and indigenously, and often involve locally-established rules or understandings governing resource use at the village level. Introduced models of community forestry are a more recent phenomena, gaining in prominence in the last three decades. These models are brought into the community by an external agent, often from the government, a local non-governmental entity, an international agency, or some combination of these (Sunderlin*, et al.*, 2007). This thesis mostly focuses on the latter, "introduced" community forestry as an intervention, while arguing for more harmonization with traditional and local management systems.

[2] The Growing Forest Partnerships is supported by the International Institute for Environment and Development, the World Bank, IUCN, and the UN Food and Agriculture Organization, all major actors in global environment and development work.

1.1.2 Community forestry as a subset of community-based natural resource management, in the context of decentralized forest governance

Throughout this introduction and most of the thesis, I use the terms community forestry and community-based natural resource management to refer to similar concepts, both of which occur in the context of decentralization of forest management. Here, I provide some explanations of the latter two terms.

1.1.2.1 Decentralization, power and authority

Decentralization is the process by which a central government cedes powers to actors and institutions at lower levels in a political-administrative hierarchy (Mawhood, 1983, cited in Ribot, et al., 2006). Three core dimensions of decentralization have been described: fiscal, administrative and political (Manor, 1999; Schneider, 2003). Fiscal decentralization occurs when higher levels of government cede influence over budget and financial decisions to lower levels (as cited in Sharma, 2006). Administrative decentralization, also known as deconcentration, occurs when powers are devolved to representatives of the central government in local areas. Political decentralization, also known as democratic decentralization, entails the transfer of power to actors or institutions that are accountable to the population in their jurisdiction (Ribot*, et al.*, 2006; Sharma, 2006). This thesis looks at community based forest management as a form of democratic decentralization of forest governance – the transfer of power over forest resources and management to local governments and authorities representative of local populations.

At the heart of decentralization is the question of power. While several authors have attempted to define and deconstruct the concept of power for decades (as cited in Raik*, et al.*, 2008), many return to the definition of power offered by Max Weber as a starting point:

> "Power is the probability that one actor within a social relationship will be in a position to carry out his own will despite resistance, regardless of the basis on which this probability rests" (Weber, 1947, p. 152).

Raik *et al.* (2008) review the use of the concept of power as coercion (getting someone to do something that they otherwise would not do indicates having power over them), and note its prominent use in discussing power in the field of natural resources and protected areas. Agrawal and Ribot (1999) distinguish four types of powers: 1) power to create rules or modify old ones; 2) power to make decisions about how a particular resource or opportunity is used; 3) power to implement and ensure compliance to the new or altered rules; and, 4) power to adjudicate disputes that arise in the effort to create rules and ensure compliance.

The terms power, authority and legitimacy are often used interchangeably in the literature, but authors have sought to clarify the different concepts. Hutchcroft (2001) distinguishes between power and authority in terms of formality: authority refers to formal roles conferred upon individuals in their official capacities, while power refers to informal roles where values, interests, and goals of the choosing of the person with power are pursued. Uphoff (1989), in interpreting the words of Max Weber, provides further clarification: Power can be seen as the parent, overarching concept that encompasses terms such as authority and legitimacy. Uphoff explains authority as some special position or role which enables a person in it to make commands in the name of the group, and to back them with rewards or sanctions in its name. He further states that if a group/public basis claim is lacking, then the concept veers towards general compliance relationships best described as power (Uphoff, 1989, p. 301). He explains that authority and legitimacy differ in that the former is a claim for compliance (by the one with authority), while the latter is an acceptance of that claim (by those subject to the authority). Each one, authority and legitimacy, Uphoff argues, augments the power resulting from the other; for example, the power associated with authority somewhat depends on the legitimacy conferred on it.

Decentralization implies changing power structures (Raik*, et al.*, 2008), and is expected to empower citizens, especially disadvantaged groups, in relation to a distant government (Samoff, 1990). In this context, this thesis addresses the power shift from central governments to communities in managing forests in which they live in and around. I borrow mostly from

Agrawal and Ribot's description of power as the ability to make decisions about how the forest resource is used (1999), and consider community and local forest user empowerment as the ability to make decisions that can result in desirable outcomes for the community/local forest user. I also borrow from Hutchcroft (2001) and Uphoff's (1989) descriptions of authority as conferring a formal power role, but specifically use it here to mean authority bestowed by legal decree, without regarding it as having been legitimately conferred upon it by *all* actors.

Decentralization of forest management has been a major trend in global forest governance for the past three decades (Agrawal, et al., 2008; Ribot, et al., 2006). More than three quarters of developing countries and countries in transition are in the midst of experimenting with decentralization of natural resource management (Contreras-Hermosilla, *et al.* 2006; Ribot, 2004). National governments have sought to decentralize power over many services, including forest management, for several reasons (reviewed in Manor, 1999), some of which include: appeasing demands from international donors, NGOs and local citizens demanding better governance by enhancing public sector transparency and accountability; reducing costs of overextended central bureaucracies; and succumbing to pressure to right the wrongs of commercial forestry that excluded local people (Agrawal and Ribot, 1999; Brown and Lassoie, 2010; Manor, 1999).

A principal aspiration in the preference for decentralization is achieving governance that is just and democratic, where people have a say in their own affairs (Agrawal and Ribot, 1999). In some cases, effective decentralization has increased the capacity of local populations to make their needs and demands heard, by increasing the interactive capacity of local governments through fair elections, accountability mechanisms and local government associations (Larson, 2003). Yet, decentralization has often not resulted in such outcomes. Central governments have oftentimes obstructed the decentralization process and retained control over resource management (Edmunds and Wollenburg, 2003b; Larson, *et al*., 2008a; Wittman and Geisler, 2005). Ribot *et al.* (2006) note instances where governments have

limited the kinds of powers transferred, thus undermining the ability of local governments to make decisions. Thanh and Sikor (2006) note that actors hold actual power once legal rights, actual rights and practices mutually reinforce each other. They also note that power structures are determined not only by the relationship between central and local actors, but also by power relations among local actors. Examples abound of decentralization giving responsibility for forest management to local institutions with no internally recognized legitimacy or accountability to the local population (Nygren, 2005), where local elites dominate decision-making and capture associated benefits (Pulhin, 1996), or where power is given to non-traditional authorities, undermining cultural traditions (Brown and Lassoie 2010; Oyono 2005).

Several authors assert that the process of decentralization (i.e., how the rights have been transferred) will largely determine the success of decentralization. Some contend that the central condition for effective decentralization is representation and downward accountability and responsiveness of the empowered local authorities (Agrawal and Ribot, 1999; Ribot, 2005). Larson (2003) adds that along with downward accountability, effective decentralization also requires that: communities have the resources and capacity to assume their new responsibilities and powers effectively; local authorities can be assured of the security of newly acquired powers; and communities are provided with incentives for sustainable resource management. Manor (1999) argues that for decentralization to work, the three types of decentralization (administrative, political and fiscal) need to occur. He further states that responsibilities should be decentralized when economies of scale cannot be reached, but that overly complex development projects or spatially extensive projects should not be devolved to local level authorities.

These recent trends in decentralization of natural resource management have created the context in which community-based natural resource management has been able to proliferate.

1.1.2.2 Community-based natural resource management

Community-based natural resource management (CBNRM) is a broad term referring to community control and management of natural resources (Tacconi, 2007). CBNRM encompasses the following characteristics (after Kellert*, et al.*, 2000): the devolution of power and authority over natural resources from central governments to more local and indigenous institutions and peoples; involving community members in the management and conservation of natural resources; linking socioeconomic development with environmental conservation; legitimizing traditional resource and property rights; and lastly, including traditional values and ecological knowledge in modern resource management. Many terms have been used to refer to CBNRM, such as social and community forestry, community wildlife management, cooperative or co-management, community-based conservation, community-based ecosystem management, collaborative conservation, among others (Conley and Moote, 2003; Kellert*, et al.*, 2000). In this thesis, I refer to community forestry as a subset of CBNRM focused on forests, as their underlying principles and rationalizations are often theoretically interchangeable. Community forestry can be viewed as part of a larger movement toward CBNRM that began in developing countries in the 1970s and 1980s, and in developed countries in the 1990s (Charnley and Poe, 2007). Decentralization of forest management can provide the basis for scaling up CBNRM initiatives (Tacconi, 2007).

1.1.3 Theoretical and actual implications of community management

Theoretically, there are many reasons why CBNRM and community forestry are attractive concepts. Many authors have reviewed recent trends of decentralizing natural resource management and promoting community-based forest management, and offered rationalizations for this shift in governance (Agrawal and Gibson, 1999; Agrawal and Ribot, 1999; Bradshaw, 2003; Charnley and Poe, 2007; Conley and Moote, 2003; Kellert*, et al.*, 2000; Larson, 2003; Larson and Soto, 2008; Ribot, 2004). Some of these rationalizations are summarized below; counter-arguments follow.

From the resource management perspective, decentralization of natural resource management is seen as an alternative to the perceived failings of centralized, or top-down, management. It

is theorized that local communities will do a better job of managing local resources sustainably because of their proximity to the resource; local managers are expected to be more attuned to the local environment and more readily able to pick up on and accommodate environmental changes due to their intimate relationship with their surroundings and their proximity to the resource. It is also theorized that local decision-makers will pursue more sustainable management, due to their vested interest in the long-term maintenance of their environmental surroundings, and will be better able to monitor resource use. This decentralization of powers is also supposed to increase efficiency by reducing transaction costs and internalizing costs.

From the community's socio-economic perspective, CBNRM has been seen as a way to alleviate poverty and improve living standards of local and rural peoples. It has also been promoted as a tool for the empowerment of local peoples by giving them a greater stake in decision-making and authority over the natural resources they use and environments they live in or around. CBNRM is expected to increase participation, secure resource rights, and enhance social justice by empowering traditionally marginalized groups. It is also theorized that greater community stability and resilience can be achieved if communities are more actively involved in strategies for their own local economic development. CBNRM is also a way to give a legitimizing voice to traditional values and traditional ecological knowledge in modern natural resource management science.

The integration of these two perspectives is an attractive theoretical proposition, one that has prompted the promotion of CBNRM globally for a variety of natural resources, including wildlife, fisheries, water, and forests. Beyond the theory, empirical evidence has shown that decentralization of decision-making can benefit natural resource quality (reviewed in Garnett, et al., 2007; Sayer, et al., 2008). Multi-site studies have shown that greater local participation in decision-making has led to positive outcomes on local incomes, forest biodiversity, and carbon storage (Chhatre and Agrawal, 2009; Persha*, et al.*, 2011). In Central America, Bray *et al*. (2008) found that community-managed forests can be as effective as protected areas in

reducing deforestation, while delivering more local benefits. Wiley (1999) reports of improved forest conditions in Tanzania in cases where forest authority is vested in the community. Community-based forest management in many cases around the world has improved efficiency, equity, democracy and ecosystem health in forest-dependent communities (Larson, 2005; Molnar, et al., 2007). Case studies from around the world show that community forest enterprises can be profitable and deliver many additional socio-cultural and ecological benefits to local communities (Bray, 2004; Bray, et al., 2003; Dev, et al., 2003; Molnar, et al., 2007). For these reasons, community-based forest management has been promoted as a model to create long-term economic development and self-reliance in rural communities, while promoting the conservation and sustainable use of forests and consolidating rights over traditional lands and resources (Bray*, et al.*, 2008; Pagdee*, et al.*, 2006; Scherr*, et al.*, 2003b).

But this community-based approach has also met with some criticisms. Bradshaw (2003, p. 138) states that the assumption that the local community will better manage the resource needs to be predicated on a community's credibility and genuine interest in stewarding local resources in the interests of all stakeholders – including future generations and non-locals – and also on the community's capacity to manage the resource. Bradshaw expands on this by stating that we cannot assume that all communities are concerned with the well-being of their particular place so as to preclude resource exploitation, nor can we assume that local communities will willingly address global concerns such as climate change or biodiversity loss (Ritchie, 1996, as cited in Bradshaw, 2003). Tacconi (2007) argues that forest conservation does not necessarily follow from decentralization, as it may be in the best interest of communities and local governments to deforest for underlying economic incentives.

Indeed, empirical evidence from around the world points to several shortcomings in the consequences of many community forestry and CBNRM models. Blaikie (2006) harshly criticizes CBNRM for having largely failed to deliver the expected and theoretical benefits to

local communities, delivering more of its promises on natural resource management than assisting communities (p. 1943-1944). In Nepal, community forestry resulted in inequities among community members (Kanel and Kandel, 2004). In Cameroon, Brazil, India and Nepal, community and joint forestry programmes marginalized some communities, traditional cultures, and certain groups within communities (Edmunds and Wollenberg, 2003b; Oyono, 2005; Pokorny, 2009; Timsina, 2002). Furthermore, community forestry-related development initiatives in the Philippines and elsewhere have suffered from elite capture and have failed to achieve the intended development outcomes (Pulhin, 1996).

There are many reasons why CBNRM should or should not theoretically work towards achieving social and environmental sustainability in resource management, and the empirical evidence is divided as well. It is a management system that merits further implementation and study, in order to better understand under what conditions CBNRM can be successful. Looking to the more successful examples of community-based management systems around the world can provide further insights into this.

1.1.4 The community forestry experience in Latin America

Regardless of its setbacks, and perhaps due to the expected benefits, central governments' desire to delegate their management responsibilities, or grassroots movements' advocacy for more rights over community forests and traditional lands, community forestry is on the rise around the world and particularly in Latin America.

Approximately 1.6 billion people around the world live in or around forests (The World Bank Group, 2008). Globally, approximately 11% of the world's forests are community-owned or managed (RRI and ITTO, 2009; White and Martin, 2002). This is most apparent in tropical countries, where 22% of forests are in community hands in some form (RRI and ITTO, 2009),. In Latin America, about 25 million people live in forested regions (Kaimowitz, 2003), and indeed it is in this region where the recent shift in global forest governance towards community ownership began in the 1970s before spreading to other developing regions. In

fact, the bulk of the some 215 million hectares transferred to communities in the 1990s has been in Latin America (White and Martin, 2002), amounting to about 20% of forests being community-conserved (Molnar*, et al.*, 2007); in tropical Latin America, the proportion increases to 32% being community-conserved (RRI and ITTO, 2009).

The majority of forest-dependent people in Latin America have historically used and continue to use the forest mostly for subsistence purposes. Anthropologists and other social scientists have documented the many ways in which indigenous and local people have traditionally and actively managed their forests, for example through swidden agriculture integrated with timber management (Balee, 1989; Michon*, et al.*, 2007; Padoch and Pinedo-Vasquez, 1996; Pinedo-Vasquez and Rabelo, 2002; Sears*, et al.*, 2007a; Sikor, 2006). However, the formal notion of community forestry (Sunderlin's "introduced" community forestry) came about in the development discourse in the 1970s and 1980s as a way to enhance the livelihoods of the rural poor (de Jong*, et al.*, 2008), and for reasons outlined above as part of the broader movement toward CBNRM (Charnley and Poe, 2007). In the Amazon in particular, community forestry was seen as a way to reclaim traditional and indigenous territories (de Jong*, et al.*, 2008). While some of the earliest examples of community forestry emerged in the 1970s in Nepal, the Philippines and India as an alternative to failed social forestry programmes (Charnley and Poe, 2007), successful examples from Mexico and Central America have contributed to the concept's popularity in other regions (de Jong*, et al.*, 2008).

The community forestry experience in Latin America is varied. De Jong *et al.* (2008) review differences that characterize some community forestry initiatives and enterprises in the region (p. 55-60):

- Communities have in recent decades strengthened their access to forest resources. However, actual rights over forest resources vary considerably, from communal properties and communal ownership of forest resources in Mexico to usufruct rights in countries such as Guatemala, Honduras, Peru, Bolivia and Brazil. In the latter cases,

communities do not have ownership of the land, state-owned forests and lands are set aside for their use.

- Management areas vary considerably in size – smallholders manage forests on plots up to 100 hectares, while some collectively managed areas or concessions can reach 100,000 hectares.
- Decision-making structures exist within the communities that outline rules for resource use and property, with many having a general assembly of some sort.
- The economic importance of forestry within the community is variable – timber and/or non-timber management can be a primary activity within the community, or can be just one of many livelihood strategies.
- The form and intensity of assistance received from governmental and non-governmental institutions differs in various locations, within and across countries.
- There is great variability in terms of community forestry initiatives' efforts towards vertical integration in the production chain – some communities sell logs, saw logs on site in the forest, have sawmills, do varying degrees of secondary processing of timber and non-timber products, and some run enterprises that sell ecosystem services.

Studies in developing countries have explored the different conditions that have both enabled and prevented successful outcomes in community forestry projects. Authors have identified such challenges as limited access to markets (Scherr, et al., 2003a; Scherr, et al., 2003b), insecure tenure and unrecognized traditional rights (Colchester, 2008; FAO, 2007; Pagdee, et al., 2006), adverse policy and regulatory environments (Molnar, et al., 2007), low productivity of community forest enterprises and their financial viability (Humphries, et al., 2009; Medina and Pokorny, 2008), inadequate organizational capacity (Porro, et al., 2008), and limited access to technical know-how (Louman, et al., 2008; Molnar, et al., 2007).

Molnar et al. (2007) provide a review of community forest enterprises (CFE) around the world, noting that they have had mixed results to date due to uneven regulatory and policy frameworks. Countries like Mexico and Guatemala stand out as having provided a consistent

framework for CFE emergence and growth (Molnar, et al., 2007), and now, with Honduras, provide some of the more relatively advanced examples of CFEs in the region. Amazonian countries have made advances in recognizing and demarcating indigenous territories, with 13% of Brazilian forests and approximately 31% of Bolivian forests set aside for community and indigenous use, and 46% of Colombia's forests and 33% of Peru's owned by communities or indigenous groups (White and Martin, 2002). However, introduced community forestry in Amazonia has been so far limited to pilot initiatives throughout the basin (Molnar*, et al.*, 2007), with limited success to date (Medina and Pokorny, 2008; Medina*, et al.*, 2008).

1.1.5 Bottom-up, or still top-down?

Community forestry, and CBNRM more broadly, have been promoted by critics of the top-down approach as an alternative to centralized management. CBNRM was meant to be a bottom-up, grassroots movement. As noted above, one of the characterizing features of CBNRM is the inclusion of traditional values and ecological knowledge in modern resource management (Kellert*, et al.*, 2000). CBNRM programmes are not meant to seek the involvement of local people in decisions made by outsiders, they imply that the local people *themselves* will be making decisions about forest management (Sikor and Nguyen, 2007).

Yet in many ways, introduced community forestry has diverged from the original intentions of community-based resource management. Such programmes have been conducted in a very top-down manner. Communities are expected to deliver on scientific principles which are rarely community-constructed or locally derived (Blaikie, 2006). On CBNRM, Blaikie (2006) writes, "there are many instances where local knowledge has not been able to negotiate on an equal basis with official scientific knowledge, but has instead been shaped by what is offered by outsiders, who make strategic choices about which ''local knowledge'' is heard and conformable to their scientifically given environmental goals, and then ventriloquised as the voice of the community" (p. 1944). Similar sentiments have been echoed by authors on community forestry, particularly in the Amazon. Pokorny and Johnson (2008) state that

existing support strategies for community forestry in the Amazon are based on the top-down transfer of knowledge generated by offsite experts. Medina et al. (2008; 2009a; 2009b) show how community forestry in the Amazon has been dominated by the interests of powers outside the communities, namely, development and/or conservation agencies or logging companies that create partnerships with the communities for forest management. Pulhin (1996) suggests that, in the Philippines, community development objectives were created by central governments, resulting in the artificial homogenization of communities. Edmunds and Wollenburg (2003b) review cases in different countries where the vision of the local forest users and that of the government agency engaging in the community differed greatly in terms of benefits, decision-making and forest quality, resulting in local disappointment with development outcomes.

Furthermore, despite the increase in land that has come under theoretical control of communities in recent years and the attention that community forestry has garnered in the development community, transfer to local governments of significant authority regarding forest resources is rare (Larson, 2005), and in many areas devolution of forest management has been "partial and disappointing" (Charnley and Poe, 2007, p. 301). Even with increased devolution and an enhanced role for local forest users, local forest users have often had little influence in deciding on forest management objectives, especially when state objectives conflict with local livelihoods, cultural values, and local management systems (Edmunds and Wollenberg, 2003b). In many cases, statutory rights given to communities have often not automatically turned into rights in practice, and, as mentioned above, central governments have retained control over resource management in many countries in Asia, Africa and Latin America (Edmunds and Wollenberg, 2003b; Larson*, et al.*, 2008a; Mbatu, 2010; Ribot*, et al.*, 2006; Wittman and Geisler, 2005).

A central tenet of community forestry and CBNRM is political empowerment and participation of local people (Larson and Soto, 2008; Neumann and Hirsch, 2000; Ribot, 2004; Skutsch, 2000). Yet, despite the prevalent rhetoric of community empowerment and

participation, community forestry is often promoted in a top-down manner, either by promoting industrial-scale forestry practices at the community level (Amaral and Amaral Neto, 2005; Benatti, et al., 2003; McCarthy, 2006; Oyono, 2005), or by putting forward the interests of development or conservation agents outside the community (Cooke and Kothari, 2001; Medina, et al., 2008; Medina, et al., 2009a).

While the currently prevailing top-down nature of community forestry cannot be blamed for all problems community managed forests are facing globally, such criticisms have inspired the approach taken in this research: looking to local perspectives, experiences and views to better understand practices, processes and attitudes in a community forestry setting.

1.2 Research objectives

Although community forestry continues to increase globally, it still faces a number of challenges and in many situations has not delivered its promised benefits. Its implementation also seems to continue to be dominated by a discourse defined outside the community by external agents such as governments, non-governmental organizations (NGOs), and private companies. The primary purpose of this research was to provide further insights on the community forestry experience from the perspective of the community member/local forest user. This is done with the goal of improving community forestry initiatives by taking into account the local user's perspective in order to harmonize interventions with the original intention of empowering communities. The two research aims were to: examine the status quo of community forestry from the perspective of the local forest user; and suggest a path forward based on local forest users' needs and wants.

To achieve these research aims, the objectives were to:

1 Assess the amount of decision-making power the local forest user currently has;
2 Outline the perceived challenges that community and local forest enterprise owners have in managing their forests; and,

3 Ascertain local perspectives on and goals for forest management practices in order to integrate them into current intervention models.

Objectives 1 and 2 are linked to the research aim of examining the status quo of community forestry from the perspective of the local user. The first objective assesses the status of the decentralization process by seeing how much decision-making power is in the hands of the local forest user. Given this distribution of power and the amount of decentralization that has taken place, the second objective further examines the challenges the local user faces in forest management. As the literature suggests, a top-down perspective continues to dominate the community forestry discourse and its implementation. Thus the third objective is forward-looking, in that it suggests a way to shift the balance of power in introduced community forestry towards a more bottom-up perspective, by taking into account local goals and practices.

1.3 Methodological approach

Qualitative research methods were used to address the research objectives through an embedded case study approach. Qualitative methods were useful in gaining an in-depth understanding of local perspectives on and local processes governing forest management. With this, the research involved elements of ethnographic methods, in that the natural world was observed by the researcher through visits to case study communities (Yin, 2003).

As the purpose of the research was to provide a fresh perspective on better ways to advance community forestry, I avoided prior commitment to any theoretical model (Lincoln and Guba, 1985). Instead, the research was guided only by the assertion that it should seek the perspectives of the local forest user in order to reveal a more bottom-up approach to designing community forestry initiatives and interventions.

For objective 1 on assessing the amount of decentralization of forest management, several authors have proposed ways to measure the degree of decentralization that has taken place.

Schneider (2003) measures political decentralization by looking at representation of local interests through civil society organizations of political parties, including local elections. Hutchcroft (2001) creates a framework that examines a range of local and national political factors. Forsyth *et al*. (forthcoming) produce a conceptual framework to assess authority in forest co-management arrangements in Canada. Here, in keeping with the "local perspectives" theme of this thesis, I created a framework for assessment based on aspects of decision-making that were considered important to the local forest user. Power was measured as whether the local forest user was the one making decisions relevant to their use of the forest resource, either through formal authority (as defined above) transferred to the local level, or informally through locally, but not nationally, legitimate avenues.

Elements of grounded theory were used to approach research objective 2 on outlining perceived challenges. With grounded theory, data are collected and analyzed iteratively, and constant comparisons of new and existing data are used to refine emerging categories and create theory grounded in the data (Glaser, 1998; Glaser and Strauss, 1967). While the idea of a researcher not engaging in any literature review prior to undertaking grounded theory research is perhaps unrealistic, a grounded theory approach here allowed me to explore the second objective without preconceived theories of how community forestry initiatives should work. Instead of coming to the table with a specific theory to test, using elements of grounded theory here allowed the data to speak for itself, and allowed the local community members' perspectives to emerge, rather than addressing the problem with theories that have been conceived by outside experts.

Similarly locally-grounded methods were used for objective 3 on ascertaining local perspectives on, and goals, for forest management. Rather than approaching the problem with a set of forest management goals produced external to the community and testing their applicability in the community, I first sought the views of the community members on what forest management goals should be, and then discussed these in comparison with existing introduced community forestry models.

More detailed methods will be described in Chapter 2-4.

1.3.1 Multiple case study approach

The research design was based on a multiple, embedded case study approach. Case studies are a detailed and in-depth research inquiry into each case studied. A case study approach is appropriate for this research as it focuses on social processes, rather than making claims about particular populations or establishing patterns within countries. An embedded case study approach was used in that two case study countries were chosen, and within each of those countries, three case study communities were chosen. Multiple case studies allow for comparison of emerging themes among the studied communities, while providing valuable insight into unique community situations (Verschuren, 2003).

Two case study regions were purposively chosen for the study: the Yucatán peninsula in Mexico and the eastern Amazon in Brazil. These two regions provided an interesting contrast in terms of the development of community forestry. Mexico is seen as having the most advanced community forestry sector in Latin America, with several examples of advanced enterprises (Charnley and Poe, 2007; Molnar, et al., 2007). With several hundred community-based forestry enterprises in operation throughout the country, it has been promoted as a global model for sustainable landscapes (Bray, et al., 2006; Bray, et al., 2003; Klooster, 2003). Meanwhile, community forestry in Brazil, which came about from an exogenous push mostly from NGOs trying to promote more sustainable forest practices in the Amazon (Amaral and Amaral Neto, 2005), has a relatively shorter history. Given unfavorable conditions for community forestry in the Brazilian Amazon, such as unregularized land tenure, weak local social organization, and lack of access to credit, markets and technical assistance (as cited in Amaral and Amaral Neto, 2005), it is unclear if and under what conditions these community forestry initiatives may succeed, and they have had mixed results

to date[3] (Pokorny, et al., 2010). The contrasting experiences in these two regions provided insights into how community perspectives compare and contrast between established models of community forestry (the Mexican cases) and less established models (the Brazilian cases).

Both case study regions were used to address Objectives 1 and 3. For Objective 2, examining the challenges that community and local forest enterprise owners have in managing their forests, only the Brazilian case studies were used. This decision was taken because the community forestry situation in Brazil is much less advanced than in Mexico, and thus required more attention to challenges faced by communities, to provide an in-depth understanding of why community forestry in Brazil, specifically, has been struggling.

Sampling of the case study communities was also non-random and purposive (Lincoln and Guba, 1985). The cases showcased different management models in the regions, although they were not meant to be an exhaustive representation of all community forestry models in the two regions. The communities were selected purposively as participating in community-managed forestry and with the aid of collaborators[4] in each country, where collaborators already had long-standing relationships with the communities in question.

Table 1 describes the six case studies (see Appendix B for a map of the locations of the case study communities). Further details about the case studies are provided in Chapters 2 and 3.

[3] A detailed history and status of community forestry in the two regions is reviewed in Chapter 2.

[4] Collaborators who aided with community selection and facilitated logistical matters in Brazil were Miguel Pinedo-Vasquez (Columbia University) and David G. McGrath (IPAM- Amazon Institute of Environmental Research). In Mexico, Luis Manuel Arias Reyes (CINVESTAV - Research and Advanced Studies Center of the National Polytechnic Institute of Mexico), Heliot Zarza Villanueva (UNAM – National Autonomous University of Mexico), and Victoria Santos (OEPFZM – Organization of Community Forests in the Zona Maya) aided in case study selection.

Table 1 The case study communities in Mexico and Brazil

Country	Mexico			Brazil		
Case study (as referred to in dissertation)	Caobas	Naranjal Poniente	Yaxcabá	Mazagão	Oficinas Caboclas de Tapajós (OCT)	MAFLOPS
State	Quintana Roo	Quintana Roo	Yucátan	Amapá	Pará	Pará
Management model	Community timber enterprise, divided in work groups; community sawmill	Community timber enterprise; community sawmill	Traditional forest management (no timber commercialization)	Traditional forest management with illegal timber commercialization. Small-scale sawmills within community	Wood extraction for furniture making workshop	Colonist-company partnerships in government sponsored settlements
Communal or individual properties	Communal	Communal	Communal	Smallholder	Communal	Smallholder
Communities sampled	Ejido of Caobas	Ejido of Naranjal Poniente	Select ejidos in the Yaxcabá municipality (interviews in ejido of Yaxcabá and with leaders of Cancobdzonot Tadzibechen, Popola, Yaxuná, Yokdzonot)	Foz de Mazagão Velho	Nova Vista and Nuquini. Also interviewed leader of Surucuá	PDA Igarapé da Anta and PDA Santo Antonio (also interviewed leaders of PDS Igarapé da Anta and PDA Santa Rita)
Indigenous?	No	Yes (Maya)	Yes (Maya)	No	No	No

1.3.2 Data collection

Fieldwork was conducted between June and October 2008 in Brazil, and between February and April 2009 in Mexico. Semi-structured, open-ended interviews were conducted with community leaders and other community members during the field visits (a sample of interview questions is copied in Appendix A). Key informants were identified with the help of local collaborators, and a networking approach (Knight, 2002) was used to identify other interviewees in the community who were currently taking part, or had taken part, in forest management.

Semi-structured interviews with community members were designed to elicit information on their forest management practices, governance structures, benefit-sharing mechanisms,

challenges they face in managing their forests, perceptions of good forest management, and benefits from forest activities. Academic experts, as well as government, industry, and NGO representatives, were also interviewed in order to provide further clarity on the topics at hand. A total of 122 interviews were conducted, 107 of which were with community members. A review of relevant legal norms and forestry codes and laws was also conducted after the interview data were analyzed to verify the legal rights of resource use in each country and clarify historical details concerning specific cases.

1.3.3 Data analysis

NVivo 8, a qualitative data analysis software package, was used to code and maintain the data. A conventional qualitative content analysis (Hsieh and Shannon, 2005) of the transcribed interviews was conducted, deriving coding categories directly from the transcripts. For Objectives 1 and 2, transcripts were first open coded to create as many categories as possible under the broad themes "governance" (Objective 1) and "challenges" (Objective 2). Open coding for Objective 3 was not restricted to particular themes. Axial coding was then done to group together and refine the categories found by open coding (Strauss and Corbin, 1998).

For Objective 2, the networking tool within NVivo 8 was useful in uncovering relationships between and among concepts that emerged from the coding, in order to create a framework outlining relationships amongst categories. Selective coding was used to refine and explain relationships within the framework, thus forming the grounded theory (Strauss and Corbin, 1998).

Further details on data analysis to address each research objective are provided in Chapters 2-4.

1.4 Structure of the dissertation

The next four chapters of this dissertation address the research objectives presented in this introductory chapter. Figure 1 outlines the structure of the dissertation. Chapters 2 and 3 address the first research aim, to examine the status quo of community forestry from the perspective of the local forest user. Chapter 3, along with Chapter 4, also addresses the second research aim of suggesting a path forward based on local forest users' needs and wants.

In Chapter 2, a framework is created for qualitatively assessing the amount of decision-making power the local forest user has (Objective 1) in the case study communities in Brazil and Mexico, identifying identifies criteria of relevance to community members' rights and day-to-day activities.

Chapter 3 continues this assessment of the status quo of community forestry by examining the challenges that community and local forest enterprise owners have in managing their forests (Objective 2). This chapter presents a framework showing challenges faced at different phases of community engagement in formal management in Brazil, once again from the perspective of the community member. This chapter also offers a path forward: the interrelatedness of challenges in the framework emphasizes that all challenges need to be addressed in a holistic manner for communities to maintain a profitable and self-sufficient operation.

Both Chapters 2 and 3 point to conclusions that reaffirm the literature on introduced community forestry – local decision-making authority remains limited, and community forest enterprises still struggle to reach self-sufficiency and continue to be strongly influenced by and dependent on external agents. With this better understanding of the current status of community forestry in these two nations, Chapter 4 continues on the theme of suggesting a path forward. Instead of promoting community forestry through this top-down approach which limits local empowerment and has met with varying degrees of success, this chapter proposes designing community forestry initiatives from the bottom up. In this chapter, local

perspectives on and goals for forest management practices are ascertained, in order to integrate them into current intervention models (Objective 3).

Chapter 5 is the concluding chapter of the dissertation, and provides a discussion of the findings of chapters 2-4, their implications for community forestry in the broader context, research limitations, and suggestions for future research.

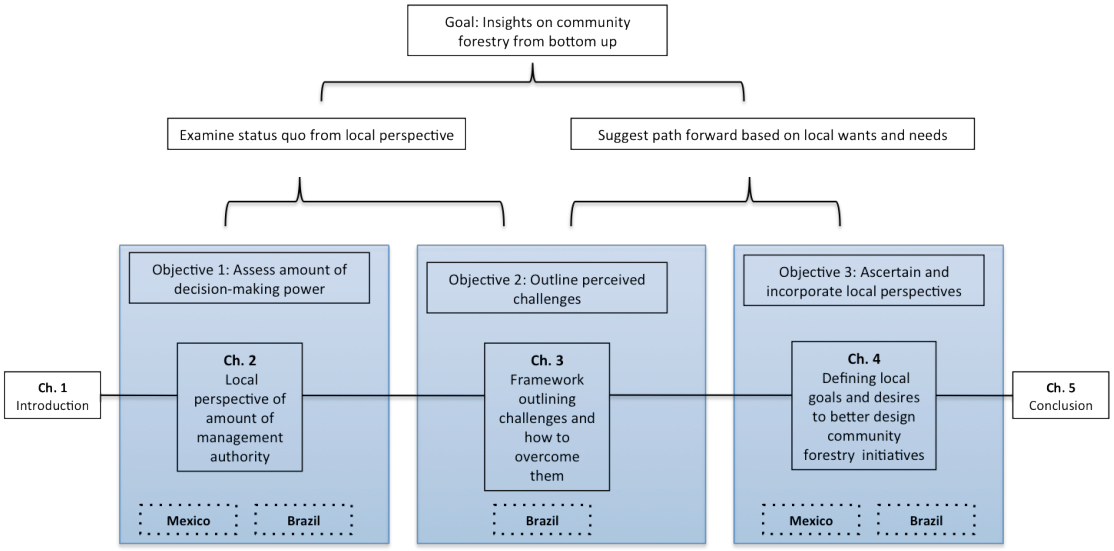

Figure 1 Structure of dissertation

2 ARE FOREST-DEPENDENT COMMUNITIES SECURING LEGITIMATE MANAGEMENT AUTHORITY OVER THEIR FORESTS? CASE STUDIES FROM BRAZIL AND MEXICO

2.1 Introduction

Decentralization of forest management, the process by which a central government cedes powers to actors and institutions at lower levels in a political-administrative hierarchy (Mawhood, 1983, cited in Ribot*, et al.*, 2006), has been a major trend in global forest governance for the past three decades (Agrawal*, et al.*, 2008; Ribot*, et al.*, 2006). This is particularly apparent in the developing world: 22% of tropical forests are community-owned or managed[5] (RRI and ITTO, 2009; White and Martin, 2002); and more than three quarters of developing countries and countries in transition are in the midst of experimenting with decentralization of natural resource management (Contreras-Hermosilla*, et al.*, 2006; Ribot, 2004).

Three core dimensions of decentralization have been described: fiscal, administrative (also known as deconcentration) and political (also known as democratic decentralization or devolution (Ribot, 2004)) (Schneider, 2003). Fiscal decentralization occurs when higher levels of government cede influence over budget and financial decisions to lower levels (as cited in Sharma, 2006). Deconcentration occurs when powers are devolved to representatives of the central government in local areas. Democratic decentralization entails the "transfer of power to actors or institutions that are accountable to the population in their jurisdiction" (Ribot*, et al.*, 2006, p. 1865). This article looks at community-based forest management as a form of democratic decentralization of forest governance – the transfer of power over forest resources and management to local governments and authorities representative of local populations.

[5] Only 3% of forests in the developed world are community-owned or managed (White and Martin, 2002)

Theoretically, decentralized management can improve efficiency, equity, democracy and resource management (Ribot, 2004; Ribot*, et al.*, 2006), and empirical evidence has shown that decentralization of decision-making can benefit natural resource quality (reviewed in Garnett*, et al.*, 2007; Sayer*, et al.*, 2008). And indeed, community-based forest management in many cases around the world has improved efficiency, equity, democracy and ecosystem health in forest-dependent communities (Larson, 2005; Molnar*, et al.*, 2007). For these reasons, community-based forest management has been promoted as a model to create long-term economic development and self-reliance in rural communities, while promoting the conservation and sustainable use of forests and consolidating rights over traditional lands and resources (Bray*, et al.*, 2008; Pagdee*, et al.*, 2006; Scherr*, et al.*, 2003b).

Effective decentralization strategies have increased the capacity of local populations to make their needs and demands heard. It has increased the interactive capacity of local governments through fair elections, multiple accountability mechanisms and local government associations (Larson, 2003). In terms of the local government decision-making sphere, Larson (*ibid*) highlights the following as factors that influence the social and environmental outcomes of decentralization: local incentive structure, power relations, capacity, and environmental and social ideology.

Studies have shown that devolution policies have had both positive and negative livelihood benefits (Edmunds and Wollenberg, 2003a). In many cases, statutory rights given to communities have often not automatically turned into rights in practice, communities have not been able to turn those new rights into benefits, and central governments oftentimes obstruct the decentralization process and retain control over resource management (Edmunds and Wollenberg, 2003b; Larson*, et al.*, 2008a; Ribot*, et al.*, 2006; Wittman and Geisler, 2005). Ribot *et al.* (2006) note ways that central governments can undermine the ability of local governments to make decisions, including by limiting the kinds of powers transferred. Transfer to local governments of significant authority regarding forest resources is rare

(Larson, 2005). Even with increased devolution and an enhanced role for local forest users, local forest users have often had little influence in deciding on management objectives, especially when state objectives conflict with local livelihoods, cultural values, and local management systems (Edmunds and Wollenberg, 2003b).

Before being able to assess the consequences of decentralization on forests and forest-dependent people, it is useful to take a step back and assess the amount of democratic decentralization that has actually occurred. This study looks at the local level and assesses the amount of authority that the forest user and the community have over their resources. This viewpoint is local stakeholder-centric – instead of using the central government as the starting point and assessing powers devolved to lower levels of government, it looks at the individual forest user or community and the amount of decision-making power acquired at that level.

Here, an exploratory case study approach is taken to measure decentralization of forest governance in Brazil and Mexico. The question is asked, qualitatively-speaking, how much authority do communities have in governing their forest resources? A framework for assessment is developed that identifies criteria of relevance to community members' rights and day-to-day activities; criteria that community members in case study communities identified as important aspects of control or rights over forest resources. This framework provides a useful tool for assessing how much forest management decentralization is actually occurring in terms of the amount of formal and informal decision-making power acquired, from a community perspective.

2.2 Methods

Six case studies were chosen in Brazil and Mexico. Brazil and Mexico make for an interesting comparison; both countries have been promoting community forestry, but formal community forestry is much more established in Mexico and more enshrined in current legislation, with several legislative changes since the 1980s giving increasing power to communities over their resources. However, both governments still heavily regulate the forest sector.

Sampling of the case study communities was non-random and purposive (Lincoln and Guba, 1985), in order to have a variety of community forestry models represented. The case studies were selected with the help of local collaborators in both countries based on pre-existing relationships with the communities. In Mexico, the cases were: Caobas and Naranjal Poniente (Quintana Roo), both of which were part of the pilot programme of community forestry in the 1980s; and traditional forest management in Yaxcabá (Yucatán). In Brazil, the cases were: traditional smallholder forest management in seasonally-flooded forests (*várzea*) in Foz de Mazagão (Amapá); *Oficinas Caboclas de Tapajós* (OCT), a small-scale furniture-making cooperative in three communities (Nova Vista, Nuquini and Surucuá) in the Tapajós-Arapiuns Extractive Reserve (Pará); and colonist-company partnerships in government sponsored settlements (Santo Antonio and Igarapé da Anta, also in Pará).

Fieldwork was conducted between June and October 2008 in Brazil, and between February and April 2009 in Mexico. Semi-structured interviews were conducted with community leaders and other community members during the field visits. Key informants were identified with the help of local collaborators, and a networking approach (Knight, 2002) was used to identify other interviewees in the community who were currently taking part, or had taken part, in forest management. Semi-structured interviews with community members were designed to elicit information on their forest management practices, governance structures, benefit-sharing mechanisms, the amount of authority they had or would like over a particular resource use, and whether they had problems working within the current system of authority or would prefer an alternative. Academic experts, as well as government, industry, and NGO representatives, were also interviewed in order to provide further clarity on the topics at hand. A total of 122 interviews were conducted. A review of relevant legal norms and forestry codes and laws was also conducted to verify the legal rights of resource use in each country.

NVivo 8, a qualitative data analysis software tool, was used to maintain and code the transcribed interviews. Elements of the conceptual framework emerged through the coding as

elements identified by community members, where certain aspects of control or decision-making over resource use would be pointed out by community members as something they would like to have, or currently have, authority over.

2.3 The cases

This section provides a brief history of community forestry in both countries and outlines the forest decision-making structure within the case study communities. Produced from information presented by interviewees and a review of the relevant legal norms and laws, the section highlights both powers and governance structures enshrined in legislation in Mexico and Brazil, and where the current local situation varies from these. This information provides the contextual basis for the overall assessment of decision-making power in the cases, as well as the assessment framework, described in the subsequent section.

2.3.1 Mexico

2.3.1.1 History of community forestry

Mexico is seen as having the most advanced community forestry sector in Latin America (Klooster, 2003), and is being promoted as a global model for sustainable landscapes (Bray*, et al.*, 2003). 80% of the remaining forests in Mexico are village-owned properties (Bray*, et al.*, 2003), and Mexico has a long history of community resource management. Collective organizations of farmers, organized into rural cooperative communities, or *ejidos*, were formed after the Mexican Revolution in the early 20th Century. The agrarian reform provided secure tenure to communities over their land, but not forest resources. In the 1970s, rural forest communities took advantage of agrarian reforms and the dismantling of state-owned enterprises following structural adjustment, and demanded control over logging businesses on their territories to create their own community forest enterprises and oversee of forest management. Several communities mobilized and formed associations, and made links with university graduates to gain from technical expertise and train community members in technical aspects of community based forest management (Chapela, 2005).

In Quintana Roo, the Forestry Pilot Plan was implemented in the 1980s, with German assistance, as a joint initiative of the Mexican federal and state governments. The Pilot Plan established permanent forest areas in several *ejidos*, where community timber management plans were developed and agriculture prohibited (Vester and Navarro-Martinez, 2005), and provided communities with training and infrastructure for forestry. The Pilot Plan brought industrial-scale forestry to the community-scale, including the adaptation of management plans used by parastatal logging companies previously operating in the area. This model of forestry continues to this day, although annual cuts and acceptable tree diameters have been reviewed in light of more recent research. Small adaptations to the local context were made to harvesting practices; for example, in lieu of using maps (which were deemed too complicated), marks on sticks are now used to outline quadrants and numbers of trees of each species to be harvested in the quadrant.

Following the adoption of a new forestry law in 1986, which made it possible for professional teams from within the communities to develop the legally required forest management plans (instead of the Forest Service), communities developed their own technical staff and management approaches. Through step-wise changes in legislation, the government loosened control of forest resources, and in 1992, with removal of a reference to the government's "primordial" rights over forests, communities gained full timber rights.

2.3.1.2 Local forest governance structure

An *ejido* governance template was also established during agrarian reform; *ejidos* have a General Assembly of all legal community members with land rights (*ejidatarios*), which elects a *comisariado* – president, secretary and treasurer – every three years. In many ways, Mexican *ejidos* have a very egalitarian system. Each *ejidatario* gets a vote in the General Assembly on all forest resource matters. The meetings of the General Assembly are a forum for discussion, where *ejidatarios* debate the merits and disadvantages of any decisions to be made regarding the community and natural resources. All views are accommodated as much

as possible, until a vote is called to decide on a matter. This governance structure provided a strong base for forest governance, involving all *ejidatarios* in decision-making, enforcement and profit sharing, while designating a separate leadership in some cases for day-to-day forest management decisions and for the running of a community sawmill. Together, they decide how profits should be spent (reinvested in an enterprise, on community projects, or divided amongst *ejidatarios*). All *ejidatarios* receive part of the profits from forest management, even if they have nothing to do with forestry activities.

However, those who are not *ejidatarios* (called *repobladores*) do not have the same rights and are not given any dividends from community forestry, thus do not benefit directly from forest management. The majority of *ejido* inhabitants are non-*ejidatarios*. This marginalizes women, who are only ever given the rights of an *ejidatario* if their husband has given them that right.

2.3.1.3 Legal restrictions on forests

The General Assembly of an *ejido* decides on the long-term vision for the community forests and land. Within the *ejido*, they have the ability to designate protected areas, productive lands for agriculture, forest plantations and livestock, and forest management areas. They also have the liberty to decide how the *ejidatarios* will benefit from forest management areas and who will manage them, and the long-term purpose of management. However, some legal[6] restrictions apply to certain forest types. For example, tropical forests and *monte alto* (literally, tall forests) with a regeneration time of greater than 20 years are not to be converted to other land uses. The *ejido* is also required to retain a minimum of 20% forest cover, including riparian forests, windbreaks, and forest patches. While deforestation limits are stipulated by law, the General Assemblies of the *ejidos* have also decreed which areas will be permanent forest reserves, which will be production forests and which can be converted, and this is well-regulated internally. In preserving parts of the forest on *ejido* land, one *ejidatario* commented that "*ejidos* do it out of custom for their own local use," but national

[6] Here, "legal" restrictions refer to rules legislated at the national or state or level, as opposed to "local" restrictions or rules, which are decided upon within the General Assembly or similar community-level body.

laws also exist specifying the percentage and type of forest that is supposed to be preserved in *ejidos*.

This means that while strategically the *ejidos* are limited by legislation, local day-to-day decision-making power is high, as interaction with the authorities on forest cover is very limited on a day-to-day or year-to-year basis. Clearing of non-protected forests for the rotating *milpa*[7] system of agriculture is still practiced and is internally regulated, where *ejidatarios* get permission from the *comisariado* for new agricultural plots. For clearings larger than 10 hectares, the property holder needs to present a manifestation of environmental impact to SEMARNAT (Secretary of Environment and Natural Resources).

The government has supported the creation of plantations of precious hardwoods in several *ejidos* in the Yucatán, through co-financing and technical expertise. Such projects, however, have to be approved by the *ejido's* General Assembly.

2.3.1.4 Commercialization[8] *of forest products*

Despite the community's ability to decide on the long-term vision of their forests and land (within the limits of land use conversion laws), and having their timber rights enshrined in law, the government continues to have a heavy hand in Mexican community forestry through high regulation of extraction and commercialization. Legislation dictates that a government-approved management plan, elaborated by a forest engineer or technician, is required to commercialize wood products. Annual allowable cuts for precious woods such as mahogany and cedar, and minimum harvestable diameters, are prescribed by the responsible government agency. Permits are also required to sell polewood from the management area. Polewood commercialization, however, is conducted at the individual level and not communally – *ejidos* are given a limit for polewood sales by volume, and this is split amongst interested

[7] *Milpa* is a crop-growing system used throughout Mesoamerica that produces maize, beans and squash.

[8] Commercialization or the selling of forest products for income-generating purposes is distinguished here from domestic use for subsistence purposes

ejidatarios. Racelis and Barsimantov (2008) note that the polewood permitting system by the government is inadequate, and recommend that locals use their knowledge of the species to improve the system.

Local decision-making does, however, take place within this restricted sphere – *ejidos* for the most part can choose not to exploit the maximum amount timber allowed, as well as the species harvested. They are also free to decide the timber's end product and destination. They can choose the forest engineer who will elaborate the management plan, including qualified persons from within the community, which allows for community participation in management plan elaboration. Everyday decisions of forest management are taken at the level of workgroup or ejido for commercial timber management. The ejidos are free to split into workgroups to divide the annual allowable cut, the labour, and the benefits. They communally run the sawmill and choose their own buyers.

Commercialization of non-wood forest products[9] (NWFPs) is also heavily regulated. Any commercialization of NWFPs is subject to official norms for the type of species in question. These norms vary depending on the range of species they cover, but most include the requirement to submit notification to SEMARNAT, prepared by a technician, annually or every five years with a long list of information that includes harvesting techniques and environmental safeguarding measures employed. Selling any wild game also requires authorization. Within the limits of required notifications, the community members have a high degree of liberty in making other decisions concerning the harvest and selling of NWFPs from their forests.

2.3.1.5 Subsistence uses of forest products

Collection of firewood from dead wood, silviculture pruning or bushes does not require government authorization. The Forest Law stipulates that the use of forest products for

[9] The term "non-wood" forest product is used here to indicate forest products other than timber and firewood

domestic purposes does not require permission, unless the product is subject to any official norms, which none are, so far. Polewood for construction, however, is internally regulated, with a strong ethic to only take what you need. Community members still need authorization for hunting for local consumption or sale in quantities meant to satisfy basic needs. The Wildlife General Law stipulates that subsistence users of wildlife will receive support, technical assistance and capacity building to help them fulfill these legal requirements.

2.3.1.6 Caobas and Naranjal Poniente

Caobas and Naranjal Poniente were both part of the Forestry Pilot Plan of Quintana Roo in the 1980s, and thus have very similar models of community forestry as promoted by the Pilot Plan. Both communities have well-developed forest enterprises with a community-run sawmill. Forestry is mechanized and the enterprises focus mostly on high-valued species, such as mahogany (*Swietenia macrophylla*) and cedar (*Cedrela odorata*), although several other species are also harvested for commercial or personal uses (see Vester and Navarro-Martinez, 2005). In Caobas, due to internal conflicts, the *ejido* found the need to divide into seven work groups to manage forest resources rather than manage them as a whole *ejido*; each work group has its own governance structure, meetings, and allocation of the annual cut for the whole *ejido*. Forestry in Naranjal Poniente is managed at the *ejido* level. In Naranjal Poniente, they rotate the forestry jobs around several people in the *ejido*, so that more people are given the chance to benefit from the employment opportunities that timber management provides.

Both *ejidos* are primarily agricultural, practicing a rotating *milpa* system, but clearing is strictly prohibited in the forest permanent estate due to federal legislation, the conditions of the initial Pilot Plan, and by decree of the General Assembly. Both *ejidos* follow all legal requirements for timber extraction and comply with most environmental legislation. Hunting, however, has been occurring without filing the required paperwork. In Caobas, interviewees presented contradictory information on the legality of hunting, with some believing that it was legal for subsistence use and others stating that it was totally prohibited. Concerned with the

reduction of availability of game, the *ejido* put together a group of watchmen to enforce the prohibition. The communities also sought authorization to sell palm thatching (*huano*) and gum (*chicle*).

Most ejidos with community forestry belong to a regional association of producers, *Sociedades*, a non-governmental organization that provides technical support to the ejidos. The various *Sociedades*, representing their respective ejidos, are consulted in the creation of new technical norms, and many ejido members interviewed commented that they felt their respective *Sociedad* did a good job in representing their interests in interactions and negotiations with higher levels of government. Caobas is a member of the *Sociedad de Productores Forestales Ejidales de Quintana Roo*, and Naranjal Poniente, as a Mayan community, is a member of the *Organizacion de Ejidos Productores Forestales Zona Maya*.

2.3.1.7 Yaxcabá

Forests in Yaxcabá, a municipality located in Yucatán state comprising of several *ejidos*, have been reduced substantially through agricultural activities, and the secondary vegetation that remains has come about through shifting cultivation (Graefe, 2003). The *ejidos* practice traditional forest management within their *milpa* cultivation system, using domestically various forest products from secondary forests of different ages (Graefe, 2003; Sanabria, 1986), but they do not have timber enterprises.

The General Assemblies of each *ejido* decided to create a *Fundo Legal*, a forest surrounding the villages, where felling for agriculture is prohibited, but forest resources can be used for personal uses. They also have a custom of keeping four to five hectares of *monte alto* in agriculture areas for their apiaries. The community members follow their traditional practices for forest management, with limited intervention and very limited outside enforcement.

> "It's just a custom of people that if they need wood they can go take it."

The community has more liberty to decide on forest use and clearing because they do not have similar tropical forests to the other two *ejidos*, but they are still not meant to fell *monte*

alto. They do, however, still occasionally fell *monte alto*, as the soils are richer than in the younger, regenerating forests. In one of the *ejidos* of Yaxcabá, outsiders had offered to help with a reforestation project, but the Assembly voted against it because people did not want to lose land for agriculture:

> "Many people have apiaries with four hectare reserves. So if we also had reforestation of 50-100 ha, where would we do *milpa*? There's no more space."

Several community members in the various *ejidos* carve wooden masks, made mostly from chacá (*Bursera simaruba*), for selling in nearby tourist destinations, such as Chichen Itza. They ask permission from their *ejido*'s *comisariado* prior to harvesting chacá, but this does not seem to be an effective means of regulation, as many commented that the chacá was finishing because there were no rules restricting harvest. In some *ejidos,* they had to buy wood from neighbouring areas because they were running out of chacá. Technically, commercializing wood products without the proper permits from SEMARNAT is illegal. Many *ejidos* within the Yaxcabá municipality also "illegally" sell charcoal, although they seek permission from their *comisariado,* as well. However, forest law enforcement in this region is weak.

2.3.2 Brazil

2.3.2.1 History of community forestry

Community forestry in Brazil came about from an exogenous push largely by NGOs trying to promote more sustainable forest practices (Amaral and Amaral Neto, 2000). Since the early 1990s, community-based timber management projects have been initiated in national forests, extractive reserves, and agricultural colonization areas, after community-based management was identified as one of the principal means to reduce deforestation (Miyasaka Porro and Stone, 2005). In 1996, a program known as ProManejo was put in place to promote formal timber management by communities. In 1998, Brazilian forestry law was reformed to create a category for community forest management for timber. After the turn of the century, community forestry proliferated in the Brazilian Amazon; by 2005, over 300 plans for

community forestry had been approved or were being elaborated, with over 3,000 families involved in managing 338,000 hectares, up from 12 initiatives in the late 1990s (Amaral and Amaral Neto, 2005). In 2008, a new Brazilian community forestry policy was created, which had undergone extensive consultations amongst community groups and NGOs working with communities prior to its finalization. Community forest initiatives in the Brazilian Amazon represent a variety of different experiences, with diverse organizational structures, business models, target social groups, and differing access to forest resources and end products (Amaral and Amaral Neto, 2000). Many of the projects involved high financial investments from supporting external organizations, mostly for training community members to follow legal requirements for forest management (Medina and Pokorny, 2008).

Unlike Mexico, land ownership in many parts of the Brazilian Amazon is not clear, and there are several different designations of public forests set aside for community administration, including indigenous territories, extractive reserves, and different categories of government-sponsored settlements (for an historical review of the development of these categories, see Larson*, et al.*, 2008a).

In contrast with the Mexican case studies, land and resource ownership, as well as community-level forest governance structures, vary among the three Brazilian case studies examined here. The following sub-section outlines legal requirements for forest use that are common to the three case studies, but not necessarily all community forestry in Brazil. Following this are descriptions of the three case studies in Brazil and how they differ, including their compliance with legal requirements.

2.3.2.2 Legal requirements

The communities and smallholders with some sort of legal land tenure have the power to decide what the long-term objective of managing their forest stands will be, but within the context of existing legislation that limits them to only converting 20% of the forest for other purposes. Forest conversion is highly regulated; annual permits need to be sought for

agricultural clearings. For the remaining 80% of the forest (called the legal reserve), they have the ability to decide whether the forest will be protected completely or managed for timber, non-timber products or environmental services, and whether they will involve a third party such as a logging company in the management.

If a community or smallholder decides to sell timber from their land, regardless of the land ownership status, legislation dictates that a government-approved management plan[10], elaborated by a forest engineer or technician, is required. In 2006, the forestry law was modified to allow for simplified management plans for communities with low intensity operations, and recent legislation in the state of Pará (Brazil) allows for simplified management plans for smallholder and community management in the *várzea*[11] that does not exceed three trees per hectare or 45 cubic meters per month of sawnwood for small-scale processors.

In most cases, day-to-day planning decisions have been devolved to the community or smallholder, while environmental regulations on harvesting practices are still observed. They have control over daily decisions with regards to commercial harvest, while observing legal management practices contained in the forestry code or various norms (protecting riparian zones, no logging on steep slopes, etc).

For commercializing NWFPs, no permits are required for management, transportation or storage. However, smallholders, communities and companies alike are supposed to deliver annual reports to the relevant agency describing realized activities, the species and product, as well as the quantities extracted.

Some limitations on amounts of wood products for domestic use exist in the Brazilian legislation, but these were not enforced in the case studies. The Brazilian communities have

[10] For federal reserves, these are administered by the federal government body; otherwise, these can now be approved by the relevant state body.
[11] *Várzea* is a seasonally-flooded forest growing along rivers in the Amazon.

full legal control of the NWFPs for domestic use, provided that they have at a minimum the resource use permission property document. However, hunting of wild game is illegal, although ongoing in most situations.

2.3.2.3 Mazagão

Most residents in Mazagão do not own their land, as all *várzea* land is considered federal territory. The state government, through a JICA-funded project, is helping the residents obtain resource use permission documents, which give them legal permission to access above-ground resources on their designated piece of land, but are non-transferable and non-definitive. At the time of fieldwork, most families in Mazagão were still waiting for their documents. Prior to this, families in the area had informally divided lands amongst themselves, and were well aware of boundaries as such[12], although there were some reports of some encroachment by neighbours, mostly for stealing the palm fruit *açai* (*Euterpe oleracea*), or by livestock.

Mazagão is a conglomeration of smallholder properties, where forest-related decisions are made at the household level, and forests are managed by families on individual household lots. Families manage trees in their fields, fallows, home gardens, and forests for both wood and non-wood forest products. Timber extraction is only seen as an occasional activity by families, to supplement more profitable activities such as *açai* (*Euterpe oleracea*) and shrimp harvesting. A handful of owners of family-run, small-scale sawmills exist in the area, whose main economic activity is still timber extraction and processing for sale in local and regional markets. These local activities are considered illegal, as no management plans are sought, and the residents are pursued by local enforcement officers over timber sales. The residents have not been able to hire forest engineers to elaborate plans for them and help them navigate through the extensive bureaucracy involved in legalizing their activities (Chapter 3).

[12] The state's land demarcation project was threatening to change the community's informal demarcations, which had been based mostly on boundaries created by many small rivers. The state project was assigning resource use documents by taking a GPS point in the person's house, and calculating a 500m radius around this point, ignoring existing demarcations and waterways.

However, local officials have given the resident sawmill owners an informal limit on the amount of sawnwood that they can sell without the necessary permits (a "subsistence" level), limiting their decision-making over amounts, but not over species harvested, practices used, destination or end product.

The residents of Mazagão were, for the most part, highly dissatisfied with the level of authority that they had over timber management. The heavy enforcement and timber limits had steered many away from the timber industry, with a few sawmill owners selling off their sawmills in recent years. "You need authorization to do anything […] nobody has this authorization, nobody can follow this law, or they wouldn't live here." In discussing the legal requirements with which they are meant to comply for forest management, a few residents commented that the government did not understand the *caboclo* lifestyle, and the laws do not take their needs into account: "We're not deforesting, we're extracting. The government doesn't see this."

Associations exist within the community for various activities, such as a women's association for fruit extraction and processing, and fisheries resources are managed more communally. The state government is planning on establishing a new community forestry project in the area, and is requiring the strengthening of a community association as a prerequisite for beginning the project, to act as a representative body of the smallholders. However, at the time of the field visit there were already smallholders complaining that the association and its leaders did not represent their views. Besides changing the current governance structure within the community, it remains to be seen if this new project will marginalize some community members. The new community forestry project will also entail outside technicians making management decisions based on legal requirements and technical considerations that have little resemblance to current and long-standing management practiced by the residents of Mazagão[13].

[13] For example, legal management plans expect natural forest regeneration post-harvest, which would entail leaving the area empty for some time. However, *caboclos* would plant

2.3.2.4 OCT in the Extractive Reserve

The *Oficinas Caboclas de Tapajós* (OCT) began in 1998 as a collaborative initiative involving two communities of the Tapajós-Arapiuns Extractive Reserve[14] (RESEX) on the Lower Tapajós River, to develop a community forestry project based on the production of simple, hand-made furniture using wood from sustainably managed community forest reserves. Currently, six communities along the Tapajós River are involved in the cooperative: three in the RESEX Tapajós-Arapiuns and three in the Tapajós National Forest (FLONA). Only the communities in the RESEX were included in this study[15].

After several years of conflict in the 1980s between commercial loggers and the communities living on the west bank of the Tapajós River, the National Institute for Colonization and Agrarian reform, INCRA, granted those communities a 13-km wide, 64-km long extractive forest reserve, RESEX *Tapajós*-Arapiuns. As members of federal reserves, community members have legal and exclusive use rights to community forests. In this case, ownership is not firm, as the communities are using and living in public forests that have been set aside for the communities, meant to devolve responsibility of managing these public forest lands to the communities, but retaining several restrictions on forest use. Communities in the RESEX, manage the community forest collectively, and thus decisions involving the forest are taken collectively at community meetings lead by elected leaders. There is also a higher level governing body for the RESEX as a whole, which includes a committee with representatives from the various communities within the RESEX, as well as government representatives and other stakeholders in the region. Each RESEX is meant to have a RESEX-wide management

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annual crops in the felled area, which promotes natural succession while also being useful to the smallholder (Pinedo-Vasquez *et al.*, 2001; Sears and Pinedo-Vasquez, 2004).

[14] Extractive reserves (RESEX) in Brazil are created on the demands of traditional and indigenous communities with the objective of using public land to sustainably manage natural resources and preserve local traditions and the extractivist lifestyle.

[15] It was not possible to obtain the necessary research permits to conduct interviews in the FLONA within the time frame of the field work.

plan that outlines allowable activities within the RESEX. The management plan for RESEX Tapajós-Arapiuns is still, after several years, awaiting approval by the federal authorities.

By fighting for the RESEX designation, the OCT communities were fighting for a long-term vision of preserving their traditional ways of life and culture, mostly based on NTFP extraction (Cronkleton*, et al.*, 2010). While they have gained that legal recognition, the government is still involved in creating a long-term vision for the reserve, by having to approve a long-term management plan for the RESEX, and imposing a long list of restrictions on permissible activities within the RESEX. In the RESEX, a management plan is required to commercialize timber from the community forest, but wood products can be sold from family plots (but not logs or sawnwood) to other members of the RESEX without permits. For personal consumption, community members notified their community leader of their intention to harvest timber within the community forest, as a form of internal regulation.

The OCT in each community works within the existing community governance structure – while they are an independent body made up of a handful of artisans with their own administration and decision-making power over the functions of the cooperative, they seek permission from the community to use wood from the community forest and they have to pay a dividend of profits from furniture sales back to the community. While the forest is a communally owned resource, ultimately, the artisans in the cooperative are the ones who benefit the most from this initiative. One OCT member commented on how some community members feel about OCT:

> "It's seen that eight families are benefiting from this. We of course pass a percentage to the community, but people think that only OCT workers are benefiting."

However, anyone is free to join the group of artisans and benefit from it as much as they wish. The community is given a dividend of the profits (fiver percent) and is kept abreast of OCT activities and they are invited to OCT meetings. They also have benefited as a whole from better conservation practices in the forest, and several environmental education courses that were part of the NGO support to the project. Almost all interviewees in this case study said

that they value the standing forest more now with the added value the furniture cooperative brings to their forests, and they are more careful to protect the forest from fires used for agricultural clearings. While the community does not have voting power over OCT activities, it does have decision-making power over the forest resource. At the time of the fieldwork, there were some reports of mismanagement of the funds from furniture sales, and the community president threatened to shut down operations until the issue was sorted out.

OCT has prepared a legal management plan for their timber use, but they have been waiting for years for its approval, as the federal government first has to approve a management plan for the RESEX as a whole. Operations continue in the meantime.

Communities in the RESEX Tapajós-Arapiuns, as in most RESEXs in the Brazilian Amazon, have fought for recognition of their traditional lifestyles, and have affected policy change successfully by gaining that recognition. No community members interviewed in the OCT case study expressed dissatisfaction with their level of authority, although there was some impatience expressed with the fact that their management plan had yet to be approved. The residents of the various communities in the RESEX are represented in the RESEX-wide management council, which is formulating the RESEX-wide utilization plan. Some residents commented that they were able to ensure the maintenance of most of their extractivist activities. However, in other RESEXs in Pará, it was noted that community groups were struggling to maintain adequate representation on their management councils to prevent other local stakeholders (e.g., loggers and ranchers, who are also part of the council) from gaining control (Cronkleton*, et al.*, 2010). Cronkelton *et al.* (*ibid*) further note that resource use decisions that had once been made at the community level were now taking place at the territorial level. In the *Verde para sempre* RESEX (Pará), other studies have found that while the RESEX recognizes land access and usufruct rights for smallholders, local practices and sources of livelihoods are not necessarily recognized in the RESEX's management principles and rules (Larson*, et al.*, 2008a).

2.3.2.5 Colonist-company partnership

Between 1994 and 2002, over 300,000 families were settled in the Brazilian Amazon from other parts of the country (Barreto*, et al.*, 2006). In certain settlement schemes, the colonist families are each given 100 hectares of land. INCRA gives the colonist a temporary title over the land, called a *Protocolo*, which indicates that land titling is underway (Merry*, et al.*, 2006). Although the government has sanctioned their settlement, there is usually a long delay in issuing tenure documents, thus complicating the possibility of getting a forest management plan if they wanted to exploit their forest resources, or a loan to initiate any projects. Upon encouragement from the government, colonists form associations to then partner with logging companies to manage the timber on the colonists' land, in this case with the company MAFLOPS (Forest Management and Lender of Services). The company builds roads within the settlements, demarcates colonist lots, helps households obtain a temporary land tenure permit, and obtains legal permission for harvesting according to an approved management plan based on reduced impact logging (RIL) (the partnership is described in further detail in Chapter 3).

Because of this partnership, there is some confusion amongst colonists in this case study about how much access they have to their forests and timber. Although the colonists technically own the timber on their plot, some colonists interviewed were under the mistaken impression that once they have signed the contract with the logging company they no longer had access to their timber or even the forest. Comments included

> "I don't really understand. It's a reserved area of IBAMA [Federal Institute for Environment and Renewable Natural Resources]. We can't touch it,"
>
> "we can't really enter there,"

and

> "we still have the right to go in the forest, but we can't cut anything."

While this is true for commercializing timber (commercialized harvest is limited to the management plan produced by the company and approved by the government), the colonist is not prohibited from entering the forest and/or accessing non-timber resources.

In the settlements studied here, individual colonists are meant to have title to their own plots of land and can thus make decisions at the household level. They form associations within the settlements, with elected leadership that is meant to represent their interests. While the colonists had the ability to decide whether to contract a third party to manage their legal reserves, some colonists commented that they were not adequately informed about what forest management meant, with some noting they were more or less given a contract to sign almost immediately after arriving to the settlement – therefore they were not able to make an informed decision. Others commented that they only did it because they felt they didn't have much choice if they wanted roads to be constructed in the settlement. Thus, while they were free to choose to enter into a contract, circumstances had it that most colonists had little choice in the matter.

In the case of the colonist-company partnership, there are a couple of discrepancies between their legal entitlements and what is actually happening. Firstly, while the government settles them with the promise of land ownership, INCRA is facing a large backlog of settlement claims, and thus the titling process is slow. Without a title, the settlers are not able to manage their forests legally. The partnership with the logging company sped up this process, as INCRA for some time had an arrangement with the company to expedite title issuing for the purpose of starting forest management. Also, many interviewees pointed to the problem of illegal, clandestine loggers, noting that the government was not helping the settlers to keep these loggers out of their property. It was also pointed out that many settlers who did not make a contract with MAFLOPS ended up selling their logs to illegal loggers.

Another discrepancy between legal entitlements and reality specific to the colonist-company partnership is that once the colonist signs the contract with the logging company, they are effectively signing away their decision-making rights over several aspects of forest management which smallholders are meant to have; all timber management and commercialization decisions are now made by the company. The company hires the engineers

and elaborates the plans, and decides which species and individual trees to harvest, the rate of harvest, extraction methods and the destination and price of the timber. The colonist is responsible for post-harvest forest maintenance. Colonists are, however, free to opt out of the contract made between the association and the company. A few colonists interviewed commented that the leader of the settlement had negotiated the contract with the company with little input from other colonists who had little knowledge of what was happening, and thus decided against joining. Given that legal timber management is a foreign activity to the mostly agriculturist colonists, the logging company is filling a need by providing all management services, from planning and harvest to sales. However, this system perpetuates a cycle of dependency on outside intervention, since little to no training, technology or forest knowledge transfer occurs from the company to the community. The colonist benefits monetarily from a one-time deal, but is not left empowered to manage his/her forest in the future.

Also in contrast with the other cases where forest profits reach the community or smallholder directly, the colonists in these partnerships are paid for the timber at lower than market prices, not only because the company acts as an intermediary between the colonist and the sawmill, but also to cover the costs of building and maintaining the road network within the settlements – a responsibility of the government. Many interviewees commented that they could have sold their timber for a higher price if they did not have such a pressing need for a road network in the settlement, or if the government had provided them with the appropriate infrastructure once having settled them. One outside expert interviewed noted that the relationship between the company and the colonists has been heavily criticized as being unequal, and that the commercial contracts were being questioned by social movements as not having many advantages for the colonists[16]. In PDA Santa Rita and PDS Igarapé da Anta, the colonists were actively looking for other forest management options due to their dissatisfaction with previous company partnerships. Given the little training and knowledge

[16] At the time of research, this criticism prompted the government to put approval of management plans coming from these contracts on hold.

the colonists have of forest management, this will likely only occur with a large external intervention, which will likely bring with it additional issues of control.

In this case study, almost half of those interviewed expressed an interest in managing their own forests and increased decision-making power over day-to-day activities of forest harvesting, if they had the necessary conditions and support:

> "It would be much better if we could do it ourselves, to have more control, make our own decisions, take out what you want when you want."

> "[With these contracts, the company] becomes the owner and gives the orders. This is wrong, the community should be the owner of the process, should be the one giving the orders, not the company. What happens? […] The company ends up doing what they want. The [colonist] association loses autonomy, loses power. […] And we don't want any more of this. We want our autonomy. In reality, community management is the property of the community, no? The power should be with the association and not the logging company."

2.4 Results and discussion: The development of a conceptual framework

The exercise of coding the interview transcripts revealed several aspects of decision-making power and control over resource use that were relevant to community members. These were elements they would like to have, or currently have, authority over. These are presented in Figure 2, as a conceptual framework that provides a breakdown of the elements of forest-related decision-making power of importance to communities. The framework is then applied to the information presented above in the case studies to produce a qualitative assessment of the amount of decision-making power the communities in this study have over their forest resources (Table 2).

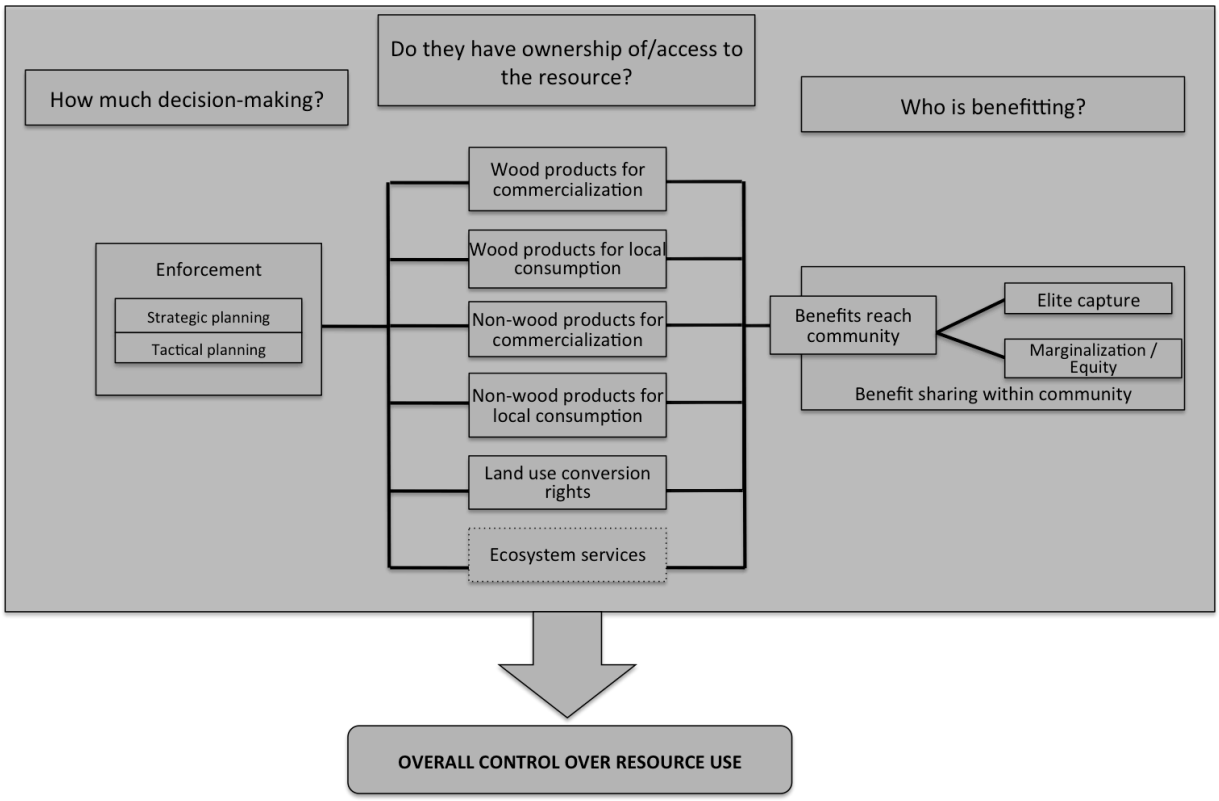

Figure 2 Decision-making power: A conceptual framework
Elements of importance in qualitatively assessing the amount of forest management authority that a community has. Three main questions frame the conceptual framework: Does the community have access to the resource? If they do, how much decision-making power do they have over each type of resource use? And, who is benefiting from the resource use? The dashed line around the "ecosystem services" box indicates that, while this did not emerge as a principal theme from the interviewees at the time of field work, the momentum being gained by such mechanisms as REDD will likely increase its importance to communities.

The framework is described using three framing questions: Does the community have ownership of and/or access to the resource? How much decision-making power do they have over the resource? And, who is benefitting from use of the resource?

Access: Does the community own the land, the resource, and/or the ecosystem services provided by the resource? Whether they do or do not have ownership, do they have access to the following products: wood products that they can commercialize for profit; wood products that they can use for personal consumption; non-wood products that they can commercialize for profit; and non-wood products that they can use for personal consumption. Also, within

their access rights, do they have the right to convert one land use to another? Are these rights exclusive of outsiders? Literature on tenure will often mention alienation rights as well (e.g., Barsimantov*, et al.*, 2011), but alienation rights did not emerge as a theme from the interviews. Only one interviewee in Brazil mentioned that they had heard of the possibility of being paid for carbon and standing trees; while this is not an issue that was identified as being important to the interviewees at the time of the field work, it will likely gain in importance quite rapidly considering the current progression of projects related to reducing emissions from deforestation and forest degradation (REDD) and carbon markets globally, and thus has been added to the framework as an issue of ownership of ecosystem services.

Decision-making: Decision-making power can be divided into strategic planning and tactical planning. Strategic planning here refers to the long-term vision for the landscape. Does the community have a say in what they want the landscape to look like in 50 or 100 years? Are they the ones deciding on the overall forest use or purpose? Are governments or other interventionists deciding for them what the use of the forest will be? If so, were the communities involved in making that decision, and what was the degree of their participation?

Tactical planning includes decisions that are made when implementing the chosen strategic plan. It looks more to operational aspects, and can be further divided into medium-term and short-term decision making. Medium-term tactical planning occurs on the time scale of a harvesting cycle or annual operational decisions. This includes obtaining management plans, deciding on which species to harvest, and the annual or cyclical harvest levels. Short-term tactical planning involves the day-to-day operational decisions: harvesting operations, silviculture methods, and post-harvest treatment and forest maintenance methods; division of labour and of harvest amounts; secondary processing decisions; and sales (deciding on prices, buyers, and quantities).

An additional aspect of decision-making and control is enforcement. Who is doing the enforcement? Is the community self-regulating activities and self-enforcing rules, or is an outside force such as a national or state government body enforcing the laws and sanctions?

Benefit-sharing: Finally, who is benefitting from the resource use? Are the benefits, reaching the community? If so, how are they being distributed within the community? Are there cases of elite capture or marginalization of certain groups, or are benefits distributed equitably amongst all community members.

Table 2 Application of framework to case studies
✓ indicates that the community has authority over that element, × indicates that it does not. ✓× indicates that the community has authority over some aspects but not others, or that they are meant to have a certain right but do not have it in reality. A red symbol indicates that the symbol is more dominant when both symbols are present. [abbreviations: comm. = commercialized; Dom. = domestic; conv. = conversion]

	ACCESS	**DECISION-MAKING**							**BENEFIT-SHARING**		
			Tactical planning							**Within community:**	
	Own/ access to resource	**Strategic planning**	Comm. wood products: medium-term	Comm. wood products: short-term	Dom. use wood products	Comm. NWFPs	Dom. use NWFPs	Land use conv.	**Benefits reach community**	Equal decision-making	Equal benefit sharing
Mazagão	✓×	✓×	✓×	✓	✓	✓×	✓×	✓×	✓	✓	✓
OCT	✓×	✓×	✓×	✓	✓	✓×	✓	✓×	✓	✓	✓×
Maflops	✓×	✓×	×	×	✓×	n/a	✓×	✓×	✓×	✓×	✓
Caobas	✓	✓×	✓×	✓	✓	✓×	✓×	✓×	✓	✓×	✓×
Yaxcabá	✓	✓	✓×	✓	✓	✓×	✓×	✓	✓	✓×	✓×
Naranjal	✓	✓×	✓×	✓	✓	✓×	✓×	✓×	✓	✓×	✓×

Combining the assessments in these three main categories (access, decision-making, and benefit-sharing) gives an overall assessment of the amount of control a community has over its resource use. As Table 2 shows, assessing how much management authority communities have over their forests does not result in a straightforward answer; clear "yes" or "no" results are rare. For many elements the results are multi-faceted. In some cases, the community has power over certain aspects of an element, but not all. In other situations, the community member has a statutory right, but is not able to practice that right, or the community does not have a particular right, but continues with an illegal practice anyways. In many situations, decisions are being made at the community level, but communities in both countries are working within such a tight regulatory framework that many important decisions are being made for them.

In both countries, the government maintains significant control over forest resources through heavy regulation of extraction. In Mexico, the community has control over the strategic planning, but the government strongly inserts itself into medium-term tactical planning by heavily regulating extraction. In Brazil, the government has a strong hand in both the strategic vision (through unconfirmed tenure systems in many cases, and even with private properties by limiting conversion) and heavy regulation of medium-term tactical planning. In general, communities and smallholders have high decision-making power over use of wood products for subsistence purposes, for both medium-term and short-term tactical planning. In both countries, short-term tactical planning is devolved to the community or smallholder level, with the only exception being the case of community-company partnerships where the company assumes these responsibilities. Thus, there seems to be a negative correlation between time-scale and local decision-making; communities have more control over short-term planning activities, and the government inserts itself more into medium-term and long-term planning. However, the results also show that there is variation in forest management authority levels depending on the context – namely, the legal framework of the countries in question, but also the specific community or management model.

An additional factor that should be considered in this overall assessment is the effect of intervention from outside agents on the ability of the community to follow local customs. Interventions that come from outside agents (be they subnational, national, or international, governmental or non-governmental) in the form of money or training for specific management practices, which can alter traditional practices or change local practices as a condition of the funding provided, can ultimately affect the decision-making authority of the community[17]. If the community is pandering to the intervener's choices and decisions, then local control is somewhat compromised. In the same vein, a community's ability to follow traditional customs for managing resources, or ability to interpret national laws at the local level to accommodate traditional practices, is also an important aspect of local control. If there is flexibility in a nation's legal framework to allow for localized modifications, local management authority is enhanced.

Interventions from NGOs and development projects controlled and defined by external agents often have a strong and altering effect on the traditional decision-making and harvesting structure of NWFP (Herrero-Jauregui et al. 2009) and timber management (Medina and Pokorny, 2008). As indicated in the case study descriptions, interventions from agents outside the community that have changed the way that resources are managed inside the community are common to almost all of the case studies (see Chapter 3 for a discussion on community forestry enterprises' difficulties in becoming self-sufficient and independent of interventionists, and Chapter 4 for further discussion of the influence of top-down approaches to community forestry brought by such interventions).

[17] Here, a distinction is made between active and indirect interventions; we focus on the former. An active intervention is an intervention linked to a specific intervening outside actor or funding source that comes into the community advocating for and causing a change in behaviour, while an indirect intervention is a change in behaviour that comes about as a reaction to an outside change in legislation or market fluctuations, for example.

Edmunds *et al*. (2003) point to the right or ability to implement policy at the local level, including enforcement, as an important aspect of decentralized management. This varies in the case studies, but generally in both countries, the final word on enforcement resides with a federal government agency. In many situations, when the government agency does not or is not able to enforce the law, the community takes it upon themselves to regulate and enforce rules. In the Mexican cases, enforcement of laws governing forest use, exclusive of commercial timber, is weak. In some cases, this has resulted in *comisariados* regulating extractive and land clearing activities through informal systems of permissions, and setting up committees to monitor hunting and disarm individuals (in Caobas). In Yaxcabá, the lack of enforcement has not pushed the communities to regulate harvest of *chacá* internally, leading to unsustainable harvesting of *chacá* driven by high demand for artisanal artifacts. In these cases, the lack of enforcement by higher levels of government has led to *de facto* decentralization of management decisions, with varying consequences for the forest. Thus, if the government is writing laws that they cannot enforce (as is the case in much of Mexico), where does the power lie? Is the lack of enforcement leading to *de facto* decentralization of decision-making power? This is not the case in Mazagão (Brazil), where high levels of enforcement have resulted in less local decision-making power. The development of a legal community forestry project in this area will further reduce the decision-making power of the community, as management decisions will be made by outside technicians, and the new structure will supersede existing governance at the household level. This was a common finding in India, where *de facto* decision-making of local governments was supplanted with the new government attention brought on by joint forest management initiatives (Edmunds*, et al.*, 2003).

Community forestry, as a strategy for democratic decentralization, is meant to empower forest-dependent communities. An important aspect of empowerment is the ability to make decisions at the local level. These results show that, in some cases communities, have not been empowered by legislation to make certain decisions – they are making them despite existing legislation. For example, in Yaxcabá, local users have high decision-making power

over their forests, since they disregard legal prescriptions. They are able to carry on with technically illegal activities in this case due to weak enforcement, but in Mazagão they are unable to do so due to stronger law enforcement.

There were several discrepancies between the rights that communities are meant to have and the rights that they actually have. This was the case for access rights in Mazagão, for planning rights in the OCT RESEX due to delays in the government's processing of permissions, and for ownership and tactical planning rights in the colonist-company partnership. Recognizing the potential for abuse with such partnerships, the government recently passed a decree limiting the possibility of hiring a third party to manage forests in settlements, but without providing for additional training or support for colonists. Thus, without such a service, the colonists are left with rights to exploit the forest, but without the other necessary empowerment tools to exploit the forest legally. Larson *et al.* (2008a), in a study of decentralization in several Latin American countries, came to a similar conclusion – that although communities are being empowered with new legal rights, in practice, they have not yet been able to enjoy these rights.

Another important aspect of local empowerment is the ability to affect change in policies if one is dissatisfied with the current situation. Satisfaction with level of authority or control over resource use in the case studies varied by country; in general, community members in Mexico were more satisfied with their levels of management authority than in the Brazilian case studies. The ability of an individual to affect change in local governance in all case studies is high in theory, because of mechanisms that promote accountability of local officers to the electorate. These include oversight committees in Mexico, frequent community meetings in both countries, frequent elections, and, except for *repobladores* in Mexican *ejidos*, an equal vote in the community assembly. Paths for affecting change in higher-level policy exist in both countries, through the *Sociedades* in Mexico, and through a consultation process for the creation of a national community forestry policy in Brazil, but effectiveness of these pathways was not investigated in this study.

2.5 Conclusion

This study has described the amount of management authority that the case study communities have over their forests. Ultimately, the question for policy makers and academics to consider is, how much decentralization is the right amount? A spectrum of decentralization options can be described, anchored by clear endpoints – completely centralized forest management at one end and completely decentralized management at the other. At either end, communities can either have no control or complete control over their forests. However, taking into account the number of elements identified in this framework, the path between these two extremes is not necessarily a simple, linear progression. Meaningfully comparing the position of different communities along this spectrum can be difficult, since some communities have more power over certain elements, but less over others. Additionally, there is ambiguity over even the amount of control that a community has over any particular element. This indicates that, while the endpoints are clear, the area between the two endpoints in this spectrum can be hazy.

What point along this spectrum is ideal? Is the goal of decentralization really to reach that end point of completely decentralized power? Or should the goal be to find a location in the middle of that hazy spectrum where we can balance the best outcomes for the people and the forest? If so, how do we find the optimal balance between forest quality and social satisfaction with level of access, decision-making and benefit sharing? This study has focused on a qualitative measurement of the amount of authority communities have over their forests, but the next step, to look at the consequences for the forest of different levels of local control, has not yet been undertaken. However, some observations of forest quality during the fieldwork, as well as community perceptions of forest quality, were noted – these varied in each case study community. Even in cases in the same country, where communities have the same levels of power, communities have dealt differently with their natural resources; in two cases (Caobas and Naranjal Poniente), they have taken it upon themselves to regulate

harvesting, while in another case (Yaxcabá) with the exact same rights, they have no rules to regulate harvesting and have overexploited a species that is in high demand.

Several studies have demonstrated that transferring of rights to local bodies has resulted in overexploitation of the resource, while other studies have shown the opposite: forests under community management have lower deforestation rates (Bray*, et al.*, 2008; Chhatre and Agrawal, 2009). In a study of 80 communities in 10 countries, Chhatre and Agrawal (2009) found that greater rule-making autonomy at the local level is positively correlated with high forest carbon levels and livelihood benefits. In many cases, communities have developed elaborate systems of governance in time (Gibson*, et al.*, 2007; Ostrom, 1990). Ultimately, it is not just a matter of transferring rights, but a question of how the rights have been transferred, and whether appropriate incentives and support have been offered that make for successful outcomes (Larson, 2003). Indeed, this is evident from the case studies presented here; the colonists in the government-sponsored settlements would likely continue to farm and deforest if left without the necessary support to manage their timber[18], while in Caobas and Naranjal Poniente, the *ejidos* are sustainably managing their forests, partly because of the amount of support they received to begin their enterprises in the 1980s, and because of the continued support provided to them by the *sociedades* and the federal government. Ribot (2004) argues that central governments should be able to set and enforce minimum standards for resource extraction by local groups to ensure sustainable management without excessively burdensome management plans, but in Brazil, the process of obtaining legal management plans is still considered a large obstacle to forest management (see Chapter 3).

Decentralization and forestry modeled after industrial-scale logging are not necessarily compatible without extensive external intervention for funding and training. If communities are acquiring more authority over forest management, but are still required to follow strict legislation that is based on the industrial model of forestry (Benatti*, et al.*, 2003),

[18] When asked what they would have done if the logging company did not offer a contract, most colonists said they would have continued to clear for agriculture.

communities will require external technical and financial support to do so (Medina and Pokorny, 2008).

NGOs or governments will support communities to manage forests in a certain way for a certain amount of time, yet not necessarily in a way that supports traditional practices or governance structures. Medina *et al.* (2009b) state that "community forestry has been transformed into an issue that only well educated forest engineers can discuss" (p.4), noting that in many cases in Brazil, either the logging company or the development organization is making the decisions. This leads to the question, should communities be "empowered" to comply with existing legislation, by providing them with the right training to follow rules and laws that are set for them, or should legislation and policy be modified to accommodate traditional practices? It has been argued that projects that imposed foreign models of forest management and governance are less likely to succeed since they often disregard the local context and long-standing practices and cultures (Colchester, 2008; Pokorny, 2009; Pokorny, *et al.*, 2010). However, the experience in Mexico shows that, with the right investments, support systems and governance structures, it is possible to effectively adapt the industrial forestry model to the community level. Mexican community forestry has been upheld as a positive example for others to follow, given benefits that communities have enjoyed and maintenance of forest cover, but this study shows that the government is still heavily involved in decision-making. Does this mean that in our rights-based approaches, decision-making right and control over resources can be somewhat compromised if other social and economic rights and benefits are fulfilled? This would lead to the conclusion that the formula for successful community forestry will likely include a good amount of decentralization of authority, but without reaching the extreme of complete decentralization. Deciding the right place along that spectrum will likely be context-specific, and will involve a delicate balancing act of local and central authorities, to ensure that both local and non-local values and demands are met.

3 FRAMING COMMUNITY FORESTRY CHALLENGES WITH A BROADER LENS: CASE STUDIES FROM THE BRAZILIAN AMAZON

3.1 Introduction

Community forestry has been promoted in Latin America and globally by multilateral agencies, NGOs, and governments as a way to promote the conservation and sustainable use of tropical forests, consolidate rights over traditional lands and resources, and reduce rural poverty (Bray*, et al.*, 2008; Molnar*, et al.*, 2008; Molnar*, et al.*, 2004; Pagdee*, et al.*, 2006; Scherr*, et al.*, 2003a; Smith*, et al.*, 2003). Case studies from around the world show that community forest enterprises can be profitable and deliver many additional socio-cultural and ecological benefits to local communities (Bray, 2004; Bray*, et al.*, 2003; Dev*, et al.*, 2003; Molnar*, et al.*, 2007). Other cases point to shortcomings of current community forest models that have resulted in inequities among community members (Kanel and Kandel, 2004), the marginalization of some communities and traditional cultures (Oyono, 2005; Pokorny, 2009; Timsina, 2002), and failure to achieve the intended development outcomes (Pulhin, 1996).

Studies in developing countries have explored the different conditions that have both enabled and prevented successful outcomes in community forestry projects. Authors have identified such challenges as limited access to markets (Scherr*, et al.*, 2003a; Scherr*, et al.*, 2003b), insecure tenure and unrecognized traditional rights (Colchester, 2008; FAO, 2007; Pagdee*, et al.*, 2006), adverse policy and regulatory environments (Molnar*, et al.*, 2007), low productivity of community forest enterprises and their financial viability (Humphries*, et al.*, 2009; Medina and Pokorny, 2008), inadequate organizational capacity (Porro*, et al.*, 2008), and limited access to technical know-how (Louman*, et al.*, 2008; Molnar*, et al.*, 2007).

Community forestry in Brazil developed in response to efforts by NGOs to promote more sustainable forest practices (Amaral and Amaral Neto, 2000). Since the early 1990s, community-based timber management projects have been initiated in national forests, extractive reserves, and agricultural colonization areas, after community-based management was identified as one of the principal means to reduce deforestation (Miyasaka Porro and Stone, 2005). After the turn of the century, community forestry proliferated in the Brazilian Amazon; by 2005, over 300 plans for community forestry had been approved or were being elaborated, with over 3,000 families involved in managing 338,000 hectares, up from 12 initiatives in the late 1990s (Amaral and Amaral Neto, 2005). These initiatives represent a variety of different experiences, with diverse organizational structures, business models, target social groups, and differing access to forest resources and end products (Amaral and Amaral Neto, 2000). Many of the projects involved high financial investments from supporting external organizations, mostly for training community members so they can comply with legal requirements for forest management (Medina and Pokorny, 2008). It is still unclear if and under what conditions these initiatives may succeed, considering the unfavorable conditions for community forestry in the Brazilian Amazon such as unregularized land tenure, weak local social organization, and lack of access to credit, markets and technical assistance (as cited in Amaral and Amaral Neto, 2005).

Much of the empirical case study work to date has focused on the in-depth study of how groups have overcome one or a few of these challenges, but few have mapped out a more complete picture of what obstacles individual communities face, from establishing a forestry initiative to the point of achieving a sustainable and successful enterprise. With a framework that provides an overview of the challenges likely to be faced, and illustrating the interrelatedness of these challenges, practitioners will have a clearer understanding of how to best design and implement community forestry initiatives.

In this work, a grounded theory approach was used (Glaser, 1998; Glaser and Strauss, 1967) to explore the challenges faced by three different community forestry models in the eastern

Amazon of Brazil in order to produce such a framework for practitioners. A grounded theory approach allows us to explore these issues without preconceived theories of how community forestry initiatives should work, instead allowing the data to speak for itself to produce a framework that can be used to describe the challenges communities face in managing their forests. A case study approach has been used for an in-depth examination of three different community forestry models: traditional smallholder farmers managing timber on their fields, fallows, and forests, which is then processed in local small-scale sawmills; community groups managing forest resources to produce wood for small-scale furniture-making workshops; and colonists in government-sponsored settlements partnering with a company that extracts and sells their timber.

3.2 Methods

3.2.1 Case study selection

A multiple case study approach allows for comparison of emerging themes among the three studied models, while providing insight into each community's unique situation (Verschuren, 2003). Sampling of the case study communities was non-random and purposive (Lincoln and Guba, 1985). Three case studies of community forest management were selected with the help of local collaborators based on pre-existing relationships with the communities. The cases showcase three different management models in the region, although they were not meant to be an exhaustive representation of all community forestry models in the eastern Amazon.

3.2.2 The case studies

3.2.2.1 Family forestry: traditional smallholder land management systems in várzea

Foz de Mazagão Velho is located approximately 33 km southwest of Macapá, Amapá state, in the flooded forests – *várzea* – of the municipality of Mazagão, in the estuarine floodplain in eastern Amazonia. The smallholders of Mazagão live on lots that vary in size from 10ha to 100ha. While all *várzea* land belongs to the federal government, the majority of households

have a government-issued permit for the use of resources on their land. Their main income-generating activities include small-scale, commercial management of planted stands of *açai* palms (*Euterpe oleracea*), harvesting of shrimp, and occasional timber extraction. Families manage trees in their fields, fallows, home gardens, and forests for timber and non-timber forest products (NTFPs). Harvesting of *açai* is considered by smallholders to be one of the more profitable and reliable economic activities available, due to ease of harvesting and processing, high market demand, and the lack of legal requirements for its sale. Firewood is still used for cooking, although most residents have gas stoves. Timber extraction is only seen as an occasional activity, as most of the valuable species were removed by the timber industry in the recent past (Barros and Uhl, 1995; Pinedo-Vasquez*, et al.*, 2001a). Farmers plant and protect cedar (*Cedrela odorata*) and other valuable species in their fallows to encourage natural regeneration, and avoid felling commercial species on their plots when clearing land for agriculture, with the expectation that, one day, the trees will be harvested as needed (this management system is described in further detail in Sears*, et al.*, 2007b).

This safety net approach contrasts that of the handful of owners of family-run, small-scale sawmills in the area, whose main economic activity is still timber extraction and processing for sale in local and regional markets. The sawmill owners originally obtained much of their equipment and training from the now defunct large-scale forest industry in the region (Sears*, et al.*, 2007b) and have since incrementally acquired additional equipment. These sawmill owners regularly extract timber from their own lots (depending on the size of their land), while also buying and extracting individual standing trees from other families' lots. Timber extraction is labour-intensive; besides using a chainsaw for felling and sectioning the log, all work is done manually with no heavy machinery, including hauling the logs through the mud to the nearest waterway. Logs are lashed together to form rafts and towed to the sawmill.

Logging is a family-based activity, and decision-making regarding extraction occurs within the household context. As timber extraction is labour-intensive, it is common for family members to pay a day's wage to other community members for their help with logging, or to

have the sawmill owners participate in the extraction as well. While many households are members of cooperatives and/or community associations, these are mostly concerned with *açai* harvesting and marketing. At the time of the field research, the onset of implementation of a project funded by the Japanese International Cooperation Agency, JICA (mostly involving *açai*, but eventually involving timber as well), had encouraged some community members to strengthen the community association, as one of the required first steps in developing a "community forestry" project.

3.2.2.2 Caboclas Workshops: Community-based forest management and artisanal workshop

The *Oficinas Caboclas de Tapajós* (OCT) began in 1998 as a collaborative initiative involving two communities of the Tapajós-Arapiuns Extractive Reserve on the Lower Tapajós River, IPAM –Amazon Institute of Environmental Research, and the Woods Hole Research Center (USA) to develop a community forestry project based on the production of simple hand-made furniture using wood from sustainably managed community forest reserves. The project was subsequently expanded to include groups in six communities, three from the Extractive Reserve (Nova Vista, Nuquini, and Surucuá) and three from the Tapajós National Forest (Pini, Itapaiuna, and Prainha) on the eastern side of the Tapajós River (McGrath*, et al.*, 2004). All six communities are between six and 15 hours by boat upstream from the town of Santarém. Initially, the artisans used fallen trees of various hardwood species found in the forest and abandoned fields to make simply designed furniture. Subsequently, groups of artisans in each community developed forest management plans for 100ha-200ha community forest reserves under the guidance of a forest ecologist and a project forester. Thus far, forest management plans have been completed and submitted to IBAMA (Federal Institute for Environment and Renewable Natural Resources) by five of the six communities. However, only the three plans for the Tapajós National Forest communities have been approved; those of the Extractive Reserve must first wait for the completion of the Reserve-wide management plan. While the amount of timber actually consumed by the Workshop is small compared to the available standing resources, the communities wanted to obtain an approved management plan as a way to further legitimize their activities.

The community grants exclusive timber use rights from the community forest reserve to the Workshop, and in exchange, each workshop is expected to invest five percent of the Workshop's sales in a community fund, which is used for communal projects such as maintaining the community generator or building a new church. In 2006, the six community workshops created a cooperative to provide logistical support, market production, and administer finances. A further five percent of sales is invested in the maintenance of the cooperative and the rental of retail space in Santarém. The remaining earnings from sales are divided among the artisans, based on the number of hours each has worked in the previous period. The principal economic activity in these communities remains shifting agriculture, with manioc (*Manihot esculenta*) as the main crop. All artisans involved in the project continue to cultivate crops, fish, and hunt and they regard their involvement in OCT as a supplemental activity.

3.2.2.3 Colonist-company forestry partnerships in government-sponsored settlements

Between 1994 and 2002, over 300,000 families were settled in the Brazilian Amazon from other parts of the country (Barreto*, et al.*, 2006). Each family was given 100 hectares, of which they are entitled to clear 20% for agriculture, and to legally manage the remaining 80% of forested area with an approved management plan, according to Brazilian law. INCRA (National Institute for Colonization and Agrarian reform) gives a colonist temporary title over the land, called a *Protocolo*, which indicates that land titling is underway (Merry*, et al.*, 2006). Colonists form a community association and, encouraged by INCRA, sign a contract with a company that manages their forested land and harvests their timber. These logging companies build roads for the community and to access the timber, obtain the necessary legal documentation for forest management, and pay the colonist per cubic meter or per tree. Colonist forests are a major source of timber for the industry, accounting for as much as thirty percent of total round wood production in the Brazilian Amazon (Lima*, et al.*, 2003; Nepstad*, et al.*, 2004). However, in most areas this relationship has led to degradation of colonist forests, while providing colonists with below market prices for their timber and access roads

that serve only to extract timber. INCRA's efforts to encourage this system have been criticized as a way for loggers to legitimize access to colonist timber, and for the government to pass on its responsibilities to the private sector for providing basic services to newly established colonist communities (Greenpeace, 2008). Others contend that, when well regulated, this form of partnership in colonized areas can provide a supply of legal timber from the Amazonian frontier that benefits both commercial loggers and colonists. Given the importance of this system in the Brazilian Amazon, proponents argue that it makes sense to invest first in improving this system rather than to seek to substitute it with an entirely new policy based on concession logging in national forests (Lima*, et al.*, 2006; Nepstad*, et al.*, 2004).

The partnerships undertaken by the company MAFLOPS (Forest Management and Lender of Services) are an example of this management model[19]. In 2008, MAFLOPS had been working with settlers from 13 associations, representing 17 communities in settlements Moju 1 and 2, and Fordlândia in the western portion of Pará. MAFLOPS builds roads within the settlement, demarcates colonist lots, helps households obtain a temporary land tenure permit, and obtains legal permission for harvesting according to an approved management plan based on reduced impact logging (RIL). Management plans include up to 73 different species at a harvesting intensity of $14m^3$/ha. The company pays each household for the timber removed from its land in one lump sum. Among the community members interviewed, this amount varied between R$3,000 and R$23,000[20], depending on the amount of timber removed from their land. Most of the timber is sold to two sawmills in the area. MAFLOPS stands out amongst other companies using this model by providing, in some communities, incentives to the settlers to preserve their forest until the next cutting cycle through cultivation of perennial crops to limit deforestation from slash-and-burn agriculture. The company also encourages the communities to start other projects involving NTFP and wood residue harvesting.

[19] Government and NGO interviewees indicated that the MAFLOPS partnerships were better than most company partnerships, in terms of having more just contracts, positive outcomes for the colonists and better forest management than other companies.
[20] equivalent to US$1,595 and US$12,232 at an exchange rate of R$1 = US$0.53; 9 June 2010, www.oanda.com.

3.2.3 Fieldwork

Fieldwork was conducted between June and October 2008. Residents of Foz de Mazagão Velho were interviewed for the family forestry case study. For the Caboclas Workshops, interviews were conducted in Nova Vista and Nuquini. A Caboclas Workshop participant from Surucuá was also interviewed in Santarém. For the colonist-company forestry partnerships, interviews were conducted in two communities within the Moju settlement: PDA Igarapé da Anta (which had already completed its contract with MAFLOPS), and PDA Santo Antonio (which had an ongoing contract). Also interviewed were leaders of two other communities (PDS Igarapé da Anta and PDA Santa Rita), who were looking for alternatives to partnering with a company for forest management after having had negative experiences with other companies.

Semi-structured interviews were conducted with community leaders and other community members during the field visits. Key informants were identified with the help of local collaborators, and a networking approach (Knight, 2002) was used to identify other interviewees in the community who were currently taking part, or have taken part, in forest management. While a gender balance in interviewees was initially sought, the mostly patriarchal nature of forest management in the case studies resulted in an overrepresentation of male interviewees; of the 61 community members interviewed, 16 were women. Semi-structured interviews with community members were designed to elicit information on their forest management practices, their perspectives on challenges they faced in forest management, and benefits that arise from forest management. In addition to interviews, guided walks through the community forest and farm properties were taken, where individual farmers described their management practices in more detail. Academic experts, as well as government, industry, and NGO representatives, were also interviewed in Belém, Macapá and Santarém, in order to provide further clarity on the topics at hand.

A total of 74 interviews were conducted, each lasting between 20 minutes and 2 hours. Local histories of the communities and surrounding regions were determined through oral history interviews of community leaders and elders; this data was triangulated with the non-community expert interviews, as well as from the grey and peer-reviewed literature on the region.

3.2.4 Data analysis

Data were analyzed using a grounded theory approach. With grounded theory, data are collected and analyzed iteratively, and constant comparisons of new and existing data are used to refine emerging categories (Glaser, 1998; Glaser and Strauss, 1967). NVivo 8, a qualitative data analysis software, was used to maintain and code transcribed interviews. Interview transcripts were coded with the intent of uncovering problems and challenges that communities have had in managing their forests. Here, challenges that were identified or inferred by the community members themselves in interviews were emphasized. Once a final list of challenges was produced, the interviews were reviewed again to detect linkages and relationships between challenges, as identified by the interviewees. For example, several interviewees identified inadequate financial resources and bureaucracy involved in obtaining legal management permits as two separate challenges, but then they also identified a link between the two challenges (financial resources are needed to hire a certified forester to produce a management plan needed to file for a logging permit). The causal relationship between the two challenges and the direction of the causation were additionally noted. Relationships between challenges, where overcoming one challenge would positively or negatively affect the ability to overcome another challenge, were categorized on this basis. With the assistance of NVivo 8, a schematic network was created showing the challenges as nodes, and the relationships between the challenges as links (Miles and Huberman, 1994). This network was used as the model for the analytical framework of the study.

3.3 Results

The common themes that emerged from interviews in the three case studies are outlined in Table 3 as challenges to forest management. These challenges, as well as the linkages among them, were identified by interviewees from the communities, and verified by non-community member interviewees. Figure 3 shows schematically the linkages that have emerged from these interviews. In this section, the schematic model is described, and then applied as a framework to assess the challenges faced by communities in each case study.

The model described in Figure 3 can be divided into two main phases: the development phase, where several enabling conditions (tenure, organizational capacity, technical knowledge, and capital) are required at a minimum to be able to obtain an approved legal management plan and begin legal management – the end goal of phase 1; and the implementation phase, where, with the legal papers in hand, a number of challenges (illegal loggers, markets, infrastructure, and managerial skills) affect how well the enterprise performs, which ultimately affects the level of economic return. All challenges need to be addressed before reaching the ultimate goal of a self-sufficient enterprise.

The challenges in phase 1 are the root problems limiting community forest management. Land ownership, or securing land tenure, is needed to: get a management plan approved; increase access to credit and thus start-up capital (although having land tenure alone will not guarantee a line of credit[21]); and thwart clandestine or illegal loggers that take advantage of unclear tenure arrangements to invade lands. Community organization is often needed to attract financial investment from outside sources, and often simplifies the process of obtaining legal logging permits. Capital is needed for: paying a professional forester to create a management plan in order to operate legally; and investing in the infrastructure needed for a forestry initiative to function. Financing is also needed for capacity building within the community; while many traditional communities have traditional and localized knowledge of forest

[21] Obtaining bank loans for forestry activities is in itself a difficult task; industrial loggers, as well as community loggers, described this as a problem.

management, communities often need assistance in acquiring knowledge related to legal forest management specifications and secondary processing, accessing markets, and other aspects of organizing and running a forest enterprise. Communities that have knowledge of the true market value of timber will be less likely to sell their timber cheaply to clandestine loggers. With clear land ownership, start-up capital, organizational capacity, and knowledge, communities are empowered to begin legal forest management. The end point of phase 1, doing legal forest management, is a large obstacle for many communities (see Table 3). Without adequate finances, communities cannot afford to hire a professional forester to create a management plan. Furthermore, the long and bureaucratic process involved in obtaining the correct documents is a deterrent to many community members unfamiliar with the system. However, without these legal documents, communities are harassed by local enforcement officers, putting their enterprises at risk. With the legal papers in hand, communities need to then tackle obstacles that will affect the success of the enterprise.

Phase 2 details the challenges related to business issues and performance factors to consider after the community has been empowered to begin legal operations. Having a legal management plan discourages clandestine loggers, as it more firmly establishes that the area is well controlled, and it reduces the temptation of the landowner to sell his or her timber illegally to the clandestine loggers. By complying with legal requirements, community-produced timber is more likely to reach markets beyond the local regions, increasing market access. Legal timber also accesses purchasers willing to pay higher prices for the assurance of legality, enhancing profitability of legal enterprises. Having adequate start-up capital (a root problem) as mentioned earlier is necessary to build needed infrastructure, and well-maintained infrastructure can increase profitability by increasing the efficiency of operations. Lastly, effective management of the enterprise, including having good business management skills and marketing knowledge, working well together, and having fair decision-making and benefit-sharing mechanisms in place, plays a significant role in the smooth running of the enterprise, contributing to profitability and sustainability.

Challenge	Description of Challenge
Land ownership	Most traditional communities not living in reserves or formal settlements lack clear title to their forests and lands, so their rights to the land may be vague and in dispute. Some formal recognition of land or use rights is a requirement for legal forest management.
Organizational Capacity	Organizational capacity refers to the community's capacity to organize a forest management initiative. This usually entails the need for strong leadership to initiate the process.
Financial Capital	Communities require start-up capital to invest in the necessary infrastructure, equipment, and to hire a forester to undertake forest inventories and prepare and oversee implementation of management plans. This is usually provided in the form of a project grant.
Technical Knowledge	While community members have a deep understanding of forest ecology, they do not have the technical knowledge or legal certification required to manage forest resources as prescribed by law. Nor are community members likely to have the understanding of government bureaucracy needed to navigate the legal hurdles to approve a forest management plan.
Legal Management	All legal logging needs to be based on a legal management plan prepared and signed by an accredited forester and approved by the relevant government authority (state environment agencies for the most part, or IBAMA in federal territories). Approval of the management plan is a long, bureaucratic process.
Clandestine loggers	Clandestine or illegal loggers can enter a community's territory and illegally log high-value species, with or without the community's consent, and without a legal management plan. Harvesting often drastically degrades the forest as few safeguards are employed by the illegal loggers. Communities are either robbed of their valuable timber, or are paid below market prices.
Market access	Smallholder communities generally have limited access to markets due to their physical isolation, precarious transport and communication, limited contact with buyers and lack of market and marketing knowledge. They may also have difficulty competing with industrial-scale operations that flood the market with cheaper products.
Infrastructure	Forest management, for timber and non-timber harvesting, requires a certain amount of physical infrastructure, such as roads, equipment, and/or a reliable power supply. In some cases, infrastructure needs include secondary processing equipment.
Managerial skills	Skills related to effective management of the enterprise, business acumen and entrepreneurial capacity, day-to-day decision making, marketing skills, ability to resolve internal conflicts, and ensuring equitable benefit sharing are oftentimes lacking in rural communities.
Economic Returns	The result of deficiencies in operational factors is low and frequently insufficient economic returns to keep the initiative afloat, and to keep participants interested in the activity.

Table 3 Challenges faced by communities managing their forests

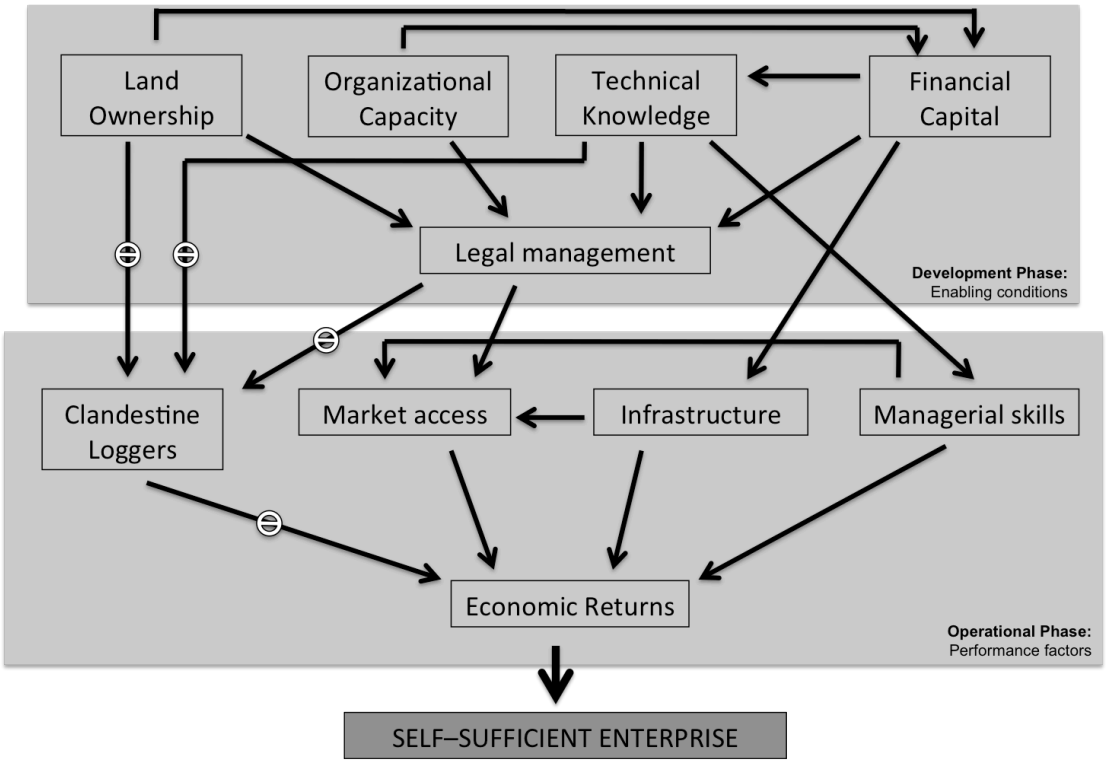

Figure 3 Framework model of challenges faced by communities managing their forests in the Brazilian Amazon

Arrows indicate that overcoming one challenge will enhance the ability to overcome another challenge. Arrows with the ⊖ symbol indicate a negative effect.

Communities will likely have to overcome all of the challenges in the model to reach the end point of having a financially profitable enterprise. Increased economic returns can not only increase household income, but can also be reinvested to overcome the challenge of getting further management plans approved and maintaining or enhancing existing infrastructure. Profitability will then lead to the ultimate goal of a self-sufficient enterprise.

3.3.1 Application of the framework

This section discusses how the model can be used to describe the challenges faced by each of the case studies, highlighting the stage that each case study is at in overcoming challenges (Figure 4).

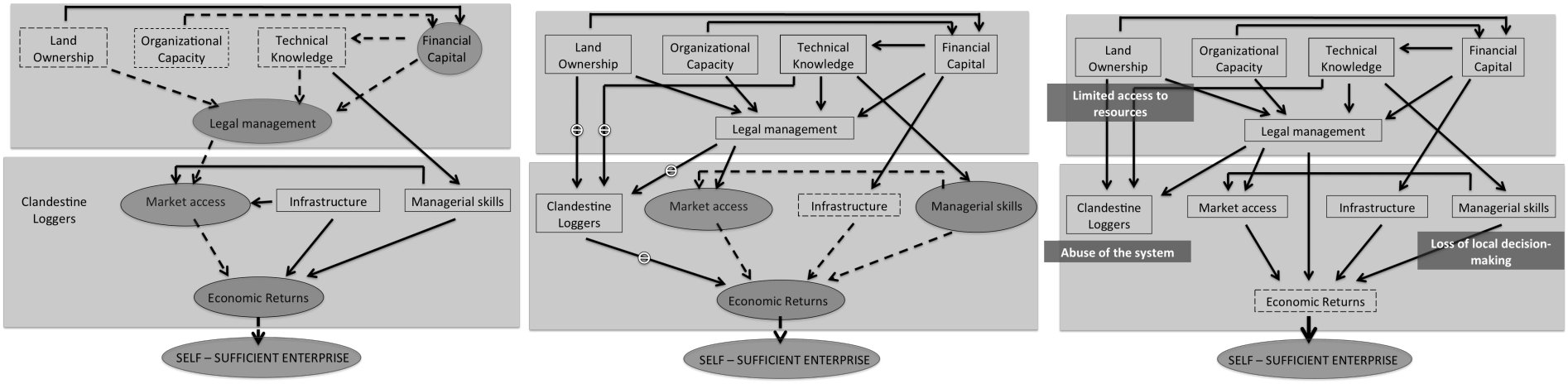

Figure 4 Application of the framework to the three case studies
(a) smallholder family forestry in Mazagão; (b) collective forests and artisanal workshop (*Caboclas* Workshop); and (c) colonist-company partnerships. Solid boxes indicate that the community has overcome this challenge. Dashed boxes indicate that they have partially overcome the challenge. Solid arrows indicate that the ability to over come one challenge has allowed them to overcome the other challenge. Dashed arrows indicate that the inability to overcome one challenge has prevented them from overcoming the other. Highlighted circles indicate factors that continue to present a challenge to the community. In (c), the highlighted boxes "limited access to resources," "abuse of the system," and "loss of local decision-making" are additional problems that emerge from this particular business model (see text).

3.3.1.1 Smallholder family forestry

Most residents in Foz do Mazagão Velho do not officially own their land, as all várzea lands are considered federal territory, with the exception of a handful of households that have definitive title. Ownership is informally defined amongst community members. The state government, through the JICA-funded project, is helping the residents obtain resource use permission documents[22], which give them legal permission to use the resources on their land, but are non-transferable and non-definitive. The documents are based on simplified land surveys based on a GPS point recorded within a resident's house and giving the resident use authorization of land for a 500m radius around that GPS point. Some interviewed residents complained that the surveying was inaccurately dividing lands. At the time of research, INCRA was planning to create an official settlement in Mazagão, after which the residents will either be given collective or individual ownership of the land. Once tenure is made official, the state government is planning on beginning a "community forestry" project in the area, but without clarifying land ownership, the project cannot be initiated. Ongoing smallholder family forestry activities, which are not associated with the government project, are discussed here.

The principal challenge to smallholder forest management voiced by residents of Mazagão was legality and its enforcement. Households and sawmill owners sell their timber without creating official management plans, so their activities are considered illegal, and they are pursued by environment enforcement officials.

> "Wood is a dangerous thing. I stopped doing it and sold my sawmill because IBAMA was pursuing me,"

commented one resident. The most often cited reasons for not getting legal permission was the complexity and high cost of the process, especially the need to deal with bureaucracy to obtain permits including many trips to the state capital. Residents noted that they needed legal authorization for so many forest-related activities, so that

[22] At the time of research, 75 of 117 households had such documents.

> "nobody has authorization, nobody can follow these laws, or they wouldn't be able to live here… it's impossible to do things legally at the small scale."

According to one resident, the process is further complicated because

> "every year, the government and laws change, closing doors… [the state government officials] don't speak the *caboclo* language… the government lacks the knowledge of the extractavist lifestyle necessary for survival in the forest."

A government representative commented,

> "[there are] many, many laws that you have to follow. Legislation is complex. Who understands these? The technicians."

Recognizing the subsistence needs of the residents, local environmental enforcement officials have agreed to a provisional authorization on the amount of wood that sawmill owners can sell outside of the local area. This informal limit was set at 70 dozen boards per month for non-local markets, which most residents complained was barely enough to keep the sawmills running. Prior to the enforcement of this limit, one sawmill owner said that he sold at least 200 dozen boards per month to these markets. In the mid-1990s, most lumber processed by the family-run sawmills in the area was sold in regional markets in the Amazonian cities of Belém and Santarém, and some was even sold internationally to French Guiana (Pinedo-Vasquez*, et al.*, 2001a). The "illegal" wood goes to local markets at a lower price than it would in regional markets. Thus, with the restrictions, they are required to sell less, for less, and to fewer markets. Sawmill owners complained that the enforced limit does not bring in enough money to cover the enterprise's expenses, and is often not worth the hard work involved in extraction and the harassment by local authorities. At the time of the field visit, a couple of sawmill owners had sold or were considering selling their sawmills to others for these reasons. Most residents now focus on agricultural activities, and harvesting *açai* and shrimp.

Applying the framework to this case study, the residents of Mazagão are currently stuck at the legal management issue. Land ownership and capital play a role in not being able to obtain legal permits, as both are needed to complete the process and both are lacking in this situation. However, the innate complexity of the process of legalization and the laws themselves, which the residents do not feel adequately take into account the caboclo lifestyle, are what most residents pointed to as the principal challenge. The fact that their timber was not entirely legal resulted in limiting their market access and receiving lower returns, making timber extraction an unattractive activity for many.

With the resources use permission documents, residents will have fulfilled one requirement of obtaining a legal management plan, and will have better access to credit, which could potentially help them hire a technician to elaborate plans. But the complexity of the process will likely continue to discourage smallholders from seeking out management plans. The JICA-funded, government-run proposed community forestry project aims to address this by funding the process of elaborating management plans for four hectares for each household. They expect that with the profits from timber from the first four hectares, households will be able to hire a technician for the next four hectares the following year. This new system of forest management could have many implications. This type of "legal" management would have outside technicians making management decisions based on legal requirements and technical considerations that have little resemblance to current and long-standing management practiced by some of the residents of Mazagão (as described in Pinedo-Vasquez*, et al.*, 2001b; Sears and Pinedo-Vasquez, 2004). Furthermore, a potential drawback to the community forestry project is the imposition of a new organizational structure on Mazagão residents; currently, decision-making about forest resource management occurs at the household level, and one of the requirements of the new project is a strengthening of the decision-making power of the community association, which was revived as a prerequisite to funding the project. This may prove problematic, as it will change the decision-making structure within the community with regards to smallholder-owned forests. Several residents interviewed had also expressed that the association did not represent them or their views, and did not want to

participate in its structure. This restructuring of the organization of resource use counters lessons learned from several case studies across Latin America, which point to the importance of recognizing and retaining existing community organizational structures and rules in external interventions (Pokorny, 2009; Pokorny*, et al.*, 2008).

3.3.1.2 Collective forests and artisanal workshop

Communities participating in the Caboclas Workshops have already overcome many of the challenges presented in Figure 3. As members of federal reserves, the Tapajós-Arapiuns Extractive Reserve and the Tapajós National Forest, community members have legal use rights to community forests, which has also helped to keep clandestine loggers away. ProManejo (Project of Support to Community Forest Management in the Amazon) and Funbio (Brazilian Fund for Biodiversity) provided the funding to initiate the project through IPAM and the Woods Hole Research Centre. Approximately R$1 million (over US$560,000) was invested in the six participating communities for infrastructure, strengthening community organization, commercializing the product, tree growth studies, and training and courses on environmental issues, forest management, and furniture making with simple tools (Medina and Pokorny, 2008). This substantial investment helped the communities involved overcome the "financial capital" and "technical knowledge" challenges. In fact, each community as a whole had the opportunity to participate in seminars and courses on the environment and natural resources management at the outset of the project, which have helped them in controlling forest fires and protecting watersheds. The communities involved were already well organized to work on communal projects, as it had already been customary for community members to devote time to community projects, such as fixing roads and bridges and building schools and churches[23]. By initially only using fallen timber and dead trees, most of the legality issues were skirted, since no management plan was required. The funding was also used to pay for certified foresters to produce management plans for felling standing trees; communities in the RESEX are awaiting approval of the RESEX-wide management plan

[23] This is largely a result of help from the Catholic Church and the Rural Workers' Union of Santarém, which have played roles in training community leaders and developing local organizational capacity (McGrath *et al.* 2004).

before the community plans can be approved. Residents noted that, with this management plan, their forests would be more clearly delineated and documented, which would more likely keep others out and provide their operation with even further legitimacy. Thus with the external help, OCT communities were able to successfully complete the development phase.

Transition to the operational phase started well with a series of contracts with a major national furniture retailer. After the contract expired, demand for the furniture decreased, with the main retail spaces being only the cooperative's store in Santarém and a seller in Alter do Chão, a nearby tourist destination. Adding to this, funding for the initiative ended and IPAM was unable for several years to obtain new funding for their partnership with OCT. While some accompaniment was maintained, planned investments in organizational capacity building and marketing could not be continued. As a result, the OCT cooperative was left largely on is own before members had assimilated the necessary understanding of their roles and acquired the management and marketing skills they needed for successful operation.

Administrative problems were exacerbated by the limited and largely ineffective efforts in marketing. Declining sales and financial mismanagement led to low returns and delays in paying members for their production, discouraging workers who either produced less or left the organization:

> "the most negative aspect of the Workshop is the slow return of money. We work hard, and then we wait a long time to see the money."

At the outset, the Caboclas Workshops began with up to thirty participants in each community. At the time of research, two groups in Nuquini had five and nine active artisans respectively, and Nova Vista and Surucuá had eight each. Those who remained however continue to find the Workshop a good source of part-time employment, and a pleasant alternative to working under the heat of the sun for several days of the month.

Motivation among the various Workshop groups also varies, resulting in some communities, particularly those in the FLONA, producing more pieces and thus benefiting more than

others. In Nova Vista, a couple of interviewees also pointed to the lack of motorized transportation as limiting profits, since they were restricted to either carrying timber from the forest to the workshop on their shoulders or by bicycle. Commercialization of their product also suffers because contact with external markets is difficult, considering that they have only one pay phone for the entire village.

In terms of managerial skills, internal conflicts, benefit-sharing mechanisms, and leadership problems within the cooperative were also mentioned by a few Workshop artisans in Nova Vista as obstacles. At the time of the visit to Nova Vista, work in the Workshop had mostly stopped, due to disputes between the workers and the leader of the cooperative. In the recent past, the president of Nova Vista had threatened to shut down the Workshop because the community was not receiving its fiver percent cut.

This phase reached a low point in early 2009, when new funding was obtained to invest in developing the cooperative's organizational capacity, marketing efforts, and in improving productivity and quality. At the time of writing, the cooperative is entering a new phase that seems to be putting the enterprise back on track. The leadership is being renewed with more dynamic business oriented leaders preparing to take over coop administration, the hiring of a commercial agent who is leading a much more effective marketing effort, new opportunities for exporting products to the US market, and increased investment in developing organizational capacity. If this effort is successful the OCT could become economically and administratively self-sufficient, although some outside assistance will probably be necessary for some time. When asked whether the Workshop was ready to function autonomously, interviewees noted that, while they had been running mostly on their own, they still needed help in marketing and establishing financial security.

3.3.1.3 Colonist-company partnerships

The colonists in government sponsored settlements face all of the challenges displayed in the model. Although the government has sanctioned their settlement, there is usually a long delay

in issuing tenure documents, thus complicating the possibility of getting a forest management plan if they wanted to, or a loan to initiate a project. Without the proper financing, they have little start-up capital to invest in equipment and infrastructure (the government is responsible for constructing a road network in the settlement but construction is often delayed by years). Furthermore, many colonists come to the Amazon as farmers from other regions in Brazil, particularly the drier northeast, and are unaccustomed to the forests that they are settled in. They also often have limited knowledge of or experience with forest management, let alone management of the local forests. Many settlers interviewed stated that clandestine loggers are a large problem in the area: either they log clandestinely without the settlers' permission, or they pay the settler a low price for a few logs and then damage much of their forest property with poor logging and skidding techniques.

Partnering with a forest management company helps the colonist to overcome most of the barriers that communities face in managing their forests for timber. In the case of MAFLOPS, the company helps the colonists obtain tenure documents (INCRA for a time had an understanding with MAFLOPS and had been expediting issuance of these documents), and builds a network of roads for the settlement, which the colonists can use for basic movement and the company can use to transport timber. The company has the knowledge and equipment needed to do the management, takes care of all the legality issues including getting a management plan approved, and builds the necessary infrastructure. The structure of the day-to-day functioning of the enterprise is determined mostly by the company itself, but colonists are involved at the outset in having to self-organize in an association to initiate the contract (although individual colonists do have the option to opt out of the contract), which often involves strong leadership to initiate. A benefit-sharing mechanism is also set by the company through contracts.

The company also takes care of the sale of timber to industrial-scale sawmills. Access to these mills is simplified by the fact that the company is able to extract timber from many settlements and, thus, provide the necessary volume for industrial-scale mills. In essence, by

giving the task to a company, the colonist has little need to be involved beyond receiving payment for logs on their property. However, the colonists are paid a lowered price for their timber, since the company needs to factor in the costs of building and maintaining the road network for the settlement.

"We exchanged our timber for roads,"

"we sold our wood at the price of bananas,"

several of them commented, noting that they had little choice since they did not have any roads and could not wait for the government to construct them. The lack of any secondary processing of the logs within the community also results in lowered profitability for the colonists. In PDS Igarapé da Anta, the association was looking for ways to manage the forest themselves, to keep more of the profits within the community.

An additional aspect of this forest management model that is not expressed in the framework is the high potential for abuse with community-company partnerships (Greenpeace, 2008; Mayers and Vermeulen, 2002; Medina and Shanley, 2004), and this was indeed an issue in the government-sponsored settlements. One association leader commented that some companies, MAFLOPS excluded, obtain legal documentation to manage a few parcels of land within a settlement, and then log from other lots illegally while also paying lower prices. Colonists have no former knowledge of legal management or their own rights to be able to ask for a fairer deal. Companies can build poor roads to save money which, when not maintained, will quickly be rendered unusable by tropical rainstorms. In Santa Rita, the association had broken a contract with a company more than once because of repeated abuses of the partnership.

Colonists have also abused these partnerships; many sell the timber off their land and then abandon or sell the land, returning to the city with their profits. Absentee settlers are a very real problem. For example, of the one hundred families settled on paper in Santa Rita, only forty-two actually live there; in PDA Igarapé da Anta, it is less than twenty of the sixty-three families; in PDS Igarapé da Anta, ten of forty. One association leader said,

> "There are two types of people in the settlements: those that go there to work the land and those that want to exploit timber. But both types are settled in the same legitimate way – INCRA gives them a lot, thinking that they will be working the land with their family, but this is not what happens. They have a house in the city, but get "settled" to exploit the timber, and work the land just enough to make it more valuable for reselling."

Lots have been resold multiple times already in many settlements, despite it being against government policy. INCRA is trying to resolve the problem of absentee colonists by inspecting settlements, but past inspections had not solved the problem. During the field visit to PDA Igarapé da Anta, INCRA was also re-demarcating lots, essentially re-doing the work that MAFLOPS had done several years back. Not only was this seen as a waste of resources, some colonists complained that their properties were being redrawn despite having already cultivated parts of it.

3.4 Discussion

3.4.1 Self-sufficiency as the ultimate goal …

Each of the three management models summarized here is at a different stage of overcoming challenges (see Figure 4). In Mazagão, they are trying to overcome the first few hurdles of land ownership and bureaucracy to be able to manage their forests legally. The Caboclas Workshop is struggling with market access, slow financial returns, and some internal conflicts, causing a decline in community motivation for the initiative. In the settlements, colonists would not have been able to overcome any of the challenges without partnering with a company, but even with the partnership they are receiving lowered economic returns than they could be. However, none of the three models have been able to get the community initiatives to the final goal: a self-sufficient enterprise, or independence from an external, intervening agent[24].

[24] It should be emphasized here, however, that forestry was not the principal livelihood activity in any of the communities studied, with agriculture or açai and shrimp harvesting being of foremost importance. Thus it is

Self-sufficiency of a community forestry initiative should be the ultimate goal for development interventions and communities alike, but can also be the greatest challenge (Medina and Pokorny, 2008; Pokorny, 2009; Pokorny and Johnson, 2008; Pokorny*, et al.*, 2010). Currently, the residents of Mazagão are not relying on an external agent for their forest management. However, difficulties in accessing markets and problems with enforcement officials are very real challenges limiting forest management's contribution to the community's economic development and thus overall self-sufficiency. It remains to be seen whether the state government's new plans for community forestry will enhance self-sufficiency in the long run or create dependency on outside project money. The Caboclas Workshops are on the road to self-sufficiency and independence from their supporting NGOs, but this would not have been possible without substantial initial investments from an external agent. Finding their niche market would enhance profitability and increase motivation within the group. With the increased profits, investments can be made to enhance their enterprise, by improving infrastructure and equipment, training more artisans, and paying for the process of acquiring future management plans.

While the community-company arrangement seems like a win-win-win situation (the company has access to timber it would not otherwise have access to, INCRA has passed on the responsibility of improving the settlements to the private sector, and the colonist benefits monetarily from forests on their property without having to overcome the traditional barriers to management), the principal drawback to this model is that it is not oriented towards community self-sufficiency. The community-company partnership, as it stands, perpetuates a system where the colonists will always rely on a company's help to manage their forests. Little to no knowledge of forest management is transferred from the company to the community[25], meaning that colonists are left without the ability to initiate management on

important to note that in discussing self-sufficiency here we are not addressing self-sufficiency of the community in a broader sense, just the independence of the forestry initiative.

[25]To its credit, MAFLOPS does offer colonists some employment opportunities, but in reality, very few colonists in the case study communities participated beyond accompanying the loggers when extracting logs from their land.

their own, despite now having acquired land documents, and some money and infrastructure. Furthermore, the colonists are left without access to their timber until the next cutting cycle, 20 to 30 years after the company has logged their forest. This results in a loss of the safety net that forests provide (CIFOR, 2007) and limits their decision-making power over their own land and resources – an important element of self-sufficiency.

Part of self-sufficiency, and community empowerment, is the ability of communities to make decisions for themselves on issues such as the use of their resources. In the settlements, meaningful local decision-making over forest resources is minimal, beyond the decision to participate or opt out of the contract with the logging company. Yet the desire to have more control over their forests was generally expressed by colonists. More than half of those interviewed stated they would be interested in managing their forests themselves, in order to have more control, be able to extract timber when needed, and get a better price for their logs. However, all lamented that they did not have the necessary "conditions" to pursue management. One person who had opted not to enter the contract with MAFLOPS said that he wanted to do the management by himself, but that he could not obtain the necessary documents because he did not have land title and could not get credit.

Decision-making amongst the residents of Mazagão occurs at the household level for forests, but not having legal title to their land until recently meant that legal rights over these resources were limited. This meant that although decision-making was localized, activities resulting from those decisions were considered illegal for the most part. The new resource use documents have empowered the residents slightly by giving them some legal recognition, but this empowerment is tempered with their continued trials with legal enforcement.

With the Caboclas Workshops, communities have secured their lands and are actively involved in decision-making over their forest resources. The artisans in each Workshop make decisions on their outputs, and their respective communities are kept abreast of developments within the Workshops and collectively make decisions regarding the forest. Community

members also continue to benefit from access to their forests and the use of non-timber forest products in the forest reserve.

3.4.2 … but how to get there?

By pointing to the main obstacles facing communities in the Brazilian Amazon, the framework developed in this study offers many points of entry for interventionists aiming to promote community forestry. Most, if not all, formal community forestry initiatives involve partnerships with one or more outside agents who provide funds and technical assistance in preparing a legal forest management plan, training to strengthen community organizational and technical capacity to implement the plan, and access to funds to acquire equipment and other infrastructure and cover the costs associated with all these activities. However, considering how interrelated the challenges in both phases are, to get to the end point of self-sufficiency, the framework needs to be considered in its entirety, and both the development and operational phases need to be completed.

The framework shows that four root issues (land ownership, knowledge acquisition, community organization, and adequate finances) need to be addressed before being able to address the next big challenge: legal management. These tools of empowerment are needed as the foundation upon which a community can build its enterprise. Because of the technical nature of a scientific management plan, much of the focus of the first phase is often on preparing the management plan and obtaining the documents needed to accompany the plan, on equipment and infrastructural investments, and the technical skills needed to implement the management plan. Often investments in developing organizational capacity to operate a collective business enterprise do not receive adequate attention in this phase. Another critical role commonly played by an external agent is to assist in navigating government bureaucracy to assemble the documentation required for the management plan and in obtaining approval for the plan itself. Without securing these first, there is no sense in working on challenges further down the framework, such as securing market access or investing in infrastructure.

Tenure security is considered one of the precursors to sustainable forest management (FAO, 2007). Property rights in approximately half of the Brazilian Amazon are unclear (Barreto*, et al.*, 2008), with rampant falsification of tenure documents, informal ownership of lands, land invasions, and overlap of land claims causing social conflicts and complicating conservation and development projects in the region (e.g., Amaral and Amaral Neto, 2005; Barreto*, et al.*, 2008; Brito and Barreto, 2009; Carvalheiro*, et al.*, 2008; Greenpeace, 2003; Ros-Tonen*, et al.*, 2008). A recent, controversial Provisional Measure (*Medida Provisória* 258/09), sanctioned by the Brazilian president in June 2009, established rules for regularization of 67.4 million hectares of public land in the Amazon, aiming to clarify tenure by making it easier for smallholders and settlers to claim legal land ownership. While such a measure can be seen as a positive step in ensuring that communities obtain one of the empowerment tools needed for forest management – something that the framework developed here calls for – it has met with a great deal of opposition from environmental groups that point to the potential for abuse without the proper oversight (Frayssinet, 2009; Greenpeace Brasil, 2009; Phillips, 2009).

Knowledge acquisition in the form of technical assistance has been a primary target for interventions. Pilot community forest management projects, such as those funded through the G7 Pilot Programme for the Protection of Brazil's Tropical Forests (PPG7), have aimed to adapt industrial forestry models to a community setting (Amaral and Amaral Neto, 2005; Benatti*, et al.*, 2003), requiring the training of community members in technical, legal, organizational, and managerial matters (Amaral and Amaral Neto, 2005), often entailing significantly high initial investments (Medina and Pokorny, 2008) and sometimes changing traditional organizational structures and rules in the communities (Pokorny, 2009; Pokorny*, et al.*, 2008). Medina and Pokorny (2008) found that after initial investments in training, communities were able to act autonomously in several aspects of management, but were still reliant on outside help for management plan preparation, planning of field activities, and the running of sophisticated machinery. They also found that despite extensive investments in capacity building, communities often lack managerial capacity to maintain working capital (Medina and Pokorny 2008). This can be seen in the Caboclas Workshop case study; although

extensive investments were made at the project's outset for community training, Nova Vista was still struggling with the management of the business structure.

If the obstacles of land tenure and knowledge acquisition are overcome, but finances are lacking to hire a forest professional to write a management plan and help overcome the bureaucracy involved, community foresters will not likely be able to practice legal management in Brazil. Smaller-scale initiatives have trouble covering these technical costs (Medina and Pokorny, 2008), suggesting two possible interventions. The first would be to continue a project-based approach to promoting community forestry, where significant amounts of money are pumped into a community to initiate specific projects, such as the case of the Caboclas Workshops, or as a means of initiating legal management (as Amapá state is planning) in the hopes of eventually producing a self-sufficient operation. The second option would be to simplify the process of getting community operations approved as "legal" to enhance the spontaneous adoption of community forestry. The former intervention approach has been favored in Brazil[26] and is supported by the 2009 Community and Family Forest Management Policy (PFMFC)[27], although the Environmental Secretary of the state of Pará has recently made some changes to the legal framework that have simplified the procedures for legal management for smallholders in *várzea* areas (Instrução Normativa No. 40, 11/2/2010).

A theme that runs throughout the three case studies is how government actions and inactions greatly increase the difficulties that communities face to develop sustainable, forest-based industries. Several different elements are involved:

1) Government land tenure policy or lack thereof has made it very difficult for community groups to obtain legal title to their lands or to obtain legally recognized use rights.

[26]As evidenced by the numerous project interventions in the past two decades, such as those financed through the PPG7 and its subprogram, ProManejo.

[27]The principles that the PFMFC is based on include initiating the elaboration and implementation of management plans as instruments to orient forest managers, and providing technical assistance and rural extension; the Policy also addresses planning for how to get resources to such activities.

2) The legal and technical requirements for approval of management plans are so great as to be beyond the capability of any community group that does not include a registered forester. It is far easier to obtain a permit to deforest than to manage a standing forest. Given the effectiveness of enforcement in much of frontier Amazonia, it is also far easier to log illegally than to legally manage forests.

3) Community groups are left at the mercy of illegal loggers in many parts of Amazonia due to the government's ineffective enforcement of forestry laws, yet community groups are often the ones getting harassed by environmental police.

4) The government is unable to meet its obligations under its own requirements for land settlements and legal forest management. For the former, the fact that INCRA has often not provided the required infrastructure and funding has meant that colonists have had to rely on selling off their timber to obtain start-up capital to develop their farms. Also, INCRA settles people who are not legitimate colonists and then, as in the case of the PDS Igarapé da Anta, does not approve the management plan because the association includes illegitimate colonists. For the latter, management plans, especially for community forestry enterprises, often take an unacceptably long time to be approved and make excessive administrative demands on community associations. The management plans for the RESEX Tapajós-Arapiuns communities have not yet been approved because the management plan for the RESEX as a whole has not yet been approved.

5) There are many instances where government forestry policy has sought to solve the problem of illegal forestry by making regulations ever more restrictive, rather than by simplifying requirements for legal management and making it easier for community groups to obtain approval for management plans, while stepping up enforcement to reduce the pressure of illegal loggers. A recent Instrução Normativa (No. 61, 9/4/2010) issued by INCRA makes it impossible to obtain a legal management plan in settlements that do not have an approved settlement development plan, yet there is an enormous backlog of settlements waiting for such plans. This in the view of the Brazilian Forest Service makes it all but impossible to develop sustainable logging operations in these settlements, which in the absence of government

enforcement just encourages further illegal logging and deforestation (Serviço Florestal Brasileiro, 2010).

Besides recent changes to norms for parts of Pará, the current legal framework in Brazil has meant that communities will always need an outside intervention to kick start legal management initiatives; as the case of Mazagão illustrates, it is difficult for communities to spontaneously begin doing legal management because of the bureaucracy involved, while the other two case studies were only able to overcome this challenge with the help of either a company or an NGO. With a project-based approach to promoting community forestry, there is the risk of a project coming to a halt once the development initiative money dries up, requiring constant subsidies to the communities (Medina and Pokorny, 2008; Pokorny, 2009; Pokorny*, et al.*, 2008). In addition, a project-based approach may marginalize those communities that are not part of any projects, by setting standards too high and further limiting non-project communities' access to markets.

Strong leadership and organization are often pointed to as important challenges and essential for successful community management (e.g., Amaral and Amaral Neto, 2005; Ostrom, 2000; Pagdee*, et al.*, 2006; Taylor and Zabin, 2000), especially in the case of heterogeneous interests within a community (Varughese and Ostrom, 2001). While basic skills and knowledge can be acquired through training, the capacity of leaders to learn and grow through on-the-job experience is critical to the overall performance of the enterprise, especially as community organization and that of a business are quite different and so are the skills required. However, organizational issues were not featured as prominently as other challenges by interviewees in this study. Although community members interviewed here did not often list leadership as a problem *per se*, it can be inferred that strong leadership was important from the beginning of the initiative and throughout. Indeed, it was pointed out that the first leaders of the new government-sponsored settlements pushed forward the initial contracts between the colonists and the logging companies, even when the colonists originated from a variety of places and conexts. With smallholder forest management in Mazagão, leadership of

the community as a whole plays a smaller role since forest and land management are household-level activities. However, with the new government initiative, community organization and rules governing forests will be changed and the leader of the association will have a larger role to play, already causing some tensions within the community (as described in the results section). The one case where leadership was a problem was in one of the communities of the Caboclas Workshop, where the current leader of the cooperative was being singled out as losing the trust of the artisans. While the community members did not see this as a problem in initiating the project, it was seen as an obstacle to its continued success. Otherwise, the communities involved with the Workshop already had a strong organizational structure, including elected leadership and a well-functioning community association.

The aforementioned empowerment elements are needed to be able to start legal community forest management. Once these have been achieved, a number of business issues need to be overcome to effectively operationalize the enterprise. Discouraging clandestine loggers, accessing markets, investing in and maintaining infrastructure, and solidifying management and organizational aspects of the enterprise are all important factors. Managers must be able to reconcile community relationships with the work relationships required for efficient production to ensure that the enterprise is able to meet its contractual obligations in terms of quantity, quality, and timing. Managers must also be able to inspire the confidence of their fellow community members involved in the collective enterprise. This will undoubtedly affect the profitability and success of the enterprise and, thus, eventual self-sufficiency.

Another major challenge is that of marketing the products of the forestry enterprise in a timely fashion and at prices that ensure an adequate return to the enterprise and participating workers. This requires a detailed understanding of regional markets for their products, good working relationships with the key actors in regional markets and the ability to negotiate process and conditions that are consistent with the needs and capacities of the community enterprise. It also requires an ability to develop and maintain a network of buyers, to cultivate customers and to sell the product. Scherr *et al.* (2003a) point to several potential competitive

advantages that forest community producers have, including proximity to and knowledge of local markets, resident owner-managers, price advantages, and branding in specialized markets. Proximity and knowledge of local markets is an advantage in Mazagão (Pinedo-Vasquez*, et al.*, 2001a), and both Mazagão and the Caboclas Workshops have resident owner-managers, but these advantages are tempered with enforced legal limits and managerial problems, respectively. The Caboclas Workshops produce a branded, high value-added product for specialized markets, and in general are able to eke out a small profit margin (Medina and Pokorny, 2008), but they are still having trouble finding the right markets. Medina and Pokorny (2008), in a study of several community forest management initiatives in the Amazon including the Caboclas Workshops, found that smaller-scale initiatives had high production costs compared to companies and much lower productivity. This study found that the slow and decreased financial returns were the principal reasons explaining why artisans discontinued their participation in the Workshops. Reduced profitability resulting from imposed legal limits in Mazagão also discouraged sawmill owners from expanding or even continuing their activities.

However, despite lower economic returns, the artisans that remained in the Caboclas Workshop appreciated being able to participate in the workshop while still maintaining their agricultural fields and undertaking other livelihood activities. Medina and Pokorny (2008) also found that community members were less concerned with maximizing economic returns, instead preferring to pay fairly for labour. While community forestry initiatives need to produce enough profits to stay afloat and keep participants engaged, it is also important to note that communities, unlike private enterprises, are less likely to aim for maximizing profits in forestry to the detriment of other values such as well-paid employment opportunities, time for other livelihood activities, and availability of NTFPs. However, having enough working capital to cover day-to-day operational expenses, maintenance of infrastructure, and in some cases, salaries when sales involve significant delays between product delivery and payment is essential to maintain operations and stable employment.

The interrelatedness of the elements of the presented framework shows that it would be prudent to approach the promotion of community forest management in a holistic manner. Focusing interventions at only the level of empowerment, or only at one or two operational issues, will not be sufficient for a community enterprise to become self-sufficient. In many ways, the operational phase is the more complex of the two, and while many initiatives are able to complete the development phase with outside assistance, relatively few of these enterprises are able to make the transition to a self-sufficient community business. Agendas of NGOs or governmental agencies often focus on one or two of these interventions, for example, on securing resource rights or access to markets, or, as is the case in many Brazilian pilot projects, concentrating on training communities to conduct forest inventories and reduced impact logging. In many cases, outside technical assistance ends or is significantly reduced as the community enterprise enters the operational phase. Without a holistic approach, an enterprise will have great difficulty becoming self-sufficient. Much depends on how well the new managers and other members of the enterprise have assimilated their new roles and skills and on the availability of some level of continued outside assistance in making the transition from the developmental phase to the operational phase. The nature of the challenges identified also point to the need for interventions by multiple agents, as addressing the framework holistically will likely be beyond the scope of any one agent, and can also include changes to policy, as discussed above.

3.5 Conclusion

A framework was built showing the challenges to community forest management in the eastern Brazilian Amazon and the interrelatedness of these challenges. Considering that this framework was developed from three case studies, the ability to generalize its use is limited (Yin, 2003) as it may not capture the nuances of other business models, or even other communities using the same business models. Recognizing such nuances is crucial in planning interventions that are contextualized to local situations and that integrate local knowledge and traditional practices (Pokorny, 2009; Pokorny*, et al.*, 2008). However, the framework presented here can be used as a starting point for practitioners to identify

challenges to self-sufficiency in community forest management. This paper argues that there are two main phases in developing a community forestry initiative, developmental and operational, and that focusing on only one challenge or phase will not be sufficient, as all aspects need to be addressed in a holistic manner to reach the endpoint of self-sufficiency. It also shows that communities have great difficulty in meeting the government's regulatory requirements to be able to legally manage forest resources and market products derived from these resources. With outside assistance, groups have managed to complete the developmental phase, but in many cases the intervention model has not adequately prepared communities to successfully make the transition from the developmental phase to the operational phase. In addressing both of these phases, the initiative is able to transition from being a project to becoming an independent business enterprise. It is hoped that this framework will encourage practitioners and agents of conservation and development to either broaden their agendas to adopt a more complete approach, or begin a cross-agency dialogue on how best to cover all of the aspects addressed in the framework.

4 INTEGRATING COMMUNITY-DEFINED GOALS AND PRACTICES IN THE DESIGN OF COMMUNITY FORESTRY INITIATIVES

4.1 Introduction

Community-based forest management has been promoted globally to enhance the conservation and sustainable use of tropical forests, consolidate rights over traditional lands and resources, and reduce rural poverty (Bray*, et al.*, 2008; Molnar*, et al.*, 2008; Molnar*, et al.*, 2004; Pagdee*, et al.*, 2006; Scherr*, et al.*, 2003a; Smith*, et al.*, 2003). In the past three decades, this form of decentralized forest governance has become a major trend globally (Agrawal*, et al.*, 2008; Ribot*, et al.*, 2006), with 22% of forests in developing countries being community-owned or managed (White and Martin, 2002).

Some of the central tenets and, in fact, the *raison d'être* of community forestry and related small-scale enterprises, include enhancing social justice, political empowerment, and participation of forest-dependent people (Larson and Soto, 2008; Neumann and Hirsch, 2000; Ribot, 2004; Skutsch, 2000). Yet, despite the prevalent rhetoric of community empowerment and participation, community forestry is often promoted in a top-down manner, either by promoting industrial-scale forestry practices at the community level, or by putting forward the interests of agents outside the community such as NGOs, logging companies, or government institutes (Cooke and Kothari, 2001; Medina*, et al.*, 2008; Medina*, et al.*, 2009a).

Traditionally, forest sector development has favoured large-scale industrial production and overlooked the development of small-scale commercial forestry (Donovan*, et al.*, 2006). In fact, society's definitions of sustainable forest management, as elaborated by several regional and national criteria and indicators (C&I) processes, have been created with industrial logging

in mind, focused on ensuring a steady supply of timber, while limiting detrimental effects on the environment and society. These C&I have been criticized for having been developed using a top-down approach that does not take into consideration local forest management needs or practices (Hajjar*, et al.*, 2009; Karjala and Dewhurst, 2003).

In many situations, industrial-scale logging practices have been used as the model on which community forestry is based (Amaral and Amaral Neto, 2005; Benatti*, et al.*, 2003; McCarthy, 2006; Oyono, 2005). In Latin America, oftentimes, 100% tree inventories, management plans, and annual operation plans elaborated by forest technicians are required for commercialization of timber, often requiring sophisticated technologies and practices out of reach of most communities without significant external support (Benatti*, et al.*, 2003; Sabogal*, et al.*, 2008). Pokorny and Johnson (2008) state that existing support strategies for community forestry in the Amazon are based on the top-down transfer of knowledge generated by offsite experts. On the other hand, in Mexico, industrial processes that were thought to be out of reach of communities were adopted successfully when communities were provided with the appropriate support (Bray, 2003; Bray, 2004).

However, this support, needed by communities to fulfill the expectations of practicing forestry modeled on industrial-scale practices, has resulted in communities becoming reliant on external agents to develop forestry initiatives. In this way, yet another top-down approach is introduced into community forestry promotion; one where the agenda of the intervening, and often funding, agency is imposed on the local population. Cooke and Kothari (2001) present examples of participatory approaches to rural development that ended with manipulation of local populations and imposition of outside agendas rather than local empowerment. Medina *et al.* (2008; 2009a; 2009b) show how community forestry in the Amazon has been dominated by the interests of powers outside the communities, namely, development and/or conservation agencies (governmental and non-governmental), and industrial logging companies that form partnerships with communities. Development projects often disregard local realities, demanding from communities new technical, organizational,

and managerial capacities to deal with markets and technologies suggested by the external agent (Pokorny and Johnson, 2008).

Additionally, examples of how governments retain a degree of control over community forestry and shape local practices abound worldwide (Chapter 2; Edmunds and Wollenberg, 2003a; Larson*, et al.*, 2008b; McCarthy, 2006; Oyono*, et al.*, 2005). In many of these cases, communities have become overly-reliant on external agents for financial and technical support, and initiatives risk failure when such subsidization ends (Medina and Pokorny, 2008).

Instead of promoting community forestry through this top-down approach that limits local empowerment and has met with varying degrees of success, this paper proposes designing community forestry initiatives from the bottom-up. It does not suggest that there is no role for external agents to play; rather, a bottom-up approach is used to ascertain the needs, wants, and current realities of communities managing their forests, in order to better design support systems brought from the outside. Simply put, this bottom-up approach involved going to case study communities and asking local families what was important to them in terms of how they benefit from their forests, how they manage their forests, and what they want from forestry initiatives. What emerged was a list of aspects of forestry that were important to the studied communities that can be used to help design and inform community forestry initiatives and interventions. This list can enhance intervening external agents' understanding of local processes and needs, and can also be used by community members themselves to monitor the progress of their forestry initiatives in fulfilling local needs.

4.2 Methods

A case study approach was used to study community forestry initiatives in the Yucatán Peninsula of Mexico and the Brazilian Amazon. These two regions provide an interesting comparison in terms of development of community forestry. Mexico is seen as having the most advanced community forestry sector in Latin America, with several examples of

advanced enterprises (Charnley and Poe, 2007; Molnar*, et al.*, 2007), and has been promoted as a global model for sustainable landscapes (Bray*, et al.*, 2006; Bray*, et al.*, 2003; Klooster, 2003). Meanwhile, community forestry in Brazil, which came about from an exogenous push mostly from NGOs trying to promote more sustainable forest practices in the Amazon (Amaral and Amaral Neto, 2005), has a comparatively short history, with mixed results to date (Pokorny*, et al.*, 2010; Chapter 3). The contrasting experiences in these two regions, along with the diversity of community forestry models studied here, provide insights into how community goals compare between established models of community forestry (the Mexican cases) and less established models (the Brazilian cases).

Six case studies were chosen in Brazil and Mexico. Sampling of the case study communities was non-random and purposive (Lincoln and Guba, 1985) in order to have a variety of community forestry models represented. The case studies were selected with the help of local collaborators in both countries based on pre-existing relationships with the communities. In Mexico, the cases were: Caobas and Naranjal Poniente (Quintana Roo), both of which were part of the pilot programme of community forestry in the 1980s; and traditional forest management in Yaxcabá (Yucatán). In Brazil, the cases were: traditional smallholder forest management in seasonally-flooded forests (várzea) in Foz de Mazagão (Amapá); *Oficinas Caboclas de Tapajós*, a small-scale furniture-making cooperative in three communities (Nova Vista, Nuquini and Surucuá) in the Tapajós-Arapiuns Extractive Reserve (Pará); and colonist partnerships with the logging company, MAFLOPS (Forest Management and Lender of Services), in government sponsored settlements (Santo Antonio and Igarapé da Anta, also in Pará) (see Chapters 2 and 3 for full descriptions of the case studies).

Fieldwork took place between June and October 2008 in Brazil, and between February and April 2009 in Mexico. Semi-structured, open-ended interviews were conducted with community leaders and other community members during the field visits. Key informants were identified with the help of local collaborators, and a networking approach (Knight, 2002) was used to identify other interviewees in the community who were currently taking

part, or had taken part, in forest management. Semi-structured, open-ended interviews with community members were designed to elicit information on their forest management practices, their perceptions of good forest management, their governance structures, how they benefit from forest activities, how different forest products are used, and the difficulties they have in managing their forests. Semi-structured walks with community members through forests, fields, fallows, and home gardens helped to illustrate management practices and identify various forest products used for subsistence or commercial purposes. In total, 107 interviews were conducted with community members. To gain further insight on the perspectives of external intervening agents on community forestry initiatives, interviews were also conducted with the proponent of the respective initiative. These included representatives of government agencies, the company (MAFLOPS), intervening NGOs and regional associations.

NVivo 8, a qualitative data analysis software package, was used to conduct a conventional qualitative content analysis (Hsieh and Shannon, 2005) of the transcribed interviews. Coding and categorizing of community member interviews revealed aspects of forest management that emerged as important to community members. Categories were grouped thematically into themes and sub-themes and are presented in Tables 4-6.

4.3 Results and discussion

This section presents aspects of community forestry that emerged as important to community members, noting whether they are already benefiting from or applying the practices, or if there are aspects that they aspire to have. Community member responses were categorized into three themes: governance structures, both within the community and in relation to external bodies (Table 4); benefits sought from management (Table 5); and ecological management practices (Table 6). While Tables 4-6 present all of the aspects that emerged from the interviews, the discussion analyzes key themes, trends, and interesting commonalities and differences among the case studies and between the two countries, and thus will not address all aspects individually.

4.3.1 Governance structures

Many aspects related to forest governance in the communities emerged from the Mexican case studies, showing the importance that is placed on governance aspects of forestry in those case studies (Table 4). However, while the desire to have some form of land title was present in all the cases, this was much more prominently mentioned in the Brazilian cases than the Mexican ones. Unlike in Mexico, where community land tenure is secure and established, in the Brazilian cases, there was still uncertainty in tenure due to delays in land titling, causing difficulties in legally managing forests (see Chapter 3). This explains why land ownership was brought up more often in interviews in Brazil, and why these aspects had not yet been achieved in those cases. Ability to access resources was brought up in all cases, with only a few interviewees from the MAFLOPS case lamenting the fact that they could not access their own forest after the logging company had extracted timber (they were somewhat mistaken – the colonists could access the forest, but could not commercialize timber until the next cutting cycle; however, many colonists interviewed misunderstood this). In the Oficinas Caboclas case, exclusive access to forest resources emerged as important to the communities, since one of the reasons for fighting for creation of an extractive reserve was to keep outsiders away from their forests and timber.

The Mexican community structure, based on collective resource management, emerged with agrarian reforms in the early 20th century (reviewed in Chapter 2). In the 1990s, the *ejidos* (rural cooperative communities) were given the option to parcel collective land for private ownership, but none of the case studies here opted to do this, preferring to retain collective ownership and management. The collective ethic thus featured prominently in the Mexican interviews.

The Mexican governance structure contrasts sharply with smallholder management in two of the Brazilian case studies, where many interviewees commented on their satisfaction with the system of individual or household level ownership and decision-making. In Mazagão, several interviewees made it clear that their community association did not represent their interests

Table 4 Governance-related forestry aspects of importance to communities
Closed circles indicate an aspect of forestry that emerged from interviews as important to the individual or community, determined by whether the aspect was mentioned by two or more interviewees in one community. Open circles indicate that interviews revealed that the aspect was important, but had not yet been achieved. Larger circles represent the heavier importance placed on that aspect by interviewees, evaluated by noting when interviewees prioritized the aspect or a majority of interviewees in one community brought up the aspect. n/a indicates that the aspect was not applicable in that case study.
[MAZ=Mazagão case study; MAF=colonist-MAFLOPS partnership case study; OCT= Oficinas Caboclas de Tapajós case study; YAX= Yaxcabá case study; CAO= Caobas case study; NAR= Naranjal Poniente case study]

Sub-themes	**Aspects of forestry**	MAZ	MAF	OCT	YAX	CAO	NAR
Land ownership/resource access	have legal documentation for land and forest ownership	○	○	●	●	●	●
	have individual land/forest title	○	○	n/a			
	have collective land/forest title (no divisions)			●	●	●	●
	be able to access forest resources	●	○	●	●	●	●
	have exclusive access to forest resources			●			
Participatory decision-making on forest use	availability of a forum to express opinions/resolve conflicts		●	●	●	●	●
	community members have right to vote on community decisions/ decisions taken collectively		●	●	●	●	●
	community involved in decision making of forest group			●		●	●
	decisions that are made by the community are respected			●	●	●	●
	conflict resolution is done in a participatory manner				●	●	●
	satisfaction with internal organizational structure and forest work group management					●	●
	forest work groups coordinating well amongst each other		n/a		n/a	●	n/a
Local control of forest management /independence	community is principal decision-maker for forest activities			●	●	●	●
	household is principal decision-maker for forest activities	●	●				
	independence from external agent to do forest management (not dependent on company interests or NGO support)		○	○			
	receive government grants/support					●	●
	receive technical support from regional associations				●	●	●

Sub-themes	Aspects of forestry	MAZ	MAF	OCT	YAX	CAO	NAR
Lack of illegal loggers	no timber theft or selling to illegal loggers		○	•			
Following customs and community rules on forest use	seek community permission to extract wood from forest for subsistence uses			•	●	•	•
	do not exceed individual ejiditario limits for polewood extraction	n/a	n/a	n/a			•
	no clearing in *Fundo Legal* or community protected areas			●	●	●	●
	take only as much from the forest as you need			●	●	●	●
	only fell trees in full moon days					•	•
representation and relationship with external forest-related body	community association represents community member interests and seeks projects for community development		○			•	
	transparency in contracting process with logging company		○				
	good communication with regional association				•	●	●
	regional association represents community interests				•	●	●

well and that they would rather manage their timber at the household level. In the MAFLOPS case, they looked to their community association leaders to represent their needs in seeking external funding or contracts for forest projects, but ultimately their decision-making was also done at the household level.

Independence, or overcoming their dependency on an external agent, featured prominently in both countries. The communities, for the most part, were dependent to varying degrees on external agents such as the government (for grants in the Mexican cases), an NGO (for logistical and technical support in the *Oficinas Caboclas* case) or a logging company (MAFLOPS), and many expressed a desire to lessen that dependency. In the *Oficinas Caboclas* case, it was assumed that eventually they would be working independently of the supporting NGO:

> "if [the NGO] left, we'll have to learn how to climb the stairs ourselves to carry this forward. This is something that they have always told us from the start, that we need to learn how to do this to be able to walk on our own two feet."

However, few interviewees thought that they had reached that point of independence:

> "[the NGO] was a necessary advisor in the beginning. And now, we work pretty much alone. It's not 100%; we still need things from them. Our own difficulty is getting the money in our pockets."

In MAFLOPs, dependency on the company was criticized:

> "… [the logging company] becomes the owner and gives the orders. This is wrong, the community should be the owner of the process, should be the one giving the orders, not the company."

In Mexico, the communities were satisfied with amount of independence they had in managing their forests (no interviewees commented to the contrary). However, they continue to apply for grants from the government for co-financing for various community projects, including sawmill upgrades and agriculture or animal husbandry aid, and rely on external expertise from regional associations for forest management. Interviewees did, however, point out that community rules that had been decided by their General Assembly featured prominently in the way that their forests were managed, indicating a level of independence in their decision-making authority (see Chapter 2). Following community rules also featured more prominently in the Mexican case studies and the one Brazilian case study with a collective forest, *Oficinas Caboclas*.

4.3.2 Benefits sought from forest management

Table 5 shows what the case study communities wanted or appreciated most as a benefit from forest management or what forest management initiatives brought to the communities. Unlike in Table 4, where issues emerged mostly in the Mexican cases, most of these issues emerged in both countries. Benefits such as income, employment, improved living conditions, supply of non-timber forest products (NTFPs), and enhanced knowledge of forests and forestry were highly valued in both Mexico and Brazil.

In both countries, employment and income were the most often cited benefits to come from forest management. However, income from timber or NTFPs was rarely cited as the principal

income source for a household – it was often seen as an additional income source, indicating an economic integration of livelihood activities at the household level. Residents of Caobas and Naranjal Poniente commented that in some years forestry income was higher than agricultural income. Full-time employees of timber enterprises, however, derived most of their income from forestry. These included: the smallholder sawmill owners in Mazagão, whose principal activity was extracting and sawing wood; the person who maintained the sawmill equipment in Caobas; or the rare occasion when MAFLOPs hired staff from within the community in which it was operating. Otherwise, employment opportunities were seasonal or part-time, or were seen to benefit only a small group of people. This was most apparent in the case of *Oficinas Caboclas*, with only a handful of artisans participating in the furniture making. In contrast, in Naranjal Poniente, job opportunities in timber extraction and milling were rotated around the community so as to provide more people with the opportunity to earn a daily wage.

In the Mexican cases, where yearly profits from the forest enterprise were distributed as dividends to all *ejidatarios* (legal community members with land rights), the interviewees stressed the importance of having a sustained yearly income from forestry, regardless of whether they worked for the enterprise. Interestingly, in the MAFLOPS case, many interviewees preferred a sustained yearly income from their timber, rather than a lump some payment every rotation as had taken place through their contracts:

> "[annual payments] would help out a lot – to always have a little."

In the Mazagão case, timber was seen by some as a safety net; they would sell a tree to the local sawmill when they needed extra cash to supplement their principal income sources, namely, selling açai (fruits of Euterpe oleracea) and shrimp. In the other cases, community members also appreciated that some of the timber profits were invested in the development of the community (for example, fixing roads and bridges, and building schools, churches, and

Table 5 Benefits sought from forest management

Closed circles indicate an aspect of forestry that emerged from interviews as important to the individual or community, determined by whether the aspect was mentioned by two or more interviewees in one community. Open circles indicate that interviews revealed that the aspect was important, but had not yet been achieved. Larger circles represent the heavier importance placed on that aspect by interviewees, evaluated by noting when interviewees prioritized the aspect or a majority of interviewees in one community brought up the aspect. n/a indicates that the aspect was not applicable in that case study.

*sustainable supply of these products was not assessed in this research. Open circles indicate the instances where interviewees mention that a particular forest product is less available than in the past or is becoming scarce. Closed circles do not indicate that the supply is assured, just that interviews had said that this was an important factor to them, and did not further comment on whether or not the product is still plentiful.

Sub-themes	**Aspects of forestry**	MAZ	MAF	OCT	YAX	CAO	NAR
Income	individual cash income	●	●	●	●	●	●
	collective cash income (for community projects)			●		•	•
	dividends are divided equally among ejidatarios					●	●
	sustained yearly income to supplement agriculture and other income		○	●		●	●
	safety net cash injection	•					
Employment	increased employment in community	•	•	●	•	●	●
	rotating jobs to provide more employment for community members						•
	opportunities for youth to remain in rural areas			•	●	●	●
Improved living conditions and community infrastructure	improved living conditions/develop community to provide incentive to stay in the interior/rural areas	●	●	●	●	●	●
	adequate transportation/road system		●	○		•	•
	energy available for processing equipment	•		•		•	•
	individual lots delineated	•	●				
	collective profits are invested in improving community infrastructure (roads, schools, medical and water posts, vehicle use, home improvement)			●		•	•
	profits are invested to improve business infrastructure (equipment upgrades)	•		•		●	●
	profits are invested in improving agriculture infrastructure (mechanization/perennial crops)		●	•			•

Sub-themes	Aspects of forestry	MAZ	MAF	OCT	YAX	CAO	NAR
Supply of timber and non-timber forest products	supply of wood for subsistence uses for construction, furniture, canoes not jeopardized*	●	●	●	●	●	●
	supply of commercial timber not jeopardized*	●	•	●	○	●	●
	supply of game not jeopardized*	●	○	●	•	○	•
	supply of fruits not jeopardized*	•	•	•	•	•	•
	supply of nuts not jeopardized*	•	•	•	•	•	•
	supply of useful vines not jeopardized*	•	•	•	•	•	•
	supply of oils, leaves, bark and medicines not jeopardized*	•	•	•	•	•	•
	supply of ceremonial NTFPs not jeopardized*				•		•
	supply of firewood not jeopardized*	●	●	●	●	●	●
	supply of rubber/gum not jeopardized*			●		●	●
	supply of palm thatching not jeopardized*				●	●	●
Enhanced knowledge and skills	of business management, marketing, and accessing markets	•	○	○		•	•
	of agroforestry systems	●					
	of legal forest management (including forest inventory, species ID and felling techniques)	○	○	•		•	•
	of measuring timber volumes					•	•
	of fire management			●	●	●	●
	of safety measures to be taken in sawmills and during operations	•		•		•	•
Preserving culture	Valorizing culture through cultural wood products (forest and animal themed furniture; traditional masks)			•	•		
	protecting species that are culturally important (timber and non-timber - tuqui, limonaria, guaya, caniste)			•			•
	maintaining forest for aesthetic reasons		●	•	•		
	Chichanha (cultural heritage site) is protected	n/a	n/a	n/a	n/a	•	n/a
	protect forest area used for cultural ceremony						•
Preservation for future generations	Forests should be maintained for future generations	•	•	●		●	●

meeting spaces). In the MAFLOPS case, "roads" was the primary answer to the question "what benefits can forest management bring to the community." Roads were a principal need for new settlements, and the colonists felt that, without the timber management contracts, which included constructing a road system within the settlements, they would still be waiting for the government to build those roads (see Chapter 3).

In both countries, the importance of NTFPs was manifested in interviewee descriptions of the various subsistence and commercial uses of NTFPs such as *açai*, vines, palm leaves, nuts, fruits, honey, bushmeat, rubber, and gum. Medicinal plants, for the most part, were cultivated in home gardens in Mexico, while in Brazil, they were often collected from the forest. There were many instances where forest management was adapted to ensure the continued availability of these products, including directional felling to avoid useful palms and trees and protecting forest areas for apiaries. Forest areas or specific trees were also protected for ceremonial purposes (Naranjal Poniente only), aesthetic value, potential ecotourism opportunities (Caobas only), and seeding trees. It was also important for everyone interviewed to have access to wood for subsistence purposes, mostly for construction and for firewood.

Many interviewees commented that they really appreciated the training and courses that the community forestry initiative brought to the community. Learning fire management skills was brought up often in the Mexican and *Oficinas Caboclas* cases, with comments on how forest fires in their respective communities had been reduced since receiving training on how to control fires when making agricultural clearings. In the Brazilian cases, the lack of knowledge of business management and marketing, and of legal forest management, were brought up often as challenges within the community that needed to be overcome in order to better benefit from forestry.

4.3.3 Ecological management practices

In all of the cases presented here, community members were primarily farmers. Timber management was seen as an additional activity to supplement agricultural work, for example, through seasonal paid employment or occasional earnings:

> "[furniture-making] work is every other week, and it helps to get people out of their fields and out of the sun."

This explains the results in Table 6 that show the importance of integrating forestry and agricultural activities, temporally, economically (see Section 4.3.2), and in some cases, even

spatially. In terms of temporal integration, in both Mexico and Brazil, a prominent aspect of forest management was the desire to have adequate time to also tend to agricultural fields. In all but one case (Mazagão), the need to have adequate space for agriculture fields was also highlighted by interviewees; clearing for agriculture was prohibited in forest management areas, and interviewees expressed that this was acceptable as long as they still had sufficient land for agriculture. In Yaxcabá, one *ejido's* General Assembly voted against a government-sponsored timber plantation project because they were concerned that they would not have enough space to grow their crops.

In answering the question "what is forest management," many interviewees responded by referring to a forest area set aside from agriculture, where one had to follow the legal requirements and obtain the proper documents (hence aspects in Table 6 on following legal requirements):

> "[forest management is when you] delineate an area, and in that area you do everything legally. If you do management, you can put your hand there. It's easier for you to harvest wood without getting in trouble with [the government], because management is something legal. So that you're able to work."
>
> "[Management is] an area that is reserved by law – can't touch it [for agriculture]."

During a lengthy interview on the importance of managing a forest legally and the benefits of preservation, one *Oficinas Caboclas* participant commented:

> "We learnt forest management to take care of timber, minimize harm to profitable trees. We value the timber more now."

But when asked what benefits come from leaving a forest standing, the interviewee answered,

> "we use the forest for cultivating crops, we need the forest to be able to plant, to cultivate."

This reinforces the idea that these forest managers are still primarily farmers that also use the forest's environmental services for agriculture.

Table 6 Ecological management practices
Closed circles indicate an aspect of forestry that emerged from interviews as important to the individual or community, determined by whether the aspect was mentioned by two or more interviewees in one community. Open circles indicate that interviews revealed that the aspect was important, but had not yet been achieved. Larger circles represent the heavier importance placed on that aspect by interviewees, evaluated by noting when interviewees prioritized the aspect or a majority of interviewees in one community brought up the aspect. n/a indicates that the aspect was not applicable in that case study.
[MAZ=Mazagão case study; MAF=colonist-MAFLOPS partnership case study; OCT= Oficinas Caboclas de Tapajós case study; YAX= Yaxcabá case study; CAO= Caobas case study; NAR= Naranjal Poniente case study]

Sub-themes	Aspects of forestry	MAZ	MAF	OCT	YAX	CAO	NAR
Respect	respect the forest, the environment, and the humans living in it	●	●	●	●	●	●
Respecting legal requirements for forest management	following all laws and legal requirements on forests and forest management	○	●	○		⬤	⬤
	do not exceed AAC limits for individual species			●		●	●
	do not harvest smaller trees	⬤		●			
	respect DBH limits					⬤	⬤
	no clearing for agriculture in designated forest management areas		⬤	⬤		⬤	⬤
	management plan is followed			○		●	●
	protecting timber species protected by law (eg. granillo, sirricote)					●	●
Forest management for wood products, non-wood products and agriculture	forestry does not detrimentally detract from time for tending to agriculture fields	⬤	⬤	⬤	⬤	⬤	⬤
	forestry does not detrimentally detract from space for agriculture fields		⬤	⬤	⬤	⬤	⬤
	ensure forest is left to regenerate for long enough before clearing again to make for richer soils for agriculture	●		●	●	●	●
	keep valuable timber species in agriculture fields	⬤	●			●	
	protect or limit damage to *açai* palms and other important NTFPs during agricultural and forestry activities (directional felling)	⬤	●	●	●	●	●
	protect valuable timber species and saplings with directional felling	⬤	●	●	●	●	●
	encourage saplings of timber species (usually fast-growing species for polewood) in fallow management	⬤			●		
	clear non-desired species to make space for desired species (timber and non-timber)	⬤		●		●	
	protect seeding trees	⬤		●		⬤	⬤
	protect forest around apiaries				⬤	⬤	⬤
	protect tree species that are used by honey bees				●		
	focus firewood collection and wood for charcoal from agriculture clearings				⬤	●	●

Sub-themes	Aspects of forestry	MAZ	MAF	OCT	YAX	CAO	NAR
Protected areas	no clearing for agriculture in designated protected areas			●	●	●	●
	protected areas for environmental services are respected			○	●	●	●
	unique pine forest is protected	n/a	n/a	n/a	n/a	●	n/a
	seeding area is protected					●	●
	reduction in forest fires/control of fires used for clearing		●	⬤	⬤	●	●
	stream and river water levels not lowered		●	⬤		●	
	monte alto surrounding village protected village during hurricane	n/a	n/a	n/a			●
Replanting	replant after felling	⬤		●		●	●
	maintain community plantations of valuable species					⬤	⬤
Reducing wastage	making use of timber species when clearing field for agriculture (rather than burning it due to lack of permit to sell it)	●	○	●			
	make use of whole tree/timber residues		●	●		●	
	use efficient saws in sawmill to reduce wastage		n/a	n/a	n/a	●	●
Ecotourism	ecotourism opportunities are realized					○	

For the most part, forest management was seen as a "project" that was brought into the community to preserve the forest. However, in Mazagão (where a community forestry initiative had yet to be implemented), interviewees responded to the question "what is forest management" quite differently, outlining forest management techniques that they employ. These included "*limpiando*" (literally, cleaning) – clearing non-desired species and vines from the area to give room for desired species to grow in fallows – and planting various regenerative plants in an agroforestry system and to aid in the regeneration of fallows. "Management is clearing, conserving, planting." During walks through one of the smallholder forested properties in Mazagão, it became clear that the smallholder knew the location of each tree and palm; he had planted almost all of them after having cleared for agriculture, and cultivated them for a specific purpose, such as selling the timber if extra cash was needed by the family, for polewood (fast-growing species), or for use of its non-timber products. Clearings made by timber extraction were planted with annual crops, which promoted natural

succession, while also providing useful products to the smallholder (Pinedo-Vasquez *et al.*, 2001; Sears and Pinedo-Vasquez, 2004). In Mazagão, forest and agricultural management are one and the same, spatially, economically, and temporally.

4.3.4 Designing community forestry initiatives from the bottom-up

> "If the community doesn't want it, for sure this project is not going to have much success. Success will depend on what the community wants."
>
> -local government representative, Brazil

Traditionally, community forestry initiatives have been modeled after industrial scale systems of forestry based on well-developed forest science. But an argument can be made for looking at forestry in a different way. Michon *et al.* (2007) advocate promoting a new paradigm for integrating local communities' forestry practices into tropical forest science and management. What they refer to as "domestic forests" are managed mostly by farmers, and are described as a "conceptual continuity of planted forests with the natural forest, in matters of vegetation's structure and composition as well as economic traits and ecosystem services" (p. 1). Michon *et al.* describe local management practices from around the world that share similarities with those practiced in Mazagão. Pinedo-Vasquez *et al*. (2002), Michon *et al.* (2007), Padoch and Pinedo-Vasquez (2010), and Pinedo-Vasquez and Rabelo (2002) describe the regenerating forests resulting from this type of management as uneven-aged forests with several strata containing high species diversity and producing a wide range of economic products. Padoch and Pinedo-Vasquez (2010) call for the inclusion of this type of swidden agriculture in the forest conservation paradigm; here we call for including "domestic forests" that result from swidden agriculture in the community forest management paradigm. This should also be recognized as an acceptable form of forestry, both nationally and internationally.

Community forestry initiatives should be designed in a way that is compatible with the needs, desires, and practices of the communities in question. This paper outlines several aspects of community forestry that community members want from forest management, including

preferred governance structures, perceived benefits, and management practices. Having pointed to differences in these aspects across the case studies, the importance of considering individual community contexts and desires is highlighted. While the desired benefits from forest management were quite similar across the case studies, the preferred route to achieving those benefits (in terms of management practices and governance structures) varied. The Mexican community forestry model, as exemplified in Caobas and Naranjal Poniente (or even more famously successful models in Mexico such as Ixtlán de Juarez (Molnar*, et al.*, 2007)), is often looked to as a model for promoting community forestry in other regions. While there are no doubt many lessons to learn from such cases, such models will not work the same everywhere. For example, what emerged as particularly important to Mexican communities (a collective community ethic) was clearly not echoed in all communities.

Yet, consideration of local needs and practices does not always occur (see Chapters 2 and 3). On community forestry initiatives in the Amazon, Medina *et al.* (2008) comment that

> "[these] initiatives are often not compatible with local realities and development agencies require local communities to manage their forests according to priorities determined by the agency" (p. 1).

As one resident of Mazagão commented,

> "The government lacks the knowledge of the extractivist lifestyle necessary for survival in the forest. The government doesn't understand the [management] techniques."

A municipal government representative of Mazagão (external to the community) commented on local management practices:

> "it's not really management that they're doing. Well, they have been doing *some sort* of management, but if they had a management *project* [italics added for emphasis], they would be able to sell their timber [legally] and fetch a better price."

This quote is an example of how interventionists (in these case studies and beyond) have historically seen forest management projects – they consider legal forest management to be something different to the management of the forest that is already occurring.

Development initiatives often bring the status quo approach to forestry to a community so that the communities are able to comply with legal requirements, but these requirements often fail to take into account site-specific, traditional practices that integrate forestry and agriculture. In the case of Mazagão, the planned government-sponsored intervention (see Chapters 2 and 3) does not even take into account the smallholders' preferred governance structures. In the Brazilian state of Amazonas, community forestry promoters are trying to find a way to balance local preferences with new forestry models; they are supporting individualized management for smallholders, while coordinating harvesting and operations collectively in order to create the necessary volume to reach the right markets (S. Gonçalves, IDAM – Instituto de Desenvolvimento Agropecuario e Florestal Sustentável do Estado do Amazonas, personal communication).

4.4 Conclusion

For community forestry initiatives to be relevant to the local communities they are meant to be supporting, the initiatives need to take into account what the community wants from forest management. This conclusion has been reached several times in the past, yet interventionists (conservation and development interventionists, government institutions, etc…) still do not always take this into account, either because they are working within the limitations of a national and local legal framework that does not recognize informal, traditional forestry practices, or because they are promoting a status quo view of forestry that is incompatible with traditional practices.

Here, a starting point for designing community forestry initiatives is presented: a method for identifying the needs and wants of the target beneficiaries of the intervention. This exercise identifies the community's own aspirations for forestry projects. The exercise of producing such lists is useful for defining project goals in a way that is more meaningful to the community, and importantly, for identifying appropriate processes that will be used to reach

these goals, processes that are also compatible with community aspirations, interests, and existing institutions and local practices. While many different aspects of forest management that should be considered by external agents when designing interventions are listed here, these lists can also be used by community members when designing and/or monitoring their own initiatives; local forest managers will have a better idea of what is important to the community as a whole in monitoring local forest management practices.

From the case studies of Brazil and Mexico presented here, important intervention design elements were identified that can be useful to consider in promoting community forestry initiatives in other regions. It is apparent that initiatives need to go beyond the production of timber, which has, in many locations, been the principal focus of interventions. In both countries, timber management was only one of sometimes many livelihood strategies, economically, temporally, and sometimes spatially, and that the target beneficiaries for these interventions consists of farmers – likely to be the case in other regions of the developing world as well. This indicates that a livelihood approach needs to be considered when implementing community *forestry* projects. However, while some themes emerged as common to all case studies, there is no universal model or rule that can be applicable in all situations; site-specific details emerged from all the cases and, thus, interventions should be modified accordingly after having repeated such an exercise in other locations.

It will take creative solutions to successfully harmonize community needs and practices with the needs and practices of society and markets external to the communities. Agents of conservation and development still have a role to play in this, but this role needs to be rethought to involve more of a bottom-up approach. Using a bottom-up approach to define goals of community forestry revealed that a shift in frame of reference is needed – away from a timber-only focus to a complete consideration of local livelihoods. This will take some rethinking of how such initiatives are designed, and a re-evaluation of interventionists' goals and definitions of good forest management.

5 CONCLUSIONS

Community forestry is a promising development path for forest-dependent people, a path that has the potential to integrate conservation goals with poverty reduction and consolidation of traditional land rights in rural areas. Indeed, in many places, community forestry has succeeded in achieving such goals. However, there are many situations in which this promise has yet to deliver on-the-ground results. This dissertation contributed to answering the question of why some of these initiatives are still struggling, and suggested a path forward that deviates from current practices.

This research provided further insights on the community forestry experience in the Brazilian Amazon and the Yucatán Peninsula of Mexico, from the perspective of the community member/local forest user. This perspective is unique in a field dominated by an "expert discourse" (Medina*, et al.*, 2009b, p. 1), where local ideas for forest management are often ignored (Medina*, et al.*, 2009a; Medina*, et al.*, 2009b), local knowledge is not given the same weight as official scientific knowledge (Blaikie, 2006), and local interests are not considered in designing interventions (Edmunds and Wollenberg, 2003b). This dissertation was an attempt to make the local perspective heard – to use locally-defined criteria to assess the aspects of community forestry that are important to the local forest user. This research tried to avoid bringing to the table preconceived notions of what community forestry should look like and what the rules of engagement should be. Instead, it sought to go to the local forest user and hear what he/she had to say about what aspects of forestry were important to them and their community, and what was constricting their ability to manage the forest and/or run a forest-related enterprise.

In this sense, this research sought a bottom-up approach to better understand local practices, processes and attitudes. I do not claim that this bottom-up approach has revealed the solution to all problems facing community forestry, it merely adds an important and understudied

perspective, the perspective of the people that are meant to be empowered by such community forestry initiatives.

A common theme that runs through Chapters 2-4 is that of the balance of power between the community and agents outside the community, which still seems to be skewed towards the outside agent despite the continued rhetoric of community empowerment. A central tenet of community forestry, it can be argued, is to empower local communities by putting economic and social development into their own hands. This is done by devolving rights and ownership over natural resources to the local level and supporting the community in carrying out sustainable and profitable forest-related activities that contribute primarily to community well-being. However, terms such as 'sustainable' and 'profitable' are often defined outside the community. Sustainable forestry as a concept comes pre-defined as a package of practices that meet international or national norms of forestry and often does not take into account local and traditional practices (see Chapters 1 and 4). Profitability, narrowly defined as positive net income, is seen by intervening agents as the primary goal for the community enterprise. While community forestry initiatives need to produce enough profits to stay afloat and keep participants engaged, case studies explored here make the point that, unlike private enterprises, communities are less likely to aim for maximizing profits in forestry to the detriment of other values such as well-paid employment opportunities, time for other livelihood activities, availability of NTFPs, and in some cases, ensuring equal distribution of benefits and opportunities (Section 4.3.2). Yet it is rare that the community is the one defining these terms.

This dissertation explores this balance of power. Chapter 2 draws the boundaries around the amount of forest management authority the community has by outlining what they do and do not have decision-making power over. It also highlights the influence that outside agents have on shaping local practices and decisions (Section 2.4). Within the limitations of this power structure, Chapter 3 points to concrete challenges that communities must overcome. Some of these challenges, such as insecure land tenure and overly demanding legal regulations that do

not recognize local practices, link back to the imbalance of power away from the community (Section 3.4.2). Chapter 4 offers a way forward by putting more power in the local forest user's hands, simply by having the forest user play a vital role in defining the goals and processes of the forestry intervention, thus ensuring an intervention that is more attuned to local needs and practices. Aligning the goals of the interventionist with the goals of the communities is essential to re-balance the power structure, or even tilt it towards the community for enhanced community empowerment.

5.1 Addressing the research objectives and contributing knowledge to the field

This research assessed the status quo of community forestry in the Brazilian Amazon and Yucatán Peninsula of Mexico, in terms of the challenges communities face and the amount of authority they have over the forest resource, and made recommendations for advancing community forestry based on local forest users' needs and wants.

5.1.1 Objective 1

The first objective of this dissertation was to assess the amount of decision-making power the local forest user has over the forest resource. Chapter 2 addressed this objective by creating a framework that identifies criteria of relevance to community members' rights and day-to-day activities, and using this to qualitatively assess the amount of forest management authority that has been devolved to the community or local forest user. Findings suggest that in both countries, the government has retained significant amounts of control over forest resources through regulation of extraction of wood and, in some cases, non-wood products (Section 2.4).

This is a common finding in other regions around the world where governments have tended to obfuscate resource right transfers or limit the kinds of powers transferred. (Edmunds and Wollenberg, 2003b; Larson, 2005; Larson*, et al.*, 2008a; Ribot*, et al.*, 2006; Wittman and Geisler, 2005). In Central and South America, Larson *et al*. (2008) and Wittman and Geisler

(2005) found many cases where the bundle of forest rights granted to communities continued to be limited by restrictions on use, with the state authorities continuing to play a central role in decision-making. In Canada, Forsyth *et al.* (forthcoming) concluded that increasing access to the forest resource by aboriginal communities has not resulted in an increase in decision-making power. Edmunds and Wollenburg (2003b) document several cases in South and Southeast Asia where state authorities continue to heavily influence management objectives in community forests. Mbatu (2010) found that in Cameroon, the centralized power structure continued despite legislative changes in the 1990s that promised more bottom-up management processes.

However, in breaking down the elements of forest management of specific interest to the community, it was revealed that the case study communities in this research have high decision-making power over use of forest products for subsistence purposes, and are gaining more control over day-to-day decisions for the commercialization of forest products, including timber (Table 2). Importantly, benefits from forest management are now for the most part fully reaching the community, except for the community-company partnership (Table 2). This is quite a difference from the position a few decades ago in both Brazil and Mexico, where communities had few rights over forest resources, and received little in terms of benefits from forest industries operating in their areas. However, as has been the case in several community forests around the world, benefit distribution remains unequal within the communities studied here. Importantly, elite capture in these cases was not as prominent as it has been in other cases (for examples and reviews, see Pulhin, 1996; Brown and Lassoie, 2010; Ribot, 2004; Mansuri, 2004).

Thus, it is useful to use such a framework as the one created here (Figure 2) to divide into components the different elements of forest management of importance to the community in question; this revealed that some advances have been made in the amount of power transferred to the community, but communities are still far from being in charge of the development of their own forestry activities. This framework can be further enhanced by

combining it with other frameworks that measure participation, such as Arnstein's ladder of citizen participation (Arnstein, 1969), or Forsyth *et al.*'s framework to measure participation in co-management structures (Forsyth et al., forthcoming); combining these can produce an assessment framework that provides more information on the quality of power that communities have over each of the elements identified in Figure 2.

5.1.2 Objective 2

The second objective was to outline the challenges faced by community and local forest enterprise owners. Chapter 3 addressed this by building a framework showing the challenges to community forest management in the eastern Brazilian Amazon and highlighting the interrelatedness of these challenges (Figure 3). The framework showed that in the development phase of the forestry initiative, four root problems (land ownership, knowledge acquisition, community organization, and adequate financial capital) need to be addressed to obtain legal management permission. With this permission in hand, further challenges to operationalization are presented (deterring illegal loggers, maintaining infrastructure, obtaining necessary managerial skills and accessing markets).

Several of the challenges identified in the Brazilian case studies are common to community forests around the world, in both developing and developed countries. Land tenure insecurity was identified as a major challenge determining outcomes in several multi-site studies (Macqueen, 2010; Molnar*, et al.*, 2007; Pagdee*, et al.*, 2006). Community forests in North and South America, Asia and Africa struggle with market access and financial viability (Barry & Associates Consulting Inc., 2005; Gough*, et al.*, 2010; Pokorny and Johnson, 2008; Pokorny*, et al.*, 2010; Scherr*, et al.*, 2003a), variable local management capacity (Porro, *et al.*, 2007; Bullock and Hanna, 2008), and local imbalances of power and internal conflicts (Bullock and Hanna, 2008). Strong leadership and community organization have also been identified elsewhere as important factors in governing common resources (Ostrom, 2000; Varughese and Ostrom, 2001; Taylor and Zabin, 2000).

Yet few studies have produced a more complete and grounded picture of the challenges that a community forest enterprise will face, in its initiation and maintenance. The framework produced here uniquely produces such a picture, by highlighting the interrelatedness of these challenges; this interrelatedness emphasizes the need to address all the challenges in a holistic manner in order for communities to maintain a profitable and self-sufficient operation (Section 3.4.2). This message counters current practice in many parts of the Brazilian Amazon. Pilot initiatives there often focus on training community members on forest inventory and reduced impact logging techniques, while neglecting training on business management skills or neglecting infrastructural needs. If a project-based approach to community forestry is followed, where funding from an external agency is poured into a particular community to advance a specific community forestry model, then the community enterprise involved will need support to overcome all the challenges laid out in this framework. Considering that many community forestry enterprises suffer similar setbacks the world over, this framework can be used as a starting point for practitioners elsewhere to identify challenges to self-sufficiency, while recognizing the need to adjust the framework to reflect the nuances of particular contexts. For example, the framework produced here was used to guide discussions with the Haida Nation in British Columbia, Canada on their community forest management (Gough *et al.*, 2010). The framework was found to be a useful tool to describe the upcoming challenges that the Haida expect to face as they begin to have more control over forest management on their traditional lands. The framework was, however, modified to take into account their unique situation and perspective.

5.1.3 Objective 3

The third objective was to ascertain local perspectives on and goals for forest management practices in order to integrate them into current intervention models. Chapter 4 addressed this by identifying the needs and wants of local forest users in relation to forestry activities. These can be useful in defining goals for forestry projects that are more meaningful to the community, and in identifying appropriate processes to reach these goals. This chapter presses the point that forestry interventions that are overly focused on timber production need to be

harmonized with other livelihood strategies, particularly agricultural practices (Sections 4.3.2 and 4.3.3). The diversity of goals expressed by the different case study communities (Tables 4-6) underlines the fact that site-specific models of intervention will be needed to take into account the variety of contexts and community desires. Again, these results counter the conventional way of introducing community forestry in many places. Community forestry has been dominated by decision-making by offsite experts with limited input from communities, in Brazil (Medina*, et al.*, 2009a), elsewhere in Latin America (Sabogal, *et al*., 2008), India, China, and the Philippines (Edmunds and Wollenburg, 2003b). In many locations, introduced community forestry models tend to replicate models deemed successful in other locations without consideration of local contexts (Edmunds and Wollenburg, 2003b). Forestry practices which have been developed for large-scale forest industry have been imposed on community forests in places as diverse as Brazil (Amaral and Amaral Neto, 2005; Benatti *et al*., 2003), Canada (McCarthy, 2006) and Cameroon (Oyono, 2005).

The exercise undertaken in Chapter 4 can be repeated in other jurisdictions to determine local goals in forestry interventions, but the goals identified in these case studies might have limited applicability elsewhere, given unique community contexts. In some cases, the goals identified by communities may be similar to the ones identified here, but preferred routes to achieving those goals, in terms of governance structures and management practices, may differ. Thus, this exercise can also be used to determine appropriate processes for goal achievement. I do not argue that offsite experts and conventional or scientific forestry have no role to play in community forestry, but I do suggest that the models of forestry that are being promoted in such communities should be heavily informed by local practices, and the local forest user's perspective should be used to design such interventions.

5.2 Implications for the actors

By endorsing the local forest user's perspective throughout, this dissertation adds a local perspective to the problem of how to improve the community forestry experience. The results of this dissertation can be useful to communities and local forest users as they begin formalizing community forestry activities. The framework of challenges presented in Chapter 3 can be a useful roadmap of anticipated challenges that should be considered when, for example, writing a business plan for a community enterprise in the Brazilian Amazon. Producing lists of community-identified goals (Chapter 4) can also be done by community members when designing and/or monitoring their own initiatives; local forest managers will have a better idea of what is important to the community as a whole in monitoring local forest management practices. Both the framework and the goals identified here (Figure 3 and Tables 4-6) can be used as a starting point for work in other locations, but would of course have to be adjusted to accommodate local contexts.

But perhaps more than to the communities themselves, this dissertation speaks to those intervening in communities, intervening for the well-intentioned purposes of social and economic development, natural resource conservation, or a combination of the two. This research points to many possible recommendations to different intervening agents promoting community forestry initiatives. Many actors besides community members themselves are involved in promoting community forestry globally. These include government agents at different levels, inter-community associations, local and international environmental NGOs, researchers, local and international development agencies, and international policymakers. Here, I address a few of the most important actors.

Clearly, national and state governments continue to play a large role in promoting, and in some cases impeding (Section 3.4.2), community forestry, and the results of this thesis lead to recommendations in several areas that governments have an influence over. Despite the decentralization rhetoric, governments still retain a good amount of control over community forests worldwide (Edmunds and Wollenberg, 2003b; Larson, et al., 2008a; Ribot, et al.,

2006; Wittman and Geisler, 2005). Policymakers still have to decide what amount of decentralization of forest governance is appropriate for their jurisdiction, given possible benefits that can be had with more local control, and possible drawbacks. The results of this thesis in this respect are perhaps not as telling as larger scale projects such as that of Chhatre and Agrawal (2009), showing an association between greater rule-making autonomy at the local level and high carbon storage and livelihood benefits in 80 forest commons around the world. But it is clear that with the transfer of rights, appropriate incentives and support for community forests are needed to make for a successful outcome.

Chapter 3's framework of challenges (Figure 3) can be seen as a road map of the different types of support that will be needed. The framework provides many entry points for both governmental and non-governmental institutions and development agencies, in terms of providing support for technical training, business management, infrastructure development, etc… The message reiterated from the above section is that interventionists need to consider the challenges framework as a whole, and not just focus on one or two aspects and then expect the community enterprise to run smoothly on its own after the project funding has terminated.

However, two aspects of the challenges framework are solely in the realm of government: land tenure, and excessively burdensome management plans and legal requirements (Section 3.4.2). Government land tenure policy needs to be clarified in order for community groups to obtain legal title to their lands or to obtain legally recognized use rights, which can then in turn be used to overcome other challenges such as obtaining financing and management plans. This has not been a problem in Mexico following the century-old agrarian reform, but continues to plague communities in Brazil and other countries. On legal requirements of forest management, Ribot (2004) argues that central governments should be able to set and enforce minimum standards for resource extraction by local groups to ensure sustainable management without excessively burdensome management plans. However, in Brazil, burdensome management plans remain a principal reason why many local forest users forgo

legal pathways for extracting and selling timber (Section 3.3.1.1). The process by which such plans are acquired needs to be made cheaper and more accessible to the community forest user, and this can be done in two ways. One, is to make the process less laborious, time-consuming, and technical, and more accommodating to different community governance structures. Secondly, traditional forest management techniques, some of which are described in Section 4.3.3, need to be taken into consideration so that legal requirements do not contradict local practices, or even criminalize them. With a legal framework that is modified to value local practices, intervening agencies (governmental or non) will have more leeway to accommodate local practices and livelihoods in designing interventions.

Formal forestry education has a role to play in this. Guariguata and Evans (2010) state that education of foresters across the tropics on NTFPs, multiple use management of forests, and engagement of stakeholders is limited and underdeveloped. They suggest that, in Latin America, the lack of knowledge among graduates of technical and economic aspects of multiple-use management and participatory approaches to forest resource use is partially due to the apparently limited interest of the government in promoting multiple use of forests, possibly due to the low contribution that NTFPs make to the national economy. As national governments are still major employers of forestry graduates across the tropics (as cited in Guariguata and Evans, 2010), these graduates are the technicians working with communities and promoting various forestry practices in community forestry models. These graduates need to be adequately trained to work with local communities in a more participatory manner, and a greater understanding of local practices should be an essential component of their education.

5.3 Research limitations and future work

As with most research, there are several limitations to this work, some of which provide interesting avenues for future work.

Case study research presents a set of research limitations. Considering that this work was based on six case study community forestry models, the ability to generalize from these cases is limited. As much as possible, I have sought to support the results of each chapter or corroborate my findings with existing literature and theory, as well as through theoretical replication in my case study choices, to illustrate that my general findings are not unique to any one case. Hopefully, this has strengthened the conviction of my conclusions and enhanced external validity. If funding and time had allowed for it, revisiting the communities to validate the study's findings would have been ideal. It would be useful, for example, to have the community members prioritize *ex-post* the lists produced in Tables 4-6, in order to have a better idea of which aspects of the long lists are of such importance to the community as to be non-negotiable in designing future interventions. Revisiting the communities and seeking their approval of the results would also help to address another limitation to this work: the assumption that I, as a non-local, was able to truthfully represent the local perspective. This would have also helped to tease out any researcher subjectivity that may have occurred while undertaking the grounded theory methodology.

Qualitative methodologies were used for data collection and analysis, which presents the limitation of not being able to extrapolate the results to the entire population under study (i.e. the population of individuals in each community and also the population of communities in a given study region). This research opted for an in-depth understanding of certain processes and community forestry models, rather than generalizability; an inevitable trade-off. Within each community, an attempt was made to collect different view points by interviewing community members involved in different forest-related activities, of both genders and different age groups, but a formal stratified sample was not sought.

Replicating this research in other locations would help to validate the conclusions, and also provide essential information about the community forestry experience in other jurisdictions. The framework produced in Chapter 2 (Figure 2) could be used as a way to compare and contrast decentralization processes across multiple countries. The validity of the challenges framework (Figure 3) could be tested in other locations. This has already been partially done in one location (Gough*, et al.*, 2010), resulting in some fine-tuning of the framework for the specific context. Finally, the exercise of producing locally-defined goals of community forestry (Tables 4-6) can be useful for other jurisdictions interested in promoting community forestry in a more bottom-up manner.

An alternative to using the grounded approach to address objective 2 would have been to create a framework based on a thorough review of examples of community forestry challenges in the literature and the theories behind these challenges. Different relationships between the elements of this prefabricated framework could then have been individually tested as hypotheses in the case studies to validate the robustness of the framework. While there is merit in choosing an approach that makes use of the existing, substantial body of literature on community forestry challenges, such an approach would not have reflected the voice of the local forest user in the same way that my chosen approach has, thus running counter to the goal of this dissertation: to provide insights on the community forestry experience from the local perspective.

While this thesis used the two case study regions to provide a variety of cases, a more comparative approach between the two regions would have been interesting and could have provided valuable lessons in community forestry experiences between the two countries. The comparative approach could examine how factors within and outside the community have influenced the progress of community forestry in each country.

5.4 Some final thoughts

I do believe that community forestry has the potential to achieve much of what it is theoretically meant to, and that listening to the voice of the local forest user is essential in achieving this. But to say that I am a strong advocate of bottom-up processes instead of top-down processes is perhaps too simplistic. I do not think it likely that central governments will relinquish complete control of forests, nor do I necessarily think that it would be a good idea to, and especially not if they are unable to provide the proper incentives and support to communities to ensure sustainable natural resource management. There will be aspects of community forest management that will likely remain outside of the community's purview, some for good reason. But without the community member playing an essential role in the design, strategic planning, and everyday activities, community forestry will have failed to achieve at least one of its goals: empowering the local forest user.

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APPENDIX A – INTERVIEW SCRIPT

The following questions were used as a preliminary basis for conducting interviews in the case study communities. Interviews were conducted in Portuguese in Brazil and in Spanish and Maya in Mexico (with the aid of a Maya/Spanish interpreter), and so questions were translated into the local language and I attempted to include local colloquialisms for clarity. Given the varied nature of the community forestry models and contexts studied in both countries, adjustments were made to the questionnaire for each community. In addition, the semi-structured, open-ended nature of the research resulted in deviations from the original interview scripts, and these are not captured below. Some of the forest management questions were asked on guided walks.

General questions about the community and forest operations, addressed to community leaders/elders only:

How long has the community been settled here?
How many people live here?
[Depending on how old the community is] How many people lived here 50 years ago? 10 years ago?

Who owns this land?
Are there any specific legal rules you have to follow concerning your forests?
Are there customary regulations or laws that the community follows?

Are there forest plantations? Protected forest areas? Agriculture areas? Pasturelands?

Are these communally owned/managed or do individuals or families manage them?

Forestry Operation

Who owns this enterprise?

Could you describe to me how the forestry operation here works? [prompt – felling, extracting, machinery]
Are the logs processed within the community?
    [If not] How are they sold and processed, and to whom are they sold?
    [If they are processed] What types of products are produced?
Where do you sell the product?

What types of trees are harvested? For selling? For local use?
What type of non-timber products are harvested from the forest? For selling? For local use?

Do you plant trees? Do you protect certain patches of trees to: promote natural regeneration; provide particular environmental services; ensure access to certain forest products? Do you cut down undesired plants?

Do you have a management plan?

[if yes] Who prepared the plan?

How many people work in forestry? [if sawmill is in community] How many people work in the sawmill?

How are benefits distributed within the community? [prompt: Are the profits reinvested into the forestry operation? Invested in other community projects? Profits distributed among forestry workers/community members?]

Decision making

How does the decision-making process work? Who makes the day-to-day decisions? What about bigger decisions, like annual cut, investments, etc.? [prompt: are there special committees? Does the community as a whole vote on things]

How often are there community-wide meetings? Are forestry issues discussed during this time? Do community members vote on forest management issues?

Are community members generally included in decision making? Does everyone have a vote?

Historical aspects

Tell me a bit about how the history of the forestry enterprise [prompts: outside help? Financing? Infrastructure? Organization?]

Has your community always managed their forest in this way?

[If not] what did the management system look like before?

Why did you decide to change the system? Was it an internal decision from within the community?

What are some benefits that have risen from this change in management practice - benefits to the community, and benefits to the forest?

Do you have problems with encroachment on your land, or illegal logging? If so, how is/was this controlled?

What are some challenges that your community has faced with regards to the forest operation? [prompt: internal/external]

Questions addressed to all interviewees:

What is your name?
How old are you?
Number of children/location?

How long have you lived here?

Principal activity/occupation?

How much land do you have? Does this land belong to you?
What do you plant?
How much land do you clear every year?

Do you make more money in agriculture or in forestry?

What products do you use from the forest? [prompt: timber, firewood, NTFPs]

Do you sell any forest products?

Where do you sell them? Do you have any problems selling?

How do you spend the money you get from selling timber/NTFP?

Ok, now I'm going to ask you some questions about your opinions on forests and forest management. Please keep in mind that I'm not looking for a right or wrong answer, just your own opinions and perceptions.

In your opinion, what is forest management?

How does forest management benefit you and your family? The community? The forest?

Do you think forest management has a negative impact on the forest? On the supply of NTFPs? On animals that you hunt?

How would you judge if the forest was being managed well?

Do you do anything to help the trees regenerate?
Do you protect any particular trees or forested areas?

There are national laws and rules that you have to follow when you manage the forest. Do you feel that these laws restrict your activities or how you would want to use the forest?
Does the community value the forest more now?

Relationship between forest enterprise and community and external bodies

Has the forest enterprise benefited the community? Has it brought any problems?

How do you see the community's relationship with the inter-community association/NGO/company/government agency?

Challenges

What are some challenges/problems that you've had in managing the forest/running the enterprise [prompt: internal/external]

How can the situation be improved?

How do you see the community/forest enterprise in the future?

Decision-making

Do you participate in the community meetings?

What are these meetings for?

Do you feel included in the decisions of the community? Can you present your opinion in the meetings?

Is it difficult to come to agreement about forestry issues?

APPENDIX B – MAPS SHOWING LOCATIONS OF CASE STUDY COMMUNITIES

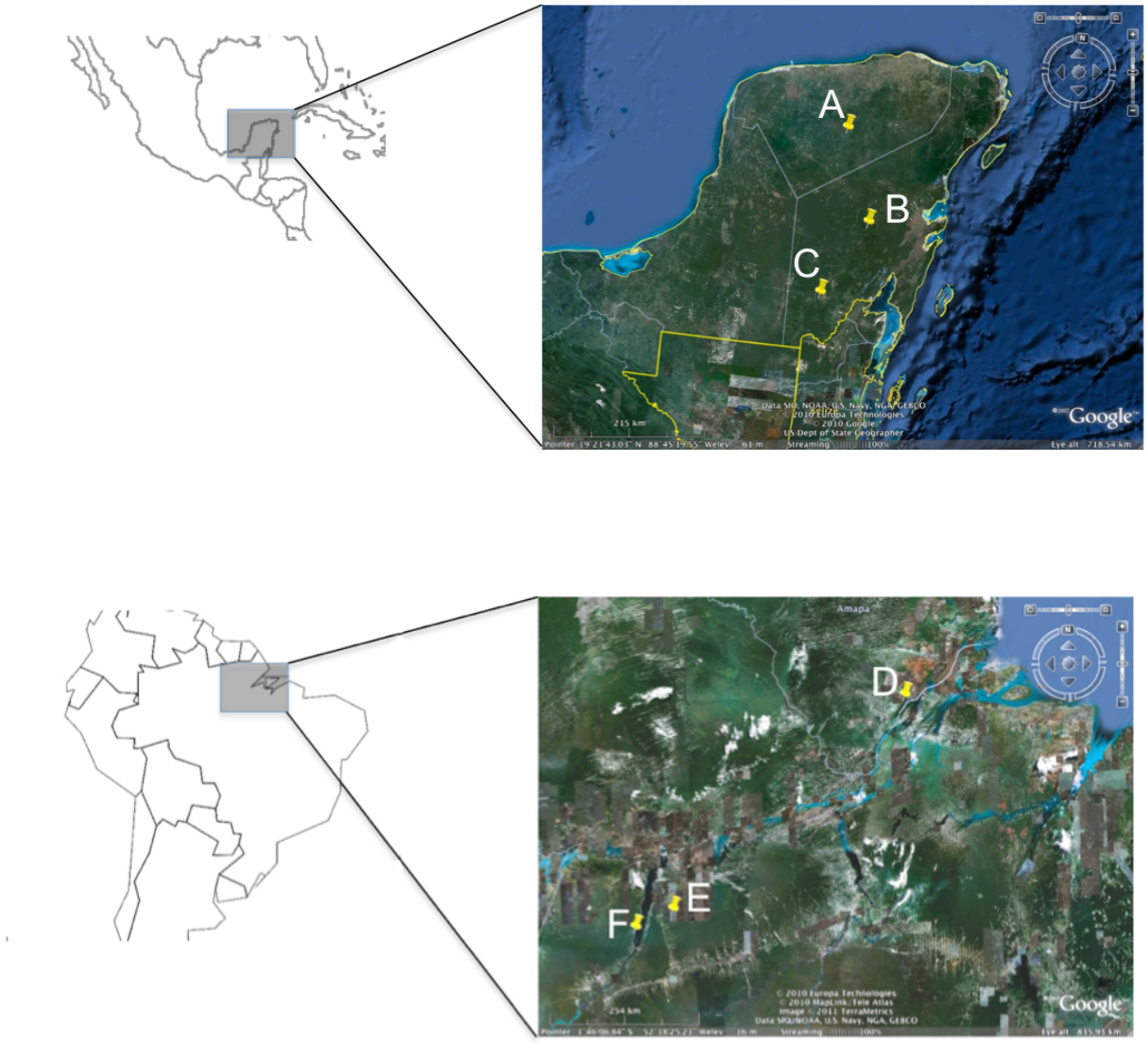

Figure 5 Locations of case study communities in Mexico and Brazil
A: Yaxcabá, Yucatan (Mexico); B: Naranjal Poniente, Quintana Roo (Mexico); C: Caobas, Quintana Roo (Mexico); D: Mazagão, Amapá (Brazil); E: Igarapé da Anta and Santo Antonio, Pará (Brazil); F: Nova Vista and Nuquini, Pará (Brazil)
Maps adapted from Google™ Earth