



2014

CARBON FORESTRY: PURSUING CLIMATE CHANGE MITIGATION AND POVERTY ALLEVIATION THROUGH MARKET-BASED FOREST CARBON SCHEMES IN CHIAPAS, MEXICO

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CARBON FORESTRY:
PURSUING CLIMATE CHANGE MITIGATION AND POVERTY ALLEVIATION
THROUGH MARKET-BASED FOREST CARBON SCHEMES IN CHIAPAS, MEXICO

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Arts and Sciences
at the University of Kentucky

By

Jonathan James Otto

Director: Dr. Tad Mutersbaugh, Professor of Geography

Lexington, Kentucky

2014

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ABSTRACT OF DISSERTATION

CARBON FORESTRY: PURSUING CLIMATE CHANGE MITIGATION AND POVERTY ALLEVIATION THROUGH MARKET-BASED FOREST CARBON SCHEMES IN CHIAPAS, MEXICO

Forest carbon projects seek to alleviate rural poverty and mitigate global climate change by facilitating the flow of capital from actors looking to offset CO₂ emissions to land managers willing to engage in offset-oriented reforestation, afforestation, and forest preservation activities. In Mexico, forest carbon schemes have been pursued within the country's national Payment for Ecosystem Services (PES) program, and through REDD+ pilot projects and separate voluntary initiatives. In this dissertation, I explore one voluntary project, Scolel' Te, which is managed by the non-governmental organization (NGO), AMBIO. Focusing on the case of Scolel' Te, I show how forest carbon projects undermine social relations in ways that weaken participating communities and threaten project success. First, I examine how carbon forestry market integration undermines social relations by pushing risk on participant labor and encouraging the establishment of disenfranchising labor arrangements. Second, I analyze how farmer participation in Scolel' Te undermines social relations within broader community settings. Such effects, I argue, are only visible when analyzing the social ramifications of carbon forestry within the context of intra-community social relations. Finally, drawing on labor studies, I critically re-assess the role of participatory methods in carbon forestry, suggesting that they undermine the social relations of production between farmers and project managers, thereby threatening project success. This analysis demonstrates how shifting market dynamics, historical factors, and labor processes converge in the context of carbon forestry, and underscores the implications of such work for participating farmers and carbon forestry more broadly.

KEYWORDS: Carbon Forestry, Mexico, Labor, Political Ecology, Development

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ACKNOWLEDGEMENTS

Countless individuals and organizations have assisted me in completing this dissertation. First and foremost, my appreciation goes to AMBIO, to the two communities who collaborated with me in this research, and to the Fulbright Foundation and Inter-American Foundation who provided funding for this dissertation research. Without your generosity and support this dissertation would never have been completed. I am indebted to AMBIO for allowing me to research their organization and their program. You opened your doors to me and shared your time, and for that I am extremely grateful. To the families in the two communities who generously welcomed me into their homes, and who taught me so much more than this dissertation could ever reflect, thank you. Finally, thank you to the Fulbright Foundation and Inter-American Foundation which provided me with generous funding for this research, and which connected me to dear friends, accomplished scholars and professionals who both inspire and motivate me. It is my hope that this research facilitates and encourages the continued pursuit of development and environmental conservation projects that are truly enriching and empowering for all who are involved.

I am extremely grateful to my dissertation advisor, Tad Mutersbaugh, for his dedication to my growth as a scholar and for shaping how I know and think about Mexico. Tad's commitment to my research was unending, and his energy and enthusiasm were constant. Moreover, his feedback and insights were central to the completion of this dissertation. Tad, this dissertation would not have been completed without you. I am also grateful to my dissertation committee - Sue Roberts, Morgan Robertson and Lisa Cliggett – for their support and feedback throughout the research process.

Thank you to my family for your love and support. You were patient with me throughout the process, and you believed in me even when I did not believe in myself. The dissertation research and writing process would have been unimaginable without you. I love you and am forever grateful for your presence in my life.

Finally, thank you to my friends in Mexico and Kentucky who made the dissertation research ever more gratifying. Over the course of six years you very graciously and generously shared your lives, homes and time with me. You provided me sanctuary in times of need and encouragement in the face of doubt. I will never forget the horse rides, Ultimate Frisbee games and salsa dancing.

To all who accompanied me on this journey: you have inspired me and enriched my life. You were both the catalyst that sparked this endeavor, and the source of energy that encouraged its completion. I can only hope that the next adventure will be equally rewarding.

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CHAPTER 1: INTRODUCTION

Carbon Forestry and the Undermining of Social Relations

Introduction

In southern Mexico many development programs are designed to expand markets for various goods and services. They are often initially lauded by funding agencies, governmental ministries and managing organizations that suggest that the initiatives provide innovative options for alleviating poverty in the country's most impoverished region. However, despite the early fanfare, projects often disappear following a short initial burst of activity, regressing into a skeleton of unmet goals and broken promises. At times, the causes and effects of project disintegration are clear as initiatives fall victim to shifting funding priorities, to project mismanagement by corrupt organizations, and to opposition faced by supposed beneficiaries who contend that projects do not adequately align with their goals and livelihoods. In such instances, the implications of projects for participating communities are often clearly negative. At other times, however, a given project's inability to successfully achieve its goals of poverty alleviation and the roots of such failure are less visible. They become obscured by a project's outward appearance of success and by the sincere intentions of managing organizations.

In this dissertation, I examine the case of a carbon forestry initiative in Chiapas, Mexico, Scolel' Te. I argue that contrary to its outward appearance of success, the project shows how carbon forestry, like many development projects, undermines the very social relations upon which development and environmental conservation depend. I contend that social relations are undermined in three particular regards: 1) by enrolling farmers in unequal labor arrangements that disenfranchise participants; 2) by threatening the standing of participating farmers within their communities; and 3) by altering farmer relationships to their land in a manner that is blind to the many factors that shape farmer land-use patterns and resource management practices. Social relations represent a key component of rural community life in Mexico and are, moreover, essential to the long-term success of Scolel' Te. Thus, the destruction of social relations in the program is damaging to farmer livelihoods and is detrimental to carbon forestry initiatives as it erodes the very foundation upon which project success depends.

As a forest carbon project, Scolel' Te – which means “Tree that Grows” in the local Tzeltal language – is designed to alleviate rural poverty and mitigate global climate change by paying rural farmers to offset CO₂ emissions by establishing agroforestry systems. Payments to farmers are derived from the sale of carbon credits in international voluntary carbon markets, an

activity that is executed by the program's managing NGO, AMBIO. Scolel' Te began in 1994 and 1995, but has experienced its greatest growth under AMBIO since the organization's formation in 1998. According to Brown and Corbera (2003) from 1998-2003, under AMBIO's management, Scolel' Te grew from 47 farmers in six communities located in Chiapas' central highlands region to over 450 farmers in 20 communities in the central highlands and Lacandón regions of the state, including some in the neighboring state of Oaxaca. Participation expanded to over 650 farmers in 23 communities in 2005, and as of 2012, included over 1,100 farmers representing 77 communities and eight Mayan languages in Chiapas and Oaxaca (see Figure 1.1). While carbon credit production has expanded into Oaxaca (shown in light grey in Figure 1.1), primary production is located in Chiapas (shown in dark grey in Figure 1.1). The organizational structure of Scolel' Te consists of the managing NGO, AMBIO, the work of participating communities that are recruited and trained by AMBIO, and the work of regional and community technicians – *técnicos regionales* and *técnicos comunitarios* – who are trained in the technical aspects of project management, and who serve as liaisons between AMBIO and participating communities (see Figure 1.2).

Given Scolel' Te's successful expansion across Chiapas and into Oaxaca, and given the fact that AMBIO has managed to sustain project activities over nearly 20 years, the project is often considered to be a regional success story. On the one hand, AMBIO's efforts to mitigate global climate change through agroforestry projects have been recognized by the conferring of awards such as the National Forestry Merit Award (Premio Nacional al Mérito Forestal) by Mexican president, Peña Nieto, in 2013. On the other hand, the Plan Vivo Standard – the framework under which AMBIO's activities are organized – is widely recognized within the international carbon offset community to be an iconic participatory approach to environmental conservation and rural development. The standard, which originated in the Scolel' Te project, has garnered international recognition for the project and its managers. Such recognition positions Scolel' Te as a success story within broader international efforts to mitigate global climate change and alleviate rural poverty, and in a national context where the Mexican federal government has sought to take the lead internationally in REDD+ preparations (see Shapiro, 2010 and Shapiro-Garza, 2010). Thus, AMBIO provides a visible and influential case for examining how social relations are undermined in carbon forestry projects.

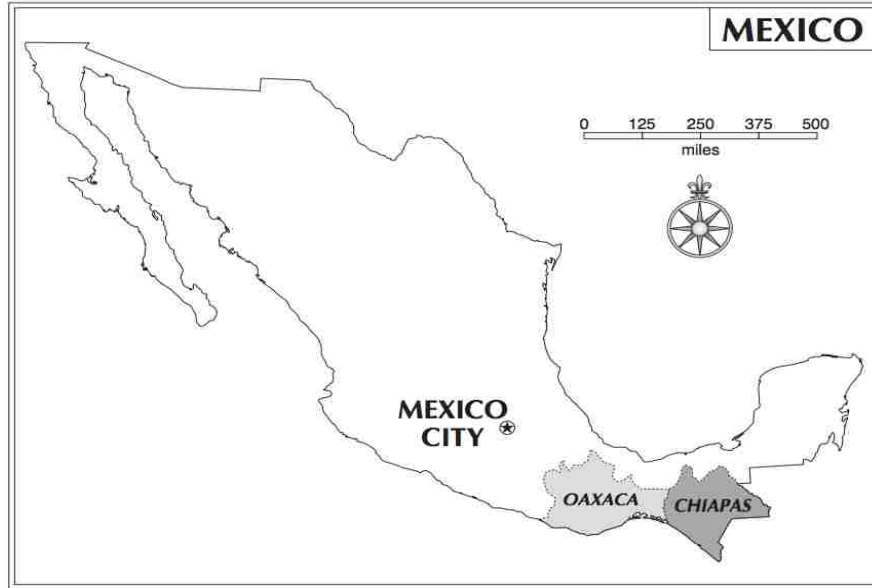


Figure 1.1 General Project Area of Scolel' Te in Oaxaca and Chiapas
Map Credit: Dick Gilbreath

In this dissertation, I focus on AMBIO's attempts to combine environmental conservation with social development within Scolel' Te, an approach that resonates with Osborne (2011). Focusing on the Lacandón region of Chiapas, Osborne assesses the manner in which laboring in Scolel' Te limits farmers' ability to produce subsistence and other cash crops, thereby acting as a form of enclosure. However, this dissertation departs from Osborne in four regards: 1) by shifting the regional focus from the eastern Lacandón region of Chiapas to the western Sierra Madre region; 2) by shifting attention from how laboring in Scolel' Te alters farming practices, toward how such work undermines participant relationships within their broader communities; 3) by assessing how farmers are exposed to risk through their participation in projects that are influenced by the unpredictable and fluctuating supply and demand dynamics within voluntary carbon markets; and 4) by uncovering the logics and motivations underpinning the labor arrangements in which participating farmers are enrolled. In doing so, this dissertation provides a nuanced understanding of how certain logics and broader market forces influence project management in carbon forestry and undermine social relations between AMBIO and farmers and among farmers within participating communities.

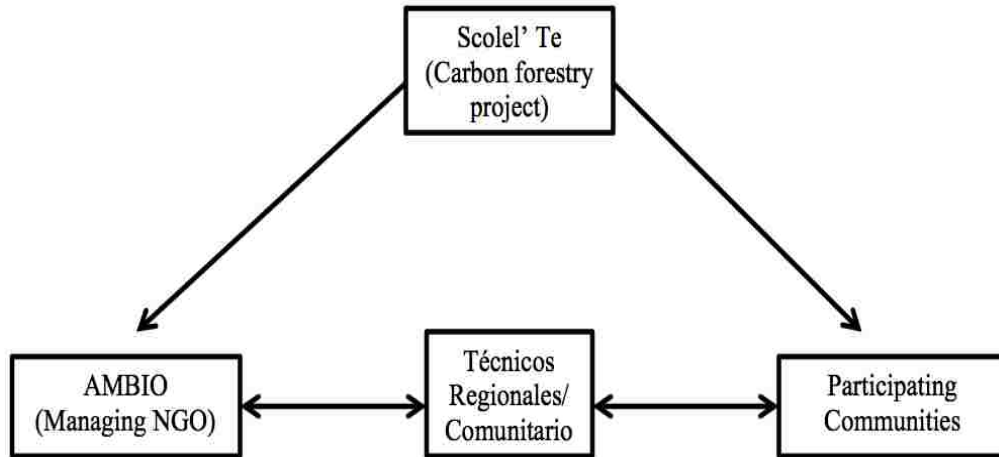


Figure 1.2 Organizational Relations in Scolel' Te

This dissertation draws from and builds upon work within political ecology that critically assesses the social and environmental effects of development. First, I take my cue political ecology work that emphasizes the need to contextualize development and shifting social relations within broader social, political and economic contexts (Peluso, 1992). Looking to Peluso, I argue that in order to understand how carbon forestry operates in Chiapas, it is necessary to situate it within the state's broader historical and contemporary political, social and economic context. Second, I look to political ecology work that recognizes that as social relations shift in the context of development practice, so too do peoples' relationship to one another and to the natural environment (see Carney and Watts, 1991; Peet and Robbins, 2011; Peet and Watts, 2004 [1996]; Schroeder, 1999). In this vein, I argue that social relations are undermined as a result of multiple forces – e.g. labor arrangements, market dynamics, management practices and differential power relations within communities – and that as social relations change so do farmer relationships to their communities and the natural environment. While drawing on several insights within political ecology, I also build on this work in important ways. Within political ecology, labor studies are tied to considerations of household labor, particularly in the context of development programs, shifting gender roles and wage labor (Carney 1996; Carney and Watts, 1991; Jarosz, 1996; Schroeder and Suryanata, 2004; Stonich, 1993). However, I expand on the use of labor studies in political ecology by looking explicitly at the labor processes of carbon forestry and the social effects of participation in such work. Moreover, I draw on global commodity chains literature as a means to situating carbon forestry within a broader carbon credit economy. By incorporating critical labor studies and global commodity chains perspectives, I am also able to uncover inequalities in the labor arrangements within the carbon credit commodity chain. In this

regard, this dissertation draws from and builds on political ecology work in an effort to create a diverse approach to analyzing how social relations are undermined in carbon forestry.

Argument 1: Carbon Forestry Market Integration Undermines Social Relations by Pushing Risk on Participant Labor

Carbon forestry is an extremely labor intensive process, and thus depends on AMBIO's ability to enroll farmers to work in Scolel' Te in an extended division of labor – a division of labor characterized by uneven power relations and the cheap work of técnicos comunitarios. Técnicos comunitarios carry out a variety of tasks related to the monitoring of farmer land parcels, responding to farmer discontent, and disseminating project information shared by AMBIO to fellow participants. They are, however, compensated only for the first of these activities, monitoring farmer land parcels, a component of the labor arrangement that is shaped by management decisions and external market forces. In Chapter 3, I demonstrate how the effects of shifting supply and demand dynamics within voluntary carbon markets restrict AMBIO's ability to meet project costs. Thus, as AMBIO sought to expand Scolel' Te into Chiapas' western Sierra Madre region, it was forced to respond to limited resources by reducing pay to técnicos comunitarios, who deem salaries insufficient given the work – paid and unpaid – that they are required to complete. The effects of such labor arrangements disenfranchise técnicos, some of whom threaten to abandon the project. In Chapter 3, I demonstrate how the nature of this labor arrangement reflects the capacity of those in relative positions of power to shift the consequences of limited resources and shifting market conditions onto those with no ability to influence budgeting and management decisions.

Work within political ecology provides critical insights into the effects of integrating environmental qualities and development initiatives into broader market structures. Examples have examined how broader market integration influences banana production and trade in St. Vincent and the Grenadines (Grossman, 1998) and mushroom harvesting in China (Yeh, 2000). Political ecology work highlights, moreover, the complications tied to commoditizing environmental resources such as water (Bakker, 2011) and to marketing and selling carbon offsets (Bakker, 2005; Buck 2007; Bumpus and Liverman 2008). However, despite the utility of this work for underscoring how broader market influences shape local experiences, it is often insufficient on its own for elucidating the specific structure of the chain of actors and activities involved in commodity production. Moreover, it is often silent on how broad market influences shape specific labor structures. In order to address these issues I respond to Bumpus and Liverman's (2011) call to use commodity chain perspectives to examine the interconnected nature

of actors and activities in carbon offset production. I do so by turning to commodity chains work, particularly in certification literature while also incorporating perspectives from critical labor studies.

Commodity chains literature is diverse, but is unified by a general concern with inequalities in the global economy, particularly as they emerge through rent-seeking behavior (see Gereffi, 1994). More specifically, commodity chains approaches examine links in the chain, noting that activities in one link may alter those in another. Commodity chains analyses within certification literature demonstrate, for instance, how certification requirements influence local labor practices such as those related to inspection activities in southern Mexico (Mutersbaugh, 2004). Such work illustrates, moreover, how certification requirements established by international certification boards located in the global north constitute a mode of environmental governance for the global south in which labor relations are re-worked according to the objectives of a given certification (Klooster, 2006). These perspectives may be usefully combined with critical labor studies literature, which recognizes the need to analyze the extended nature of production processes, with a particular focus on *pre-production* and *auxiliary* labor (see Sayer and Walker, 1992). Taken together, this work provides a useful framework for analyzing how shifting supply and demand dynamics within international voluntary carbon markets influence the formation of specific labor arrangements that ultimately disenfranchise enrolled farmers on whose work AMBIO depends.

Argument 2: Carbon Forestry Threatens Farmer Standing Within Participating Communities

Farmers participate in Scolel' Te for a variety of reasons, one of which revolves around the opportunity to enhance their standing within their respective communities. For técnicos comunitarios, the wish to build on one's intra-community standing is dashed as they become the subject of rumors and a source of mistrust in the face of unmet farmer expectations related to late payments and assumptions of corruption. These effects of carbon forestry on project participants are often invisible to managing NGOs and development practitioners, and are only observable when viewing carbon forestry in light of broader social relations within a given community. In this dissertation, I use the term 'prestige' as shorthand for these important respect and status relations. Prestige forms an important component of rural community life in Mexico, the presence of which facilitates one's access to resources and opportunities within and outside her community. A loss of prestige, however, alters one's ability to live a productive life as social relations deteriorate and mobility and access to resources become constrained.

In the Mexican literature, prestige is earned by one's demonstration of her commitment to her community through the completion of communal labor (Redfield, 1930; 1941), by her participation in religious ceremonies and the carrying out of responsibilities through the *cargo* system (Cancian, 1965), and may be earned through gendered positions of power within a community. It is a term that is attached, moreover, to one's age, and to highly gendered notions of masculinity such as *machismo* (see Gutmann, 1996). However, prestige is not strictly confined to men, as women too may fulfill the requirements of contributing to social life within their communities that may, in turn, result in the attainment of prestige relative to other community members (Stephen, 1991). Likewise, in Cambell's (1997) analysis of traditional healers in The Gambia she shows how connections to organizations outside one's community may also result in the attainment of prestige. However, in her study of the Glebo Liberian ethnic group, Mary Moran (1990) demonstrates that prestige may also be lost by women if they engage in activities that run counter to community social ideals. In this community and relational context, engaging with development projects is inherently risky: if projects fail, the negative reputational effects may be severe.

As these examples demonstrate, prestige is important to take into consideration because for many, the consequences of enhancing their standing within their community, or conversely, of damaging it, may have strong emotional and material effects related to ruined relationships, reduced mobility within a community, and limited access to resources and opportunities.

Within political ecology concepts of prestige and social standing have been discussed, albeit to a limited extent. Peet and Watts (2004 [1996]) note, for instance, that analyzing institutions – what they refer to as the “rules of the game” and the “rules-in-use” – is necessary for understanding how social actors gain access to and control over resources. Referencing Ribot (1998), Peet and Watts (2004 [1996], page 24) note that these “rules” constitute “prestige,” authority and access to opportunities in a given place. While Peet and Watts examine prestige in the context of institutions and one's participation within specific institutions, Schroeder (1999, page 40) links the concept of “prestige” to development. He examines how participation in agroforestry-based development programs may alter one's prestige within her household and her community, at once creating the opportunity to enhance it, while threatening to diminish it. In this dissertation, it becomes clear that when social standing is damaged in the ways described by Schroeder, the effect is to undermine one's status within her community and the trust of her fellow community members, ultimately weakening *Scolel' Te*. These effects, however, are not limited to *técnicos comunitarios*, but may extend to *Scolel' Te* as well. When a loss of prestige erodes trust relations, future participant mobilization may be complicated. This is illustrated by

Breslow (2014) who indicates in her study of salmon recovery projects, the centrality of community trust in conservation initiatives. Moreover, as illustrated by Horowitz (2010), trust relations within communities determine, at times, how a community may positively or negatively perceive outside organizations administering development programs. Thus, an erosion of trust relations within a community may undermine participant perceptions of Scolel' Te and the managing NGO, AMBIO.

In Chapter 4 of this dissertation I examine how prestige emerges from the “rules of the game” of the *ejido* institution in Chiapas’ western Sierra Madre region. I highlight the fact that prestige is differentially conferred (or not) upon people depending on a variety of factors, including one’s access to formal ejidal authority in her community, gender norms, and age. However, following Schroeder, I suggest that prestige may be earned through participation in carbon forestry, thereby constituting an important factor for why those with no access to formal ejidal authority may choose to participate. However, looking at the case of *técnicos comunitarios*, I note that involvement in Scolel' Te may also threaten a person’s prestige, thereby undermining their status within the community, an effect that although unseen at times, has significant implications for project participants. Ultimately, prestige is not the only lens through which to examine the affective components of work in development programs. However, drawing on literature on rural Mexico and political ecology work, I suggest that it is a useful approach for highlighting the lived experience of doing carbon forestry and for uncovering the sometimes less visible social outcomes of a project that on the outside would appear to be beneficial to all who are involved.

Argument 3: Carbon Forestry Reshapes Farmer Relationships to Land and Undercuts their Relationships to AMBIO and Scolel' Te

Carbon forestry activities designed to achieve community buy-in in Chiapas are predicated on a limited understanding of farmers and farmer land-use decision-making. They are designed to reshape farmer relationships to their land and to development projects more generally. However, given their narrow frame of reference, participatory activities ultimately reshape farmer land-use patterns in ways that undermine the social relations of production between farmers and AMBIO. In Chiapas, farmer land-use practices relate to the production of corn, beans, coffee, and cattle. For many farmers land is tied to survival through subsistence food production. How land is used, however, is shaped by the complex interaction of a variety of factors within rural farming communities. These factors, although known by AMBIO after 17 years working in Chiapas, are often invisible in the face of development objectives that warrant alternative perspectives on

natural resources and resource use. For AMBIO, smallholder land is valuable not only because of its potential to produce corn, beans, cattle and coffee, but also because of its potential to capture CO₂ and to produce carbon credits. In order to assess these issues, I analyze participatory activities in *Scolec' Te* from two perspectives: 1) as a discourse, and 2) as a labor process. Drawing on social theory, political ecology and critical development literature, on the one hand, I argue that the first approach is essential for clarifying how AMBIO thinks about farmer's including who they may become through their participation in *Scolec' Te*. On the other hand, looking to critical labor studies, I argue that second optic is necessary for analyzing how farmers are expected to enact carbon forestry within their communities, and why AMBIO needs to produce a certain pattern of activity and relationship to the land among farmers.

Farmer buy-in to *Scolec' Te* and participatory activities are, according to AMBIO, necessary for the long-term success of carbon forestry. First, they suggest that farmers must begin to trust AMBIO in a context where trust for outside organizations and development projects is not automatic, and to believe that their work will counteract the problem of climate change. Second, AMBIO notes the importance of mitigating risk to project longevity by inducing farmers alter land-use practices by limiting fires and cattle grazing. In this sense, the use of participatory activities is designed, in part, to build trust from the start, and to induce farmers to believe that their efforts will respond to the problem of climate change. However, as shown in Chapter 5, participation in *Scolec' Te* is also designed to instill among participating farmers a new type of thinking about and interaction with the natural environment – in essence a new relationship based in altered practices and beliefs. While such work is important to securing community buy-in and to securing the buy-in of future project funders, this analysis ultimately demonstrates the limited ability of participatory activities in *Scolec' Te* to achieve community buy-in, and its effects in undermining the social relations of production.

Contextualizing *Scolec' Te* Within Regional Development Practice

In taking the viewpoint of community-based carbon forestry participants, I argue that *Scolec' Te* has much in common with, and indeed, is representative of many market-based development initiatives in southern Mexico – particularly given the propensity of these initiatives, situated within a broader development landscape, to destroy social relations. The manner in which such devastation occurs varies, however, from one project to the next. In what follows, I briefly examine two market-based development projects that I became familiar with during the course of my graduate studies. I do so: a) to demonstrate that social relations may be dismantled in a very visible and dramatic fashion; and b) to draw a contrast between such dramatic examples and

Scolec' Te, a project within which the undermining of social relations has been much less visible, and to a certain extent obscured by the seemingly outward success of the project. As will become clear through these case studies and over the course of this dissertation, the undermining of social relations is tied not to outward lies and corruption as seen in the first case study or the mobilization of paramilitary groups as seen in the second. Rather, social relations are undermined in Scolec' Te through measures that are often deemed to be progressive and democratic by project leaders, and which are motivated by the good intentions of the managing organization.

Case 1: Cacao in Southeastern Mexico

Mexico's largest cacao plantations are located in the states of Chiapas and Tabasco where soils, climatic conditions and ample government and private funding have permitted commercial cacao production. However, local politics often present a roadblock to new project development by groups outside the two states, forcing them to either abandon cacao production altogether or to take the risk of pioneering new initiatives in other regions.

It was in this context that investors from the U.S. and Mexico enthusiastically decided to establish a USD \$8 million organic cacao project in southeastern Mexico, a region with no history of commercial cacao production and little other commercial agriculture to speak of. The narrative presented by project developers suggested that since Mayan communities had grown cacao in the region over 500 years ago, this project would present the opportunity to return the crop to its geographic and cultural roots in a large-scale and sustainable manner. They noted that farmers from nearby communities would be employed to work on the land, thereby making them an integral part of sustainable organic cacao production. Project planners spoke of the plantation in terms of a synergy between indigenous communities and agribusiness, highlighting the opportunity to improve the livelihoods of the former by integrating them into the latter. For them, the project was a modernist agricultural dream to engineer the peninsular countryside into the largest organic cacao plantation in the country.

Government officials in the region were ecstatic, proclaiming the project to be one of the most important agricultural undertakings in the region, heralding it as a progressive cooperative model of rural development.¹ Officials from the Mexican Ministry of Agriculture (SAGARPA) at the federal level and the Mexican Ministry of Agriculture and Rural Development (SEDARI) at

¹ These perspectives were obtained through a series of informal talks with officials from Mexico's Ministry of Agriculture (SAGARPA).

the state level welcomed the project with great fanfare, with the former offering to promote it as a cornerstone to the Ministry's regional rural development plan. Many government officials at federal and state levels understood the initiative to be a catalyst for development in the region, seeing it as a progressive model of cooperation between local farming communities and private industry.

However, despite broad support for the initiative, some remained skeptical with regard to its environmental and commercial viability. Local experts in agriculture and in the ecological conditions of the region argued, for example, that the soils, forest cover and seasonal threat of hurricanes in the region would make a commercial cacao plantation economically and ecologically unviable. Soils in the region stood in sharp contrast to the deep, fertile soils of Chiapas and Tabasco. Instead, these soils were shallow and overwhelmingly rocky, and their clay consistency made them prone to flooding during the rainy season (June - October).² Additionally, much of the region was forested, and while deforestation was not technically or legally impossible, it did present the operation with significant financial costs tied to clearing the land and to 'compensating' or 'offsetting' the ecological impact of the would-be deforestation of nearly 300 hectares of primary forest. Finally, the presence of hurricanes in the region threatened the longevity of the project, as a single hurricane could potentially destroy significant portions of the plantation. Because of these factors many experts informed project developers that they found significant risks associated with pursuing the initiative in the region, and urged them to look elsewhere.

Despite the warnings, project developers went ahead with the plan, signing an usufruct contract of nearly three decades with a local community, which guaranteed the establishment of the plantation on hundreds of hectares of ejido land.³ This was followed by the initiation of plant propagation activities, the deforestation of large tracts of land to prepare for planting, the digging of large drainage ditches to relieve the clay soils of excess moisture, and the installation of a multi-million dollar irrigation system to support the cacao plants during the dry season (November - May).

I first arrived at the plantation nearly two years after initial activities had begun. I came in a car full of out-of-state agronomists anxious to see the widely recognized cacao project.

² Soils in the region have a depth of only 1 meter. It was suggested by local experts that this was far less than the 2 meters needed to allow for the full development of a cacao tree taproot.

³ The term *ejido* refers to a system of communal land tenure developed following the 1910 Mexican Revolution. In this dissertation I conflate the terms *community* and *ejido* to keep in following with the common rhetorical practices of NGOs, government officials and others in Chiapas.

However, as we turned onto the one-kilometer dirt road leading from the plantation entrance to the project offices, I saw what looked to be more like an abandoned urban construction zone than a cacao plantation. Large cement poles stood crookedly in place of what was once primary forest, supporting power lines designed to supply electricity to 15 wells feeding the irrigation system. Where the irrigation system was to be installed laid piles of disjointed white PVC tubing, fully exposed to the open air. Alongside the road were ominous ditches with depths ranging from 5-10 meters designed to drain the clay soil of all retained moisture. Horror registered on the agronomists' faces as we passed the shallow, dry soil that had been haphazardly mixed with bedrock, making the land resemble a lunar landscape rather than a site of commercial agriculture. Finally, we passed a nursery full of wilted and dying cacao plants, clear victims of neglect and mistreatment.

The plantation appeared to reflect all of the worst nightmares of the local experts and none of the vision held by the initial project developers. All that remained of the original vision were a series of faded signs near the plantation entrance that read "cooperation," "co-creation," and "sustainability." The rest spoke to an agricultural initiative gone horribly wrong.

I learned later that day and in the following months that misguided leadership, internal corruption and a lack of experience plagued the plantation, resulting in a series of decisions and practices that sent the project spiraling out of control. No soil studies were completed to verify the opinions of local experts, whose warnings went entirely unheeded. Meanwhile, corrupt relationships with suppliers and contractors rotted away any sincere intentions to construct a successful plantation. The irrigation system was left in disarray with only a small percentage of the wells in functioning order, the drainage system was contracted out to a civil engineering firm with no experience in agriculture, and the land preparation was left to people who had no knowledge of local soils and whose work ultimately undid thousands of years of soil formation in only a few weeks.

In addition to the significant ecological waste associated with the project, I learned that the relationship with the Mayan community on whose land the project had been initiated had also fallen into disarray. Discontent with the project quickly grew within the community as farmers watched the destruction of their lands on the mismanaged plantation and saw the project fall victim to poor decision-making and corruption. Additionally, the community accused the company of having stolen fine wood and other resources from their lands, of having violated the usufruct contract, and of having reneged on their initial promise to contribute to economic development in the community. Finally, local governance structures within the community had

become divided with some leaders seeking to cash-in on the corruption associated with the cacao project and others looking to expel the project from the ejido.

The cacao project had become a story for the newspapers as once-supportive government officials began to quietly question its future. Eventually, after replacing the plantation's administrative staff, cleansing the project of its ties to corrupt distributors and contractors, and trying determine alternative directions for the project, the investors decided to end their involvement. They had lost nearly USD \$8 million to the initiative and no longer found the project to be economically viable. The community, however, was left with hundreds of hectares of destroyed land. Their community leadership was divided, and many felt as though they had been lied to and cheated by the company implementing the project. What is more, farmers who had been contracted to work on the plantation were left with destroyed land and no employment, and many were forced to migrate to nearby tourist destinations to find work. In the end the project was not commercially successful, and it certainly did not comply with the development objectives or conservation goals that had been tied to it at the start. As a result, many in the community saw the project as yet another example of an outside organization making significant promises only to lie in the end.

Case 2: Highway Development in Chiapas

“The ‘bad government’ threatens to strip us of our territory and land so as to plan its bad neoliberal projects that do not benefit us as indigenous communities” (Bellinghausen, 2009).⁴

In spring 2009, construction began on a highway project designed to link the two main tourist cities in Mexico's southernmost state, Chiapas, San Cristóbal de las Casas and Palenque – a project the Mexican government had been publicly promoting for months. The vision? A modern rural Chiapas defined by sustainable tourism that would be facilitated by efficient transportation routes and enhanced commerce in the region (Romero, 2009). However, despite strong government support for the highway, opposition to the project quickly became apparent. Some indigenous communities in the central highlands region opposed it, arguing that it would facilitate aggressive resource extraction and environmental destruction, and present a series of dangers to communities located along the highway's proposed path.

⁴ Statement made by the Zapatista communities of Mitzitón, Jotolá y San Sebastián Bachajón regarding the San Cristóbal-Palenque Highway project

In the summer of 2009 I first arrived in Mitzitón, a Tzotzil community on the outskirts of San Cristóbal de las Casas, and the first community to be affected by highway construction (see Figure 1.3 showing the early construction that led out from San Cristóbal de las Casas to Mitzitón).⁵ I met with community leadership to learn about the highway, their perspectives on the project, and their opposition to it. As we left the community assembly hall and walked through the ejido toward the land parcels where farmers had planted beans and corn, my guides indicated areas marked by government officials and contractors where the highway would pass, bisecting community land used for agricultural production. They noted that the highway would effectively result in the loss of significant portions of farmland for the community, pollute the river that passed through the ejido, and present dangers to the community and its animals.



Figure 1.3 Early Highway Construction between San Cristóbal de las Casas and Mitzitón
Photo Credit: Author

In protest of the project Mitzitón organized two roadblocks, joined by indigenous supporters throughout the state who also worried that their communities would be negatively affected. Mitzitón also sent community representatives to the state capital of Tuxtla Gutierrez to speak with planners about the highway project, but were met with silence by government officials who downplayed the project, suggesting that no concrete plans had been developed.

⁵ Tzotziles, principally located in the central highlands region of Chiapas, represent one of many indigenous groups throughout the state.

The Mexican government responded violently to the protests carried out by Mitzitón and its fellow supporters, hoping to weaken project opposition. Paramilitary groups funded and encouraged by the Mexican government entered the ejido at night, threatening the community, stealing animals, and vandalizing property (Romero, 2009). On July 19th, 2009 members of the paramilitary group, Ejército de Dios, entered Mitzitón, killing one person, Aurelio Diaz. What had originally been billed as a development project designed to bring sustainable tourism and other economic opportunities to Chiapas was now the face of violence in Mexico's southernmost state. It started as a modernist dream to transform rural Chiapas into a commercial paradise marked by flourishing tourism and productive agribusiness, but was transformed into a violent nightmare where distinguishing the project's beneficiaries was no longer a simple task. However, Mitzitón was undeterred by the violence and continued to protest the highway project. Eventually, the project was suspended in December 2009. The Mexican government justified its decision by appropriating the democratic language of the Zapatista movement, suggesting that it was the "pueblo that gives orders and the government's duty to obey" (El Heraldito de Chiapas, 2009). The project was widely seen by local NGOs, academics and activists to have been a development failure. In the end, the highway was never constructed and the end result was a violent divergence from the original plan.⁶

Like these other projects – the highway initiative and the cacao plantation – carbon forestry as undertaken in the Scolel' Te model seeks to improve local livelihoods by remaking rural Mexican space and by integrating the communities in question into broader commercial markets. Yet, carbon forestry in Chiapas follows the trend of many development projects in the region, falling short of its promises and leaving social devastation in its wake. In the case of cacao in southeastern Mexico, the dream was to establish export markets for organic cacao, and to channel generated revenue to the participating community in the form of new agricultural infrastructure and salaries. It was suggested that the livelihoods of the participating community would be

⁶ In October 2013 the San Cristóbal-Palenque highway project made a surprising resurgence as the Chiapas State Government announced that it would re-initiate the project, albeit in a slightly modified form. The state government has sought to prioritize transparency the second time around, listing the exact communities through which the highway will pass. What is more, they announced that the project will no longer pass through Mitzitón, but will instead head north of the community. What remain unchanged about the highway project are the vision and the goal: to create a modern Chiapaneco countryside defined by high-speed transportation networks that would facilitate commerce, tourism and travel between two of the most economically important cities in the state.

improved through revenue generated from the sale of organic cacao. In the case of the highway project in Chiapas, the claim was that the highway would improve commerce and transportation, thereby supporting the growing tourism industry, and allowing for safer and faster intra-state transportation. It was argued, moreover, that communities located along the path of the highway would be able to develop new commercial opportunities by producing and selling artisanal goods, by transforming natural resources – e.g. forests, waterfalls, and rivers – into ecotourism sites, and by converting agricultural practices (coffee production, for example) into agro-tourism initiatives. As with the cacao project, it was assumed that the highway would allow for the integration of local communities into broader markets, and that this would lead to the improvement of the livelihoods of all those associated with the initiative. However, both projects, although different in nature, ended in a similar destructive fashion.

In instances such as those presented by the cacao and highway projects, the effects of such failure are visible and violent as the supposed beneficiaries face new threats of insecurity, a loss of valuable natural resources, and the destruction of social cohesion within their communities. However, the undermining of social relations through development initiatives is not always conspicuous, and may accompany even those projects that, on the outside, would appear to comply with their stated objectives and benefit those toward whom project activities are directed. In such instances, the process of uncovering undermined social relations requires a close examination of the broad market influences, logics, and power inequalities that accompany project management strategies and labor relations within a given program. Doing so is the purpose of this dissertation.

In Chapter 2, I take on three tasks that serve as a necessary prerequisite to my analysis of how social relations are undermined by the exercise of carbon forestry. First, I examine how one central aim of carbon forestry, environmental conservation, has come to be defined not by state regulation but by the commoditization and marketing of environmental qualities. Doing so is necessary for drawing parallels between market-based development projects such as the two presented above and carbon forestry. Second, I briefly outline the broader carbon markets in which carbon credits produced in Scolel' Te are bought and sold. By clarifying this market context, I show that carbon forestry is situated not only regionally within Chiapas, but also internationally, within carbon markets. Moreover, it sets up the discussion in Chapter 3 about the effects of broader market dynamics on local carbon forestry activities. Finally, I explicate the regional and historical dimensions of development in Chiapas and the Sierra Madre region more specifically. This analysis is essential for showing how carbon forestry emerges within the context of broader development trends within the state. Together, these three points demonstrate

how carbon forestry is linked to broader international markets and the uneven and destructive history of market-based development in the state.

In Chapter 3, I build upon this context to examine the first of the three ways in which *Scolet' Te* undercuts social relations, namely, by exposing the project to market dynamics that necessitate the use of disenfranchising labor arrangements between AMBIO and participating farmers. Drawing on commodity chains and transaction costs perspectives, I narrow my focus from the broad contextual analysis presented in Chapter 2. In this Chapter I suggest that AMBIO's efforts to expand *Scolet' Te* and to further entrench the program within Chiapas' development landscape, is limited by its exposure to risk emanating from shifting dynamics within international voluntary carbon markets. Drawing on a commodity chain perspective and critical labor studies, I analyze AMBIO's efforts to overcome the consequences of shifting market dynamics through the use of an extended division of labor with a variety of actors, including participating farmers. Looking at the case of *técnicos comunitarios*, I suggest that such labor arrangements reflect inequalities in the carbon credit commodity chain, and demonstrate the capacity of those in relative positions of power such as AMBIO to shift the consequences of limited resources and market fluctuations onto those with no ability to influence budgeting and management decisions.

In Chapter 4, I examine the second means by which carbon forestry undercuts social relations by threatening the prestige of participating farmers within their communities. This chapter highlights the fact that carbon forestry, like many development projects, stands to simultaneously improve a person's prestige within their community or to diminish it, depending on a variety of factors including project management and broader carbon market influences. I show, however, that despite the goals of many, including *técnicos comunitarios*, their social standing is ultimately diminished as they become the subject of rumors and a source of mistrust. Looking back to Chapter 2, however, this chapter also demonstrates the extent to which trends within global carbon markets shape the perceptions and experiences of participating farmers with regard to *Scolet' Te*.

In Chapter 5, I examine the final of the three means through which *Scolet' Te* undercuts farmers in carbon forestry. I examine how attempts to alter farmer relationships to their land through participatory exercises is blind to the many factors that shape farmer land-use patterns and resource management practices, and ultimately threatens their long-term commitment to the project. In this chapter I discuss participatory mapping and member education programs as an instance of broader efforts by AMBIO to achieve community buy-in to *Scolet' Te* – initiatives that are made necessary by the distrust of farming communities toward development programs

described in Chapters 2 and 4. I suggest that participation must be seen as both a discourse and a labor process through which farmer relationships to their land, to capital and to development are reorganized so as to ensure the long-term success of Scolel' Te. I argue that while such efforts make strategic sense for AMBIO, they often occur at the expense of marginalizing farmer asking farmers to engage in land-use practices that threaten their long-term participation.

CHAPTER 2: CONTEXTUALIZING CARBON FORESTRY

Situating Scolel' Te within Carbon Markets and Chiapas' Social History of Development

“Chiapas loses blood through many veins: Through oil and gas ducts, electric lines, railways, through bank accounts, trucks, vans, boats and planes, through clandestine paths, gasps, and forest trails. This land continues to pay tribute to the imperialists: petroleum, electricity, cattle, money, coffee, banana, honey, corn, cacao, tobacco, sugar, soy, melon, sorghum, mamey, mango, tamarind, avocado, and Chiapaneco blood flows as a result of the thousand teeth sunk into the throat of the Mexican Southeast. These raw materials, thousands of millions of tons of them, flow to Mexican ports and railroads, air and truck transportation centers. From there they are sent to different parts of the world: The United States, Canada, Holland, Germany, Italy, Japan, but with the same fate – to feed imperialism. The fee that capitalism imposes on the Southeastern part of this country oozes, as it has since from the beginning, blood and mud” (Marcos, 1994).

Introduction

In the above quote from his essay, *The Southeast in Two Winds A Storm and a Prophecy*, written in 1992 on the eve of the Zapatista uprising and published through a variety of sources over the next few years, Marcos explicates in graphic detail Chiapas' relationship to the rest of Mexico and the world. As he indicates, the relationship is one that has, “from the beginning,” and which continues to be, defined by capitalist processes of natural resource exploitation. The effect, as Marcos goes on to describe, is impoverishing as blood loss from the bite wound of capitalism weakens its victim. Marcos' impassioned perspective resonates with critiques of the cacao project and highway initiative described in Chapter 1, and gestures toward a general trend among development in southern Mexico in which the benefits are distributed among the few while the majority is forced to bear the consequences of environmental destruction, social upheaval and market risk. In concert with Marcos, I argue that the nature of carbon forestry and similar development projects is not arbitrary, but rather, develops within established relations of exploitation and domination, thereby leading to trends in project design and outcomes that are often predictably destructive. The marketization of carbon credits is like previous forms of extraction described by Marcos, although this would not appear to be the case at first glance. The carbon credit is an intangible commodity altogether different than traditionally extracted commodities such as wood, coffee or corn, and the forms of surplus extraction are less visible.

However, in this chapter I link carbon credit production and marketization to broader trends within the state, suggesting that strong similarities persist.

Carbon forestry is a continuation of the trend highlighted by Marcos, albeit in the form of market-based environmental conservation. It is designed, like other forms of agriculture-based development projects in Chiapas, to extract value from the land and labor of farming communities, and to sell produced commodities in international markets. However, in order to adequately contextualize carbon forestry within Marcos' narrative and the broader development landscape of Chiapas, it is important to clarify three points: 1) how environmental conservation, which is a central aim of carbon forestry, has come to be defined not by state regulation but by the commoditization and marketing of environmental qualities; 2) the nature of broader carbon markets in which carbon credits are bought and sold; and 3) The regional and historical dimensions of development in Chiapas and the Sierra Madre region more specifically. Together, these three points demonstrate how carbon forestry is linked to broader international markets and the unequal and destructive history of market-based development in the state. In this chapter I will address each point in order as a means to providing the historical, political, economic and environmental context of carbon forestry in Chiapas.

Market-based Environmental Conservation

Environmental conservation through the commodification and marketing of environmental qualities is often discussed in terms of sustainable development in which capitalist growth and environmental conservation are linked (see Brundtland, 1987). Sustainable development gained strong public backing in Agenda 21 at the 1992 Rio UN Conference on Environment and Development. Agenda 21, which focused on poverty alleviation, resource conservation and empowerment, proved to be an early step in ever-expanding efforts to link both sustainability and economic development. Since then, payment for ecosystem services (PES) initiatives have become a popular element of that trend, promising to preserve and promote the natural environment while contributing to the improved financial well being of local populations. One arm of PES initiatives includes forest carbon projects, which have proliferated globally over the past eight years under the Kyoto Protocol and alternative voluntary measures. Forest carbon initiatives are a form of environmental conservation seeking to alleviate rural poverty and mitigate global climate change by facilitating the flow of capital from actors needing to offset CO₂ emissions to those willing to engage in offset-oriented reforestation, afforestation, and forest preservation activities.

Carbon forestry represents a break from environmental conservation as an outcome of state-based regulation. It is predicated on the production of carbon credits by sequestering CO₂ via forestry activities, and the sale of those credits in global ‘carbon markets.’ While such schemes have become popular, particularly under the REDD+ umbrella, efforts to conserve the natural environment through market-incentives are not confined to climate change mitigation. They have also been mobilized to govern water use (see Bakker 2005; 2011) and to protect biodiversity (Brockington and Duffy, 2010). While these trends have encompassed more traditionally identifiable resources such as water and wood (see also Prudham, 2005), they have also expanded to include ecosystem services such as the cleansing and biodiversity-promoting qualities of watersheds (Robertson 2004; 2006; 2007) and the carbon sequestration capacity of carbon sinks such as forests (see Bumpus and Liverman 2008; 2011). As market-based environmental conservation has grown in popularity so too have efforts by governmental and non-governmental actors to achieve development and climate change goals by producing and selling carbon credits in global voluntary and compliance carbon markets.

While efforts to achieve environmental conservation and development via market mechanisms have become widespread, Marcos’ quote reminds us that capitalism has local effects that must be critically assessed. These effects are both historically situated and regionally distributed, and must be analyzed along both historical and spatial dimensions. Studies of carbon forestry take on a regional character, particularly in a state such as Chiapas where a high degree of cultural, ecological and geographic heterogeneity persists (see Rus and Hernandez Castillo et al, 2003). In the Sierra Madre region where this analysis is focused, farming communities are majority mestizo, a marked difference with the central highlands and Lacandón regions. Moreover, development programs in the north-central portion of the Sierra Madre have been associated less with parallel counterinsurgency objectives common to the central highland and Lacandón regions of the state. As a result, the nature of development projects in the Sierra Madre, and community attitudes toward such projects, differ from other parts of the state. By narrowing my focus on the Sierra Madre region, I not only address the local specifics of development programs in Chiapas, but also fill a gap in research on the Sierra Madre region, created by a tendency among researchers to focus their analyses on the central highlands and Lacandón regions (see Hernandez Castillo, 2003).

From a historical perspective, carbon forestry forms part of a much broader social history of development in the state. In this chapter I argue that carbon forestry is tied to Chiapas’ social history of development in three ways: first, the diverse actors on which project success depends are intimately connected to broader patterns of social life, including past development initiatives

within the state. In Chapter 3 I analyze the extent to which AMBIO relies on these actors, including government institutions that are implicated in development projects past and present in order to expand *Scolet' Te* into the Sierra Madre region. Second, *Scolet' Te* exhibits several elements of past development practice in Chiapas. On one hand, processes of carbon credit production tied to *Scolet' Te* in the Sierra Madre region hint at the longstanding relationship of the region as defined by the production and export of agriculture-based products such as coffee for consumption in the global north. On the other hand, fluctuating carbon markets stand to impact producers in a manner not altogether different than the boom and bust cycles associated with colonial and post-colonial markets for fine wood and contemporary global markets for corn, coffee and cacao. These links are especially relevant in Chapter 4 where I examine mistrust within participating communities toward community-level workers that emerges, in part, from shifts in the supply and demand dynamics within broader voluntary carbon markets. Finally, the interactions between AMBIO and participating communities reflect tensions, concerns and conflicts related to the past experiences of AMBIO and participating communities with development in the state. The nature of these interactions is especially apparent in AMBIO's attempts to secure community trust and achieve buy-in through the use of participatory mechanisms tied to *Scolet' Te* (see Chapter 5). Given the links between Chiapas' social history of development and the various components of *Scolet' Te*, understanding this history is essential for contextualizing the discussions of the program in subsequent chapters.

In addition to highlighting the local historical and social context in which carbon forestry emerges, it is also necessary to clarify the specific nature of carbon markets – the veins – through which produced carbon credits flow from Chiapas to international buyers. In order to do so, I first examine the nature of neoliberal development in Mexico, given its influence as the broad ideological and institutional framework in which carbon markets have emerged. I emphasize the fact that neoliberalism is rooted in diverse networks of actors, and that such networks are essential to the formation of carbon markets. I then outline the broad contours of the voluntary carbon market to which *Scolet' Te* contributes before analyzing Chiapas' social history of development. By analyzing the economic, social and political contexts in which carbon forestry has emerged, we may begin to clarify how social relations are undermined through such projects in subsequent chapters, and may thus, better contextualize *Scolet' Te* within Marcos' narrative.

Development as Neoliberalism

Many accounts of marketization begin with an analysis of neoliberalism as an expression of market expansion and state withdrawal (see Peck and Tickell, 2002). In Mexico, neoliberal initiatives unfolded only slowly and unevenly, with varying degrees of success, and included the privatization of some minor state-owned enterprises, attempts to convert communal land into private property, the production of industrial goods for export, and the implementation of policies aimed at restricting wage growth so as to attract foreign investment (Middlebrook, 2003; Otero, 1996). Successive technocratic presidents including Miguel de la Madrid (1982-1988), Carlos Salinas (1988-1994), and Ernesto Zedillo (1994-2000) supported the move toward a neoliberal model, seeing it as an answer to the 1982 debt crisis (Otero, 1996). For the Mexican countryside the neoliberal transition meant a withdrawal of federal funding for rural development programs (Fox and Haight, 2010) and a re-orientation of development practice toward market-based measures – measures that were presumed by technocrats and multilateral funding agencies such as the World Bank to be more efficient.⁷

The effects of Mexico's neoliberal transition for Mexican society have been wide-ranging, although a regional perspective must be taken in order to adequately assess them. In this regard, Otero (1996, page 3) suggests that “[the] country-level analysis is made more complex by its [Mexico's] vast regional heterogeneity, not only geographical and physical but social, economic and political as well.” He notes, for example, that Mexico's economic integration with the U.S. and Canada has been concentrated in Mexico's northern and central regions, including Mexico City, far outpacing southern Mexico. It is this regional heterogeneity that complicates simple conclusions about Mexico's transition including the development projects that have been designed within the neoliberal rubric. As Marcos indicates, the benefits of neoliberalism in Chiapas have been unevenly disbursed as finances and resources are extracted from the state.

However, despite the limited success of many neoliberal initiatives, the continued pursuit of additional schemes such as the highway project presented in Chapter 1 is motivated by the

⁷ The Mexican government, for example, discontinued funding for the state-run agricultural research institute, the National Institute for Forestry, Agriculture and Fishery Research (INIFAP), forcing it to either close its doors or obtain its own funding, of which it chose the latter. While it has been able to generate revenue in northern states that have adopted advanced agricultural technologies and practices, in southern states the organization has been reduced to a skeleton of its former existence. Many offices have been abandoned, and where the INIFAP does still operate, many of its employees are without telephone and Internet. While the INIFAP is just one example of Mexico's agricultural de-funding, it is a strikingly accurate symbol for the state of agriculture in many parts of southern Mexico.

ideological success of neoliberalism's advocacy of market-based development. This is illustrated by a recent comment by the sub-Secretary of the Mexican Ministry of Transportation and Communications (SCT), Carlos Almada Lopez, in relation to Chiapas' recently re-initiated San Cristóbal-Palenque highway project. With regard to this project, which is designed to integrate the state's impoverished people into tourism markets, he said: "it is a project of great value for the economic and social development of the state of Chiapas, which will pass through the [state's] beautiful and attractive tourist zones" (Vazquez, 2014). However, technocrats and politicians such as Almada Lopez express a preference for market-based development, while neglecting to clarify what they mean by 'the market.'

Orthodox thinking on 'the market' presents it as the ideal frame within which human activity should be organized. 'The market,' moreover, is often described by orthodox economists as infallible and as an a-political arbiter of efficiency and innovation, although its specific nature is left unexamined (Berndt and Boeckler, 2009; Callon, 2007; Mitchell, 2009). Heterodox thinking about 'the market,' which stems from literature within political economy, including Karl Polanyi, and cultural economic viewpoints, provides an alternative means of thinking about markets. While heterodox perspectives differ in how they view the nature of markets and their effects, they find common ground in their effort to move beyond the assumptions of orthodox economics (Berndt and Boeckler, 2009). Heterodox perspectives emphasize the networks of human actors that bring a market into being. However, this point alone does not sufficiently differentiate heterodox thinkers from their orthodox counterparts who also appreciate the role of human interaction in market formation. Thus, it is necessary to assess how orthodox and heterodox thinkers view the market as a force for social change.

While orthodox economists tend to view 'the market' in a positive light, many political economists see it in somewhat less complementary terms. On the one hand, political economists suggest that 'the market' is an ideological device that effectively obscures the destructive and conflictual social relations that define capitalism (Berndt and Boeckler, 2009). Berndt and Boeckler (2009) point out that political economists focus in particular on capitalist production processes and the relationship of labor to such work. In doing so they shift their focus from the realm of exchange privileged by orthodox economists to the realm of production. On the other hand, political economists understand markets in material terms, focusing on two aspects of the labor-production relationship: 1) the dialectic relationship between labor and production processes (see Burawoy, 1979 and Dunn, 2004); and 2) the impacts of capitalism on individuals and communities through their incorporation into expanding capitalist structures (see Watts,

1983; 2008). In general, this work examines ‘the market’ in terms of its destructive impact on the social, marking a forceful break from orthodox perspectives.

In a similar vein, Polanyi (2001) sought to explain markets in terms of the social. His central departure from orthodox economics stems from the idea that ‘the market’ consists of economic activity embedded in social networks (see also Berndt and Boeckler’s [2009] discussion of embeddedness within economic sociology). In other words, Polanyi (2001) attempted to place economic activity within its social context, emphasizing the connections between people, organizations and institutions that make such activity possible. In light of this work, geographers have drawn on Polanyi’s (2001) notion of fictitious commodities, examining the manner in which economic activities are embedded in specific ecological contexts. They have focused, for example, on the contamination of water in Ontario (Prudham, 2004), agricultural production (Henderson, 1998), and neoliberal environmental policy (Robertson, 2007; Robertson and Wainwright, 2013). Ultimately, Polanyi’s work runs counter to the assumptions of orthodox economists, which present ‘the market’ as a positive and omnipresent force (Ebner and Main, 2010; Gemici, 2008), thus allowing for a geographically and historically contextualized understanding of economic activity.

Stemming from this work is the perspective provided by cultural economics, which also attempts to explain markets within the contexts of their operation. Work within cultural economics critiques the concept of ‘embeddedness,’ suggesting that it runs the risk of treating markets as simply networks defined by economic activity. Scholars within this field argue that markets should not be seen as dissolving into networks, but are, instead, the effects of networks (Berndt and Boeckler, 2009). Callon (2007, page 319) argues, for example, that markets are “...a combination of material and technical devices, texts, algorithms, rules and human beings that shape agency and give meaning to action.” From this perspective, markets are seen as a type of calculus (Mitchell, 2009) and may be assessed by analyzing their composite networks. Drawing on this work, I suggest that carbon forestry must be seen as embedded within social networks, and as emerging from the work of diverse actors who are tied to patterns of development practice, both past and present. It is with this perspective in mind that I turn to the broader carbon markets within which AMBIO participates.

Voluntary Carbon Markets

Carbon markets – the veins through which carbon credits flow from Chiapas to international buyers may be compliance or non-compliance in nature. In this dissertation I am particularly

concerned with non-compliance – or *voluntary* – carbon markets in which AMBIO sells carbon credits. Voluntary markets exist in parallel to compliance markets, and account for a small percentage of carbon credit purchases, particularly those purchases realized by government offices and small corporations not associated with the Kyoto Protocol (i.e. those in non-signatory countries), and by individuals. Voluntary markets are significantly smaller than compliance markets in terms of the volume of carbon credits traded, having represented only 0.1% of total carbon credit sales in 2010 (Hamilton and Peters-Stanley et al, 2010). In non-compliance contexts, voluntarily produced carbon credits, which are referred to as Verified Emissions Reductions (VERs), are worth one ton of captured CO₂. Voluntary carbon markets differ from compliance markets in the motivations behind buyer participation and the on-the-ground effects of buyer participation for carbon credit producers. However, before assessing these differences, I briefly outline the compliance markets that run parallel to their voluntary counterparts.

Compliance Markets

Carbon markets first emerged out of a need among signatories to the Kyoto Protocol to comply with CO₂ reductions targets. However, despite the popularity of the Protocol, the lead-up to the adoption of market-based mechanisms for climate change mitigation proved to be a contested process that involved several developments in environmental science as well as political and economic influences (Calel, 2011). Calel (2011) notes that these included the 1992 Rio de Janeiro UN Conference on Environment and Development during which the Framework on Climate Change prevention was assembled, and the 1995 formation of the Activities Implemented Jointly (AIJ) program – a pilot carbon market – by the United Nations Framework Convention on Climate Change (UNFCCC) in order to test the waters for a potential international carbon market.

In addition to these developments, several contentious issues complicated early negotiations. Boyd and Corbera et al (2008) note that one hotly debated issue revolved around the treatment and inclusion of emissions sinks (those natural resources recognized for their capacity to sequester GHG emissions). A second disputed issue included whether to assign binding emissions reductions targets to developing countries (Hovi and Detlef et al, 2010). Despite such contention, significant political pressure encouraged an expeditious signing of the Protocol – what Calel (2011, page 19) describes as “... a hasty marriage [of science, climate change and economics of emissions trading rather than] a carefully engineered synthesis.” However, despite the high level of debate within the negotiations, Vlachou and Konstantinidis

(2010) suggest that the ultimate shared goal was to facilitate capitalism by protecting those industries and companies that stand to be harmed by global climate change – what Buck (2007) refers to as the flexibility of capitalism to respond to crisis.

The Kyoto Protocol was adopted in 1997, went into effect in 2005, and has consisted of two commitment periods: the first from 2008-2012, and the second from 2013-2020. The first period featured a pledge by signatories to reduce GHG emissions to an average of five percent of 1990 levels, while the second involved a more aggressive commitment by signatories to reduce GHG emissions by at least 18 percent below 1990 levels (UNFCCC, 2013). In order to meet these requirements the Protocol established several mechanisms through which emissions could be reduced or offset: the Clean Development Mechanism (CDM), Joint Implementation (JI), and International Emissions Trading (ET). While the first two are centered on projects designed to reduce GHGs (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) through the implementation of reductions projects, the third favors a cap-and-trade approach.⁸ These mechanisms provide the institutional structure behind compliance markets in which diverse actors participate in order to meet established emissions reductions targets within the Protocol.

Differences Between Voluntary and Compliance Markets

In order to understand the voluntary markets within which AMBIO operates, it is necessary to highlight how they differ with compliance markets. First, given the voluntary nature of non-compliance markets, the motivations for participation among actors who are not compelled by regulatory oversight to reduce CO₂ emissions tend to be much more diverse. On the one hand, corporations may wish to participate in non-compliance projects in order to construct an image of corporate social responsibility, or simply to attract investment from lending agencies that require some degree of corporate sustainability in their lending policies. Additionally, corporations may choose to purchase VERs if they perceive that their country may join international agreements

⁸The objective of cap-and-trade is to promote emissions reductions by first allocating emissions allowances to polluters that will permit certain degrees of pollution. The next step is to gradually decrease the number of allowances available to each polluter, thus forcing them to adopt technologies and practices that allow them to continue operating while emitting ever-shrinking permissible levels of GHGs. According to emissions trading logic, as entities reduce their emissions they may find that they have more allowances than are needed due to their advances in GHG emissions reductions. Therefore, it permits entities with surplus allowances to sell them to other entities that may need additional units in the future.

mandating future CO₂ reductions. They argue that in doing so they will be able to build the organizational infrastructure needed to facilitate future compliance.

Although corporations and individuals may purchase VERs directly from carbon credit producers, the vast majority is traded "over-the-counter" (OTC) wherein buyers and sellers deal directly with brokers (Peters-Stanley and Yin, 2013). OTC trading is driven by two categories of buyers: 1) voluntary buyers; and 2) pre-compliance buyers. Whereas voluntary buyers participate in order to satisfy a personal interest or to fulfill a corporate social responsibility agenda, pre-compliance buyers do so either: a) to buy credits that can be stored for a perceived future compliance need; or b) to sell at a higher price to organizations that may face a future compliance requirement (Peters-Stanly and Yin, 2013). While AMBIO has attempted to facilitate the trading of carbon credits to individuals via their website, the overwhelming majority of carbon credit sales are to brokers via OTC markets. AMBIO suggests that selling primarily to brokers is easier given that under such arrangements they do not have to dedicate limited organizational resources to locating and establishing relationships with diverse buyers such as individual government offices or small corporations.

Despite the popularity of voluntary markets among actors within non-signatory countries of the Kyoto Protocol, the trade of VERs in voluntary markets has proven to be unreliable and particularly vulnerable to broader trends within the global economy. This has been especially visible in the reduced overall transactions since the 2008 financial crisis (Peters-Stanley and Yin, 2013). Moreover, as will be illustrated in Chapter 3, the desires of buyers who source carbon credits through voluntary markets are less predictable given the fact that their participation is shaped not by compliance requirements but by myriad other factors, the motivations for which may wax or wane depending on personal and organizational goals. Shifting demand dynamics in voluntary markets present a certain degree of risk for producers of carbon credits in carbon forestry programs, including both managing organizations and farmers. As will become clear in Chapters 3 and 4, however, the manner in which this risk is allocated throughout the carbon credit commodity chain is uneven, and is often pushed on those with relatively little awareness of such risk and less power to determine their standing within a carbon forestry project. Moreover, as will become clear in Chapter 5, efforts designed to encourage farmer participation are often predicated on convincing farmers that participation in carbon forestry will benefit their communities, despite the existence of risks that often go unstated. The practice of overstating a project's benefits and understating its costs are common in development, particularly when enthusiasm for a project is high (Sheppard and Porter et al, 2009). However, they must be

assessed in carbon forestry, particularly as projects are pursued within the rapidly expanding REDD/REDD+ rubric.

REDD/REDD+ (Reducing Emissions from Deforestation and Forest Degradation + Conservation of Forest Carbon Stocks), has emerged on a global scale as popular payment for ecosystem services (PES) initiative. REDD/REDD+ is designed to pay local communities to engage in activities aimed at limiting deforestation, sustainably managing existing forests, and promoting reforestation. REDD/REDD+, which has received much attention and significant international funding, particularly from the World Bank REDD Readiness Fund and the World Bank Forest Carbon Fund (The REDD Desk, 2014), has created new types of environmental work across the world, and reorganized the relationship of many (e.g. farmers, REDD/REDD+ practitioners, project funders, government actors and legal experts) to their natural environment as they have become implicated in the development and implementation of the local, social and institutional infrastructure needed to make REDD/REDD+ a reality. Although REDD+ has gained much attention in recent years, the institutions required to make REDD+ a fully operational reality are still incomplete (The REDD Desk, 2014). While “REDD Readiness” plans have been developed on national levels and pilot projects have been implemented locally, much work thus far has served as a testing ground of sorts for broader REDD+ adoption in the future (The REDD Desk, 2014). Regardless, it is clear that the significant sums of money dedicated by organizations such as the World Bank toward REDD+ pilot projects have led to a detonation of projects designed to establish REDD+ initiatives in multiple countries.

Despite the popularity of forest carbon projects for mitigating global climate change and alleviating rural poverty, they have been critiqued for a variety of reasons. First, those who feel that market-based environmental conservation is ineffective have criticized them for encouraging what they identify as the problematic commoditization of ecosystems. Such critiques point out that ecosystem services are problematic commodities given their inability to be fixed as stable commodities with uniform characteristics (Robertson, 2006). Kosoy and Corbera (2010) argue, moreover, that the commoditization of ecosystem services such as forest-based carbon sinks leads to a an abstract mode of thinking about the natural environment in terms of singular abstract qualities rather than diverse and interdependent ecosystems. As Robertson (2006) notes, such modes of thinking rely on assessment methods that inevitably produce unstable and questionable data. Moreover, such methods privilege a single type of valuation mechanism – that of money – excluding all other methods of valuation for the natural environment.

Finally, echoing Marcos’ quote at the beginning of this chapter, forest carbon projects have been critically assessed for their role in the formation and extension of certain types of

environmental governance tied to markets for ecosystem services. Bumpus and Liverman (2011) and Beymer-Farris and Bassett (2012), for example, examine the CDM, voluntary carbon markets and REDD/REDD+, suggesting that each has been critiqued for promoting, at least implicitly, the formation of a “carbon colonialism” wherein people in developing countries are prohibited from accessing certain natural resources through their involvement in securing carbon offsets. This “carbon colonialism,” Bumpus and Liverman (2008) note, replicates unequal power relations common to colonialism, and that assessing such power dynamics within carbon forestry is necessary. Bumpus and Liverman (2008) suggest that such power inequalities in carbon offset projects allow for the accumulation of capital by some, while disempowering others within the context of such work. These critiques uncover the underlying logics and power relations tied to the establishment and management of PES projects, including carbon forestry. Moreover, they provide a useful foundation for many discussions within this dissertation.

Carbon Markets: The Mexico Context

Forest carbon initiatives came on the scene in Mexico through the formation of the national PES program. The idea of a national PES program was first entertained as part of a working group in the late 1990s, appearing in a proposal as part of Mexico's Strategic Forestry Program 2025, which was developed with assistance from the Inter-American Development Bank (IADB), the Finnish government, and members of SEMARNAT (Shapiro, 2010). Shapiro-Garza (2010) notes that Mexico's national PES program was implemented in 2003, and offered to pay farmers to conserve forests in order to capture CO₂, conserve biodiversity, preserve hydrological services and diversify agroforestry systems.

Mexico's national PES program began as two separate initiatives: 1) Payment for Ecosystem Services-Hydrological (PSA-H); and 2) the Program for the Development of Markets for the Ecosystem Services of Carbon Sequestration, the Derivatives of Biodiversity, and to Promote the Introduction and Improvement of Agroforestry Systems (PSA-CABSA) (McAfee and Shapiro, 2010). McAfee and Shapiro (2010) note that in 2006 both initiatives were combined into one, ProÁrbol. According to McAfee and Shapiro (2010), in 2007 ProÁrbol received more than US\$150 million from the World Bank, the Bank's Global Environmental Facility (GEF) and the Mexican Federal Government, thus allowing it to grow to one of the world's largest national PES programs. Shapiro-Garza (2010) notes that despite pressures from the World Bank to maintain strict market-based characteristics and minimize state involvement in the PES program, much of Mexico's national PES project was in fact articulated through state mechanisms. This,

they suggest, led to a broader focus of Mexico's PES program beyond only market-based environmental objectives to include state-led objectives of rural poverty alleviation.

In addition to its national PES program, the Mexican government has expanded its REDD+ preparations. In doing so the Mexican Federal Government has made changes to key national environmental laws so that they may better reflect the requirements of REDD+ (GLOBE International, 2013). In 2009 the Mexican Federal Government created the Special Program on Climate Change (Programa Especial de Cambio Climático – PECC), under which a series of programs designed to combat climate change are located, including REDD+ (GLOBE International, 2013). According to GLOBE International (2013), in 2012 important changes in two laws, the Ley General del Equilibrio Ecológico y la Protección del Ambiente (LGEEPA) and the Ley General de Desarrollo Forestal Sustentable (LGDFS) were implemented to facilitate REDD+ advancement. They note that the changes took into account the fact that most of Mexico's forests are communally owned, thus implementing safeguards for these communities.

In addition to legal transformations, REDD+ preparation in Mexico has consisted of implementing REDD+ pilot projects designed to assess the environmental, social and political contexts in which REDD+ would be implemented, including monitoring and financial mechanisms (GLOBE International, 2013). While to date these projects are not considered full REDD+ demonstration projects, they are considered to be important for testing existing mechanisms/institutions and for highlighting where new ones need to be created (The REDD Desk, 2014). According to The REDD Desk (2014), the Mexican government identified the states of Oaxaca, Jalisco, Chiapas, Yucatan, Campeche and Quintana Roo as strategic priorities for the implementation of 'early actions' – i.e. pilot projects.

Funding for these pilot projects has been quite large and stems from a variety of domestic, bilateral and multilateral sources such as the Government of Norway (US\$15.4 million), the French Development Agency (US\$4165,000), the Spanish Agency for International Development Cooperation (\$55,000), the United States Agency for International Development (US\$30 million), and over US\$600 million from the World Bank (The REDD Desk, 2014). As funding has become available many governmental and non-governmental organizations have sought to implement pilot projects in rural communities throughout south and southeastern Mexico.

Finally, Mexico indicated its interest in expanding its REDD+ efforts to an international scale when in November of 2010 the state of Chiapas signed a Memorandum of Understanding (MoU) with the governments of California and Acre (Brazil) securing the dedication of the three governments to establish a program in which carbon credits produced in Chiapas and Acre could

be sold in California's domestic carbon market. As a result of the MoU, the REDD+ Offset Working Group (ROW) was established in order to determine the legal, institutional, policy and other mechanisms necessary for allowing the international trade of carbon credits in California's domestic carbon market. At the time of the writing of this dissertation the results of the ROW study had not been released, and the Memorandum continued to be simply that – a memorandum. Despite the lack of action on the part of the three governments in moving forward with the Memorandum of Understanding, it is important to recognize that such an agreement was nonetheless important in providing a pillar of legitimacy to all three governments' commitments to establish internationally recognized climate change mitigation policies.

It is within the context of these carbon forestry initiatives that Scolel' Te must be analyzed. Scolel' Te forms part of a much broader global effort to mitigate climate change through market-based measures. In Mexico, such projects have been articulated through national efforts to enhance and protect forest resources and to alleviate rural poverty. However, Scolel' Te, although forming part of relatively new models of development rooted in market mechanisms, replicates many aspects of Chiapas' broader social history of development including its support of Chiapas as a region defined by the export of agriculture-based products. In the following section I turn to the Sierra Madre region where research for this dissertation was focused. I assess several components of the current socio-political context in the region, focusing in particular on farming, changing attitudes toward rural life, health and education. I suggest that these issues cannot be understood outside the context of Chiapas' social history of development. However, in examining this broader history, I highlight key points where the experience of the Sierra Madre region differs from that of other regions in the state.

Development and the Sierra Madre of Chiapas

Marcos' quote at the beginning of this chapter alludes to the veins through which Chiapas' natural resources flow, suggesting that their extractive effects are ecologically and socially disastrous. While the last section was focused on the nature of such veins – the voluntary markets in which carbon credits are sold – this segment focuses on the effects of development in Chiapas. To this end, I examine the state's development history, focusing on its political, economic and historical dimensions – a context in which carbon forestry has emerged in Chiapas. I begin by outlining several socio-economic and political characteristics of the Sierra Madre region in which this dissertation is focused. I then expand the analysis, examining Chiapas'

broader development history and showing several points where the Sierra Madre region diverges from trends in the rest of the state.

The two communities with whom much of this dissertation is concerned were founded in the late 1960s and early 1980s, and are located in Chiapas' central Sierra Madre region near the natural reserves, Reserva de la Biosfera La Sepultura and the Reserva La Frailesca. At the time of their founding, settlers from the municipalities of Villaflores and Villa Corzo occupied land, some of which was, and had historically been, coffee plantations established during the 19th century. Both communities are relatively young, having been established well after the state's accelerated land redistribution in the late-1930s. Nevertheless, the ejido land reform program provided an important opportunity for campesinos to acquire land and other resources needed to establish a viable agricultural livelihood. However, as will become clear, life in the rural Sierra Madre region is complicated by the conditions of poverty common to other regions in the state.

In the Sierra Madre region, motor vehicle transportation is both a curse and a privilege. For those few people with access to vehicles, car ownership provides key income-earning opportunities, as the rest remain dependent on their services for a variety of needs. Those who own vehicles earn money by transporting agricultural crops to nearby cities. These intermediaries – often referred to cynically as *coyotes* – charge inflated rates for their services, and benefit from a lack of viable transportation alternatives for farmers. Collier and Quaratiello (1994) note that the reduced profit margin stemming from the *coyotera* provides a significant financial challenge for many marginalized farmers whose income depends on the sale of corn, beans and coffee.

In the Sierra Madre region, public transportation consists of buses and *colectivos* that circulate between rural communities and municipal centers (see Figure 2.1 for the key regions of Chiapas). Buses and *colectivos* are typically owned by one driver from a cluster of communities. Trips are made from communities to the city once every four or five days, usually involving long trips on poor road and bridge infrastructure (see Appendix A). Public transportation is regulated by Mexico's Ministry of Communications and Transportation (SCT), which distributes permits to authorized transportation service providers. These permits are coveted items, allowing the holder to work as a bus driver, and thus, to gain regular access to scarce income. Customers pay an average of Ps \$35 – around US \$3 – for a one-way ticket, and take advantage of the trip to the city to purchase household items such as bread, sugar, eggs and soda that are unavailable within their community. Upon returning home, families will sell previously purchased items to neighbors and relatives. However, income resulting from household sales is limited since many vendors tend to sell the same items, thus creating a fairly inefficient informal market.

Farming in the Sierra Madre

For most people in the Sierra Madre region, key income-earning and subsistence activities revolve around agriculture. In Villaflores nearly one half of the municipal territory is dedicated to agriculture with slightly less in Villa Corzo (Lillo et al, 1999). In rural communities corn, bean and coffee production predominate (Lillo et al, 1999), while many families also keep cattle that they rely on for cheese, milk and meat. For those communities not located near the nature reserves, hunting animals such as wild bore, turkey, armadillo, deer and rodents like *tepesquintle*, also supplements household corn and bean consumption.

Land-use and land-use planning in the region is based on several factors including political influence, the availability of resources needed to plant and grow crops, the type of soil on a given plot of land, the amount of land available to the farmer, and the farming practices of each individual producer. Given that these factors may shift from year to year, planting decisions change annually with regard to which crops are planted, where the crops are planted and how much of each crop is planted. There are several political factors that shape how farmers determine the quantity of crops to be planted in a given year, the first of which revolves around natural protected areas such as the Biosfera La Sepultura and the Reserva La Frailescana. Since the creation of the reserves in 2007 and 2010, farmers report having been prohibited from hunting animals within the protected areas and from harvesting trees so as to clear more land for planting. Moreover, through their work with the Mexican National Commission for Protected Areas (CONANP) farmers have been discouraged from using fire to clear and prepare land for annual planting. Of these changes, the latter has proven to have the largest impact on agricultural practices. According to local farmers, fire not only clears land, but also kills soil-based plagues and insects that threaten annual crops. Farmers noted in interviews that by avoiding the use of fire, they had compromised production by allowing plagues and insects to flourish in the soil.

A second political factor determining the quantity of crops planted in a given year relates to government-led agricultural support programs relied on by farmers for seeds and fertilizer. According to local producers in both communities, resources stemming from government programs such as PROCAMPO are notoriously unpredictable in the sense that resources typically arrive after planting in April or not at all. The unpredictability of funding from government programs is often attributed to the corrupt practices of local politicians who present an obstacle to the efficient distribution of funds. Fox and Haight (2010) note, for example, that PROCAMPO, which was designed originally to mitigate the predicted impacts of trade liberalization on small-scale agricultural producers, has been marked by inefficiencies, unequal funding distribution and

fraud that have prevented the provisioning of resources to many poor farmers. They suggest that this has increased insecurities among poor farmers who depend on government support for their agricultural activities, thus leading to skepticism among producers toward such projects.

A third element shaping farmer land-use decisions includes land availability – a variable that is determined by a variety of factors. First, land availability is often influenced by the standing of individual farmers within their community. Land ownership within a community tends to be concentrated with those people who have voting rights in the ejido – *ejidatarios*. Those who do not have land are often forced to rent from family members or others within their communities. These farmers often find themselves in a precarious situation defined by a greater pressure to obtain the income needed to pay rent on their land. Farmers with more land ultimately have greater flexibility in determining which crops they are going to plant and where they are going to plant them, while renters are limited to planting only as many crops as can be supported by the rented land parcel – generally only enough to support their family and to pay back the lender.



Figure 2.1 Maps of Chiapas' Five Key Regions
Map Credit: Jeff Levy

Finally, a fourth factor shaping land-planning decisions involves the type of soil available to the individual farmer within their plot of land. According to farmers, beans tend to grow better

in less than fertile soil, due in part to their capacity to fix soil nitrogen. Moreover, farmers note that beans tend to grow better on slopes given that their short stature does not expose them to damaging winds during the rainy season.⁹ Corn, which is planted at the beginning of the rainy season and harvested just after the beginning of the dry season (December/January), is planted in more fertile soils. Corn tends to be planted in flatter portions of land parcels where wind during the rainy season will not damage the large stocks of the corn plant. Some farmers will intercrop beans and corn, taking advantage of the bean's ability to fix soil nitrogen and the corn plant's ability to support bean plants in order to achieve efficient production of both. Many farmers, however, do not practice intercropping, arguing that doing so complicates harvesting processes.

Ultimately, land planning decisions are influenced by political factors, land availability, soil conditions, and seasonality. Given that each of these factors varies from year to year, land planning decisions change over time and are flexible, shifting in accordance with the changing availability of land and resources needed to plant crops. Each of these factors shapes how farmers view their land and its potential to produce the crops that are needed to sustain their families throughout the year.

Changing Attitudes Toward Rural Life

While farming is a key productive activity in the Sierra Madre's rural communities, many young people have become disinterested in continuing an agricultural livelihood. Such attitudes stem, in part, from the desire to pursue material wealth outside their communities. This is reflected by the cell phones that many young people acquire despite the fact that most communities do not have cell phone service. For many people cell phones represent a relatively cheaper alternative to an MP3 player, which they use exclusively for playing music. However, cell phones have also become a status symbol among many by which they are able to demonstrate not only their access to money, but also their ambitions to obtain money. For some the cell phone is a symbolic link between the ejido and the city, between poverty and the promise of material wealth.

⁹ Beans may be planted and harvested twice in a calendar year. The first planting is at the beginning of the rainy season, and is harvested in August. Given that the harvest of the first planting falls in the middle of the rainy season, few beans are planted as wet soil conditions may complicate the harvest. Although harvests during these months may be small, they are designed to serve as a backup to the second and larger bean crop, which is harvested in December/January following the end of the rainy season. Because harvesting is less complicated during this time, farmers plant significantly greater quantities of beans so as to support the family over the next year.

The desire for material wealth is fuelled by a variety of sources. For some, it stems from access to TV within their communities. Many households have televisions, which are able to acquire local channels with varying success. Additionally, some families choose to purchase cable television, thus expanding their range of access to programs such as movies (mostly from the U.S.), *telenovelas* and athletic events. Through these sources of media people obtain alternative ideas about what life could look like outside the ejido. Desires for material wealth are further stoked by the stories of others within the community who have migrated and returned. Stories relating the migration experience are often told in masculine, heroic overtones, and deal with themes of crossing the border, of having been captured by the *migra* (the word used to describe the border patrol), and of having had a beautiful *gringa* girlfriend. “I want to go to the U.S. *de mojado*,” confessed one 14 year-old in the municipality of Villa Corzo who was particularly taken with the idea of migrating.¹⁰ “I will leave my daughter and wife if I have to, and go make money for our family. Then I will return with a truck.” Such sentiments can be strong, but they are often met with resistance by parents who refuse to give permission to their kids to do so, or by spouses who refuse to accompany their partner on the journey. Additionally, despite the dream of migrating, for many, the reality of doing so is frightening, thus motivating short migration patterns as people search out employment options in nearby cities where they may live temporarily with family or friends while they work in agroindustry and construction. In the end, although many dream of migrating to the U.S., the majority settle for a more semi-permanent local migration, preferring to work locally during the dry season and return to the community to work their land during the rainy season.

Health and Education

Another factor motivating children to want to leave their communities is the perception that their opportunities are limited at home. Many communities in the Sierra Madre region live in extreme poverty. In the municipalities of Villa Corzo and Villaflores, this is particularly true, a situation that is made worse by a severe shortage of medical services and educational opportunities. Many communities lack a clinic, doctor, medicine, or any type of emergency medical transportation. In the event of a severe medical emergency, some are forced to rent a vehicle in the community for ~US\$50 or more and drive the 1.5-2 hours to the nearest clinic. Most cannot afford such an

¹⁰ “*De mojado*” is a common term used in Mexico to refer to people who migrate to the U.S. illegally, literally translating into “wet,” with reference to swimming across the border.

expense, and as a result, many illnesses and accidents go unaddressed (see Table 2.1 for statistics on various socio-economic indicators in the Sierra Madre region).

Table 2.1 Health Statistics for Sierra Madre Region

	Villa Corzo	Villaflores	State Average
Marginalization	High	Medium	
Extreme Poverty*	42%	30%	32.2%
Food Poverty*	55%	40%	
Minimum Wage Earners of Total Employed	58%	48%	
Education			
Secundaria (Secondary School)	68%	80%	68%
Bachilleres (High School)	40%	60%	40%
Alphabetization (ages 15-24)	92% Women: 94% Men: 93%	95% Women: 96% Men: 94%	93% Women: 92% Men: 94%
Child Death			
Younger than age 5 (out of 100 born)	1.5	2.0	1.1
Younger than age 1 (out of 100 born)	.75	1.25	.75
HIV/AIDS (15-24)/1000 people	.37	2	.37
Running Water	74%	90%	76%
Surface Area w/ Tree Cover (Avg.)	21.5%	21.5%	

Data obtained from CEIEG (2012) ¹¹

Another limiting factor for young people includes meager educational opportunities. In fact, most communities in the region lack educational options beyond the secondary level. In order for students to continue studying beyond this level they must move to the nearest city to do so. However, doing so implies a great number of expenses related to food, rent, travel, and school supplies, many of which most families cannot afford. As a result most children leave school prior to or after the secondary level, as they do not have the means to continue studying.

¹¹ Definitions used by the State of Chiapas are drawn from the United Nations Millennium Development Goals (MDGs).

It is in this context that rural communities in the Sierra Madre become enrolled in voluntary carbon markets through their participation in AMBIO's Scolel' Te program.

For many, the project represents the opportunity to earn income – money that is used to purchase food, pay electric bills, and make needed trips into the nearby city. Moreover, farmers use the money to purchase necessary agricultural inputs, including tools such as machetes and rubber boots. Although the financial benefits tied to working in Scolel' Te are few, farmers suggest that it provides them with an important source of employment in the face of scarce alternatives. Moreover, as becomes clear in Chapter 4, access to income and opportunities stands to improve one's standing in her community in the absence of other opportunities. However, we cannot fully understand the Sierra Madre region, nor can we fully appreciate the role of development in the region without a broader understanding of Chiapas' relationship to development over time. More specifically, it is necessary to clarify the state's status as part of a region defined by agricultural production for sale in international commodity markets, and to highlight differences across the state in ethnic diversity, political dynamics, and poverty – each of which shed light on the Sierra Madre as a unique region within Chiapas.

Chiapas' Development History

Chiapas is Mexico's southernmost state, bordering Guatemala to the south and the Mexican states of Tabasco, Veracruz and Oaxaca to the north. It is a highly rural state, and its chief economic activity is agriculture. Chiapas is home to the second largest number of indigenous groups in Mexico (behind only the state of Oaxaca) (CDI, 2012). Moreover, as Mexico's Institute of Geography and Statistics (INEGI) (2004) reports, Chiapas has the largest monolingual native language-speaking population at 36.5% of the total population as compared to the national average of 16.6%.

Chiapas is a state of contradictions. It is known internationally for its natural wealth, and its waterfalls, rivers, lakes and mountains have been converted into ecotourism sites visited annually by tourists from around the world. Within Mexico, this wealth has provided the country with natural resources, feeding and powering its largest cities. In 1990, with only three percent of Mexico's population it produced 54% of the country's hydroelectric power and over ten percent of its corn (Collier and Quaratiello, 1999). Despite this wealth, Chiapas' population is the poorest in Mexico, with poverty and illiteracy rates at significantly higher levels than the national average. In 2012 74.4% of the state population (over 3.5 million people) lived in poverty – 32.2% of which (over 1.5 million people) lived in extreme poverty (CEIEG, 2012). These levels

are higher than those of the next poorest state, Guerrero, at 69.5%, and significantly higher than the national average of 45.4% (CONEVAL, 2012). CEIEG (2012) notes, moreover, that as of 2010 Chiapas also accounted for the highest illiteracy rates in the country at 17.8% of the state population as compared to the national average of 6.9%.

In order to understand Chiapas' poverty paradox, it is necessary to contextualize economic development in the southernmost state within broader historical patterns and events. In this segment I focus on four points of Chiapas' history, arguing that they are central to clarifying how market-based development came to exist in Chiapas and its relationship to poverty and prosperity. Specifically, I examine: 1) historical and contemporary indigenous/non-indigenous relations; 2) Chiapas' colonial past; 3) national and local political structures; and 4) Chiapas' relationship to the rest of Mexico.

Phase 1: Colonial Chiapas and the Post-Colonial 19th Century

Development during Spanish colonialism was highly agricultural, and involved the establishment of plantations, timber extraction and the exploitation of indigenous labor (Collier and Quaratiello, 1999). Collier and Quaratiello (1999) note that the success of these plantations depended on forced indigenous labor, which, once weakened by smallpox, measles, yellow fever and malaria, was replaced through the forced resettlement of Lacandón Indians from the state's eastern region. Ultimately, development during the colonial period was designed to enhance the well-being of a select group of colonial and mestizo actors who saw themselves as superior to indigenous people – the enslaved labor force undergirding colonial production and trade.

In 1824, following Mexico's 1821 independence from Spain, Chiapas seceded from Guatemala and joined the Mexican Federation, becoming the new country's southernmost state. Throughout the 19th century Chiapas' relationship to the rest of Mexico remained marginal. At just under 1,000 km from Mexico City, the influence of successive weak post-colonial governments was virtually non-existent. The power vacuum left by the retreating Spanish and the absent post-colonial Mexican government was filled by local oligarchs who had managed to amass wealth and power under Spanish colonialism (Womack Jr., 1999). These oligarchs, however, were not the only people to take advantage of the Spanish colonial withdraw. North American and European entrepreneurs exploited the trade networks built and previously monopolized by the Spanish, establishing coffee plantations in the state's western Sierra Madre region and timber extraction in the eastern Lacandón region (Collier and Quaratiello, 1999). Collier and Quaratiello (1999) note that the coffee plantations were initially stimulated by the

mid-19th century California gold rush, which provided German entrepreneurs with a commercial outlet for coffee on the Atlantic coast. They suggest, however, that while profits from coffee sales tended to remain in Chiapas and Mexico, the logging business was largely exploitative with the profits leaving Mexico for Liverpool and London where mahogany and cedar were sold to furniture manufacturers.

Toward the end of the 19th century, extractive development practices were invigorated by the policies of President Porfirio Diaz (1876-1910). During this time, rural development in Chiapas was oriented around establishing large-scale foreign-owned agricultural plantations, which were viewed as a central component in establishing an agricultural export economy. Under the *Porfiriato* development model Tzeltal, Tzotzil, Chol and Mam indigenous landholders were dispossessed of their land, which was then sold to German, American, Spanish, French and English entrepreneurs interested in creating haciendas (Rus and Collier, 2003). Dispossessed indigenous groups, once again pushed off their land, were forced into a system of migrant labor in which they moved around the state as sharecroppers, wageworkers, or seasonal contract laborers working for foreign landholders on plantations in the Soconusco Valley and the Sierra Madre region (Benjamin, 1996; Harvey, 1998; Rus and Collier, 2003). Harvey (1998) notes that the movement of indigenous labor was facilitated by the construction of highways, while the export of agricultural products was enhanced by the development of railroad networks such as the Pan-American Railroad, and the construction of telephone and telegraph lines that connected all important towns and most haciendas.

In the end, colonial and post-colonial 19th century Chiapas featured a development model designed to extract resources at the expense of the natural environment and the state's indigenous people. This time period featured a reorganization of rural Chiapaneco social space defined by the establishment of plantations in western Chiapas, the extraction of valuable tree species in the eastern Lacandón region, and the relocation of indigenous people forced to work on growing export-oriented plantations. It was a development model designed to enhance the well being of mestizo and foreign landholders, and which greatly marginalized the state's indigenous population.

Phase 2: Post-Revolutionary Development, 1910 - 1993

The 1910 Mexican Revolution brought to an abrupt end the regime of Porfirio Diaz, and was followed by several years of infighting and civil war as competing factions sought to instill their vision for the new Mexico (MacLachlan and Beezley, 2003). The infighting came to a relative

calm with the establishment of the 1917 Constitution, an extremely nationalist and progressive document (Womack Jr., 1999). In the new constitution, Article 27 gave the nation ownership of the country's land, water and subsoil resources, and paved the way for land reform designed to assist the nation's poorest people. The Revolution and the new progressively nationalist constitution represented a break from past practices that linked development to foreign interests, and privileged a more nationalist development stance.

Despite the progressive nature of the 1917 Mexican Constitution, it is commonly suggested within Mexico that much of Chiapas' indigenous population was unable to access the benefits tied to land reform and other aspects of the Revolution. This perspective stems, in part, from the fact that the effects of the Mexican Revolution reached Chiapas later than other regions of the country. Up until the mid-1930s, for example, the Mexican government continued to play a strong role in contracting Chiapas' indigenous people to work on the state's coffee plantations (Rus, 1994). As Rus (1994) notes, during this time 20,000 Indians from Chiapas' central highlands migrated to the southern Sierra Madre and Soconusco regions to work, essentially as slave labor, in coffee plantations. Rus (1994) notes that chronic poverty following the 1910 Revolution forced many Tzotzil and Tzeltal Indians to continue to work as seasonal migrant laborers. Of the experience, Rus (1994, page 268) says:

“This [migration] entailed an eight-day walk each way for which not only were they not paid, but during which they were forced to buy their own food, pay for the privilege of sleeping as a group on a veranda at night, and satisfy transit taxes as they passed through towns... in spite of a minimum wage of 1.30 pesos a day during this period, the prevailing rate for highland migrants on Chiapas' coffee plantations was only 30 to 50 centavos – and only if they could finish their *tareas*, or daily work quotas.”

Citing the case of the central highlands region, Rus (1994) suggests, however, that the Revolution eventually arrived in Chiapas in the late 1930s during the presidency of Lázaro Cardenas (1934-1940). During this time the effects of the new Mexico were felt in the form of accelerated land reform, and the formation of labor unions such as the Sindicato de Trabajadores Indígenas (Union of Indigenous Workers – STI), in which coffee workers became enrolled (Rus, 1994). These measures improved the living and working conditions for some Tzeltal and Tzotzil Indians in the central highlands. For the Mexican government, however, it proved to be a key mechanism for concentrating previously dispersed settlements into larger communities, and for enrolling indigenous workers into the state machinery through their participation in the worker's union (Rus, 1994). This was essential for beginning to close the political distance between

Mexico City and what had previously been an outlying state within the federation. As Rus (1994) notes, it also provided a strong counterbalance to the oligarchs who had solidified their power within the state throughout the 19th century.

The Revolution eventually reached the Sierra Madre region in much the same way. For campesinos here, who, unlike in the central highlands were majority mestizo, land reform proved to be an important method for obtaining previously inaccessible resources.¹² However, for many Mam Indians, the land distributed through the reform program was often located on steep slopes in the Sierra Madre mountains, making it difficult to establish a viable living from subsistence farming (Hernández Castillo, 2003).¹³ Thus, Mam Indians and other campesinos in the region continued to provide a secure source of labor for the coffee plantations as they sought to supplement marginal farming with wages earned from migrant labor.

As in the central highlands region, people in the Sierra Madre experienced the presence of the Mexican state in the form of institutionalized organizations. Such organizations included the Confederación Nacional Campesina (National Peasant Confederation – CNC), and later the Coordinadora Nacional de Pueblos Indígenas (National Coordinating Committee of Indigenous Peoples – CNPI), both of which were designed to integrate indigenous groups and campesinos into the state infrastructure. In addition to these two organizations, Hernández Castillo (2003) notes that campesinos organized themselves into alternative non-state groups such as the indigenous coffee growers' co-op, Indígenas de la Sierra Madre de Motozintla (Indians of the Sierra Madre of Motozintla – ISMAM) and the Nan Choch vegetable cooperative – both serving as organizations through which specific agricultural objectives could be pursued.

In the end, the Revolution reached Chiapas, albeit slower than in other regions of the country. However, despite land reform, conditions remained difficult in the state throughout the mid-20th century. This was due, in large part, to the adoption of agricultural policies at a national level that included investments in large irrigation projects and subsidies aimed at supporting large-scale farms in northern Mexico at the expense of smallholders (Fox and Haight, 2010). Moreover, in-line with the then popular Green Revolution, the Mexican government adopted policies that privileged irrigated wheat production rather than temporal corn production common to Chiapaneco smallholders (Fox and Haight, 2010). Additionally, Fox and Haight (2010) note

¹² The Sierra Madre region has a smaller indigenous presence as compared to the central highlands and Lacandón regions of the state, particularly in the municipalities of Villaflores and Villa Corzo where this dissertation research took place. Here, as of the late-1990s, only 1,000 indigenous language-speaking inhabitants resided (Lillo et al, 1999).

¹³ Despite the presence of coffee plantations in the Sierra Madre region throughout the 19th century, it was not until after the Revolution that the region became populated by poor farming communities (Lillo et al, 1999).

that despite efforts in the 1970s and 1980s by the Mexican Federal Government to incorporate smallholders into federal agricultural programs, many remained left out while large-scale commercial farmers continued to benefit. For many smallholders in Chiapas who had obtained agricultural land under post-revolutionary land reform, the inequality in access to financial and other resources resulted in a relative lack of options for developing a viable agricultural livelihood.

Phase 3: Counterinsurgency and Contemporary Development

At the beginning of the 1990s Mexico found itself in the midst of a neoliberal transition, which had been instigated by the 1982 debt crisis and marked by the signing and ratifying of the North American Free Trade Agreement with Canada and the U.S. in 1994. It was in the context of this transition that the Zapatistas – a largely indigenous rebel group based in Chiapas – began a violent revolt against the Mexican state, capturing several municipal seats in Chiapas and establishing a series of autonomous communities. The Zapatistas, who had been organizing since the 1980s, timed the beginning of the uprising to coincide symbolically with the first day of the North American Free Trade Agreement, which they saw as another element in the long history of disenfranchising policies toward Mexico's indigenous people. In their Declaration of War, the General Command of the Ejército Zapatista de Liberación Nacional (EZLN) identified, as a cornerstone of their movement, the goal of reversing 500 years of oppression toward Mexico's indigenous people, first carried out by colonial Spain and continued by the Mexican state. For the Zapatistas, development in Chiapas had too long been focused on exploiting the state's wealth so as to benefit a privileged few while marginalizing the rest. As then Subcomandante Marcos (1994) of the Zapatistas put it:

“One million Indigenous people live in these lands and share a disorienting nightmare with mestizos and ladinos: their only option, 500 years after the "Meeting of Two Worlds," is to die of poverty or repression. The programs to improve the conditions of poverty, a small bit of social democracy which the Mexican state throws about and which, under the regime of Salinas de Gortari carries the name PRONASO, are a joke that brings bloody tears to those who live under the rain and sun.”

The Mexican government responded to the uprising with a creative mix of repression and co-optation/negotiation – what the Zapatistas have referred to as the *política de la doble cara* (Hernández Castillo, 2003). Repression was most visible in the mobilizing of the Mexican

military immediately following the uprising. The less visible element of repression was tied to the clandestine mobilization of paramilitary groups by the Mexican government, whose aim was to divide and weaken Zapatista communities (Aubry and Inda, 1997). Aubry and Inda (1997) note that this tactic, which was prevalent in the central highlands, Lacandón and southern Sierra Madre regions of the state, involved arming and deploying poor, non-Zapatista affiliated indigenous people, to attack Zapatista supporters. They note that for many poor indigenous farmers with no access to land or other resources, paramilitarism represented their only recourse to prestige and power in an otherwise bleak situation.

Since the Zapatista uprising, cooptation has been an important component in the government counterinsurgency strategy – a component driven by state-led development programs. Following the uprising, the Mexican Federal Government focused largely on the development of large-scale infrastructure projects such as roadways, schools and health clinics via the Mexican military. This work, which has been identified by Diez and Nicholls (2006) as the ‘remilitarization’ of Mexico, has involved the realization of civic action and social projects aimed at providing assistance to Mexican citizens in cases of national emergency or necessity. These projects have been largely carried out by military-directed ‘civic action battalions’ whose assignments in Chiapas were extended from twice a month to a permanent status in 1994 (Camp, 2005). Since the mid-1990s this has resulted in an effective meshing of state-led development and counterinsurgency objectives in Chiapas. The result has been the rejection of state-led development programs by Zapatista and pro-Zapatista communities, who view government assistance as a means to weakening their movement.

While both coercive and oppressive methods are common in the central highlands and Lacandón regions of the state, they have also been present in the southern Sierra Madre region. Here, the government responded quickly following the 1994 uprising, fearing that Mam Indians who had been previously organized under government programs would mobilize in support of the Zapatistas (Hernández Castillo, 2003). For some Mam Indians, this was certainly the case. However, Hernández Castillo (2003) notes that those who did mobilize in support of the Zapatistas, given that they were an indigenous minority in the region, were forced to draw on the pluriethnic character of the autonomous regions, recruiting mestizo campesinos to join the cause. She notes, however, that while some mestizos and Mam Indians united in support of the Zapatistas, others chose to keep a guarded distance from the movement, preferring to avoid being caught between Zapatista and military/paramilitary aggression.

Following the Zapatista uprising, Chiapas experienced an explosion in the presence of NGOs interested in supporting the movement, particularly in San Cristóbal de las Casas. The

work of these organizations has differed from that of the Mexican state, and has been centered largely on establishing cooperatives through which indigenous people (Zapatista and non-Zapatista) may sell artisanal goods, either locally to tourists, or nationally and internationally. This has been important for Zapatista communities, as it has allowed them to gain access to revenue in the face of government strategies to isolate them. Additionally, some NGOs have provided legal and human rights services to the Zapatistas, and produced research regarding security and other political issues in the state, making it available to Zapatista communities and the general public.

While the Zapatista uprising affected many regions of Chiapas, not all experienced the event or its fallout in equal measure. In the Sierra Madre, the effects were largely concentrated in the southern portion of the mountains with previously organized Mam communities. However, moving north along the Sierra Madre mountains, campesinos have since tended to show a greater degree of apathy toward the movement, with some expressing disdain for the use of arms, and others empathizing with the Zapatista initiative to support the underrepresented. In the central and northern portions of the Sierra Madre, communities are majority mestizo and tend to work regularly with government organizations in a variety of development programs. While they do show skepticism at times toward government-led development, their skepticism is rooted more in a history of corrupt funding practices, having little to do with questions of counterinsurgency and cooptation.

It is in this context in which carbon forestry must be placed. It is not extractive like past development projects, although it does follow familiar patterns of agricultural production for consumption in northern Mexico and the global north. Moreover, although Scolel' Te has not been linked to anti- or even pro-Zapatista sentiments, the NGOs, individuals, communities and government organizations that make Scolel' Te possible, and thus facilitate the expansion of carbon credit production in Chiapas, are intricately enmeshed in Chiapas' socio-political dynamics. Carbon forestry is situated historically with respect to past development projects and geographically with respect to regional variations in political dynamics, ethnic composition and physical geography. Scolel' Te, more specifically, is situated within broader voluntary carbon markets that attempt to achieve environmental conservation and poverty alleviation via market mechanisms. It is with this in mind that I assess carbon forestry in subsequent chapters.

Conclusion

In this chapter I take my cue from Marcos, analyzing not only how Chiapas' wealth is extracted through various markets, but assessing the local implications of extractive industries as well. I first look at international voluntary carbon markets in which AMBIO sells carbon credits produced in Scolel' Te. Understanding this market context is necessary for Chapter 3 where I begin to assess the local implications of shifting international market conditions. I then analyze the broad social, political and historical context of development in Chiapas, noting that Scolel' Te is also embedded within long-standing patterns of social life, capital accumulation, and colonial, neocolonial and state policies. It is, like so many other projects within Chiapas' development landscape, designed to generate revenue through the sale of agricultural products in international markets. Given the interconnected nature of carbon forestry to development in Chiapas, past and present, a thorough grounding in regional geography and history was essential to facilitating analyses of this project in subsequent chapters.

In Chapter 3 I build on this analysis, focusing on AMBIO's attempts to overcome limitations posed by shifting market dynamics and prohibitive production and transactions costs in order to expand into Chiapas' Sierra Madre region. This work depends on a variety of actors, including government institutions, non-governmental organizations and rural farmers. However, as will become clear, not all actors enter into Scolel' Te on the same footing. In Chapter 3 I draw on a commodity chains perspective designed to show how power inequalities become manifest in the carbon credit commodity chain, and to illustrate how risk associated with exposing Scolel' Te to market dynamics is pushed onto those with relatively little ability to shape the nature of their work in Scolel' Te. In this sense, carbon forestry may be seen as replicating many of the relations of dominance and oppression observed in this chapter. In Chapter 4, I demonstrate how these factors combine to erode social relations and ultimately undermine farmer standing within their communities. Such effects are particularly dramatic for técnicos comunitarios on whom the success of Scolel' Te depends. Finally, in Chapter 5 I show how past experiences with development and current doubts among farmers regarding Scolel' Te necessitate the pursuit of community buy-in by AMBIO through the use of participatory exercises. I suggest that such exercises, however, are ultimately marginalizing to farmers, who find that the conditions of their participation ultimately diminish the continued personal value of their participation in the program.

CHAPTER 3: EXPANDING THE CARBON CREDIT COMMODITY CHAIN Assessing Risk and Inequality in Carbon Credit Production

Introduction

It was late in the afternoon at AMBIO's offices in San Cristóbal de las Casas when we finally sat down to rest after a long meeting with técnicos from around the state. As we ate our lunch and reflected on the meeting, two members of AMBIO's senior leadership began to explain the challenges facing Scolel' Te – challenges, they suggested, had originated in changes within the voluntary carbon market in which AMBIO participates. Demand for carbon credits, one woman noted, had shifted away from Chiapas as global buyers sought credits that had been produced in other parts of the world. She argued that such shifts restricted AMBIO's expansionist efforts and existing activities in many ways, and argued that the NGO would have to respond by figuring out how to increase the value of the carbon credits produced in Scolel' Te all the while maintaining current efforts to expand the program into the Sierra Madre region.

In this chapter I argue that as AMBIO expands Scolel' Te into the Sierra Madre region, the project becomes exposed to market risk and rising transactions and production costs, and that the manner in which AMBIO manages such risk and related costs undermines the social relations of production between the organization and participating farmers. Risk emerges from exposure to shifting dynamics within the voluntary market, and is distributed unevenly among a variety of actors. In order to clarify how and why this occurs, I draw on global commodity chains (GCC), transactions cost, and political ecology literature. I argue that AMBIO's efforts to mitigate risk and overcome prohibitive costs amounts to an extension of the carbon credit commodity chain, albeit a horizontal swelling of one link (or *box* as described by Hopkins and Wallerstein [1994]) within the commodity chain rather than its overall vertical lengthening. Taking my cue from labor studies literature, I suggest that this swelling of the link in the commodity chain occurs through the creation of a division of labor involving NGOs, governmental ministries, farming communities and international organizations within which the effects of risk and rising costs are unevenly distributed. It is a division of labor that rests on the cheap labor of some participants, and which facilitates project expansion despite challenges to continued growth.

The purpose of this chapter is threefold: 1) to clarify the nature of shifting dynamics in voluntary carbon markets, and to show where and how costs emerge from carbon credit

production processes; 2) to show how AMBIO relies on an extended division of labor involving multiple actors in order to respond to risk emanating from exposure to shifting market dynamics and to overcome transactions costs and production costs; and 3) to clarify how such labor arrangements undermine the social relations of production between AMBIO and participating farmers by disenfranchising the latter as they work in Scolel' Te. This chapter represents an important pivot from the broad context elucidated in Chapter 2 by providing a first step toward delivering an on-the-ground analysis of carbon forestry. Moreover, it is essential for setting-up the discussion of the broader consequences of participating in carbon forestry for farmers as seen in Chapter 4, and for assessing AMBIO's efforts to attain community buy-in discussed in Chapter 5. However, before examining the challenges to project expansion in the Sierra Madre and AMBIO's response to such limitations, I outline the key theoretical frameworks used to analyze the relationship between risk and social relations in carbon forestry.

Labor, Chains, Networks and Transactions: Understanding the Carbon Economy

The dual challenges of market risk and rising costs, and the unequal labor relations established in response to these factors work together to undermine the social relations needed for carbon forestry projects to succeed. In order to adequately examine the erosive effect of labor arrangements in carbon forestry on social relations, it is necessary to understand three points: 1) the nature of labor arrangements needed for carbon credit production; 2) the inequalities in commodity chains that permit the unequal distribution of risk among actors within labor arrangements; and 3) and the nature of interactions in the commodity chain that encourage the unequal distribution of risk. I assess each of these factors in the next section. However, before doing so, I use this section to outline the key theoretical pillars upon which this analysis rests. In this section, I first draw on critical labor studies, outlining the nature of the extended production processes into which many actors participating carbon forestry become enrolled. I then turn to a commodity chains perspective for illustrating the fact that relationships within commodity chains are often hierarchical in nature, leading to inequalities among intra-chain actors. Finally, I look to work on transactions costs, which provides a useful understanding of the information asymmetries within the carbon credit commodity chain, and the manner in which such asymmetries lead to rent-seeking behaviors that cultivate inequality within the commodity chain. Together, these three perspectives clarify how attempts to respond to emerging risks and rising costs may be motivated by many factors, and how such risks and costs may, moreover, be unequally distributed within the carbon credit commodity chain. As will become clear, it is the

combined effect of these challenges and the manner in which they are managed within the carbon credit commodity chain that undermines the social relations needed for the successful completion of carbon forestry projects.

Extended Labor Processes and the Extended Division of Labor

In order to understand how risks and costs are distributed unequally within carbon forestry, it is necessary to look at the organization of work in the carbon credit commodity chain. In order to do so I draw on the labor studies of Sayer and Walker (1992). In their book, *The New Social Economy*, they highlight the centrality of the *division of labor* as a concept for clarifying the organization of actors and activities in production processes. They suggest that despite the expansion of the so-called service industry, much work continues to be tied to the production of goods rather than services – work that must be seen as pertaining to an extended production process. According to Sayer and Walker (1992, page 68), the extended labor process includes:

“...work that takes place before and after products are actually formed by direct, hands-on labor, as well as work complementary to the immediate labor process. Extended labor, from R&D to janitorial work to automobile repair, is regularly mislabeled as services, especially where it is sold in a commodity form, when it is, in fact, nothing more than work that can be separated in time and space from the core of direct labor.”

Sayer and Walker (1992) go on to suggest that the extended division of labor may be organized into four categories: pre-production labor, auxiliary labor, post-production labor, and repair and maintenance. Pre-production labor, they suggest, includes product-testing, trial runs, the clearing of a field for planting, hybrid plant propagation, and other pre-production measures – i.e. labor not associated with that which accompanies normal production processes. Sayer and Walker (1992, page 69) define auxiliary labor, on the other hand, as that which “take[s] place on a regular basis during actual production, but which back[s] up or compliment[s] direct labor without ever coming into contact with materials or products.” Finally, they suggest that post-production activities involve inspection and labeling, while repair and maintenance work may continue for years following production. In this chapter I focus particularly on pre-production, production, and auxiliary labor, and their role in facilitating Scolel’ Te’s expansion.

AMBIO’s expansionist activities facilitate the program’s further entrenchment within Chiapas’ development landscape, but require pre-production and auxiliary labor arrangements designed to overcome challenges to project expansion. These challenges include responding to

the shifting interests of buyers who begin to source their carbon credits from other producers – i.e. ‘buyer flight’ – and overcoming high costs associated with project expansion and with responding to information asymmetries emerging from transaction costs. However, how this risk is distributed among actors within the extended division of labor is highly uneven. In order to better clarify these inequalities, I turn to commodity chains perspectives to examine the nature of unequal relations within the global economy.

Chains Framework

‘Chains’ framework proponents suggest that the global economy is organized into chains through which the actors and processes involved in the production of goods and services are connected. The *global chains* perspective – a term used by Bair (2009) to refer to the composite ‘chains’ framework literature – refers to three connected chains perspectives that have had strong purchase power within economic geography: commodity chains, global commodity chains (GCCs), and global value chains (GVCs). These perspectives are essential for understanding inequality in commodity chains. In this segment I draw from Bair and others to trace the three chains perspectives, including their potential for analyzing carbon forestry.

According to Bair (2009), the commodity chains optic is rooted in world-systems theory, and examines the manner in which raw materials are converted into final products. Bair (2009) quotes Hopkins and Wallerstein (1977, page 128) as defining commodity chains in the following manner:

“What we mean by such chains is the following: take an ultimate consumable item and trace back the set of inputs that culminated in this item—the prior transformations, the raw materials, the transportation mechanisms, the labor input into each of the material processes, the food inputs into the labor. This linked set of processes we call a commodity chain.”

Thus, for Hopkins and Wallerstein (1977), commodity chains signal the processes through which various labor and material inputs enhance a given commodity’s value. However, Bair (2009) suggests that, while defined in a similar fashion, global commodity chains and global value chains perspectives abandon many of the world-systems theory influences of commodity chains approaches. This is particularly visible in studies of the Marine Stewardship Council (MSC) certification of Alaskan fisheries (see Foley and Hebert, 2013). In this work, Foley and Hebert (2013) explore how various actors become embedded in the commodity chain through

certification work, examining the chain as a process understood in its own terms rather than as part of a broader world-systems framework.

Despite their differences, literature on the three ‘chains’ perspectives finds common ground in its focus on inequality within the global economy. Gereffi (1994), for instance, suggests that multiple types of rent-seeking behavior exist within commodity chains – behaviors that are governed largely by lead firms within the chain. Such behaviors differ, he argues, within buyer-driven commodity chains (BDCCs) and producer-driven commodity chains (PDCCs), and reflect the hierarchical nature of all relationships within the global economy. Within global commodity chains literature, discussions of inequalities among actors revolve around questions of governance (Bair, 2009). One arena in which this perspective has been applied is that of certification studies, which highlight the ability of lead firms to shape how commodity chains operate and how value is distributed along the chain (see Dolan, 2010). Work within this field also highlights the manner in which certification processes act as modes of governance whereby human-human and human-environment relationships are reworked through certification processes (Arora and Koshti et al, 2013; Foley and Hebert, 2013; Mutersbaugh, 2005). In the end, such perspectives are central for clarifying the dynamic relationships among groups and individuals within the global economy.

The ‘chain’s’ framework literature resembles work within political ecology that favors a ‘chains of explanation’ approach – an approach that recognizes the connected nature of actors, policies, and actions at multiple scales, particularly as they relate to issues of poverty, resource management and environmental degradation (see Blaikie and Brookfield, 1987; Peet and Watts, 2004; Robbins, 2004). This approach has been adopted, for instance, to connect development policy and food importation strategies with extreme poverty in Nigeria (Watts, 1983), to trace the effects of markets for bananas on local production in the Caribbean (Grossman, 1998), and to examine the role of global garbage politics in reshaping local ecologies in countries that receive global trash such as the Ivory Coast (Moore, 2011). In short, like the ‘chains’ framework literature, this work emphasizes the interconnectedness of actors across space and the unequal power relations among these actors, albeit with a greater emphasis on human-environment relations.

In short, these approaches draw on the ‘chain’ metaphor to illustrate how multiple actors are linked through trade and production processes. They highlight the hierarchical nature of the relationships that link intra-chain actors, and the fact that markets are often not as ‘free’ as orthodox economists might suggest. In such a context, agency – defined as *agencement* by Callon (2007) – is not only shaped by an actor’s position in relation to other actors, but by the

ability of some actors to exert influence over others (Arora and Koshti et al, 2013). Such a perspective is important for analyzing AMBIO's expansion of Scolel' Te into the Sierra Madre region. As the program expands, additional actors become enrolled and new relationships are formed. However, these relationships are rooted in Mexico's social history of development, and therefore, are not based in equal exchange. The 'chains' framework adds an important analytical component to this chapter, opening the door for critical studies of the complex social nature of carbon market expansion in Chiapas.

Despite the broad use of the 'chains' framework for studying the world economy, it has been critiqued. On the one hand, the use of the term *commodity*, which is traditionally used to refer to low-value-added products, has been seen as misleading, while Gereffi's (1994) distinction between buyer-driven commodity chains and producer-driven commodity chains has been critiqued for providing a narrow approach to viewing commodity chains (Bair, 2009). On the other hand, Mutersbaugh (2005) suggests that commodity chains do not exist in isolation, as many studies seem to imply, but often contribute to the formation of multiple chains. Finally, citing Cook and Crang (1996), Bair (2009) notes that commodity chains have been critiqued for their linearity, and thus, their limited ability to account for the complexities that define relationships within a given network. Such critiques are germane to this study given its analysis of the horizontal swelling of a single link within the carbon credit commodity chain. In an effort to work around the linear tendencies of the 'chains' framework, I draw from the work of labor studies in analyzing the division of labor within commodity chains. However, by focusing on the themes of the extended labor process and the extended division of labor discussed above, I suggest that one may begin to examine the relationships among actors that extend horizontally within a single link in commodity chains.

Inequalities among actors in commodity chains permit risks originating from exposure to shifting market conditions to be unequally distributed among actors with varying degrees of power within the commodity chain. However, risk is not the only factor that shapes unequal relationships within commodity chains. An additional factor that must be assessed is that of costs, particularly transactions costs and production costs. Such costs may motivate the pursuit of rent-seeking behavior that, as Gereffi (1994) notes, also engenders inequality within commodity chains. Commodity chain scholars have, for instance, examined rent-seeking behavior in relation to transactions costs, suggesting that such costs may lead to the adoption of opportunistic behaviors by firms (see Gereffi and Humphrey et al, 2005). In the next segment I examine these costs as an expensive effect of information asymmetries that AMBIO attempts to overcome through unequal labor arrangements with participating farmers.

Transactions Costs

Transactions costs must be assessed in this analysis, in part, due to their embrace within studies of carbon forestry, and because they facilitate an understanding of how some actors interact within the carbon market space. Transactions costs may be defined as those costs associated with determining, establishing, maintaining and transferring property rights (McCann and Colby et al, 2005). Chadwick (2006) contends, however, that despite the plethora of transactions cost analyses, there is not a universally accepted definition of the term.¹⁴ These costs stem from information asymmetries among actors involved in an exchange who have unequal access to and knowledge of the commodities being traded, thereby requiring assurances in the form of contracts, monitoring and certification. As Stiglitz (2000; 2002) notes, such information asymmetries have effects that shape economic activity. These effects, he notes, are seen in firm behaviors, which are organized so as to overcome information asymmetries tied to the buying and selling of goods. As noted above, such behavioral shifts may involve the adoption of opportunistic activities motivated by rent-seeking goals.

The transactions cost perspective has been broadly applied to a variety of contexts, both within and outside business (Macher and Richman, 2006). Macher and Richman (2006) note that such applications have included the arenas of law, health economics, agricultural economics, and public policy to varying degrees. Importantly, the transactions cost optic has also been applied to the study of payment for ecosystem services (PES) programs, including carbon forestry initiatives. The adoption of transactions cost perspectives in carbon forestry tends to correspond with concerns among practitioners regarding equity in participation among smallholders (Cacho and Marshall et al, 2005; McCann and Easter, 1999; Thompson, 1999). They note that projects with smallholders generally complicate monitoring and verification processes, thereby making them more expensive from a transactions cost perspective as compared to work with large landholders. Additionally, transactions cost perspectives are generally considered among practitioners to be a vital measure in predicting a project's long-term viability. This position is

¹⁴ Chadwick (2006) suggests that as a result, definitions may vary, ranging from narrow considerations of only exchange costs to much broader interpretations. Holden (2004), for example, includes within the transactions cost framework those costs associated with the administrative labor needed to respond to conflict and uncertainty. Additionally, he includes those costs associated with the monitoring and maintenance of projects, suggesting that doing so makes sense given their centrality to ensuring the commercial viability of a given product. Cacho and Marshall et al (2005) stretch the term even further, arguing that costs associated with the search by investors and project developers for mutually advantageous projects should be classified as transaction costs. Under this rubric transactions and their associated costs become broadly defined, and encompass the participation of many actors.

shared by AMBIO as considerations of transactions costs – particularly administration costs, monitoring costs and opportunity costs (see de Jong and Gaona et al, [2004]) – are used as a measure of Scolel' Te's long-term viability. Furthermore, as Chadwick (2006, page 259) says in relation to the transactions costs associated with the Kyoto Protocol's Clean Development Mechanism (CDM):

“Nearly all economic activities have transaction costs, but CDM transaction costs are especially important because the financial sustainability of CDM projects is so closely linked to the size of the CER revenue stream. Any factor that increases the cost of generating a CER or reduces its market price can have powerful effects on the number of CDM projects that are economically feasible and, by extension, how much GHG will be removed via the CDM.”

From this perspective, forest carbon projects are considered to be sustainable when transactions costs are low. This is important to consider in a setting where transactions costs are a normal part of business. However, how they are accounted for within a project varies. I argue that in carbon forestry such costs may be dealt with by managing organizations by pushing them off onto relatively powerless farmers who have little say in budgeting decisions.

Despite the broad use of the transactions cost approach, it has been critiqued for what has been identified as an inattention to the social nature of markets (Ghoshal and Moran, 1996). Granovetter (1985), for example, suggests that the transactions cost optic fails to examine the broad-ranging social factors that shape interactions in the market. Drawing from these critiques I argue that although the transactions cost approach may be useful for highlighting the interactions of actors within a constrained market space, it does not, on its own, adequately capture the social nature of markets. Instead, it may be combined with 'chains' framework studies and critical labor approaches discussed above so as to work around the undersocialized nature of the transactions cost perspective. In doing so, this combined approach provides a useful lens with which to analyze the expansion of carbon credit production in Chiapas, and for assessing the interactions of multiple actors within such work.

In this chapter I draw on these theoretical strands to analyze AMBIO's efforts to overcome emerging market risk and rising transactions costs and production costs. I argue that AMBIO relies on an extended division of labor involving farming communities, NGOs, governmental ministries and international organizations that carry out pre-production, production, and auxiliary labor. However, I note that not all actors enter into the program on equal footing and that some inequalities persist. In the next section I chart the challenges facing AMBIO since 2008 with regard market risk and rising costs. I then analyze the auxiliary labor carried out with

international organizations such as Conservation International, NGOs and farmers designed to increase the value of carbon credits produced through Scolel' Te within voluntary carbon markets and to capture market share. By clarifying this context, it is possible to then examine exactly how and why risk is unevenly distributed within the carbon credit commodity chain, and how unequal labor arrangements disenfranchise farmers. Ultimately, this approach provides a unique 'socialized production' optic for clarifying the issue of risk and its implications for carbon forestry.

Market Risks: The Great Recession, and the Twin Challenges of Too Much Biodiversity and of Not Being Poor Enough

“Companies are very excited to buy carbon credits from African producers because then they can turn to their client base or their board of directors and make the argument that they are supporting the poorest of people. Those same companies look to buy carbon credits from Brazil as doing so allows them to argue that they are protecting the Brazilian Amazon” (AMBIO employee).

In 2012 AMBIO indicated in interviews that its ability to sell carbon credits had declined since 2008, due in part to shifting interests among traditional buyers of carbon credits produced under Scolel' Te. This shift, they suggested, consisted of 'buyer flight' in which buyers began to source carbon credits from other parts of the world such as South America and Sub-Saharan Africa rather than Chiapas. For AMBIO, this shift threatened its ability to generate much needed revenue from the sale of carbon credits, and challenged its ability to expand into the Sierra Madre region. In order to understand this shift, it is important to look at two components of the voluntary carbon markets where AMBIO's Plan Vivo Certificates are sold: 1) the value of carbon credits to potential buyers; and 2) the nature of buyers of carbon credits produced under Scolel' Te. In this segment I address each of these points in turn.

In 2012, one AMBIO employee noted in interviews that the majority of carbon credits sold by AMBIO are to private sector buyers who purchase carbon credits in order to fulfill their organization's corporate social responsibility (CSR) objectives. CSR goals, she pointed out, have historically centered on the buyer's ability to demonstrate a set of *green credentials* to consumers – that is, to prove to clients that they are dedicated to ensuring that their operations do not detract from the well being of the natural environment. Past efforts to do so have involved simply illustrating a commitment to both environmental and social concerns, both of which were facilitated by purchasing carbon credits that seek to alleviate rural poverty and mitigate global

climate change. Traditionally, carbon credits produced in Chiapas have tended to provide private sector clients with the ability to respond to these CSR needs, particularly given the aim of Plan Vivo Certificates to contribute to climate change mitigation through CO₂ offsets. Moreover, AMBIO leadership noted that clients have been attracted to the social implications of Scolel' Te, particularly given the concerns of the Plan Vivo Standard with smallholders who have historically been excluded from participation in carbon offset projects (see Cacho and Marshall et al, 2005; McCann and Easter, 1999; Thompson, 1999). This, AMBIO notes, has allowed them to maintain the interest of potential buyers over time – a trend that began to change in 2008.

In 2012, one senior manager in AMBIO noted that since 2008 companies have sought to purchase carbon credits that are increasingly *green* in nature – that is to say, carbon credits that respond to more iconic environmental and social issues. They include, for instance, protecting biodiversity in the Brazilian Amazon or alleviating poverty in Sub-Saharan Africa. These issues, buyers suggest, are more marketable to their clientele. It is assumed by these buyers that carbon credits should be worth more in relation to CSR objectives if they are protecting widely recognized biodiversity hotspots such as the Brazilian Amazon, rather than the less-recognized rainforests of Chiapas. According to the same logic, carbon credits designed to alleviate poverty in Sub-Saharan Africa should be worth more than those produced in countries where poverty is less extreme. The shifts in CSR objectives and the corresponding ‘buyer flight’ have left AMBIO with the challenge of responding to a *fleeing* clientele. Frustrated, one AMBIO employee argued, “What they [carbon offset purchasers] don’t realize is that we have jungles, and we have poverty.” According to her, the sourcing decisions made by clients were not justified in terms of protecting the natural environment or alleviating poverty, when both goals could be reasonable met by purchasing carbon credits from Chiapas. They were, instead, rooted in marketing CSR objectives to corporate clients.

AMBIO leadership noted that shifting market conditions limited their ability to generate revenue from the sale of carbon credits – credits needed to justify Scolel' Te’s expansion into the Sierra Madre region. Without revenue from the sale of carbon credits, AMBIO faced the threat of leaving administrative costs unmet and of having to postpone compensation to farmers for their work in establishing and caring for agroforestry systems. However, AMBIO’s ability to respond was limited by two factors: 1) by the fact that the majority of buyers in voluntary carbon markets are the very private sector clients that had begun to source carbon credits from other projects; and 2) the overall number of carbon credits transacted voluntarily since 2008 had begun to decline, falling victim to the global recession. Given the homogeneity of voluntary carbon market buyers, AMBIO’s options for responding to ‘buyer flight’ were limited to courting those buyers back to

Scolec' Te. However, doing so would be difficult in a market context where overall transactions had declined. Before analyzing AMBIO's response to 'buyer flight' I examine the nature of voluntary market buyers and the overall nature of activity in voluntary markets.

In 2012, 90% of contracted volumes in voluntary carbon markets were realized by the private sector for which corporate social responsibility (CSR) is a primary concern (Peters-Stanley and Yin, 2013). Peters-Stanley and Yin (2013) noted, for instance, that in 2012 CSR concerns ranked at the top of the list of motivating factors behind private sector purchases of carbon credits (at 34%), reflecting similar patterns as in 2011. These trends are reflected in AMBIO's work, having sold the majority of the Plan Vivo Certificates produced in Scolec' Te since 1997 to private companies (Vargas Guillen and Velazquez et al, 2011). The majority of AMBIO's transactions occur "over the counter" (OTC) with brokers, while additional sales are arranged with individuals.¹⁵

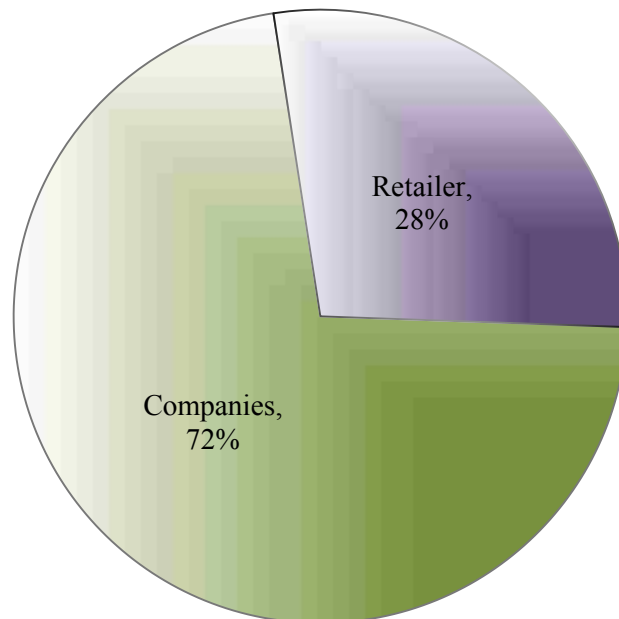


Figure 3.1 Market Sectors of Scolec' Te

Data obtained from Vargas Guillen and Velazquez et al (2011)

AMBIO's private sector clients have tended to purchase carbon credits for one of two reasons: 1) either out of voluntary interest (particularly relating to CSR objectives); or 2) for pre-compliance

¹⁵ "Over the Counter" (OTC) refers to those transactions realized outside of a formal exchange.

purposes (i.e. in anticipation of perceived future regulations regarding carbon emissions). While both concerns have motivated participation among the private sector, it is the former that, as noted above, has most shaped their clients' sourcing decisions. Voluntary carbon market purchases are thus driven by private sector participation, while the motivations for such participation are shaped largely by CSR considerations. As CSR concerns shift among buyers, managing organizations such as AMBIO must respond in order to capture market share. However, efforts to do so are further complicated by overall reduced sales in voluntary carbon markets since the beginning of the global recession in 2008.

In 2012 AMBIO indicated in interviews that its ability to sell carbon credits had declined, in part, due to shifting priorities among corporate and individual actors following the 2008 financial crisis. They suggested that since this time corporate actors, whose purchases AMBIO depended on for revenue, had become less concerned with climate change mitigation in the face of potential economic catastrophe.

Table 3.1 AMBIO Carbon Offset Transactions (MtCO₂e), 2008-2011

Year	Total volume Carbon Offsets (MtCO ₂ e)
2008	40,604
2009	6,069
2010	12,900
2011	1,380

Data obtained from Cooperativa AMBIO (2012)¹⁶

Globally, such shifts are reflected in the fact that in 2008 the total volume of offsets transacted in voluntary markets totaled a record MtCO₂e 135 million, only to fall to MtCO₂e 107 million in 2009 (Peters-Stanley and Yin, 2013). While 2010 showed a strong rebounding in the voluntary carbon markets, total sales have stayed low, falling back to MtCO₂e 97 million and MtCO₂e 101 million in 2011 and 2012 respectively (Peters-Stanley and Yin, 2013). For AMBIO, these trends are further mirrored by their total carbon offsets sold from 2008-2011. In 2008 AMBIO sold MtCO₂e 40,604, only to see the totals decrease to MtCO₂e 6,069 in 2009, MtCO₂e 12,900 in 2010 and MtCO₂e 1,380 in 2011 (Cooperativa AMBIO, 2012).

¹⁶AMBIO had not published its 2012 Annual Report at the time of the writing of this dissertation

This scenario is further complicated by the fact that among co-benefit standards – i.e. those standards that claim to account for social factors in addition to carbon capture – the Plan Vivo Standard ranks as one of the least influential, holding only 1% of the market share in 2012 (Peters-Stanley and Yin, 2013). While the reasons behind the small market share held by the Plan Vivo Standard could be many, one possible explanation includes the fact that although projects within the standard tend to command higher prices, their work with smallholders means that they are only able to contract a relatively small volume of carbon credits as compared to other projects with a higher production capacity. This complicates AMBIO’s hopes of developing timely solutions for responding to reduced transactions under the Plan Vivo Standard.

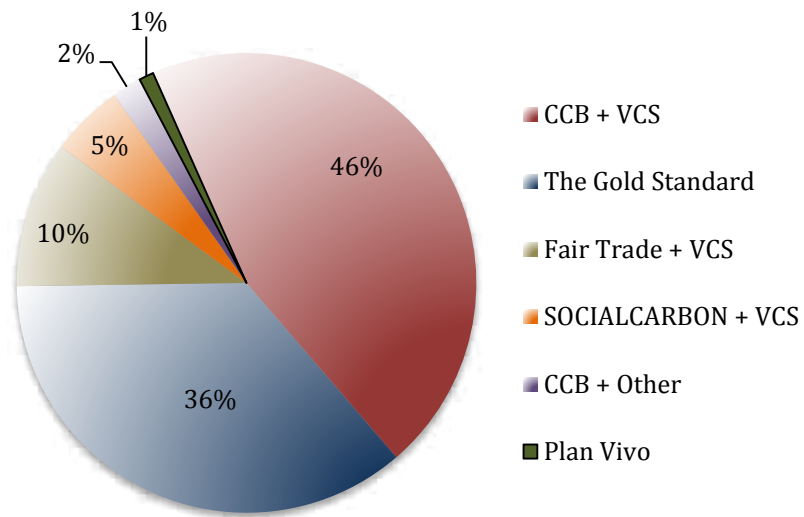


Figure 3.2 Market Share by Co-benefits Standard in 2012

Data obtained from Peters-Stanley and Yin (2013)

In the end, both scenarios – ‘buyer flight’ and decreased overall sales in the voluntary market – challenged AMBIO’s ability to generate revenue through the sale of Plan Vivo Certificates produced within Scole’ Te, and proved prohibitive to AMBIO’s ability to expand into the Sierra Madre region. Thus, overcoming these challenges became a central component of the process of producing carbon credits in the Sierra Madre region. This is the focus of the following segment.

Increasing Value through Biodiversity and Social Indicators

During spring 2012 (3 years after first beginning work in the Sierra Madre region), AMBIO invited consultants from Conservation International (CI) to assist them in resolving one of its most urgent issues: re-capturing market share within voluntary carbon markets. The strategy was to demonstrate the value of Plan Vivo Certificates to potential buyers by showing improvements in various social and biodiversity indicators in relation to established baseline measures. This, AMBIO hoped, would make carbon credits produced through Scolel' Te more marketable to private sector buyers that had *fled* the program in search of carbon credits that did not simply capture CO₂, but which also alleviated the world's most extreme poverty and improved biodiversity in the world's iconic hotspots. The work represented an additional component to the production process, what Sayer and Walker (1992) refer to as the extended labor process. Drawing from Sayer and Walker (1992), I suggest that efforts to enhance the value of carbon credits produced within Scolel' Te forms part of the production process, albeit a complementary element to the hands-on labor carried out in participating communities. It is, more specifically, a type of *auxiliary labor* that does not actually come into contact with the produced product (carbon credits), but which exists in parallel to the product as a means to enhancing its value in the carbon market.

The work laid out by AMBIO and Conservation International involved three steps: 1) identifying the key social and biodiversity indicators to be measured; 2) identifying baseline measures for each of the chosen indicators (i.e. the pre-project state of the social and biodiversity indicators within each participating community); and 3) measuring the improvement in each indicator over time since the beginning of the project. This work reflected for AMBIO the fact that it was no longer sufficient to simply reduce atmospheric carbon levels, while suggesting that other social and biodiversity-oriented benefits might result from project implementation. Instead, it showed a recognition on their behalf that they now needed to demonstrate to buyers exactly *how much* poverty had been reduced in participating communities through Scolel' Te and by *how much* biodiversity had been enhanced.

AMBIO's efforts to increase the value of carbon credits follow trends within broader payment for ecosystem services (PES) projects, including forest carbon initiatives, toward pursuing co-benefits through *bundling* and *stacking*. Both represent attempts to achieve multiple environmental objectives while bringing additional market value to the project in question. *Bundling* refers the uniting of several ecosystem service values from a single property within a single credit (Deal and Cochran et al, 2012; Larocco and Deal 2011). For example, a single

project may protect watersheds, restore wetlands and capture CO₂, and then may be sold under a single credit with a higher market value. *Stacking*, on the other hand, refers to the generation of multiple credits – such as water quality credits and carbon credits – from activities on a single piece of land (Deal and Cochran et al, 2012). Both have been adopted by organizations around the world so as to innovate within the market for ecosystem services framework and to make their carbon credits and their organizations more competitive. However, as Robertson (2006) notes, they are also problematic given that they rely on ecosystem assessments that are too simplistic in their understanding of ecosystems as abstract and singular environmental units.

While AMBIO's efforts to increase sales of its carbon credits reflect bundling and stacking trends, their work does not fit neatly within either category. AMBIO's focus, instead, was on measuring the implications of Scolel' Te on biodiversity protection and improvement, and the socioeconomic realities for participants. However, in order to measure such biodiversity and social benefits AMBIO needed to determine the baseline biodiversity and socioeconomic levels of the communities where they were working. This, however, was a problematic task given that it would involve having to go back in time to determine baseline measurements for biodiversity and socioeconomic scenarios in participating communities. Ultimately, the issue was not resolved during the time of this dissertation research, but it demonstrates many of the challenges faced by AMBIO as it attempts to increase sales of carbon offsets in a context of 'buyer flight' and declining carbon credit sales.

In the end, this work, although problematic and complex, was not altogether surprising for the AMBIO's leadership. "This is the nature of working in the [voluntary] carbon market," suggested one AMBIO employee. "Our work is a constant balancing act between on-the-ground realities and the work of responding to market demand." While AMBIO was able to easily rationalize the labor required to overcome buyer flight and reduced sales within voluntary carbon markets, the extent to which these market characteristics re-shaped the carbon credit commodity chain cannot be underestimated. AMBIO was forced to respond to these dynamics by expanding the labor process through an extension of the division of labor needed to produce carbon credits. Its work with Conservation International amounted to the swelling of a link in the commodity chain defined not only by the expansion of Scolel' Te across space, but also of the production process. The swelling of the commodity chain is not only caused, however, by the addition of auxiliary labor to the carbon credit production process. Instead, the swelling of the commodity chain must also be seen as an outcome of pre-production and production labor, both of which were necessary for the expansion of Scolel' Te into the Sierra Madre region. This work, as will become clear, depends on the cheap labor of farmers who are forced to bear the effects of reduced

carbon credit sales and prohibitive production costs and transactions costs. This is the focus of the following section.

Extended Labor Processes, Unequal Cost and Risk Distribution and the Expansion of Scolel' Te in the Sierra Madre

As AMBIO sought to court its fleeing clientele, it continued to implement new projects in the Sierra Madre region, incorporating additional farmers and communities into Scolel' Te. This work, however, was expensive, both in terms of production costs and transactions costs. In this section I analyze the transactions and production costs confronted by AMBIO in the face of project expansion, but argue that AMBIO was able to draw on a division of labor involving NGOs, farming communities, governmental ministries and international organizations in order to overcome resource limitations. Drawing on Sayer and Walker (1992), I suggest that the work carried out represents an extension of the carbon credit production process and may be categorized as pre-production and production labor. I argue, however, that while the network of actors drawn into Scolel' Te through the extended production processes was extensive, it was the farming communities who experienced the greatest degree of marginalization through labor arrangements that disenfranchised them as minority actors within the organization. The effect of such labor arrangements was to undermine the social relations of production between AMBIO and farming communities. In this section, I analyze the labor process required to extend Scolel' Te into the Sierra Madre region, and the erosive effects of such work. I do so by highlighting the specific activities, actors and labor arrangements needed to carry out research and networking and project implementation phases of Scolel' Te expansion.

Preliminary Phases of Project Expansion: Research and Networking Costs

The early phases of expansion into the Sierra Madre region involved significant pre-production work associated with research and networking. In this segment, I show how AMBIO enrolled NGOs, international organizations and governmental ministries into pre-production labor activities that were essential to overcoming research and networking costs. Before agroforestry systems could be established, it was essential for AMBIO to obtain a strong understanding of the area in which it was going to work. This involved gathering information regarding the region's socio-political dynamics, environmental characteristics and agricultural practices. Additionally, AMBIO needed to identify potential communities to participate in Scolel' Te. These tasks, although seemingly uncomplicated for an organization that had, at the time of initial expansion,

worked in Chiapas for 11 years (1997-2008), are made more difficult by the state's socio-political, cultural and geographic heterogeneity. Given the complex nature of this work, these tasks can be quite expensive in terms of the personnel, time and money required to collect and analyze data on the region and to make connections with farming communities. However, the labor arrangements designed to overcome such costs were defined as much by traditional employee-employer relationships as by alternative cooperative relations.

One way in which AMBIO sought to reduce the research costs tied to expanding into the Sierra Madre region was by *piggybacking* on its relationships to organizations with superior knowledge of and experience working in the region.¹⁷ Since its foundation, AMBIO established connections with many organizations – relationships that proved beneficial to project expansion. One such organization included the Mexican National Commission for Protected Areas (CONANP). Given the presence of three protected areas in the Sierra Madre region – the Reserva de la Biosfera La Sepultura, the Reserva de la Biosfera el Triunfo, and the Reserva La Frailescana – the CONANP is highly active in the region. Specifically, they have worked with farming communities and other organizations such as Conservation International to promote sustainable coffee production, fire management and ecotourism projects (Vargas Guillen and Velazquez et al, 2011). Drawing on this regional experience, they assisted AMBIO in building contacts with communities of interest, in providing buildings and other infrastructure for meetings and workshops, and in providing information regarding key data on the region.

While CONANP proved to be an important resource, it was not the only organization on which AMBIO relied for research and networking labor. Conservation International (CI) also proved to be a strong ally for AMBIO, providing funding for Scolel' Te, support for training workshops, and important contacts with other collaborators in the region (Vargas Guillen and Velazquez et al, 2011). In a similar fashion, the National Institute for Forestry, Agriculture and Fishery Research (INIFAP) provided AMBIO with information about the region and contacts with whom they had worked in the area. Finally, Vargas Guillen and Velazquez et al (2011) note that AMBIO drew on its relationship with three organizations – Biodiversity: Conservation and Restoration (BIOCARES), the Conservation El Triunfo Fund (FONCET) and Integrated Consultants for Sustainable Rural Development (CONIDER) – to tie early carbon credit production through Scolel' Te into existing projects in communities in the Reserva de la Biosfera La Sepultura and the Reserva de la Biosfera el Triunfo.

¹⁷ By *piggybacking* I am referring to the use of one organization's existing projects, networks and connections by another so as to facilitate their own activities. For information on how this is used in transaction cost frameworks see Bosselmann and Lund (2013).

Piggybacking on intermediary organizations greatly facilitated the work of building contacts in the region, making connections with potential communities, and gathering and analyzing data about the area, thereby reducing AMBIO's research and networking costs.¹⁸ However, the consequences of these network relations could potentially have negative consequences as well. For instance, the fact that AMBIO relied on organizations such as CONANP and CI who are already working in the region in order to establish connections with communities, meant that it would necessarily be drawn toward those communities who already have access to projects. In the Sierra Madre region significant inter-community inequality exists with regard to project access. By relying on outside organizations, AMBIO risked repeating existing patterns of access and exclusion between farming communities in the region. Additionally, given the fact that government agencies are seen with skepticism and fear by some rural communities in Chiapas, the collaboration between AMBIO and CONANP in building contacts in the region could potentially restrict AMBIO's access to those communities who prefer not to work with government agencies. In this way, piggybacking practices by AMBIO, although beneficial, may potentially limit future expansionist efforts.

AMBIO's work with intermediary organizations represents an important element in the division of labor associated with pre-production work tied to the expansion of Scolel' Te. It is a division of labor, however, that was born as much out of cooperation as traditional employee-employer relationships. In the context of project expansion in Scolel' Te, piggybacking must be seen as a type of cooperative labor tied to pre-production work. In his discussion of cooperative relationships within capitalist production Bowles (1985) argues that such arrangements depend on the ability of all parties in the cooperative relationship to benefit. Mutersbaugh (2002, page 758) suggests, moreover, that cooperation must be seen as emergent within a specific social context and from practices that are "historically and geographically-embedded." In the case of Scolel' Te, cooperation occurs within the specific context of project expansion and presents a scenario wherein all parties stand to benefit. AMBIO benefits from cooperative arrangements in the sense that it is able to carry out important research and networking tasks needed to expand Scolel' Te while reducing production costs. Intermediary organizations, in turn, benefit from their work with AMBIO by connecting with a project and an organization that have received positive national and international recognition. Moreover, AMBIO assists organizations such as CONANP in stakeholder engagement work, using its participatory mapping methodologies to

¹⁸ By *intermediary organizations* I am referring to those organizations that serve as important facilitators in new project development. I borrow the term from Bosselmann and Lund (2013) who use it in the context of transaction cost analyses.

supplement CONANP activities. In this manner, both AMBIO and cooperating organizations benefit from one another's strengths, thereby responding to the challenges presented by the specific socio-political context of their projects. Thus, AMBIO was able to overcome research and networking costs associated by establishing an extended division of labor involving governmental ministries, NGOs, and international organizations.

Project Implementation/Project Permanence: Cheap Técnico Labor and the Management of Market Risk and Project Costs

The extended division of labor needed for Scolel' Te's expansion into the Sierra Madre region required more than its work with the organizations mentioned above. In order to overcome project costs, AMBIO also depended on the cheap labor of trained farmers – técnicos comunitarios and técnicos regionales. I show however, that while such labor arrangement may have been attractive from a price perspective, they ultimately undermined social relations of production between AMBIO and técnicos, thereby destabilizing future expansion. Once all necessary information had been gathered regarding a region and potential communities had been identified, AMBIO could begin with project implementation. Unlike pre-production work, this involved a predictable sequence of activities that has been replicated throughout Scolel' Te projects across the state and into Oaxaca. The costs associated with this work were significant, and could be classified as production costs and transactions costs. In this segment, I analyze the activities through which these costs emerged, and highlight AMBIO's reliance on the cheap labor of técnicos regionales and técnicos comunitarios to overcome these costs. It is here that the inequalities in the carbon credit commodity chain become visible, especially in AMBIO's attempt to establish disenfranchising labor arrangements with técnicos - arrangements designed to overcome prohibitive costs and the 'buyer flight' discussed above. Such labor arrangements, I argue, are rent-seeking behaviors that undermine the social relations of production between técnicos and AMBIO, and threaten the very social relations upon which the success of Scolel' Te depends.

From 2008-2012, AMBIO carried out a variety of activities tied to project expansion into the Sierra Madre region and to managing existing agroforestry systems across the state. These activities included project promotion and early project development activities such as the completion of community-level training programs with participants and the elaboration of participatory maps of farmer land parcels known as Plan Vivo maps. Moreover, they included project management activities such as the monitoring of land parcels enrolled in Scolel' Te, providing payments to farmers participating in the program, the dissemination of information to

farmers about the project and climate change more generally, and the sale of carbon credits. However, with over 1,100 farmers registered across Chiapas and Oaxaca and less than 30 employees in AMBIO, project promotion and project management activities were difficult to complete. Thus, AMBIO relied on the cheap labor of trained *técnicos regionales* and *técnicos comunitarios* to whom certain activities could be delegated – particularly those which required significant time in the field. *Técnicos comunitarios* and *regionales* were elected from within participating communities, although the labor requirements of each were distinct. Moreover, both spent significant time living and working in their communities. Thus, they provided an opportunity for AMBIO to reduce the time, personnel and other resources needed to carry out essential field activities. Here, I focus on *técnicos comunitarios* for whom the work with AMBIO is particularly disenfranchising.

Técnico comunitario labor is central to overcoming the production costs and transactions costs associated with *Scolec' Te*, and consists of several activities. *Técnicos comunitarios* act in two key capacities: 1) by carrying out land parcel monitoring within their communities, and 2) by serving as liaisons between AMBIO and their communities. Each type of work is challenging in its own regard, and consists of various physical and emotional dimensions that are not compensated monetarily nor are they recognized by AMBIO. Thus, as will become clear in Chapter 4, and to a lesser extent in this chapter, such work proves challenging for *técnicos comunitarios* as they are forced to reconcile their goals for participating in *Scolec' Te* with the challenges posed by the reality of such work. However, while the reality of their participation may be difficult for *técnicos comunitarios*, it represents, for AMBIO, a key opportunity to achieve multiple goals at a minimal cost.

Monitoring activities are a key component of carbon forestry, and incur transactions costs associated with the need to insert transparency into the production and sale of carbon credits (i.e. to overcome information asymmetries in market exchanges). In other words, monitoring ensures that CO₂ has actually been captured in the agroforestry systems. Monitoring is completed in every land parcel registered in *Scolec' Te* during years 1, 2, 3, 4, 5, and 8 of the project, and provides the foundation upon which farmer payments are justified (also occurring in the same years). According to AMBIO, the realization of monitoring activities over an 8-year period allows for long-term follow-up on agroforestry systems, thereby ensuring project permanence (Vargas Guillen and Velazquez et al 2011). Once monitoring activities have been completed, a separate verification process is realized by *técnicos regionales* or by AMBIO. During project verification, 10% of the monitored land parcels must be assessed, and when necessary, all 100%

of monitored land parcels are reviewed. This work is essential to allowing for the sale of Plan Vivo Certificates, an activity that persists throughout the year.

Land parcel monitoring is a labor-intensive process for the técnico comunitario, and is the only activity for which the técnico comunitario is paid. The time required to monitor a given plot of land varies, depending on its distance from the técnico's home, the nature of the terrain, and the size of the parcel. However, the average labor time required of a técnico comunitario in the Sierra Madre region to monitor every plot within their community is 13 days per year. Monitoring activities involve hiking through mountainous land to locate each tree planted in established agroforestry systems. Thus, this work implies significant physical labor on the part of técnicos comunitarios, who must divert time from work in their own fields to monitor land parcels. Moreover, as discussed in Chapter 4, this work is often emotionally difficult for técnicos who must negotiate AMBIO's expectations with regard to the monitoring of land parcels with those of their fellow community members. Thus, some técnicos report monitoring work to be relatively undesirable from an emotional standpoint – an effect that is partially mitigated by payments for such labor.

While monitoring activities have a more or less predictable schedule, técnico comunitario work as liaisons between their communities is ongoing, and is, moreover, unpaid – a key indicator of the inequalities present in the carbon credit commodity chain. This work is recognized only nominally by AMBIO at training meetings where farmers are reminded that they are the 'eyes and ears' of the organization, but involves several physical and emotional dimensions that are not insignificant for técnicos. Técnico comunitario liaison labor involves several components: attending two meetings annually – *reuniones semestrales* – in San Cristobal de las Casas, disseminating project information to fellow participants, and receiving the complaints of fellow participants to share with AMBIO. The first involves a significant time commitment on the part of técnicos comunitarios – a commitment that is largely recognized by AMBIO. However, técnico work as the 'eyes and ears' of AMBIO is often unseen by the organization, or is only partially visible. Thus, it is assumed to consist of only simple or passive activities. The effects of this work are described in detail in Chapter 4, although I briefly outline the contours of the labor here.

Técnicos are trained every six months in an on-going training process. AMBIO holds a two-day meeting biannually with the técnicos comunitarios and técnicos regionales in order to discuss project progress and to address issues that may have arisen in participating communities. The meetings are long and require the participation of the técnicos and many members of AMBIO (see Appendix A). While AMBIO is able to provide food and shelter for the visiting

técnicos, and is able to offset some of their transportation costs, much of the burden of time associated with travel is shifted by AMBIO onto the shoulders of the técnicos comunitarios and regionales who must travel from their respective communities to AMBIO's offices (see Appendix A for a description). Some técnicos comunitarios, for whom access to public transportation is sparse, must walk several hours in the early morning prior to meetings, and then hitchhike to the nearest town where they can catch a bus to San Cristóbal de las Casas. This can be frustrating for técnicos comunitarios who have expressed a disliking for having to make such a sacrifice.

In addition to the reuniones semestrales, técnicos fulfill several functions as liaisons; 1) técnicos are asked to receive the complaints and questions of project participants in their communities, which are then relayed to AMBIO at the reuniones semestrales; 2) técnicos are also asked to share information and resources provided by AMBIO (see the discussion about pamphlets and DVDs in Chapter 5) with fellow participants in their respective communities. Of these functions, the first proves to be especially taxing for técnicos, a point that is made especially clear in Chapter 4 (see also Appendix A, Table 10A). It is especially taxing because such complaints and questions are often accompanied by the técnico's deteriorating standing within their community, but also extends into several components of a técnico's life, including social functions and leisure time when family and neighbors will ask questions about payment statuses, monitoring outcomes and other aspects associated with project participation. For many participants in Scolel' Te, técnicos are their only source of information, and thus, turn to the técnico when questions or issues arise.

Inequalities in the carbon credit commodity chain emerge in both the liaison and monitoring capacities of the técnico comunitario. As liaisons, técnicos comunitarios experience several emotional effects that extend into various facets of the técnico's life – effects that are assessed in detail in Chapter 4. In the latter instance, inequalities emerge in the pay structures tied to técnico monitoring labor. Técnicos comunitarios are paid around Ps \$90 (US \$7) per day to fulfill monitoring activities. However, as became clear in interviews, this pay was reduced from original payments of Ps \$100 (US \$8) per day beginning in 2011. This was verified by AMBIO who, when questioned, admitted that while the entire Scolel' Te project had felt the impact of reduced carbon credit sales, those who experienced the impact to the greatest extent were the técnicos comunitarios whose pay had been reduced. Thus, while costs had been cut across the board, it was the most disadvantaged participants – those farmers with no opportunity to influence budgeting decisions – who felt the greatest impact. However, both the payment reductions and the extent to which técnicos are asked to work without compensation illustrate

how inequalities in the carbon credit commodity chain become manifest in labor arrangements and compensation procedures.

Some técnicos comunitarios admitted that in the face of no other employment opportunities they would have to continue to work with AMBIO despite reduced payments. As one técnico comunitario from the Sierra Madre region, Sergio, put it: “I work with AMBIO, and it does not make sense why they lowered the payments. Maybe they pay us less than other people. Who knows?” He went on to suggest, however, that given limited opportunities he would continue to work with AMBIO. However, he noted that other técnicos had threatened to leave, arguing that a pay rate of Ps \$90 per day was cheap labor. As one técnico explained, “We are cheap labor. Next year, if AMBIO pays the same, we will leave the project.” While a reduction in payment of Ps \$10 may appear inconsequential, for farmers who have limited access to income earning opportunities, and for whom Ps \$100 could buy food or clothing for a family, or fund a trip to the nearby city, any reduction in payments would be felt economically. Moreover, the reduction in payments was often combined with the additional emotional aspects of their work as liaisons described in Chapter 4, further exacerbating técnico dissatisfaction, and further stoking resentment among técnicos comunitarios in the Sierra Madre region.

Non-Técnico Work and the Implementation of Scolel' Te

The work of project implementation involves labor inputs that extend beyond técnicos comunitarios, however, and involves the hands-on work of AMBIO. While técnico labor is central to the implementation and management of Scolel' Te, AMBIO also carries out work in participating communities, although this work is often limited to the initial stages of project development. Each year Scolel' Te activities begin with project promotion within new and participating communities, the completion of training programs with participants, and the elaboration of participatory maps of farmer land parcels known as Plan Vivo maps. Initial project promotion is carried out by AMBIO, and is central to generating interest among uninvolved farmers and communities and to maintaining the interest of already participating producers. Once farmers have been recruited to join Scolel' Te, they receive in-community training regarding issues of climate change and carbon forestry, and work with AMBIO to establish a participatory map of their land parcel. In each case, AMBIO employees must travel to participating communities to carry out project promotion, farmer training, and the elaboration of maps, thus generating production costs. Each activity requires several meetings with community leadership and newly enrolled participants, and is seen as central to the long-term success of Scolel' Te.

Once Plan Vivo maps have been created by participating farmers, AMBIO reviews them, ensuring the viability of each farmer's plan to participate in Scolel' Te.

Once farmers have been enrolled in Scolel' Te AMBIO provides a training session for participants during which Plan Vivo maps are produced and farmers elect which agroforestry systems they will utilize. Farmers who have been incorporated into Scolel' Te in the Sierra Madre region tend to utilize one or more of four agroforestry systems: *Cerco Vivo* (Living Fence), *Cafetal Mejorado* (Improved Coffee Plot), *Acahual Mejorado* (Improved Fallow Plot), and *Taungya*. *Cerco Vivo* refers to the planting of trees along pastures or corn and bean crops. *Cerco Vivo* agroforestry systems (which represent 92% of all planted agroforestry systems planted in the region) are popular among farmers in this region because they require less work than other plantations with greater tree densities, because they control erosion, and because they allow farmers to continue productive activities without competition from agroforestry plantings. *Acahual Mejorado* (which represents 6% of all agroforestry systems planted in the region) involves the management of fallow plots of land for the production of lumber, firewood and other products (Vargas Guillen and Velazquez et al, 2011). This is done through the planting of trees in fallow areas, and is especially recommended to those farmers who have sufficient additional land to produce basic crops such as beans and corn. The *Cafetal Mejorado* (which represents 2% of all agroforestry systems planted in the region) involves planting trees among coffee plantations with the goal of converting existing coffee production into shade coffee. The goal behind *Cafetal Mejorado* systems is to allow farmers to benefit from tree species with commercial value while taking advantage of the price premium associated with shade coffee. Finally, *Taungya* (which represents .30% of all agroforestry systems established in the region) refers to those agroforestry systems wherein farmers are able to plant basic crops among planted tree species during the early years of the plantation as a means to continue existing productive activities while controlling weeds and other plants that compete for necessary nutrients.

Each of the agroforestry systems involves planting a variety of tree species that are native to the region. However, it became clear in meetings with AMBIO that one of the key challenges to expanding to a new region involved gaining access to the trees needed for establishing agroforestry systems. AMBIO noted that doing so in a way that would be both cost effective and logistically viable was necessary to the long-term success of Scolel' Te in the Sierra Madre region. In response to this challenge, AMBIO was able to piggyback on the existing work of organizations and ejidos in the region, benefiting in particular from the nursery established and managed by one ejido, Ricardo Flores Magón (Vargas Guillen and Velázquez et al, 2011). As of

2011 the nursery had a capacity of producing up to 100,000 plants, consisting of twelve species.¹⁹ In addition to its work with Ricardo Flores Magón, AMBIO has historically collaborated with CONANP to co-finance the building of nurseries in the central highlands region (see Brown and Corbera, 2003), and has continued to do so in the Sierra Madre, particularly in the municipality of Villaflores.

For AMBIO, the cost of expanding into the Sierra Madre region and the costs associated with establishing and maintaining agroforestry projects are high. They may be classified as transactions costs and production costs, the former including those costs tied to project verification, monitoring and carbon credit sales, and the latter involving costs associated with farmer training, tree planting and plot maintenance. These costs, although prohibitive to AMBIO, are reduced through the division of labor with participating communities, international organizations, governmental ministries and NGOs, each of which facilitate the expansion and establishment of the Scolel' Te program. In each instance, AMBIO acts as the lead organization, shaping the nature of the relationships within this division of labor. This is particularly important in the context of AMBIO's relationship with participating communities where it is able use the cheap labor of técnicos comunitarios.

Conclusion

Scolel' Te is a market-based development project that forms part of a broader development landscape in southern Mexico. Since its formation in 1997 AMBIO has consistently and effectively sought to expand Scolel' Te across Chiapas and into Oaxaca, thereby further entrenching the program within this landscape. AMBIO's efforts to extend Scolel' Te throughout southern Mexico were most recently visible in Chiapas' western Sierra Madre region as they sought to recruit the participation of new farming communities – an undertaking that began in 2008 and stretched into 2012. While expansionist practices are normal in the context of AMBIO's management of Scolel' Te, and efforts to push into the Sierra Madre followed a positive trial period in the region, efforts to do so were met by a series of challenges. First, beginning in 2008, revenue generated from the sale of carbon credits produced under Scolel' Te began to dwindle – a reflection of shifting supply and demand dynamics in global voluntary markets and overall lower sales. Additionally, as a small NGO AMBIO faced shortages in

¹⁹The trees planted through Scolel' Te in the Sierra Madre region include: *Tabebuia rosea*, *Cedrela odorata*, *Brosimum alicastrum*, *Ceiba pentandra*, *Cordia alliodora*, *Swietenia humilis*, *Tabebuia donnell-smithii*, *Hymenaea courbaril*, *Diphysa robinoides*, *Lysiloma sp.*, *Tapirira Mexicana*, *Enterolobium cyclocarpum*.

personnel, capital and other resources such as trucks needed to manage existing Scolel' Te projects while simultaneously facilitating expansion.

In this chapter I draw on transactions cost, global commodity chains, and political ecology perspectives, along with critical labor studies to examine AMBIO's efforts to overcome these challenges and to continue with expansion into the Sierra Madre region. I argue that AMBIO's efforts to do so resulted in a horizontal swelling of the carbon credit commodity chain that included the incorporation of pre-production and auxiliary labor into existing practices – work that was carried out by actors who were deeply implicated in Chiapas' broader development landscape and its social history of development (see Chapter 2). These labor arrangements, however, were disenfranchising for farmers who felt exploited by the extent to which they are asked to complete significant work in Scolel' Te, some of which went unnoticed by AMBIO. While the undermining of social relations in the context of carbon credit production threaten the success of the project, the market challenges ultimately proved too difficult for AMBIO. In 2012 AMBIO was forced to discontinue expansion of Scolel' Te in the Sierra Madre region, both within participating communities and to new communities, until all held offsets had been sold and new sale orders had been received (Cooperativa AMBIO, 2012). This outcome demonstrates the extent to which the carbon credit commodity chain may extend horizontally within a given link, but that such growth is influenced by market dynamics that force project managers to shift production strategies and processes unexpectedly.

Despite limitations to growth, by 2012 several farming communities had been enrolled in Scolel' Te, with many farmers having committed up to four years to the project. For these farmers, project costs in Scolel' Te were analyzed in dramatically alternative terms than those used by AMBIO. For many participating farmers the costs were assessed in terms of labor time requirements (Osborne, 2011), while others measured costs in terms of the implications of participation for their relationships to their communities more broadly. In the following chapter I will address the latter issue, focusing on the implications of participation for farmer standing within their communities. In doing so, the various dimensions of técnico comunitario work that are unseen by AMBIO will become clear, particularly as they relate to the broader intra-community relations in which técnicos comunitarios are enmeshed. s

CHAPTER 4: CARBON FORESTRY AND THE SOCIAL EFFECTS OF PARTICIPATION Community Experiences of Carbon Forestry in Chiapas, Mexico

Introduction

The full spectrum of técnico comunitario labor in Scolel' Te, including its emotional and physical dimensions, is only partially visible to AMBIO, a fact that is made clear in the preceding chapter. In order to fully grasp the implications of working in Scolel' Te for técnicos comunitarios, it is necessary to contextualize both técnicos and their carbon forestry labor within broader intra-community social relations. I do so by first turning to two cases that are illustrative of how people relate to development projects within rural farming communities in the Sierra Madre region. Together, they set the scene for examining why people choose to participate in Scolel' Te and the implications of such work for their standing within their communities.

Case #1

It was early evening and Roberto, Rosalba and their 3 children were teaching me the art of eating *mango agrio con sal* (sour mango with salt), a local snack favorite. As we sat biting into green mangos my hosts began to answer my question regarding the large quantity of development projects within the community. In a hushed voice Roberto said:

“Look, there are several projects, but we do not have access to them. Really only *ejidatarios* are considered in those projects. But according to me, I see it as discrimination against us *pobladores*. They [ejidatarios] have access to everything and get all the projects, while we [pobladores] are denied the rest and are only offered the opportunity to work with AMBIO.”

We continued through the evening sitting under the mango tree talking about the nature of inequality with regard to access to participation in development projects. I learned that this was a common practice in communities in the Sierra Madre region, although not necessarily always the case in every community. Roberto admitted that as a *poblador* he had limited rights within the ejido, and that although his wife was an *avecindado* (term to be explained below), she did not receive much assistance from her father who was an ejidatario. It was a situation that made a resource-scarce existence even more difficult, and one in which Scolel' Te proved to be a rare income-earning opportunity within the community.

Case #2

We sat in Ismael's house listening to the music emanating from the community-wide dance just down the road. It was 7:00pm and we were relaxing after a long day of harvesting, depulping, cleaning, and drying coffee. "Let's go," I suggested to Ismael, "even for just a few minutes." He simply shook his head, silently signaling his disinterest. "Why not?" I questioned. No answer. I continued encouraging Ismael to join me, and eventually left with his mother and brother, determined to join the celebration and learn something new about the community.

The music and dancing had started around two hours earlier as part of the community celebration, an annual event during which the entire community gathered to honor its past and to reaffirm its shared identity through the consumption of traditional foods, music and dance. In line with traditional norms, men gathered throughout the day of the party to attend cockfights while children played and women prepared tamales and tacos to share with their families and to sell in the evening. In the afternoon, after the cockfights had ended, a visiting band, contracted from the nearest city began to play, thereby signaling the beginning of the community dance on the nearby basketball court. Children and adults alike participated in the dance, while some chose to sit around the perimeter of the basketball court, eating tamales and tacos, and drinking soda and beer. People came and went throughout the dance, with some staying late into the night. It was from the basketball court that I eventually saw Ismael standing with his uncle and watching from a distance. They stayed for a few minutes and then Ismael left, returning to the house without joining the party.

A few months later, in an unrelated conversation, Ismael confided in me: "The [development] project has not gone well. We have not received the money we are owed. When I leave the house, people ask me 'where is our money?' and 'what have you done with our money?' Some accuse me of having stolen it, and they won't stop asking about it. I prefer not to leave my house because I do not want to answer their questions anymore. It is easier to stay home."

These scenarios present two family's distinct experiences of development within their communities – experiences that were shaped both by their social position relative to other community members and by their relationship to development more broadly. The first case illustrates the frustrations held by one family with regard to their social position within the

community, and its limiting effects on their ability to participate in many development programs. For this family, the frustration was tied to the manner in which their status as pobladores and *avecindados* justified their exclusion by *ejidatarios* from participation in many development programs that they deemed central to improving their livelihoods and their standing within the community. The second scenario represents the social outcomes faced by one participant in a development project within his community. In particular, it demonstrates the isolation resulting from his leadership position within a project that, in the eyes of his community, had not complied with their expectations.

In this chapter I draw on the above cases to argue that in the absence of access to formal *ejidal* authority, some farmers in the Sierra Madre region of Chiapas enter into *Scolec' Te* in order to build upon their standing within their community, but that their participation is ultimately destructive to such standing as trust and reputation among other community members are undermined. These effects of carbon forestry are often invisible to managing NGOs and development practitioners, and are only observable when viewing carbon forestry in light of broader social relations within a given community. They are, however, nonetheless dramatic for carbon foresters who become the subject of damaging rumors within the community, and whose broader social life is damaged.

I begin this chapter by contrasting NGO perspectives regarding the social implications of carbon forestry with an alternative relational approach necessary for highlighting the obstacles faced by some farmers to participate in development projects and to build on one's standing within her community. In doing so, I show that the effects of carbon forestry for local participants must be assessed within the context of intra-community social relations in order to uncover the sometimes less visible effects of carbon forestry projects. Doing so is necessary for two reasons. First, within carbon forestry and development more generally, NGO discussions about the impacts of participation for local people are often limited to considerations of *social capital* wherein the social implications of a project are assessed only in relation to the potential of certain actors to contribute to a given project. Second, in the case of *Scolec' Te*, these narrow perspectives are exacerbated by the limited awareness of AMBIO with regard to the social impacts of the program. "We do not know the impacts of our project for the [participating] communities" noted one senior member of AMBIO who ascribed the analytical blind spot to the NGO's limited resources and personnel. In light of these perspectives, viewing farmer participation in *Scolec' Te* in the context of broader intra-community social relations is essential for providing a more nuanced analysis of the social effects of carbon forestry by demonstrating

why farmers choose to participate in the first place, and how such participation undermines their standing within their communities.

After contrasting these dual perspectives, I outline one aspect of the relational nature of community life in rural Mexico, showing how authority is distributed within formal ejidal governance structures. I show that ejidal authority figures both determine which development projects may operate within a community, and in some cases, who may or may not participate in a given program. In this analysis it becomes clear how access to formal authority – either direct or indirect – or a lack thereof may facilitate or restrict one’s access to resources, including the opportunity to participate in development projects. In such a context where those with formal ejidal authority govern access to resources, opportunities to participate in development projects and to improve upon one’s standing within the community are limited. In the case of Scolel’ Te, however, AMBIO has strongly and successfully petitioned ejidal authority figures in the Sierra Madre region to allow broad community participation, thereby permitting participation among some who would otherwise be denied access.²⁰ With this in mind, I demonstrate: 1) why some people such as Roberto and Rosalba may be denied access to participation in development projects more generally; 2) how they and others without formal ejidal authority may gain access to participation in carbon forestry through their connections to authority figures; and 3) why those with little-to-no formal authority such as Ismael may choose to participate in carbon forestry as a means to enhancing their status within their community - a social status that is based in enhanced access to income and employment opportunities and from proximity to outside organizations.

Finally, looking at the case of one group of workers in Scolel’ Te, técnicos comunitarios, I examine how, despite the hope of people like Ismael that participating in carbon forestry will enhance their standing within their community in the absence of access to formal ejidal authority, such participation ultimately undermines the relationships upon which such standing rests. As liaisons between AMBIO and their communities, técnicos comunitarios are uniquely exposed to praise when projects go well and to criticism when projects do not go as planned. Técnicos comunitarios are provided with unique opportunities to travel and attend classes, and are elevated as relative authorities within the context of Scolel’ Te. However, as monitors of farmer work within their communities, they are forced to navigate the contradictory expectations of friends and family who anticipate privileged treatment within the program and those of AMBIO who

²⁰ AMBIO emphasizes that all farmers with land and titles to that land (i.e. land registered through PROCEDE) may participate in Scolel’ Te regardless of their status within the community. According to project participants, this approach differs from other projects, particularly those presented by government organizations, which they suggest do not give such emphasis to broad ranging project participation.

holds técnicos accountable to carryout monitoring activities. Moreover, when projects do not meet community expectations técnicos become the subject of negative rumors by those who perceive the project to be functioning poorly or to be corrupt – perceptions that are shaped, in part, by farmers’ past experiences with development programs more generally. In such circumstances, participation in carbon forestry becomes a social liability rather than an asset as técnico relationships within their community are weakened and undermined.

This analysis builds on existing research of the social impact of carbon forestry – and other development projects – both regionally and theoretically. From a regional perspective, this analysis shifts the analytical focus from the heavily researched central highlands and Lacandón regions of the state to the Sierra Madre (see Hernandez Castillo, 2003). As noted in Chapter 2, the Sierra Madre region, although sharing many similarities with other regions of the state, is distinct in important ways. First, despite the state’s significant indigenous population, rural communities in the Sierra Madre tend to be largely mestizo. Moreover, while the Zapatista uprising and subsequent state efforts to pursue development-based counterinsurgency projects directly or indirectly affected many communities across Chiapas, this has not been the case in the north-central portion of the Sierra Madre region. Thus, since 1994, the nature of rural life in the Sierra Madre region, particularly as it relates to development projects, has tended to be less conflictive, and the social effects of projects tend to be less visible. Thus, given the relative lack of existing research on development in the Sierra Madre region and the socio-economic, ethnic and political differences with other regions of the state, it is necessary to assess the less visible social effects of carbon forestry in this state and development more generally.

This chapter draws on extensive ethnographic fieldwork in two communities in the Sierra Madre region and with workers in Scolel’ Te across Chiapas to assess the nature of social relations in rural farming communities and the impacts of participation in carbon forestry on those relationships. By assessing the on-the-ground effects of the labor process in carbon forestry, I provide additional insights into the social nature of such work by moving beyond the narrow social capital perspectives of many NGOs and development practitioners and the undersocialized nature of transactions costs approaches discussed in Chapter 3. In doing so, I also complicate the notion of local participation as a means to empowerment, suggesting that empowerment does not originate only via participation in a project, but is also diversely influenced by a variety of other historical and economic factors, and is shaped, moreover, by local power relations within participating communities. In what follows, I assess common NGO perspectives, particularly as they relate to the concept of social capital, and then outline the relational approach to assessing carbon forestry in the Sierra Madre region.

NGO Approaches to Mobilizing Project Labor

Studies of the social effects of carbon forestry and development more generally among mainstream practitioners are limited in scope. This is especially visible in perspectives of social capital, but also holds true for a variety of other optics used to assess Scolel' Te. Studies conducted by advisors to and early researchers of Scolel' Te commonly assess the implications of participation for local farmers, focusing in particular on questions of project viability, equity in access to participation (as determined by AMBIO) and institution-building. De Jong and Gaona et al (2004), for example, examine the transactions costs related to Scolel' Te's implementation and management in an effort to determine its economic viability as a means to achieving rural development and mitigating global climate change. Additionally, Scolel' Te has been analyzed in terms of its recruitment of and engagement with community labor, and the capacity for local participation to contribute to the strengthening of carbon markets (Tipper, 2002). In a related manner, Scolel' Te, and carbon forestry more generally, have been analyzed in terms of equity to participation among 'stakeholders' within member communities (Brown and Corbera, 2003; Corbera, 2005; Corbera and Brown et al, 2007; Corbera and Kosoy et al, 2007), and in terms of their viability as mechanisms for sustainable development (Brown and Adger et al, 2004; Montoya and Tipper, 1995). This work, although useful, often relies on limited frames of reference for assessing the social implications of Scolel' Te. As discussed in Chapter 3, transactions cost perspectives may provide insights into the financial components of project viability, but ultimately allow for a narrow and undersocialized awareness of how actors operate in the production and sale of carbon credits. Moreover, 'stakeholder' analyses often only assess the implications of farmer participation within the space of the project in question, neglecting to examine how such work shapes broader community life. 'Stakeholder' analyses form part of broader theories of social capital common within carbon forestry and among development practitioners more generally. However, as will become clear, social capital is similarly constrained in its ability to conceptualize the social effects of carbon forestry.

The relationship of social capital to climate change has been discussed with regard to climate change mitigation as well as to adaptation to climate change and its effects (see especially, Adger, 2001; Pelling and High, 2005; Wolf and Adger et al, 2010). However, in order to assess the shortcomings of social capital optics, it is necessary to first briefly outline the intellectual history of the term. Social capital is a term brought into public view by Bourdieu (1985), followed by Coleman (1988) and Loury (1987), and which became in the 1990s a means for indicating the value of social networks to network members such as development agencies,

governments and local communities. The World Bank mobilized the term, arguing that social capital is valuable because it could be created through strategic investments “in the organizational capacity of the poor” (Woolcock and Narayan, 2000: 242). Thus, social capital was seen as a form of value tied to social networks – a value that could be intentionally produced by engaging stakeholders so as to rearrange social relations in a manner beneficial to a given development program. According to Coleman (1988), social capital is formed when social relations are altered in such a way that action may be pursued. Thus social capital became a means for reorganizing social relations in ways that benefit both development and its supposed beneficiaries by changing how people relate to one another in the context of a given project.

Following Bourdieu (1985), social capital was taken-up by a series of social scientists who have sought to better define it, and to mobilize it as a theoretical tool and metric for understanding and analyzing development practice. Social capital found its place in development through attempts to emphasize the connected nature of physical capital – roads, irrigation systems, wells, etc. – and social organizations – farming cooperatives, water quality associations, etc. The term was mobilized in large part by the World Bank (Fine, 2007), which sought not only to define the term, but also to insert it into development practice. Woolcock and Narayan (2000), for example, made the case for the intentional investment in producing social capital – an asset with the potential to facilitate action. In sum, social capital came to be seen as an asset that is of value to both individuals and organizations, which may be produced through the intentional engagement of stakeholders in development projects, and which may be drawn upon as a means to ensuring the success of development initiatives.

Within carbon forestry, discussions of social capital are tied to questions about the ability of protected and generated forests to serve as long-term carbon sinks. It is noted within this literature that community participation and empowerment within processes of project implementation and management must be achieved in order for projects to succeed in the long-term (Gong and Bull et al, 2010; Olhoff, 2002; Saunders and Hanbury-Tenison et al, 2002). AMBIO has sought to activate social capital through the formation of a corps of workers discussed in Chapter 3, *técnicos comunitarios*. As was shown in Chapter 3, these workers are central to AMBIO’s ability to manage *Scolec’ Te* and to expand the program across Chiapas despite restrictions faced by shifting carbon market dynamics and prohibitive production and transactions costs. Their work, however, is not discussed by AMBIO in these terms, but is rather justified in terms of fomenting local participation and empowering community actors – in short, in terms of activating social capital. This reflects, in part, the concerns of some individuals within the organization to make climate change mitigation a democratic and all-inclusive

endeavor. “What we want to know,” suggested on senior member in AMBIO “is how to increase spaces of participation among the producers [farmers].” “We are different than the [Mexican] government and we want people to participate and to be involved,” he continued. This question of how to create ‘spaces of participation’ in which farming communities could learn about climate change and develop ideas in addition to Scolel’ Te for mitigating its effects emerged in interviews as a key organizational concern. Moreover, senior leaders within the organization, often sought advice from me, asking for input on how to enhance community participation in the project.

Efforts to facilitate action against climate change by altering the social relations among people through local empowerment and inclusivity have become popular among organizations such as AMBIO. However, the outcomes of activating social capital are not always as positive or as visible as one might expect. In this chapter I suggest that the empowerment of farmers to act as *técnicos comunitarios* in Scolel’ Te, although stemming from a progressive and well-intentioned effort to mitigate climate change and to enhance the well-being of farmers who have been politically and economically marginalized across the state, affects *técnicos comunitarios* in ways that are less than positive. These effects stem, in part, from the inequalities in the carbon credit commodity chain analyzed in Chapter 3, but are also an outcome of broader intra-community relations. More specifically, I argue that *técnicos comunitarios*, through their work, become unevenly exposed to the negative effects of project failure, particularly in instances where management practices and external carbon market influences limit AMBIO’s ability to deliver on promised goals, thereby undermining their social standing within their communities. In the following segment I outline the issue of social relations within rural Mexican communities and make special reference to the concept of prestige – an important component of intra-community social relations – as it is discussed within literature on rural Mexico and in political ecology.

Interdependence and the Relational Nature of Social Life in Mexico

Social capital approaches to assessing the social impacts of development focus narrowly on the ability of participants to contribute to the success of a project. However, the social implications of carbon forestry, like other development projects, extend beyond those considered within such limited perspectives. In order to assess the broad social implications of carbon forestry it is necessary to enlarge the sphere of analysis by taking into consideration the relational nature of life in rural Mexico and the role of social interdependence as a key component of farmer

livelihood strategies. In this segment I draw on literature on rural Mexico, critical development studies and political ecology to amplify the realm of social analysis by highlighting several approaches to understanding the relational nature of social life in Mexico. First, looking to studies of community life in rural Mexico, I examine social standing as it relates to the concept of prestige – a relational notion connoting deference and respect relative to others. Then, drawing on this work I assess the multiple means through which prestige may be attained in rural Mexico thereby enhancing one’s standing in her community. Here, I highlight the gendered nature of social relations in Mexico, showing that one’s opportunity to enhance her social standing within her community and how she does so is often shaped by gender inequalities as well as gender-defined roles within a community. Finally, I conclude this segment by briefly outlining the role of social relations as a key component of rural livelihood strategies, highlighting why it matters that someone may or may not have a positive social standing within her community.

Social standing is an important motivating factor behind why some farmers choose to participate in carbon forestry, and may be assessed from the perspective of prestige common in studies of community life in rural Mexico. In his book, *Economics and Prestige in a Maya Community*, Cancian (1965, page 87) defines prestige as the “deference and respect” a person receives because of something – “the variable on which” one can compare oneself to others within a community. He demonstrates how in Zinacantán, Chiapas prestige is attached to specific duties – service to one’s community – which are carried out by individuals. Similarly, in his study of the community of Tepoztlán in the state of Morelos, Robert Redfield (1930; 1941) describes a different type of commitment to community found in rural cooperative labor that has been conceived of as a type of obligation rooted in moral duty. While Redfield does not explicitly link such work to questions of prestige, he does note its centrality in one’s ability to maintain a positive image in the community. This positive image, which I argue is a reflection of one’s prestige – is maintained and influenced by a person’s adherence to social norms, including her contribution to the well being of her community. Ultimately, the role played by cooperative work, community tasks and festival participation is central to the building of prestige.

Cancian’s treatment of prestige as a relational concept – one that can only be understood in terms of the interaction between people – is instructive. After all, a person or a group of people can only be considered prestigious relative to a less prestigious person or group of people. Additionally, as Cancian shows, it is in the context of social interaction that prestige is made visible. In rural Mexico, community life revolves around social interaction in the form of events such as weddings, religious celebrations (e.g. Easter and patron saint days) and annual community celebrations (Cancian, 1965), and in terms of informal networks within and between

households (Cohen, 1999; Nader, 1990). It is in these interactions that prestige becomes visible, both in a non-corporeal sense (e.g. the provision of presents at a wedding, the cooking of a meal for researchers from out of town, or the possession of goods to sell to neighbors and family members) and in a corporeal sense (e.g. a person's participation in social events, and the interaction with family members and neighbors during the evening). Finally, as Mutersbaugh and Martin (2012, page 734) note, prestige may also be seen in one's "ability to command respect and have one's opinion considered during community assemblies" – what is termed the *mando*. The *mando*, they note is attained through years of leadership within the community, particularly with regard to collective labor institutions.

This work, however instructive, is at times misleading in its conceptualization of who is able to enhance their social status within a given community. Cancian and Redfield, for example, tend to discuss one's duty to their community as a largely male concern, thereby limiting the status-enhancing potential to men. Moreover, they limit public life to male activities, while implicitly consigning women's roles within the community to the domestic sphere. In a critique of this perspective, more recent literature on community life in rural Mexico argues that gender relations must be understood outside this public/private dichotomy, such that women may be recognized for their role in shaping public community life (Stephen, 1991). This, Hernandez Castillo (2006) notes, allows for viewing the various roles played by women within community life, and allows for viewing the dynamic relationship of these roles to standing within a community (see Kovic and Eber, 2003). In this vein, Stephen (1991) argues that prestige – as a marker of social standing – must be seen as something that may be obtained by women through a variety of institutions within a community. These include kinship (i.e. through the sponsorship of godchildren), ritual-based authority (i.e. through participation in and the organization of community festivals and religious events), and the reciprocal exchange of goods for labor.

Importantly, Stephen (1991, page 233) notes that while women may receive prestige through their participation in various institutions in public community life – what she refers to as "prestige systems" – the effects of prestige are often stratified along gender lines. Thus, she notes that for men, while prestige may be used to justify participation in municipal political structures, this does not hold true for women who continue to be excluded from participation in municipal governance. Moreover, Stephen notes that as many institutions through which women have historically obtained prestige within communities have declined in importance, women have been forced to make claims on prestige through alternative measures such as age. In such scenarios, age has come to represent a means through which older women may gain respect as elders within the community. Thus, while both men and women may access prestige through a

variety of means, prestige remains a highly gendered concept that provides differential access to opportunities among men and women.

Also discussing the gendered nature of social relations in Mexico is Gutmann (1996; 1997) who shows that not only are the effects of prestige stratified along gender lines, but so is the concept of prestige. He does so by linking prestige to the concept of *machismo*. Machismo, a term referring to a stereotypical male personality type in Mexico, describes a way of being for men – both physically and emotionally (Gutmann, 1996). Gutmann (1996) notes that machismo is relational in the sense that it is defined by a male's relationship to female bodies – as dominating, controlling and conquering. In line with machista perspectives is the idea that men are more socially valuable when they are *macho* – i.e. exhibiting machista traits of strength, confidence, and control. The notion of machismo has, however, also been extended to women through the use of parallel labels such as *marimacha* (or *marimacho*), referring to women with machista qualities as well as to homosexual women (Gutmann, 1997).²¹ However, machismo is broadly associated with patriarchal norms in Mexico (Gutmann, 1996) in which men are assumed to be more capable leaders and decision-makers. In rural communities in Mexico, machismo is most visible in the patriarchal and patrilineal norms that govern structures of authority and resource access.

While social standing may be built through one's demonstration of her commitment to her community, through various institutions within rural Mexican communities, and through age, it may also be enhanced through migration – particularly through the material wealth attained through migratory work. In many cases, the respect garnered as a result of migration is tied to the enhanced material wealth of the migrant upon returning to her community (Cohen and Rodriguez, 2004) as well as her access to 'prestige goods' – those goods that are considered to reflect a certain degree of privilege (Arizpe, 1981).²² Cohen and Rodriguez (2004) note that status is tied not to commitment to community, but rather to the enhanced material wealth of a migrant relative to that of her neighbors and family members as a result of her migration. This enhanced social standing, they note, is visible in the building of larger houses, the driving of cars and the consumption of goods that come to be recognized as markers of financial success such as the possession of cell phones. Thus, prestige as a marker of social standing cannot be considered apart from class.

²¹ The terms *machorra* and *machona* have also been used in a largely derogatory fashion to refer to women exhibiting stereotypical *machista* characteristics as well as to homosexual women.

²² During my fieldwork I learned that Coca Cola has acquired the status of being a 'prestige good' as consuming it tends to convey an image of relative financial success.

While prestige is variously assessed in literature on rural life in Mexico, it often ignores the question of how participation in development projects may affect one's standing in her community. Here, political ecology work is instructive. Schroeder (1999), for instance, examines how participation in agroforestry-based development programs may alter one's prestige within her household and her community, at once creating the opportunity to enhance it, while threatening to diminish it. On the one hand, he suggests that women were able to use "the strategic deployment of garden incomes [earned in agroforestry programs] to win for themselves significant autonomy and new measures of power and prestige..." (Schroeder 1999, page 40). However, while illustrating how prestige may be gained through participation in development, he also demonstrates the effects of lost prestige through development programs: "With little yet to show for all the effort, the women's absence was simply viewed as a loss of control, and by extension a loss of male prestige" (Schroeder 1999, page 41). Ultimately, for Schroeder, prestige is a fluid concept, and is something that may be gained, lost and even regained in the context of development work. The implications of prestige, gained and lost, are thus, important to consider in the context of carbon forestry.

In many of the aforementioned discussions social life in rural Mexico, the implications of social standing – positive or negative – for its subject are notable. Cancian (1965) illustrates how with prestige one is able to acquire greater access to resources, including land needed for agricultural production. This, he notes, allows those with prestige to rent land to relatively less influential and resource-rich community members who have not attained such status nor amassed material wealth. In a similar vein, Schroeder (1996) highlights the manner in which social standing defined as prestige corresponds with greater mobility for women who are able to attain access to income and decision-making power regarding how that income is allocated within the household. Alternatively, Stephen (1991) notes the diverse scenarios in which social standing as measured by prestige may be attained, noting that the benefits of such social standing may range from the opportunity to participate in community politics to the receipt of respect by younger generations. In each instance, positive social standing allowed individuals and groups of people to determine various facets of their life, including how they operate within their household, their ability to influence community politics, and the opportunity to obtain the resources needed for themselves and their families.

In rural settings poor farmers depend on a variety of factors for survival in the face of scarce resources. Scott (1976, page 13), for example, illustrates how the "struggle for a subsistence minimum" in the context of shortages of land, capital and employment opportunities force farmers to rely on a variety of factors for survival. In the Sierra Madre region of Chiapas,

one such factor is intra-community social relations. In a context where resources are limited, trade and borrowing practices between neighbors and within extended families are essential to completing daily tasks. Ismael's mother, Maria, for instance, would walk daily to her daughter's in-law's house to grind corn to make tortillas. Maria would use the ground *maza* to make tortillas and tamales, often returning the favor in-kind to her daughter's family the form of warm tortillas and *tamales de elote* (corn tamales). Such interdependence was also visible on a community-wide basis, as farmers with few options to transport crops to sell in nearby cities would coordinate with neighbor's who had acquired trucks through income earned from migration so as to transport corn, beans and coffee harvests to market. In this context, maintaining a positive social standing, and indeed improving upon social standing, becomes as much a survival strategy as a point of pride. Moreover, a loss of social standing through participation in carbon forestry may have implications that outweigh continued participation in a project that has not complied with community expectations.

It is clear that social status may be improved in a variety of ways among individuals and groups of people, and that it is dependent on a large set of values, norms and practices. Thus, where and how development projects affect participant standing within their communities must be understood to be variously dependent on the degree to which certain individuals or groups of people possess (or do not possess) prestige, and how the prestige is (or is not) conferred. Thus, for those who hold authority positions within a community that oblige them to contribute to their community, for women, migrants, men, and others, the experience of Scolel' Te as it relates to prestige is felt differently. That said, a comprehensive analysis of each of the ways in which Scolel' Te undermines social relations in its manifold contexts would be impossible in the space of this chapter. Instead, I wish to focus on how Scolel' Te alters the social standing of one group of community workers in Scolel' Te: *técnicos comunitarios* – a group whose work is central to the success of the forest carbon project.

By drawing on the relational approaches to assess the social effects of carbon forestry, questions of why farmers choose to participate and the social implications of their participation become clear. As I show in the following segments, one factor motivating participation in carbon forestry among farmers with limited access to formal ejidal authority is the desire to improve their social standing among fellow community members – social standing that may be augmented through enhanced access to income and employment opportunities, and through increased proximity to outside organizations with political and economic influence. In the following section I analyze the nature of formal ejidal authority in rural Mexico, illustrating: a) how some people such as Roberto and Rosalba are excluded from formal positions of authority within rural

ejidos; b) how connections (both direct and indirect) may provide some with otherwise elusive access to participation in development projects; and c) why some with no access to formal ejidal authority may choose to participate in projects such as *Scolel' Te* in the hopes of improving their social standing within their communities. As mentioned above, *Scolel' Te* provides a unique opportunity for those with no formal ejidal authority to participate in a development project. This exception stems from the fact that AMBIO has strongly and successfully petitioned ejidal authority figures in the Sierra Madre region to allow broad community participation, thereby permitting participation among some who would otherwise be denied access. However, in the third section I show how despite the hopes of some *técnicos* such as Ismael to build on their social standing, participation in carbon forestry ultimately undermines social relations as *técnicos comunitarios* become the subject of rumors and a source of mistrust.

Ejidos, Ejidatarios and Prestige in Community Development

Social status in rural Mexican ejidos is determined by a variety of factors, including age, access to income earned from skilled labor and migration, commitment to community in religious festivals and other events, and from the possession of formal authority as an ejidatario. In this section I examine the latter case, showing how formal ejido authority is distributed among various actors within the ejido institution. Doing so is necessary for two reasons. First, as was shown in the vignettes presented at the beginning of this chapter, those with formal authority within ejidos have significant influence, and are able to determine which development projects may operate within a community and whether or not people such as Roberto and Rosalba may participate. Thus, participation in development projects by non-ejidatarios as a means to gaining material wealth, and thus enhancing their social standing within their community, is limited. Second, even in projects such as *Scolel' Te* where broad participation is permitted by ejidal authorities, many *avecindados* and *pobladores* still depend on their connections to ejidatarios to acquire the land needed to participate. Thus, those with formal ejidal authority determine either formally or informally who may have access to participation in a given project. Clarifying these points is necessary because it highlights the challenges faced by non-ejidatarios in enhancing their social status relative to ejidatarios, particularly through development projects. However, as becomes clear in the next section, despite the window of opportunity provided by *Scolel' Te* for many non-ejidatarios such as Ismael to participate in carbon forestry, such work undermines their status within the community rather than leading to its improvement. I begin this section by first outlining the institutional nature of the Mexican ejido and how authority is distributed among

various actors. I then assess the implications of these power relations for development in the region.

The Mexican ejido is a land tenure system based in the principle of the cooperative management of local landowning. Born out of the 1910 Mexican Revolution, it was designed to facilitate the redistribution of land to the rural populace, which had been marginalized throughout the 19th century. Under the ejido system – a hybrid of Spanish and Aztec land tenure arrangements (Wilson and Thompson, 1993) – groups of 20 or more people could petition the Mexican government for a land grant. Assuming the availability of land and the approval of the application, petitioners would be granted usufruct rights to small plots of land for farming (*parcelas*) within the ejido as well as usufruct rights to land for housing (USAID, 2011; Wilson and Thompson, 1993). Additionally, common areas to be shared for grazing and other activities would be delineated. Wilson and Thompson (1993) note that the redistribution of land to farmers as ejidos was concentrated in two general time periods: first in the 1930s during the presidency of Lázaro Cárdenas (1934-1940), and later on during the 1960s and 1970s. In total, more than 100 million hectares of land – nearly 50% of Mexico’s arable land – were organized into ejidos from the beginning of the land reform program in 1917 to its end in 1992 (USAID, 2011). The significant redistribution of rural land through land reform is visible in the fact that despite its termination in 1992 and the introduction of neoliberal reforms, ejidos continue to be the principal land tenure arrangement in the Mexican countryside. Importantly, the ejido provides an important backdrop to Mexican farmer livelihoods, and has provided many with access to land and resources that, prior to the land reform program, had been scarce.

Ejidos are predominantly rural, although some encompass urban spaces (USAID, 2011). In rural ejidos subsistence agricultural production – beans, corn, cattle grazing, coffee and squash – comprises the core productive activities of farmers. While other activities such as fruit production and greenhouse-based agriculture have been introduced to ejidos through various government programs, projects tend to be unsustainable over time, generally falling victim to corrupted funding channels (Fox and Haight, 2010) and frequent election cycles.

Farmers who acquire land-use rights within an ejido are known as *ejidatarios*. They have voting rights in the ejido and form part of a General Assembly (*Asamblea*), which meets on a monthly basis, and whose function is to determine internal rules within the ejido (Cámara de Diputados, 2012). Participation in the monthly meetings is generally mandatory, and provides a space for discussing and voting on issues related to the ejido. The General Assembly elects one ejidatario to serve an unsalaried 3-year term as an Ejidal Commissariat (*Comisariado Ejidal*). The Comisariado’s key function is to represent all ejidatarios within the ejido, to respond to daily

administrative issues, and to travel into the nearest city to solicit new development projects for the community. In addition to the Comisariado the Asamblea will elect additional ejidatarios to serve in other positions such as a Secretary (*Secretario*), a Justice of the Peace (Juez Civil) and Council Workers (*Vocales*) (Wilson and Thompson, 1993). Finally, the Asamblea commonly convenes committees to administer specific projects, including development initiatives, and to respond to specific issues within the community. Taken together, these authority figures and committees provide an internal governance system through which many issues internal to the ejido are addressed. Moreover, it elevates the capacity of ejidatarios to exert direct political and social influence on their community, particularly given the fact that they are legally entitled to the ability to choose their successor as ejidatario.²³ Importantly, the fact that ejidatarios are generally men means that such power is often concentrated in male hands.

In addition to ejidatarios, two other groups of people are often identified within ejidos, but do not have the same rights and privileges as ejidatarios in the Sierra Madre region of Chiapas: *avecindados* and *pobladores*. In contrast to ejidatarios, *avecindados* – the root word *avecindar* meaning *to acquire rights and privileges* – are legally defined as Mexican nationals over 18 years of age who have been living in an ejido for one year or longer, and who have been recognized by the Asamblea as such, regardless of whether or not they have usufruct rights to land for housing or farming (Cámara de Diputados, 2012). Furthermore, according to the Mexican Agrarian Law, *avecindados* are capable of acquiring the status of ejidatario, depending on the internal regulations of the ejido in question (Cámara de Diputados, 2012). While the legal definition of an *avecindado* is broad, in the Sierra Madre, it is often used much more narrowly to refer to the children of an ejidatario – who could someday acquire the status of ejidatario and/or acquire land within the ejido.

In contrast to ejidatarios and *avecindados*, the Mexican Agrarian Law does not treat *pobladores* as a distinct category of people within an ejido, but rather, uses the word to refer to all the inhabitants of an ejido. That said, in the Sierra Madre region of Chiapas, the word *poblador* – meaning *settler* in Spanish – is used to refer to any person who comes to live in an ejido from another location, and who is neither an ejidatario nor the child of an ejidatario (*avecindado*). For *pobladores*, the acquisition of land and other rights within an ejido is quite difficult given that such resources and opportunities tend to be left to the privileged sons and grandsons of ejidatarios and land is usually inherited by *avecindados*. Such inequalities are further exacerbated by the fact

²³ Although the Mexican Agrarian Law currently defines ejidatarios as both men and women, women had been historically excluded from this privilege until 1971 (Monterde and Yolanda, 2012).

that while the number of *avecindados* and *pobladores* tends to grow, the number of *ejidatarios* tends to stay relatively even. This is due to the fact that the pace of population growth due to birth and migration tends to far outpace the transfer and exchange of *ejidatario* title rights (Artis, 2000).

Given the three groups of people in an *ejido* and the centrality of land to survival in rural communities, it is important to understand how land is transferred from one person to the next. In general, land circulation occurs via two primary mechanisms: one being non-commercial and the other commercial. Non-commercial means include inheritance (*herencia*) and donation (*donación*), with the former resulting from the death of the title-holding *ejidatario* and the latter being the free gift of land from a title-holding *ejidatario* (Monterde and Yolanda, 2012). Land-transfers by non-commercial means tend to be largely tied to patrilineal norms related to *machista* cultural practices, and almost entirely exclude women (de Barbieri, 2004; Monterde and Yolanda, 2012; Plaza, 2000; Robichaux, 2005; Vazquez, 2001). Monterde and Yolanda (2012) note, for example, that sons and grandsons are the strong preference in inheritance- and donation-based land transfers, as farm work tends to be associated with a male division of labor.

Commercial land transfers, once constitutionally prohibited within *ejidos*, have only recently begun to figure into the circulation of *ejido* land. Given that *ejidatarios* were granted use rights over a plot of land (Artis, 2000) rather than ownership, the sale of parcels was not legally possible. This changed, however, when in 1992 the Mexican Federal Government amended Article 27 of the Mexican Constitution to allow for the certification of land rights under the Program for the Certification of Ejidal Rights (PROCEDE), which allowed for *ejidatarios* to gain land titles for to up to three parcels of land – one for their farming plot, one for their house plot, and one for a percentage of communally owned resources, depending on the allocation decisions of the *Asamblea* within the *ejido* (USAID, 2011). Once individual parcels had been delineated and land titles awarded, farmers could then sell their plots of land.

In the end, the distinctions between *ejidatarios*, *avecindados* and *pobladores* are established within *de jure* and *de facto* mechanisms. On the one hand, *ejidatarios* are ensured voting power and access to land through legal definitions of the *ejido* institution. Moreover, given the restricted means through which *avecindados* and *pobladores* may achieve the status of *ejidatario*, *ejidatario* social status is relatively preserved and concentrated within the hands of an unchanging group of people. On the other hand, the designation of groups of people such as *pobladores* who have a relatively undefined status within Mexican Agrarian Law effectively creates a third class of people for whom access to positive social standing is even more elusive than for *avecindados*. Given these social distinctions and the limited opportunities for farmers to

become ejidatarios, many look to other opportunities such as *Scolel' Te* to enhance their social status by obtaining work experiences, acquiring work skills, and enhancing their access to scarce income-earning opportunities. However, as becomes clear in the next segment, one's access to these opportunities depends on the decisions of ejidatarios and the person's relationship to ejidatarios more generally.

Ejidal Authority, Social Standing and Access to Development Projects

Given their disproportionate access to resources and political influence within their communities, ejidatarios are able to shape the nature of development projects within their communities. Given this influence, ejidatario interests tend to drive decision-making within the ejido about which development projects should be permitted to operate, and which people can and/or should be allowed to participate. In conversations with ejidatarios in the Sierra Madre region, it became clear that such privilege was not only legally determined but culturally expected as well. As one ejidatario put it:

“We were the first to arrive on the land. It was a risk. We came and occupied the land, hoping the owners of the coffee plantation would not push us away or kill us. But we stayed, and it is here where we established the ejido. We are ejidatarios, and we deserve the rights we have because we sacrificed for this community.”

The stories are significant because they not only justify the standing of an ejidatario, but they also legitimize the actions taken by the ejidatarios as members of the *Asamblea*.

For many ejidatarios, the prestige rooted in their sacrifice to the community serves as justification for excluding the participation of non-ejidatarios in development projects. Their social standing, however, not only permits them to decide which projects should operate in a community, but also to use their decision-making capabilities to allow some *avecindados* to participate in a given project, particularly their sons. When new projects come into a community, ejidatarios have greater access to information about the incoming project, as well as voting rights regarding whether or not the project can proceed. This allows them to position their sons and grandsons such that they may obtain key roles in a given project. Such opportunities provide the sons and grandsons of ejidatarios with the opportunity to associate themselves with outside organizations, travelling to new cities, and gaining otherwise scarce job experience. In doing so, they are able to potentially begin to build on their own standing within their communities

resulting from the opportunity to improve material wealth through seasonal migration and new job opportunities.

In conclusion, social status for *avecindados* and *pobladores* excludes them from participation in many development projects. However, some *avecindados*, particularly the male children of *ejidatarios*, are at times able to capitalize on their relationship to *ejidatarios* in order to gain access to participation. In cases such as *Scolel' Te*, the scenario is a bit different given that broad participation among *ejidatarios* and non-*ejidatarios* was secured by AMBIO who petitioned *ejidatarios* for such flexibility. However, many non-*ejidatarios* continue to be dependent on their relationship to *ejidatarios* for access to the land needed to participate. Thus, participation in development as a means to improving one's social status proves to be challenging for non-*ejidatarios* for whom access to such opportunities is dependent on *ejidatarios* in multiple regards. However, despite such limitations, non-*ejidatarios* do become involved in *Scolel' Te*, at times taking leadership positions within the project as *técnicos comunitarios*. For them, this work represents the opportunity to build on their standing within their community relative to *ejidatarios*. However, as will become clear, their participation ultimately undermines their attempts to build their standing within their communities as they become the subject of rumors and trust is undermined.

Viewing *Scolel' Te* from the Prestige Angle

For non-*ejidatarios*, working as a *técnico comunitario* in *Scolel' Te* provides them with a unique opportunity to enhance their social standing within their communities. On the one hand, they are trained to do technical work, thereby learning skills that may be employable in the future. On the other hand, they gain access to scarce income, and increase their proximity to AMBIO, a successful outside organization with a strong network of actors across Chiapas and Mexico more broadly. However, as monitors of farmer work within their communities, *técnicos comunitarios* are forced to navigate the contradictory expectations of friends and family and those of AMBIO – a process that creates tension between *técnicos* and fellow participants. Additionally, when projects fall short of community expectations *técnicos* become the subject of rumors and negative community perceptions regarding the project – impressions that are shaped, in part, by farmers' past experiences with development programs more generally. In such circumstances, participation in carbon forestry becomes a social liability rather than an asset as *técnico* relationships within their community are weakened and undermined. In this section, I first show how tension between farmers and *técnicos* emerge in the context of monitoring work. As

discussed in Chapter 3, these emotional dimensions are largely unseen by AMBIO. I then assess the manner in which farmers become the subject of community rumors about corruption, rumors that undermine the trust upon which farmer relationships are built. However, before doing so, I build on the discussion in Chapter 3 by reiterating the role of técnicos comunitarios within the carbon forestry program.

With over 1,100 farmers in 77 communities, Scolel' Te has become a large and well-recognized carbon forestry program in southern Mexico. However, despite its size, AMBIO has less than 30 regular employees, which complicates management of the geographically dispersed project. In an effort to overcome these challenges, AMBIO employs técnicos comunitarios who are expected to ensure that carbon credit production continues unabated in the communities they represent, work that involves responding to any doubts or concerns that may arise among local participants throughout the duration of their involvement. Community technicians are elected by fellow participants from within their community, and are paid on a project-based rate. Given that they work with AMBIO, but continue to live in their communities, técnicos comunitarios are uniquely exposed to praise when projects go well and to criticism when projects do not go as planned. For técnicos comunitarios, this emotional component of their service work is at times challenging, particularly in the context of monitoring work through which participant compensation is determined. In this segment I analyze the work carried out by the técnicos comunitarios, highlighting the implications of this service work for their standing within their communities.

Monitoring

For técnicos comunitarios, monitoring work provides the opportunity to acquire skills that may be transferable to future employment opportunities with governmental ministries such as the Ministry of the Environment and Natural Resources (SEMARNAT). As such, may serve as a mechanism through which farmers may improve their social standing in their community through increased access to employment opportunities and material gain. However, for many, monitoring work has the opposite effect as they become exposed to tensions arising from the expectations of fellow participants in Scolel' Te whose land parcels they are monitoring and those of AMBIO who pays técnicos to carry out such work.



Figure 4.1 Monitoring Tree Plantings in the Sierra Madre
Photo Credit: Author



Figure 4.2 Monitoring Tree Plantings in the Sierra Madre
Photo Credit: Author

As técnicos engage in monitoring work, they are asked to work intimately with fellow participants in Scolel' Te in implementing monitoring procedures taught to them by AMBIO. This, however, is not straightforward, and often involves navigating the complex and often contradictory expectations of community members and AMBIO. Monitoring work serves two

functions within Scolel' Te: 1) to ensure that farmers are establishing new plantings and caring for existing plantings in an effective manner; and 2) to monitor the progress of plant development so as to confirm the CO₂ reductions and the commercial integrity of the carbon credits. Importantly, monitoring also provides the foundation on which payments to farmers are justified and legitimated.



Figure 4.3 Unclean Tree Planting
Photo Credit: Author

Land parcel monitoring typically begins in the early morning – around 5:00am – so as to accommodate typical farming schedules and to complete the bulk of the work prior to the peak heat of the day in the early-to-mid-afternoon. The goal of the community technician is to accompany participating farmers through their plots of land to locate each planted tree, to note the species of each tree, and to confirm its status as either alive or dead. In addition to locating and identifying each planted tree under Scolel' Te, the community technician will measure the tallest and shortest trees of each species so as to collect a representative height and weight of each one. Using this data with the number of living and dead trees, they can begin to approximate the CO₂ captured across each farmer's land parcel, and thus the payments due to each farmer for their role in Scolel' Te. In some instances where tree plantings have been carefully cleared of competing vegetation, trees can be easy to locate, thereby facilitating the monitoring process (see Figure 4.4). However, in other instances where tree plantings have not been cleaned, the

monitoring process can become very difficult when identifying young trees among competing vegetation is difficult (see Figure 4.3). While monitoring work is clearly stated to the técnicos comunitarios by AMBIO, the reality of monitoring work is often messy, given the fact that it creates uncomfortable dynamics among técnicos comunitarios whose work factors into payment processes, and producers who want, and in many cases depend on, payments stemming from their work in Scolel. Te.



Figure 4.4 Clean Tree Planting

Photo Credit: Author

Payments as a Source of Tension

Monitoring activities are central to determining farmer compensation, which is tied to the survival rate of the planted trees. While for AMBIO the monitoring process and the corresponding payment dispersal are relatively straightforward, for técnicos the payments are often a point of tension with fellow community members, particularly when participating farmers perceive them to have been delivered behind schedule. The exact manner in which payments are estimated by AMBIO is rooted in a Plan Vivo map in which farmers identify the location, type and quantity of trees they would like to plant in their land parcels (discussed in greater detail in Chapter 5). Once a Plan Vivo map has been established, AMBIO estimates the quantity of CO₂ to be captured in the given land parcel over the next 20-30 years – a time frame that is dependent on the variables

identified in the Plan Vivo as well as the local ecological conditions of the project (Corbera, 2005). From the total estimated accrued carbon, only 90% is considered for sale by AMBIO, with the remaining amount being designated for a contingency fund. The purpose of the contingency fund is to keep a store of captured carbon in the event of an unforeseen challenge to carbon credit production such as fires, plagues or unexpected participant withdrawal from the project. Of the remaining 90% considered for sale, only 80% is actually traded, meaning that 72% of the total estimated accrued carbon is actually traded. This is done in order to account for potential leakages associated with project implementation and management (Corbera, 2005).²⁴

Farmers receive an upfront payment of 18% of the total 72% of carbon traded as a form of initial working capital (Corbera, 2005). This money is important to farmers in terms of encouraging initial dedication to the heavy work of planting trees, cleaning plots of land where trees have been planted, and protecting new plantings from grazing cattle and other threats. The remaining four payments, also of 18% of the total 72% of carbon traded, are disbursed to farmers in the second, third, fifth and eighth years of the project, meaning that farmers receive a total of 90% of the money resulting from traded carbon.²⁵ The remaining 10% goes toward funding all of AMBIO's administrative and capacity-building work associated with Scolel' Te. In 2011 total disbursements to participating communities varied dramatically, ranging from a high of USD \$8,809.92 in one community to a low of USD \$18.30 in another community (Cooperativa AMBIO, 2012).²⁶

The purpose behind the spacing of the payments is to incentivize a long-term commitment by farmers to the well being of the trees identified in their Plan Vivos and planted in their land parcels. AMBIO notes that the payments made in years 1, 2, and 3 are associated with the consistent completion of tasks tied to maintaining the well being of tree plantings – the clearing of competitive vegetation, the watering of young trees during the dry season, and the

²⁴ Leakages refer to unanticipated CO₂ emissions in the designated area of a forest carbon project. AMBIO wishes to account for leakages so as to ensure that the carbon captured is “additional” to that which would have otherwise been captured. However, the leakages taken into account only include those leakages that AMBIO is aware of. Other sources of leakages that may not be considered by AMBIO could include covert logging activities carried out by farmers who are simultaneously planting trees as part of their work in Scolel' Te.

²⁵ Initially farmers were paid over the average 25-year course of a project. However, farmers tended to lose interest over time and abandon the project as they felt that the payments arrived too slowly. Thus, AMBIO decided to shrink the payment period to 8 years, noting that after year 8 trees tend to be developed to the extent that they can continue to survive over the long-term with minimal work on the part of participating farmers.

²⁶ Average disbursement to individual farmers was not published or provided informally by AMBIO. Regardless, de Jong and Gaona et al (2004) note that the maximum earnings per hectare were ~US \$700.

pruning of more mature trees – whereas payments made during years 5 and 8 of the project are designed more toward ensuring the long-term permanence of mature tree plantings.

Within participating communities farmers may have varying statuses within Scolel' Te, although each is asked to carry out the same tasks. The variation in farmer status results from staggered entry years among participants. For instance, while some farmers decide to participate in the first year of the project, others who may at first be skeptical of Scolel' Te or who may not have the resources needed to participate in the first year, may decide to enter into the project in subsequent years. In such a scenario, farmers are paid according to their respective funding schedule corresponding with their entry date. Given the shifting demand since 2008 for carbon credits produced in Mexico, AMBIO was forced to conditionally welcome new farmers. In this case, farmers were welcomed to join Scolel' Te so long as they understood that their carbon credits would be designated to the contingency fund rather than sold to the ever-diminishing pool of buyers. The produced carbon credits would be held in the fund and the farmer would not be paid for their work until a buyer could be located. This practice continued until 2012 when AMBIO decided to completely suspend project expansion until buyers could be ensured and sales increased.

Each of the five payments disbursed to farmers are determined by the results of the monitoring carried with the community technician and the participating farmers. Farmer payments directly reflect the number of trees that are living and capturing CO₂ on participant land. If trees die, the payment to the farmer will be reduced proportionally according to the number of dead trees, unless the farmer is able to compensate the loss through replanting. By linking monitoring to payments, the técnico comunitario becomes directly linked, in the eyes of participants, to whether or not they receive their payments. Because monitoring is closely tied to the payments received by farmers in Scolel' Te, many will exert pressure on the técnico comunitario to submit false monitoring reports to AMBIO which dishonestly represent the farmer's work in their favor. In such cases, the service work associated with carbon forestry comes into conflict with the expectations of service to community and family as produced through community life, an issue discussed by Mutersbaugh (2004) in the context of certification work. While community technicians have admitted to feeling pressured to acquiesce to the requests of fellow participants, they note that ultimately it is not worth it to do so given the oversight provided through subsequent verification processes.

Threat to Prestige: Late Payments, No Payments

For técnicos comunitarios, the tension that emerges in their monitoring work is tied to monetary compensation for work within the project. The effects of this tension are experienced both emotionally and physically by the técnico comunitario, and may strain relations between the técnico comunitario and other project participants. This became clear in several contexts: 1) in the complaints shared by técnicos in meetings at AMBIO's offices in San Cristóbal de las Casas; 2) in the stories told by one técnico comunitario while traveling outside the community; 3) in the interactions between técnicos comunitarios and fellow participants during monitoring activities; and 4) in the rumors and stories told among families and neighbors while socializing; and 5) in how técnicos comunitarios move within their communities, as was illustrated by the second vignette at the beginning of this chapter. In the remaining pages of this chapter I discuss each of the instances in which the tension described above emerged in Chiapas. I then conclude by suggesting that prestige concerns are not only related to the work of técnicos comunitarios, but may also relate to non-técnico participants within farming communities.

Each year AMBIO holds a series of meetings - *reuniones semestrales* – attended by both técnicos regionales and técnicos comunitarios, during which tensions experienced by técnicos comunitarios emerge (see Figure 4.5). The purpose of the meetings (also discussed in Appendix A) is to provide training for the técnicos with regard to various aspects of project management, including land parcel monitoring. The meetings are attended by técnicos from throughout Chiapas, including the state's Lacandón, central highlands and Sierra Madre region. For AMBIO, these meetings represent an opportunity to get a sense of community attitudes toward the project, and to provide técnicos comunitarios with recommendations for improving project management. Such advice includes asking técnicos to remind farmers to clean their plots of land so as to protect young saplings, refreshing técnicos on the method for monitoring land parcels, and reminding técnicos to work with fellow participants to protect planted trees from grazing cattle. For técnicos, however, the meetings represent a key opportunity for communicating discontent – both their own and that of their respective communities – to AMBIO.

Over the course of two reuniones semestrales, técnicos shared questions and doubts regarding Scolel' Te, many of which related to payment procedures and perceived late payments (see Appendix A, Table 10A). However, communication was complicated by the fact that many farmers did not speak Spanish as their first language, but instead, represented a diversity of languages spoken throughout Chiapas. Thus, many attendees were initially unwilling engage in conversation with AMBIO (an effect that was further enhanced by the fatigue felt by attending

farmers who had travelled to San Cristóbal for the meetings – see Appendix A). However, over the course of the nine-hour meetings, farmers would begin to contribute their concerns, with many standing to participate, and describing scenarios as they occurred in their respective communities. One técnico from Chiapas’ eastern Lacandón region, for instance, stood and presented issues faced within his community as a result of farmer discontent regarding delayed payments:

“Some have abandoned the project and others threaten to do so if they do not receive their money. The payments are late, and we do not want to return to monitor land parcels because the people are upset.”

Complaints and comments were often repeated by several técnicos, as those provided by one may not have been clearly understood by the rest of the group. Such was the case when a second técnico, also from the Lacandón region, stood and echoed his counterpart: “The people are upset about the payments and they do not want to clean their land parcels. They want their payments.” He was followed by another técnico from the central highlands region who suggested that tensions had arisen between he and his father-in-law who was upset for having not been compensated for his work in Scolel’ Te. “They always ask about the payments,” the person followed earnestly. These comments were met by suggestions from one senior AMBIO employee to remind farmers that it had become difficult for AMBIO to sell carbon credits due to the shifting geography of supply and demand for carbon credits (see chapter 3). However, such explanations were often long and convoluted, falling largely on the unsatisfied ears of técnicos who kept searching for an adequate answer to share with their fellow community members.

These exchanges continued for several hours in each meeting as farmers explained the complaints of their fellow carbon foresters. From the perspective of an outside observer, the repetitive nature of the complaints, and the manner in which farmers persistently sought answers to share with fellow participants in the program felt unnecessary, particularly as the meetings stretched into eight or nine hours. However, such persistence, particularly following long travel days and given participant fatigue, is significant. The persistence speaks to the fact that issues of community discontent toward Scolel’ Te, and the técnicos more specifically, which resulted from frustrations with payment processes, are significant for técnicos across Chiapas. It demonstrates, moreover, the insistence of técnicos to resolve the tensions emerging in their communities around payment schedules – issues that, for them, were affecting their relationships with fellow participants in Scolel’ Te.



Figure 4.5 Meeting with Técnicos at AMBIO's Offices in San Cristóbal de las Casas
Photo Credit: Author

While the tensions emerging between técnicos comunitarios and their fellow community members became clear in meetings at AMBIO's offices in San Cristóbal, the specific implications of these tensions for técnicos in their everyday lived experience became especially clear in my interactions with one técnico comunitario, Ismael:

It was 3:00am and Ismael and I were just beginning a 3-hour hike to the nearest community. Ismael had received a call the night before from AMBIO alerting him to the fact that a meeting had been called for all the técnicos comunitarios and regionales the next day. Our goal was to make it to the community by 6:00am where we would find the only bus leaving for the municipal seat, thereby connecting us to San Cristóbal de las Casas where project managers would be waiting at AMBIO's offices. We walked silently in the dark following the dirt road for about an hour before Ismael spoke:

"I am afraid to leave my home. People are upset with me. They constantly ask, 'where is my money?' What do I tell them? Some people accuse me of having stolen their money. I did not steal any money. Why would I do that?"

As we walked he continued talking, explaining the motivations behind farmers' decisions to participate in Scolel' Te. He noted that while many farmers cite abstract benefits to the project

such as carbon capture or more immediate benefits such as access to firewood or erosion control as a motivation for their participation, the key incentive is the opportunity to earn money.

Ismael's comments resonated with conversations I had held with other farmers in the region. "We work with AMBIO because there are no other jobs," suggested one farmer. "If we take care of the trees, AMBIO gives us, more than anything, a job... and we need to get our kids ahead." Farmer's often identified Scolel' Te as an employment opportunity in the face of scarce alternatives, and framed their relationship with AMBIO within an employer-employee dynamic.²⁷ While the money earned by participating farmers is not much, many noted that the *pequeño apoyo* (small support) allowed them to purchase certain items that would otherwise be difficult to come by, including luxury items such as sugar or meat. Others noted that the money was useful for purchasing light bulbs, machetes, boots, and other items needed for work around the house and in the fields. For others it was a source of money from which one could draw to finance trips into the city to purchase groceries, visit family, go to the doctor or tend to legal issues. In essence, participation in the project provided families with discretionary income that is a rare luxury in poor farming communities.

As Ismael and I continued hiking down the mountain toward the nearby community I learned that people within the community had recently become upset due to uncertainty surrounding the payments tied to Scolel' Te. It was this uncertainty that worried Ismael, and it was a theme that would continuously dominate my conversations with farmers over the coming months.

While farmers tended to discuss the payments tied to Scolel' Te in positive terms, they were quick to point out the uncertainty tied to their disbursement, citing two particular apprehensions: 1) the dependence of payments on tree survival; and 2) late payments. Regarding the former, one farmer noted that "the payments are not fixed," pointing out that his annual payments shift according to tree survival rates on his land parcel. "If 80 trees die this year, then my pay will be less than it was last year," he suggested. While this source of uncertainty was generally accepted by farmers to accompany participation in Scolel' Te, it was the latter that was seen as particularly unjust, and which received the greatest emphasis in conversations.

²⁷ Of 25 farmers surveyed across two communities, 19 mentioned monetary motivations as the key reason for their participation in Scolel' Te. The remaining six also mentioned monetary gain in addition to other benefits such as carbon capture and firewood access. Still others, noted that they were able to use Scolel' Te to engage in activities that would allow them to comply with the requirements tied to other development projects in the community.

Late payments tended to be either perceived (i.e. farmers did not clearly understand the circumstances of their participation in Scolel' Te and expected payments that they were not actually owed) or actual (i.e. AMBIO did not disburse payments in a manner consistent with past payment schedules), and proved damaging to farmer trust in AMBIO. The first scenario was particularly common among farmers who entered into Scolel' Te on a conditional basis prior to 2012, and who were not owed payments given the fact that their carbon credits entered a contingency fund. Although AMBIO assured that farmers had been explained this scenario, many comprehended their status in the project in alternative terms. "This is my first year and I began with bad luck," said one farmer in the region as we sat in his small home. "I don't have any land, and our opportunities are few. We are not happy about this. Maybe AMBIO took the money. Maybe the money never existed. We do not know where the money comes from, after all," guessed one farmer operating in Scolel' Te on a conditional basis. Thus, the carbon market dynamics discussed in the previous chapter have significant on-the-ground implications for farmer experiences and perceptions of Scolel' Te.

With regard to actual late payments, farmers tended to base their expectations on disbursement schedules from previous years. "Last year we were paid in December. Now it is March and we do not know when or if we will get paid," complained several farmers. "The people here become sad," suggested another participant. "When you do the work and you do not get paid... do you know what it is like to be a poor campesino?" Here, farmers did not simply question AMBIO's commitment to the project, but also began to doubt the status of Scolel' Te in general. "Some farmers are wondering what happened to the project, and have given up cleaning their tree plantings. Maybe AMBIO left us." Such uncertainty weakened farmer commitment to the project, and undermined the very trust on which Scolel' Te's long-term success depends. However, the impact of this unpredictability was especially felt by the técnicos comunitarios, who were uniquely exposed to community dissatisfaction.

"They always ask about the money," said Ismael as we neared the waiting bus. "Every time I leave the house someone wants to know where their money is and why the payments are late. It is hard because I do not know, and I do not have an answer for them."

For Ismael, the effects of this uncertainty were visible in the daily seclusion that came to define his life. For many farmers, work in the fields comes to an end in the mid-to-late-afternoon, at which point they begin to complete chores around the house or to socialize with one another. After returning from Ismael's coffee, corn and bean fields I would often eat lunch, bathe, and

then walk out into the community for the rest of the afternoon and into the evening to socialize with other friends. This socializing provided an important opportunity to gossip about news, politics and family affairs. However, Ismael often stayed home, rarely leaving to socialize.

As we sat on the bus headed for the municipal seat, Ismael admitted, “It is difficult to be accused of something you have not done. It is difficult to answer questions for things that I am expected to know, but do not have answers for. Sometimes it is easier just to stay home.”

For farmers, participation in Scolel’ Te represented an employment opportunity that promised to provide them with some disposable income needed to purchase a variety of items. However, late payments – either perceived or actual – undermined farmer commitment to the project and fomented distrust among participants toward AMBIO. The impact of this distrust fell disproportionately on the shoulders of the técnicos comunitarios, whose proximity to their communities exposed them to the frustrations felt by participants who had come to assume that they had been abandoned by AMBIO. Ismael’s experience provides a useful case for viewing the tension between his desire to fulfill the expectations tied to his work with Scolel’ Te while responding to those of his family and friends who were participating in the program.

The challenges expressed by Ismael were shared by another técnico comunitario in the Sierra Madre region, Sergio, who expressed his concern that fellow participants in Scolel’ Te within his community were reacting negatively to the late payments.

“The people become impatient and upset when the payments are late. Before I left for the last meeting in San Cristóbal, they [fellow participants in Scolel’ Te] requested me to ask AMBIO about the payments. When I returned, they asked ‘so what?’. I explain to them that AMBIO must find new buyers. The situation is difficult. They want to abandon the project, and some have already neglected their parcels.”

Sergio’s concerns reflect those expressed by técnicos from the Lacandón and central highlands regions in meetings at AMBIO’s offices, but also indicate the challenges faced by the young técnico comunitario in ameliorating the concerns of his fellow participants in Scolel’ Te. As the above quote indicates, the fact that payments had been postponed for those contributing to AMBIO’s contingency fund was due to the fact that there were insufficient numbers of buyers was not considered an adequate excuse by farmers who felt that they were owed compensation for completed work within Scolel’ Te. For técnicos such as Sergio, the knowledge that the responses provided by AMBIO for why those contributing to the contingency fund would could

not be paid, and their assurances that payments would soon arrive for those not contributing to the contingency fund motivated is the cause behind their persistence at the meetings in San Cristóbal for a better means for ameliorating the concerns of fellow participants.

Threat to Prestige: Charges of Conspiracy and Corruption

The uncertainty discussed above is not unique to Scolel' Te, but accompanies many development projects, particularly surrounding payment processes. In many Chiapaneco communities, general skepticism toward development programs combines with a lack of trust, information, and certainty, provoking a strong cynicism defined by rumors and a fleeting faith in projects and managers. In the context of Scolel' Te, such rumors prove toxic to the image of técnicos comunitarios who become inextricably linked to presumptions of corruption often associated with development programs. This became clear in conversations with Alejandro, one participant in Scolel' Te. As we sat on the porch outside his home, he said:

“You know, when Ismael (the técnico comunitario) monitors Don Jorge’s plot of land, he inflates the number of trees he has planted so that he can receive more money. Either that, or he allows Don Jorge to plant his trees with less spacing between each one so that he can plant more on each hectare of land. That is the only explanation I have for why Don Jorge makes more money per hectare than anyone else. I have done the calculations and it doesn’t make sense in any other way. They work together, you know. Why do you think Ismael sits in his home all day and never leaves his house? When he leaves, why does he only go to Don Jorge’s home?”

According to Alejandro, this perceived violation, although lamentable, was reflective of broader patterns among rural development within the state. He continued:

“Every year we are supposed to receive money from PROCAMPO. Every year we are promised seed and fertilizer, and yet every year we either do not receive it, or we receive it late after the planting season has already past. What good does seed serve us if it arrives late? And what happens to all that money that politicians promise for the Mexican countryside? Every year they promise thousands of pesos for farmers, but where does that money go? I’ll tell you where it goes, it stays in the hands of the municipal government, and we never see it.”

For Alejandro, the situation was clear: corruption within rural development exists, and comprises an unfortunate, yet normal element in such initiatives.

Community impressions of técnicos comunitarios who find themselves caught between AMBIO's expectations and those of participating farmers are infused with cynical expectations and assumptions of corruption that are as much a product of past experiences as current perceptions of Scolel' Te, particularly those tied to payment processes. Such scenarios provide fodder for rumors, which in a community of 300-500 people, spread quickly, thus tainting the image of the técnico comunitario in the eyes of some participants. Furthermore, once a rumor is established, a person's actions are perceived in ways that confirm it as truth. For instance, Ismael's choice to isolate himself from the continuous complaints and accusations tied to late payments, although allowing him to find some respite, served only to confirm the suspicions of others that he was in fact involved in wrongdoing.

While Cancian (1965) and others do not discuss the effects of lost prestige on individuals and groups of people within rural Mexican communities, they do note the benefits of prestige arising from one's contribution to their community. Cancian notes, for instance, that farmers, through their contribution to their community, are able to acquire greater respect from fellow community members, greater access to resources, and mobility within their community – both in terms of physical mobility and in terms of social status. Ismael notes that these benefits motivated his initial involvement in Scolel' Te. “I saw that there was a need for a project of this type in my community – to plant trees and obtain money – so I joined.” In doing so, he stood, perhaps, to build on his prestige in the community – something that could have contributed to his social status, access to resources, and even his standing within AMBIO. However, due to existing attitudes within the community toward development projects and the uncertainty tied to payment processes, the social implications of his work in Scolel' Te were less than ideal.

Despite these challenges, Ismael did consider several aspects of his participation in Scolel' Te to be beneficial. He noted that meeting people from cities across Mexico and from other countries, traveling to San Cristóbal de las Casas every six months for meetings with AMBIO, attending lectures and learning were clear benefits to his work as técnico comunitario. However, he suggested that the challenges he faced within the community were not necessarily a fair trade for these benefits. “This will be my last year with the project,” he mentioned, citing the frustration he felt from the implications of his work with the project on his social life and standing within the community. “It just is not worth it,” he said. “We are cheap labor and only get paid Ps \$90/day when we are monitoring land parcels.”²⁸ In the end, the social costs

²⁸ Roughly USD \$7/day

experienced by Ismael did not justify the benefits tied to the physical, intellectual and emotional labor of serving as a técnico comunitario.²⁹



Figure 4.6 Evening Gathering of Family and Neighbors in the Sierra Madre Region

Photo Credit: Author

Rumors, however, were not confined to Ismael. Rumors circulated continuously within the two communities examined in this project (see Appendix A), regarding the health of the project and others. Rumors spread regularly during the evening hours when families and friends would gather to watch TV, play marbles and talk about family and community affairs. Figure 4.6 is an example of gatherings among family and neighbors where discussions about community affairs would take place. Others, such as Carlos, would complete chores around the house or attend to hobbies such as training cocks for fighting. One evening as he lowered one bird into the cage with another, inducing it to attack, he laughed as I asked about his experience with Scolel' Te.

“I do not participate in that project. They [participants in Scolel' Te] think that if they put their land and time into this project that they will be paid. Don't they know that it won't work? Don't they know that it will never work? Why do they think this project is any different than the other programs that we have?”

²⁹ At the time of this research Ismael continued to work with Scolel' Te. I do not know whether he continues to work with AMBIO or not.

He continued to chuckle as he trained the two birds. “It seems like a waste of time to me – I don’t know why they do it.” Carlos’ comments highlighted the opinions of some who had chosen not to participate in Scolel’ Te due to their skepticism that the project would not actually benefit them or their community in a positive manner. When payments were delayed, assumptions of project failure were confirmed, and those who chose not to participate felt vindicated in their decision to abstain. Noting the negative perceptions of participants held by those who abstained from the program, Don Jorge pointed out:

“They laugh at us when they see that we have not been paid. They say, ‘see we told you not to participate.’ We told you that climate change is not real.’ Maybe we should not have enrolled in the project, but it sounded like a good idea.”

Don Jorge’s comments and those of Alejandro regarding Don Jorge signal the fact that questions of prestige emerging from participation in Scolel’ Te may extend beyond the técnico comunitario to other participants in the program. As projects fail to deliver on their promises, those who bought into the program are cast by skeptics to have been naïve in thinking the project would be of benefit to them and their families.

Conclusion

Scolel’ Te offers participants the opportunity to build on their standing within their communities by gaining new access to resources, opportunities and outside organizations. However, when projects do not go according to plan, participation in a development project may have social consequences that threaten to damage a person’s standing. Técnicos comunitarios are positioned in such a way that they are uniquely exposed to praise when projects go well and to criticism when projects do not go as planned – particularly as seen in the effects of the shifting supply and demand dynamics within voluntary carbon markets presented in Chapter 3 and discussed in this chapter. As liaisons between AMBIO and their communities they have opportunities to travel and attend classes, and are elevated as relative authorities within the context of Scolel’ Te. However, as monitors of the work carried out by fellow community members, they are exposed to pressures by friends and family to unfairly support them, as well as to rumors by those who perceive the project as functioning poorly or as corrupt – perceptions that are shaped, in part, by farmers’ past experiences with development programs (see Chapters 1 and 2). In circumstances such as these, técnicos comunitarios such as Ismael face the challenge of responding to threats to their standing within their communities in the face of pressure by AMBIO to continue their

participation. In the end, while non-ejidatarios turn to projects such as Scolel' Te to build upon their standing within their communities, opportunities to do so are severely limited by the lack of security within the carbon market. Shifting market dynamics ultimately expose técnicos (and other participants) to risk that limits and ultimately threatens their ability to achieve any kind of social ascent within their communities.

By looking at Scolel' Te from the perspective of broad intra-community social relations, the social effects of carbon forestry appear in a much more dramatic manner than social capital perspectives would have it. These impacts are not as conspicuous as the violent examples seen in the highway project and other counter-insurgency-oriented development initiatives in the central highlands and Lacandón region. However, social impacts discussed in this chapter are nonetheless dramatic for participants hoping to improve their livelihoods through participation in the project.

The issues raised in this chapter also highlight the challenges faced by AMBIO in ensuring continued community support for Scolel' Te. If farmers judge the payoff for their participation to not be worth their time, then Scolel' Te will not function. However, given AMBIO's limited resources, they are unable to respond to each of the challenges faced in participating communities in addition to normal Scolel' Te activities. Thus, AMBIO must turn to mechanisms within Scolel' Te in order to ensure long-term community commitment to the project. In the next chapter, I examine efforts by AMBIO to achieve community buy-in through participatory mapping and member education programs, suggesting that such practices ultimately undermine the social relations of production – i.e. those between participating farmers and AMBIO – by re-shaping farmer land-use patterns in ways that are insensitive to the multiple factors that shape farmer land-use decisions.

CHAPTER 5: MANAGING LABOR AND GENERATING BUY-IN Participatory Carbon Forestry in Chiapas, Mexico

Introduction

“There are many organizations that have done environmental work in Chiapas, and many have not complied with their promises to complete the work. [With *Scolet’ Te*] the most difficult aspect is that the producer [farmer] comes to trust you, to trust that you are not going to cheat him. At first what the people assume is that making a *Plan Vivo* [map] implies that we [AMBIO] are going to take their land. The most difficult aspect of our work is to convince them otherwise – to convince them that we are not going to take action, but that they will” (AMBIO employee).

Given the failures highlighted in the previous chapter, AMBIO has had to create trust with project participants – trust that, as became clear in Chapter 4, is a fluid and dynamic component of development work. This chapter examines efforts by AMBIO to create farmer buy-in for *Scolet’ Te* through the use of participatory mapping exercises and member education programs. I suggest that these participatory exercises are designed to achieve community buy-in by inducing enrolled farmers to believe in *Scolet’ Te* and to act in a manner consistent with the project’s long-term objectives. I argue, however, that participatory activities are predicated on a limited understanding of farmers and farmer land-use decision-making, and that as a result, they re-shape farmer land-use patterns in ways that undermine the social relations of production between farmers and AMBIO. In order to assess these issues, I analyze community participation from two perspectives: 1) as a discourse, and 2) as a labor process. The first approach is essential to clarifying how AMBIO thinks about farmer’s and who they may become through their participation in *Scolet’ Te* – a project that AMBIO argues is ultimately beneficial for local producers. The second optic is necessary for analyzing how farmers are expected to enact carbon forestry within their communities, and why AMBIO needs to produce a certain pattern of activity and relationship to the land among farmers – an arrangement that ultimately undermines the social relations of production between farmers and AMBIO.

Farmer buy-in to *Scolet’ Te* and participatory activities are, according to AMBIO, necessary for the long-term success of the program. On the one hand, farmers must begin to trust AMBIO in a context where trust for outside organizations and development projects is not automatic, and come to believe that their work will counteract the problem of climate change. On

the other hand, AMBIO must mitigate risk by inducing farmers to alter land-use practices by limiting fires and cattle grazing. In this sense, the use of participatory activities is designed to alter farmer relationships to development organizations and to their land – to create, in essence, a new relationship based in altered practices and beliefs. In doing so, AMBIO hopes that farmers will not only trust AMBIO and the program’s ability to mitigate climate change, but also act in ways that ensure its long-term success. Before assessing the specifics of participatory practices in Scolel’ Te I highlight mainstream perspectives on participation, perspectives that are commonly shared by organizations such as AMBIO. I then examine critical alternatives for analyzing participation, drawing on political ecology work, critical development literature, social theory and labor studies. In doing so, I set the scene for an in-depth discussion of how participation is envisioned by AMBIO, and for clarifying the manner in which such activities undermine social relations between AMBIO and farmers.

Mainstream and NGO Perspectives on Participation in Development

The problem of participation has long been of interest to multi-lateral development organizations, governments, and NGOs such as AMBIO concerned with how control over a project is allocated among various participants. These actors have associated participation with increased community empowerment (Friedman, 1992; UNDP, 1993), with the democratization of development (Mwanzia and Strathdee, 2010), and with the improved ability of practitioners to respond to the needs of development’s intended beneficiaries (Willis, 2005). As Moore (2001) notes, local participation was recognized as the counterweight to established hierarchies within development practice. Moreover, local knowledge and experience emerged as a perceived silver bullet for making development more relevant to its intended beneficiaries (Kothari, 2001), and took several forms among organizations such as the World Bank, which began to utilize Participatory Rural Appraisal, Beneficiary Assessment, and Social Analysis approaches in their work (Francis, 2001). Moreover, as will be seen, local knowledge is understood by organizations such as AMBIO to be useful for revealing hidden knowledge that may be productive of more effective development practice. In short, participation signaled, for mainstream development, a progressive turn toward inclusivity and empowerment within development work.

Participatory practice received strong emphasis first within the “Women in Development” (WID) movement in the 1970s and its “Women and Development” (WAD) and “Gender and Development” (GAD) successors, which sought to enhance women’s participation in development, to provide alternatives to male-dominant approaches, and to critically analyze

perspectives on gender within development practice (Schroeder, 1999). Moreover, the embrace of participation within development coincided with a shifting development landscape beginning in the 1980s when national governments sought to de-center development practice from macro-economic initiatives, and charged local governments with the task of directly addressing the ‘basic needs’ of the populace (Willis, 2005). As Willis (2005) notes, however, development’s decentralization also included the emergence of NGOs, whose proximity to local communities was presumed to facilitate the incorporation of participatory methods in development practice.³⁰

The use of participatory tools in development has most recently been discussed in mainstream development literature in terms of *stakeholder engagement*, wherein stakeholders are defined as those actors with a stake in the development project, and stakeholder engagement is taken to be any effort to work directly with those actors (Brett, 2003; Forrester and Swartling et al, 2008; Isham and Narayan et al, 1995).³¹ Stakeholder engagement has, in turn, been linked to the concept of *social capital* through discussions about how people act in relation to one another such that they may contribute productively to the success of a development project (Woolcock and Narayan, 2000). The goals of social capital, although not always identified as such, can be found in the post-revolutionary attempts of the Mexican Federal Government to rearrange rural social relations to form what have been termed *Comunidades Revolucionarias Institucionales* – essentially organized communities of rural farmers designed to enhance the governance objectives of the state (Rus, 1994). In the end, participation, both in past examples and contemporary thinking, came to be seen as an effective tool for enhancing the value of political and development projects, by strategically rearranging social relations.

³⁰ Decentralization reforms began in Mexico in the late-1980s and early-1990s, and featured the direct involvement of local governments in the implementation of development projects (Fox and Aranda, 1996; Otero, 1996; Teichman, 1996). This marked a strong contrast with traditional centralized clientelistic and corporatist modes of operation favored by the Mexican Federal Government since the 1910 Revolution. These decentralization efforts included state actors and development NGOs who came to fill the void left by the hollowed-out Mexican neoliberal state (Huerta Moreno, 2005; Otero, 1996; Walker and Roberts et al, 2008). However, despite this trend, state-led development practice in southern Mexico continues to have a strong presence, reflecting varying local socio-political and historical influences. Marcos (1994) notes that in Chiapas, for example, the Mexican federal government continues to play a strong role in development practice, where, he argues, such efforts comprise a key component of state-led counter-insurgency and anti-Zapatista initiatives.

³¹ Definitions of stakeholders vary across the development industry, and in other arenas such as corporate social responsibility (CSR). Definitions may be limited, including only those actors who have a financial interest in a project (IFC, 2007). However, broader definitions tend to include those actors with any stake – financial or otherwise – in the project in question. Given that the participatory efforts studied in this paper often include actors with varying stakes in a project, I take my cue from broader definitions of the term.

For AMBIO, participation in education programs and Plan Vivo mapping is often justified in terms of community empowerment. Such justifications may be useful for AMBIO in terms of justifying *Scolel' Te* to donors and outside organizations, although as it became clear in Chapter 3, *técnicos* are often enrolled as cheap labor in an effort to overcome resource limitations. Regardless, in this chapter, I make an effort to analyze the discursive components of participation, while also assessing its significance as a unique labor process. In doing so, I make it clear that participatory activities are predicated on a limited understanding of farmers and farmer land-use decision-making, and that as a result, they re-shape farmer land-use patterns in ways that undermine the social relations of production between farmers and AMBIO. However, before discussing the participatory activities, I examine participation as it is discussed in critical development studies, and link it to notions of community buy-in.

From Participation to Buy-in: Analyzing Participation as Discourse and Labor Process

Mainstream and NGO perspectives on participation revolve around questions of inclusivity and empowerment within development work. In this chapter, I move beyond these discussions by analyzing attempts by AMBIO to use participatory activities as a means to achieving community buy-in. I do so by analyzing participation as both a discourse and a labor process. Viewing participation as a discourse sheds light on AMBIO's ideas about who farmers are and who they can become – ideas that inform how and why they engage with local farmers in participatory activities. Analyzing participation as a labor process, however, illustrates how AMBIO attempts to produce a certain pattern of activity and relationship to the land among participating farmers in *Scolel' Te*. In this segment, I turn to critical development literature, social theory and labor studies to analyze participation first as a discourse and second as a labor process through which farmer buy-in is pursued. In the following section I then assess, in detail, AMBIO's participatory mapping exercises and member education programs, showing how, despite their attempts to create trust and rearrange land-use activities in the labor process, they ultimately undermine the social relations of production between AMBIO and farmers.

In order to assess below the underlying logics supporting AMBIO's attempts to engage farmers in participatory practice, it is necessary to first examine the role of discourse in participatory development more broadly. The role of discourse within participatory development must be analyzed in terms of power and knowledge (Crush, 2005; Escobar, 2005; Kothari, 2001). Critical development studies illustrate the fact that within development practice, discourse is powerful, particularly in its ability to produce specific ways of knowing (see especially Escobar,

2005 and Esteva and Prakash, 1998). This work suggests that the types of things that come to be known through development discourse include development practice as a-political (Ferguson, 1994) and as a vehicle for modernist projects (Ferguson, 1999; Scott, 1998). Moreover, this work argues that the subjects of development emerge through the discursive creation of the 'third world' (Escobar, 1995), or 'impoverished women' (Schroeder, 1999) upon which development may be enacted. Ultimately, following Foucault (1990), this work argues that knowledge is powerful, and that discourse, as a medium for knowledge production, becomes an 'instrument' of that power.

Understanding the power of discourse is important for clarifying its role in development, but so too is elucidating how discourses form within the context of development practice. In his work, Bakhtin (1981) highlights the process through which diverse discursive elements come together to form a powerful discourse. According to Bakhtin (1981), this process involves a negotiation of meanings that is particularly complex. As he puts it:

“The way in which the word conceptualizes its object is a complex act – all objects, open to dispute and overlain as they are with qualifications, are from one side highlighted while from the other side dimmed by heteroglot social opinion, by an alien word about them” (page 277).

Thus, for Bakhtin (1981), the negotiation of meanings through which objects are conceptualized in discourse is complex, and is comprised of multiple possibilities for knowing. However, he also argues that the manner in which such negotiations form coherent meanings is influenced by the specific social and cultural context in which they occur. Thus, discourse is an instrument of power that forms in a field of multiple possibilities of knowing. Moreover, its formation occurs through a negotiation of meanings that is culturally and socially influenced. From this vantage point, development discourse may be understood as a powerful mechanism through which development and its subjects come to be known. Such knowledge is produced, moreover, through negotiations in a field of multiple possible possibilities of knowing, and is influenced by the context in which the negotiations occur.

Knowledge produced in development shapes how the subjects of development are known, and has material effects in how development practice occurs. In his analysis of development programs in The Gambia, Schroeder (1999) analyzes the ways in which images of women carrying large bundles of firewood on their heads, and in some cases a baby as well, communicate the burdens experienced by women in responding to the needs of the family. He notes, moreover, that such images convey a close connection of women to the natural

environment, and suggest a selfless dedication on her behalf to the well being of the family. Schroeder (1999) and O'Reilly (2006) note that constructs of this type form a significant and powerful component of a participatory discourse, and that its effects are visible in efforts to include the participation of women, who then come to be seen by project developers and managers as victims, as having a close connection to the natural environment, and as being selflessly dedicated to the well being of family and society. Moreover, they demonstrate that such images play a key role in negotiations about the role of women within society, and justify the pursuit of participatory development interventions.

Participatory discourse creates ways of knowing development's subjects that justify the use of participatory measures by managing organizations. However, in order to analyze why and how AMBIO produces certain patterns of activity and relationships to the natural environment – relationships that are different from existing human-environment relations – it is necessary to also analyze participation as a labor processes. Doing so illustrates how farmer land-use patterns become reworked in ways that cause farmers to question the project, ultimately undermining the social relations of production between farmers and AMBIO. To do so, I make use of both Anglo-American Marxist perspectives and Foucauldian optics in order to assess how workers become enrolled in in the labor processes. The question of how farmers become enrolled in carbon forestry through the labor process is important to consider given the disappointing and destructive effects of carbon forestry as experienced by farmers looking to improve upon their marginal livelihoods through participation in carbon forestry.

Foucauldian notions of the labor process examine the exercise of power through management practices designed to align workers to manager's objectives. In this literature, employees are understood to oblige manager's objectives in the labor process not because they are forced to, but because, through their work, they have been transformed into subjects who believe in management's objectives. In such a scenario workers come to recognize themselves as autonomous individuals whose sense of identity stems from participating in the labor processes (Knights and Willmott, 1989). Elizabeth Dunn (2004) examines, for example, the manner in which workers were taught in Poland to self-govern through the implementation of Total Quality Management (TQM) practices designed to normalize worker behavior according to product quality objectives at Gerber. She notes that power was not necessarily exercised through a visible and domineering management style, but rather by inducing workers to buy-in to Gerber's product quality objectives. In a similar fashion, Robin Leidner (1993) examines the routinization of service work in the insurance industry by training sales agents to engage processes of workplace transformation in which they come to embody the routinized labor out of a desire to do so.

Leidner's (1993) study of the fast food industry is also instructive. Here, Leidner describes McDonalds' efforts to regulate labor and to preserve product homogeneity. She details the rules and steps for each segment of the dissected food preparation process that were designed to discipline workers to adhere to the "QSC" – quality, service, and cleanliness – credo. Leidner sees this type of detailed intervention in the labor process as a way to simultaneously discipline workers and to ensure product quality – to make sure all hamburgers taste like the iconic McDonalds hamburger. In these instances, power is exercised through worker participation in ensuring product quality, and is designed to govern worker actions in the workplace by reshaping their attitudes and actions such that they may reinforce their companies' broader objectives.

While subject formation is one of the means through which people become enrolled in labor processes, it is also important to consider how people become enrolled through incentives and 'game-playing.' In his 1979 analysis, Burawoy discusses the process of 'making out' as a means through which workers are able to flexibly negotiate the meaning and nature of work within the confines of factory management. However, he notes that this process, although central to getting ahead in the workplace, represents a commitment of workers to the rules of laboring in the factory. In a related fashion, Braverman (1974) examines discipline in the workplace as a means to extracting output from purchased labor, suggesting that worker autonomy is constrained within management objectives. Finally, Mutersbaugh (2005) explores the manner in which the 'harmonization' of organic standards transforms rent relations, thus complicating farmer participation in organic production. Although power takes on a different form in Marxist analyses of the labor process, this work is important for understanding the implications and experience of participation in the labor process for workers.

Drawing on critical development literature, social theory and labor studies, I critically reassess the nature of participatory development, suggesting that participation must be seen as both a discourse and a labor process. I suggest that both modalities of participation feature the negotiation of different types of meaning, and that both are central to achieving community buy-in to Scolel' Te. In the former manifestation, negotiations concern meanings about who farmers are and who they can become as a result of their participation in Scolel' Te, while in the latter, negotiations pertain to the meaning of farmer relationships to development, to their land and to capital. In this chapter I suggest that participatory exercises tied to Scolel' Te must be seen first as a discourse through which specific ways of knowing rural farmers in Chiapas emerge. It is a discourse that re-produces a specific type of knowledge about farmers – a knowledge that is then mobilized by AMBIO to justify participatory interventions in the form of mapmaking and education programs. Importantly, the meanings negotiated through participatory activities in

Scolet' Te are negotiated within southern Mexico's broader development landscape. Thus, the ways of knowing that inform AMBIO's work reflect broader attitudes and modes of thinking common to development programs within the state.

In this chapter I suggest that the suite of participatory tools used by AMBIO is essential to securing community buy-in to the project. It is, however, also important for securing the buy-in of international funders. Given the popularity of participation in mainstream development practice, the use of Plan Vivo mapping and member education programs demonstrates a commitment to local empowerment by AMBIO, a fact that may be considered attractive by potential funders. Regarding the former, I argue that community buy-in consists of two components: 1) the general acceptance of Scolet' Te by participating communities; and 2) the commitment of participating farmers to the future success of the project. The first component is concerned with questions of trust between participating communities and AMBIO, while the second is tied to the actions and beliefs of project participants over time. In the next section I examine how AMBIO draws on Plan Vivo mapping and participant training exercises in order to ensure community buy-in by forging trust between AMBIO and project participants, and by beginning to reorganize farmer relationships to development, to their land, and to capital. I argue that these efforts must be seen as a labor process and as a participatory discourse, and that they find meaning in broader participatory development trends as well as the complex socio-political context of Chiapas.

Securing the future of carbon development: AMBIO and the Plan Vivo Mapping

The participatory tools used by AMBIO originate in the Plan Vivo Standard under which Scolet' Te's activities are organized. While standards emphasize a variety of items across forest carbon projects (e.g. the protection of biodiversity and the promotion of clean water sources), the Plan Vivo Standard is recognized for privileging local participation in defining community involvement in carbon forestry, particularly through activities such as Plan Vivo mapping. In this section I argue that Plan Vivo mapping is a method of stakeholder engagement designed to achieve community buy-in by re-shaping farmer relationships to AMBIO, to their land and to capital. However, I argue that such efforts are justified through a participatory discourse that presents farmers as in need of Scolet' Te and as standing to benefit from their participation in the program. It moreover reorganizes their relationships to their land in ways that are blind to the many factors that shape farmer land-use patterns and resource management practices, thus marginalizing farmer knowledge and threatening their long-term commitment to the project. This

outcome ultimately undermines social relations of production between AMBIO and participating farmers, thereby destabilizing relationships upon which project success depends.

Plan Vivo Mapping: Trust and the Farmer-Manager Relationship

AMBIO's need to achieve community buy-in stems from the damaging effects of project participation highlighted in Chapter 4, and from a general distrust by farming communities toward development projects in the region. In Chiapas, broad mistrust among farming communities exists toward state- and non-state-led development projects. This mistrust stems, in part, from the fact that since the 1994 Zapatista uprising, state-led development programs have tended to marginalize pro-Zapatista communities who contend that such initiatives are designed to contribute to the federal government's counterinsurgency efforts (Romero, 2009). Meanwhile, many non-Zapatista communities consider development to be ineffective, as state-led agricultural support programs have been plagued by inefficiencies and corruption (Fox and Haight, 2010). For both Zapatista-aligned and government-aligned communities this scenario is compounded by the fact that the conditions of poverty they face are greater on average than those experienced by rural communities in Mexico's other regions. Given these three factors, many farming communities have come to question the intentions of government and non-government actors proclaiming to have the best interests of farming communities in mind. Thus, AMBIO's ability to recruit farmers to participate in Scolel' Te depends on their ability to alter the relationship of participating communities to development organizations, including AMBIO, from one marked by a disposition of mistrust to one defined by a shared belief in the potential success of Scolel' Te and the resultant well-being of participating communities.

Trust is central to recruitment in Scolel' Te, but it is also a key component in AMBIO's management of the program. Project management in the Scolel' Te program is complicated by Chiapas' rural and geographically diverse countryside, by the state's poor communications infrastructure, and by AMBIO's limited personnel. Thus, the success of Scolel' Te depends on AMBIO's ability to reduce farmer dependence on outside monitoring, and to induce farmers to engage in Scolel' Te not because a project manager is holding them accountable, but because they wish to do so out of their own free will. It depends on what Leidner (1993) refers to as a "routinization through transformation" in which workers learn to routinize their own labor by learning to desire routinized work. Remaking farmer subjectivities in this way, AMBIO suggests, is only possible in a scenario where trust forms a significant portion of the

organization's relationship with participating farmers. Only in the presence of such trust, they note, can *Scolet' Te* continue to operate despite scant resources.

For AMBIO, the work of building trust-based relationships that will allow for the management of *Scolet' Te* begins with Plan Vivo participatory mapping. AMBIO notes that local participation in the mapping process allows farmers to outline the parameters of their participation in *Scolet' Te*, thus making them feel as though they have a stake in the project. Mapping coordinators indicate, however, that an absence of local participation in the mapping process threatens the long-term success of the project:

“If we [AMBIO employees] become impatient with the mapping, which can take quite a long time, and decide to do the mapping ourselves, the entire planning process becomes broken and the producer [participating farmer] loses his or her identification with the project.”

This lack of identification, they advise, is especially visible in instances where farmers abandon *Scolet' Te* during the course of the project.

Issues of trust between AMBIO and participating communities surface early in the Plan Vivo mapping process. During the initial phases of the exercise farmers are asked by AMBIO's mapping coordinators to begin to map their land parcels onto a blank sheet of paper (see Figure 5.1), a task, that for many farmers and for a variety of reasons, proves to be challenging. First, given illiteracy rates in the state, many participating farmers do not know how to read and write. Thus, as AMBIO notes, the task of using a marker to draw a map closely mimics writing, and is challenging for farmers who fear embarrassment in the presence of fellow community members and the visiting organization. Additionally, given the complex socio-political climate in Chiapas since the Zapatista uprising, and the conflict surrounding mapping initiatives in the region, many farmers fear that the produced map will further empower outside actors to dispossess them of their land.³² Given these reservations, farmers are often advised by leaders in their communities to provide only general information in the mapmaking process in an attempt to limit what is shared with AMBIO. For farmers, it represents a means of 'making out' (see Burawoy, 1979) – a means of providing strategically sufficient information so as to be able to participate in *Scolet' Te* without compromising their control over land resources. However, the mistrust faced by AMBIO

³² As noted in Chapter 1, the Zapatista uprising was followed by successive attempts by the Mexican state to weaken pro-Zapatista communities – initiatives that have bred mistrust among farming communities toward outside organizations. Additionally, the destabilization of rural land tenure rights through the 1992 termination of the ejido land tenure system has led to relative land insecurity among farmers.

from the initial moments of its work with participating communities reflects broader misgivings by rural communities toward working with development practitioners in the state.

In an effort to overcome these obstacles and to encourage farmer participation, AMBIO suggests to participants that they begin by writing their name at the top of the piece of paper where the map is to be drawn. AMBIO notes that despite high illiteracy, the majority of participants are able to write their name, and that doing so instills a sense of confidence in their ability to comply with the requirements of the mapping activity. Moreover, doing so provides farmers with a small degree of familiarity with using the marker and paper in producing the map. In initial phases of the mapping process AMBIO's goal is to begin to build farmer trust that will not only facilitate mapmaking, but also endure throughout the project. "While the mapmaking process is essential to building trust, the Plan Vivo [map] is the producer's trust solidified in a document," suggested one AMBIO employee. Thus, the initial phases of the mapping activity represent the first steps in reorienting farmer relationships to AMBIO from one of doubt and misgivings to one of trust.

Plan Vivo Mapping: Reshaping Farmer Relationships to Their Land

The long-term success of Scolel' Te depends not only on trust, but also on AMBIO's ability to reconstitute farmer relationships to their land. How this happens in practice is shaped by AMBIO's expectations of who farmers are as resource managers and who they might become through their participation in Scolel' Te. These expectations, what Ferguson (1994) refers to as the expectations of development, are visible in AMBIO's perceptions of rural smallholder work ethic, land-use patterns and entrepreneurial ambition. Moreover, they are based in logics that conform to project management objectives and marginalize the knowledges of participating farmers. In Chiapas, farmer land-use practices relate to the production of corn, beans, coffee, and cattle. For many farmers land is tied to survival through subsistence food production. How land is used, though, is shaped by the complex interaction of a variety of factors within rural farming communities. These factors are political in nature, and include land availability, access to inputs such as seeds and fertilizer, shifting environmental patterns and soil conditions, and proximity to protected areas such as the Reserva de la Biosfera la Sepultura, and the Reserva La Frailescana (see Appendix A, Table 6A). These factors shift from year to year, thus, altering farmer land-use patterns that may appear erratic or unplanned over time to outside organizations.

Protected areas such as the Biosfera La Sepultura and the Reserva La Frailescana shape farming practices in several ways. First, since the creation of the reserves in 2007 and 2010,

farmers report having been prohibited from hunting animals within the protected areas and from harvesting trees so as to clear more land for planting. Moreover, through their work with the Mexican National Commission for Protected Areas (CONANP) farmers have been discouraged from using fire to clear and prepare land for annual planting. Of these changes, the latter has proven to have the largest impact on agricultural practices. According to local farmers, fire not only clears land, but also kills soil-based plagues and insects that threaten annual crops. Farmers noted in interviews that by avoiding the use of fire, they had compromised production by allowing plagues and insects to flourish in the soil.

A second political factor determining the quantity of crops planted in a given year relates to government-led agricultural support programs relied on by farmers for seeds and fertilizer. According to local producers in both communities, resources stemming from government programs such as PROCAMPO are notoriously unpredictable in the sense that resources typically arrive after planting in April or not at all. The unpredictability of funding from government programs is often attributed to the corrupt practices of local politicians who present an obstacle to the efficient distribution of funds. Fox and Haight (2010) note, for example, that PROCAMPO, which was designed originally to mitigate the predicted impacts of trade liberalization on small-scale agricultural producers, has been marked by inefficiencies, unequal funding distribution and fraud that have prevented the provisioning of resources to many poor farmers. They suggest that this has increased insecurities among poor farmers who depend on government support for their agricultural activities, thus leading to skepticism among producers toward such projects.

A third element shaping farmer land-use decisions includes land availability – a variable that is determined by a variety of factors. First, as was discussed in Chapter 4, land availability is often influenced by the standing of individual farmers within their community. Land ownership within a community tends to be concentrated among ejidatarios with formal ejidal authority. Those who do not have land are often forced to rent from family members or others within their communities. These farmers often find themselves in a precarious situation defined by a greater pressure to obtain the income needed to pay rent on their land. Farmers with more land ultimately have greater flexibility in determining which crops they are going to plant and where they are going to plant them, while renters are limited to planting only as many crops as can be supported by the rented land parcel – generally only enough to support their family and to pay back the lender.

Finally, a fourth factor shaping land-planning decisions involves the type of soil available to the individual farmer within their plot of land. According to farmers, beans tend to grow better in less than fertile soil, due in part to their capacity to fix soil nitrogen. Moreover, farmers note

that beans tend to grow better on slopes given that their short stature does not expose them to damaging winds during the rainy season.³³ Corn, which is planted at the beginning of the rainy season and harvested just after the beginning of the dry season (December/January), is planted in more fertile soils. Corn tends to be planted in flatter portions of land parcels where wind during the rainy season will not damage the large stocks of the corn plant. Some farmers will intercrop beans and corn, taking advantage of the bean's ability to fix soil nitrogen and the corn plant's ability to support bean plants in order to achieve efficient production of both. Many farmers, however, do not practice intercropping, arguing that doing so complicates harvesting processes.

Ultimately, land planning decisions are influenced by political factors, land availability, soil conditions, and seasonality. Given that each of these factors varies from year to year, land planning decisions change over time and are flexible, shifting in accordance with the changing availability of land and resources needed to plant crops. Each of these factors shapes how farmers view their land and its potential to produce the crops that are needed throughout the year.

These factors, although known by governmental and non-governmental organizations working in Chiapas, are often invisible in the face of development objectives that warrant alternative perspectives on natural resources and resource use. Political ecology literature addresses this conflict of perspectives in development work, highlighting the extent to which farmer livelihoods involve the continual balancing of social, economic and environmental factors (Bassett and Zuéli, 2003; Bryant and Bailey, 1997; Bumpus and Liverman, 2011; Hecht, 2004). It demonstrates, moreover, that although these factors are prevalent in the lives of many living in developing countries, they often go unseen by development practitioners whose objectives privilege divergent considerations.

After nearly 17 years of work in Chiapas, AMBIO has become well aware of the many factors shaping land-use patterns in farming communities, including the types of agricultural activities pursued in the state. This is especially visible in the various flexible carbon forestry systems designed by AMBIO to build on the many productive activities of participating farmers (see Chapter 3). However, despite AMBIO's sensitivity to participants' productive activities, they often view land-use decisions through a lens altogether different than that of project

³³ Beans may be planted and harvested twice in a calendar year. The first planting is at the beginning of the rainy season, and is harvested in August. Farmers noted in interviews that given that the harvest of the first planting falls in the middle of the rainy season, few beans are planted as wet soil conditions may complicate the harvest. Although harvests during these months may be small, they are designed to serve as a backup to the second and larger bean crop, which is harvested in December/January following the end of the rainy season. Because harvesting is less complicated during this time, farmers plant significantly greater quantities of beans so as to support the family over the next year.

participants. For AMBIO, smallholder land is valuable not only because of its potential to produce corn, beans, cattle and coffee, but also because of its potential to capture CO₂ and to produce carbon credits. Moreover, land is seen by AMBIO to be a resource, that, when managed in a specific fashion, could facilitate poverty alleviation by integrating farming communities into global carbon markets. According to AMBIO, however, this potential is limited by the perceived lack of entrepreneurial ambition held by smallholders in the state. As one AMBIO employee put it:

“There does not exist [among farming communities] the initiative to determine what they want. I mean, they are not proactive; they are static, waiting for whatever comes their way.”

Ultimately, in AMBIO’s view, the perceived lack of initiative by smallholders in exploiting their land to its commercial extent limits their capacity to reap its full potential.



Figure 5.1 Completed Plan Vivo Map
Photo Credit: Author

The non-entrepreneurial perspective assumed by AMBIO to be held by participating communities is often generalized to suggest that farmers have no land-planning practices. Such sentiments are common among policy makers and development practitioners in Mexican governmental and non-governmental circles. In the case of Scolel’ Te such perspectives justify land-use planning interventions such as Plan Vivo mapping in the perceived absence of pre-

existing practices by local farmers. These attitudes and comments form a discourse that presents farmers as unknowledgeable stewards of their natural resources, whose lack of ambition merits the intervention by AMBIO with the use of Plan Vivo mapping (see Appendix A, Table 2A). From this vantage point, Plan Vivo mapping must be understood as designed to introduce specific land-use planning practices so as to encourage farmers to interact with their land in a manner consistent with the objectives of Scolel' Te. As one mapping coordinator suggested, "...what we look for in the planning process is the permanence of the project within the community." Thus, the Plan Vivo mapping must be seen as a land-use planning activity designed to allow farmers to begin to view their land as the raw material with which carbon credits may be produced, and to encourage them to act in such a way that they may support the long-term production of carbon credits and the success of Scolel' Te.

Following the initial phases of Plan Vivo mapping, farmers are asked to begin to map their land, a task that proves to be challenging for many participants. This stems from the fact that many participants often find it difficult to imagine their communities and their land in ways that make them amenable to mapping. "It is a psychological question to look at a blank piece of paper and to ask, 'where do I begin?'" admitted one mapping coordinator. In response, AMBIO attempts to guide farmers in the mapping process, and in doing so to alter farmer imaginations of their own land so that they may begin to interact with it in a manner consistent with the objectives of Scolel' Te. One mapping coordinator described this process, which involves several steps, in the following manner:

"First we ask farmers to identify a location – a church, a school, or some other landmark in their community and to mark it with a symbol – a circle, a star, or even a tree. Next, we ask farmers to identify another nearby landmark, such as a road, and to mark it on the map in relation to the first landmark. Finally, we ask them to identify their house, and to mark it with a symbol on the map."

It is in this process that the map starts to obtain meaning both for AMBIO's mapping coordinators and for the mappers. It is a moment in the mapping process that, as Herlihey (2003), Herlihey and Knapp (2003) and Offen (2003) note, is transformative for both the mappers and the mapping coordinators. "They provide us an up-to-date view of their community," mentioned one mapping coordinator. "It is much more accurate than we could hope to do ourselves without their assistance". At this point the produced map begins to acquire meaning for participatory mappers as well. The mapping coordinator continued:

“After farmers have identified their house, we ask them to locate their parcel of land and to begin to draw it. We ask them to mark where they plant beans, and to show where they graze cattle. Once they have finished this we ask them to identify which [agroforestry] system they want to plant”.

AMBIO works with farmers in this manner to map their land parcels and to identify agroforestry systems so as to change farmer relationships to their land – both in terms of how they understand it and in terms of how they manage it. This, they argue, is essential to the long-term success of *Scolel’ Te*. John Pickles (2004) suggests that territory comes into being through its mapping, and that how people inhabit that territory is shaped, in part, by the produced map – a point emphasized by Mutersbaugh (2014) in noting the role of mapping in portraying communal land in Oaxaca as private property.³⁴ For Pickles, maps are responsible for the production of a new spatial reality made visible by the produced map. In this light, AMBIO’s objective with the mapping exercise must be seen as intricately tied to how carbon credit producers know and interact within the carbon credit production space. In so doing, the mapping process and the produced map become vehicles through which AMBIO may begin to assert project governance among participants.

³⁴ Within participatory mapping, both the mapping process and the produced map have been critically assessed, particularly within the sphere of critical geography. Harley (1989) argues, for example that maps are tools – sources of knowledge – that are laden with power. As tools, maps permit the holders of the map to not only newly know a space, but also to use the knowledge obtained through the map to act on that space in specific ways (Pickles, 2004). Given the power of the map as a tool, they argue that it is necessary to understand the conditions of a map’s production – i.e. who produced it and for what purposes – including how the map might be employed in a manner alternative to that intended by its original producers.

The perspectives raised by critical mapping literature are important to this discussion, particularly given two factors: 1) the highly conflictual and oft-critiqued México Indígena project in Chiapas’ neighboring state, Oaxaca, which was part of the larger Bowman Expeditions and funded by the Foreign Military Studies Office (FMSO) at Fort Leavenworth, Kansas (see Bryan, 2010; Wainwright, 2012); and 2) the tense socio-political environment in Chiapas since the 1994 Zapatista uprising. The México Indígena project, which involved the use of participatory mapping funded by the FMSO, has raised serious questions regarding the relationship between political agendas, participatory mapping and power relations (Bryan, 2010). Such questions are also relevant in the Chiapas context where, since 1994, military objectives and development have formed an integral part of the Mexican state’s controversial and violent counterinsurgency strategy. In this context the political life of maps is apparent. Thus, although participatory mapping has been heralded as a progressive element in development practice, it is not always politically and/or militarily neutral. Ultimately, it is a means through which much information may be obtained about groups of people – information with which many goals may be pursued. Plan Vivo mapping does not have the stigma of other mapping initiatives in Mexico, and has not been linked with controversial activities such as the México Indígena project. However, Plan Vivo maps are no less powerful, nor is the Plan Vivo mapping process.



Figure 5.2 Plan Vivo Mapping with Community Mappers and Mapping Coordinators
Photo Credit: Author

While such work is justified by AMBIO according to their attempts to achieve project permanence and to activate social capital, it is founded on assumptions about who farmers are as farmers and resource managers that come into conflict with the perceptions and logics held by the farmers themselves. While many farmers participate in the Plan Vivo mapping process, some indicate a dissatisfaction with the manner in which they are asked to organize their land-planning activities as a condition of their participation in the program. Speaking with one farmer, Don Zacarías, in the Sierra Madre region about the Plan Vivo mapping, he responded curtly, and in a frustrated manner, to my question regarding the assumption that farmers do not have defined land-use planning practices:

“From the moment the farmer wants to plant corn, he already has a work plan. From the moment the farmer wants [to build] a house, he already has a work plan. From the moment a farmer wants [to build] a table, he already has a work plan. From the moment a farmer wants [to build] a chair, he already has a work plan... what material he is going to use, how much it will cost... this is his work plan. It is nothing else... just different. There in AMBIO it [the planning process] is different because it is letters, books, forms and journals. Here no. Here it is the farm. It is practice. The farmer does not write it down, but he remembers. Everyone has a plan... everything has to be planned, that’s just the way it is.”

The frustration inherent in this quote was motivated, in part, by what seemed like childish questions by someone who clearly had no idea how agricultural production is achieved. On the other hand, however, it reflected a chorus of comments and attitudes among others within the region who inferred that farmers have planning processes that are influenced by multiple factors (see Appendix A, Table 6A). In response to questions about planting decisions, one farmer responded in an exasperated manner, “The decision is easy... do we have the money to do it [plant] or not. If we do not have the money, we do nothing.” In the end, farmers indicated that they no longer wished to commit to a project that forced them to engage with their land in ways that they did not find beneficial or commensurate with their needs. “I must use fire to clear my land”, suggested one farmer, Carlos, who noted its ability to adequately and effectively prepare land for planting.

Plan Vivo Mapping: Shifting Farmer Relationships to Carbon Capital

Plan Vivo mapping is designed not only to alter farmer relationships to AMBIO and their land, but also to capital. Through their integration into carbon markets farmers enter into relation with several forms of capital that drive carbon markets, particularly investment capital designated for new project development, including project expansion, and revenue that results from the sale of carbon credits. On one hand, capital designated for new project development confronts farming communities in the form of project implementation and project expansion. On the other hand, revenue related to the sale of carbon credits confronts farmers in the form of payments for work in promoting carbon capture by establishing and maintaining agroforestry systems. While both forms of capital stem from distinct actions, they are alike in that their presence depends on the continued success of forest carbon projects. Efforts to ensure continued investment in project growth and to safeguard revenue generation from the sale of carbon credits are visible in risk mitigation. In the context of Scolel’ Te, risk mitigation involves pro-actively addressing, to the extent possible, all factors that may threaten the release of CO₂ into the atmosphere. These factors contribute to the *risk of reversal* – i.e. the risk of emitting CO₂ rather than contributing to its sequestration – and include the destruction of planted trees by variables such as neglect and fire, and land-use activities such as cattle grazing (Galik and Jackson, 2009).³⁵

³⁵ Those factors that are outside the control of project managers – known as force majeure – are often accounted for in complex clauses within the purchase agreements developed between carbon credit sellers and buyers (Hawkins and Nowlin et al, 2010).

One element of Plan Vivo mapping is designed to organize farmer land-use activities such that their actions result in risk mitigation rather than risk proliferation, thereby safeguarding investments in project development and ensuring the continued flow of revenue from carbon credit sales. Once maps have been produced and the agroforestry systems have been selected, AMBIO works with farmers to identify key risks to carbon credit production. For many farmers, one key land-use activity involves the application of fire to prepare land for planting. However, despite the efficiency of such fires in clearing brush and killing plagues, AMBIO notes that it represents a risk to agroforestry systems. Thus, AMBIO begins by asking farmers to indicate on the Plan Vivo map where fire is used on their land parcel. Additionally, farmers are asked to identify whether their neighbors use fire so as to locate external fire-related threats. Next, working with the map, coordinators demonstrate to farmers how to strategically place fire line trenches so as to control burning fires, and begin to discuss alternatives to using fire for land clearing and preparation. The purpose of this exercise is to develop methods for controlling and limiting the use of fire so as to minimize its threat to established agroforestry systems.

An equally destructive force to newly planted trees is grazing cattle, which often leads to the destruction of saplings, thus reducing the tree's ability to grow over time. During the Plan Vivo mapping, farmers are asked to identify areas of their land parcels where grazing cattle may threaten tree plantings. Farmers are then asked to protect new plantings by identifying areas where they can move cattle so as to isolate them from the planted trees. Thus, Plan Vivo mapping is designed, in part, to minimize risk in the carbon credit production process, particularly those risks associated with the use of fire in agricultural activities and by grazing cattle. In doing so AMBIO hopes to not only safeguard revenue generation tied to the sale of carbon credits, but also to demonstrate to potential investors in project expansion that Scolel' Te is able to provide a positive return on investments in project development. This is illustrated by Figure 5.3, which shows how two subsistence activities – the use of fire for land preparation and cattle grazing – present risks that may prevent future investment in Scolel' Te by international project funders and international carbon credit buyers.

In the end, Plan Vivo mapping is strongly influenced and shaped by AMBIO. AMBIO not only aids local participants in overcoming their reservations with regard to the mapping process, but also inserts itself into the activity. From the start, AMBIO dictates what types of knowledge and information will be reproduced in the Plan Vivo map. Given AMBIO's influence in the production of Plan Vivos, it is clear that Plan Vivo mapping is not designed to utilize local frames of reference in the implementation of Scolel' Te, but about reinterpreting local knowledge within external frames of understanding – frames which reflect the ideals and goals of AMBIO

about climate change mitigation and rural poverty alleviation. Within the mapping process, visible power dynamics between coordinators and mappers shape how participation is managed, what is included in the map, and for which purposes. These accounts demonstrate the extent to which participation is limited by power relations within development projects (see Mutersbaugh, 1998; O'Reilly, 2006), and the manner in which those activities, which claim to be participatory, are designed to implement governance within project management.

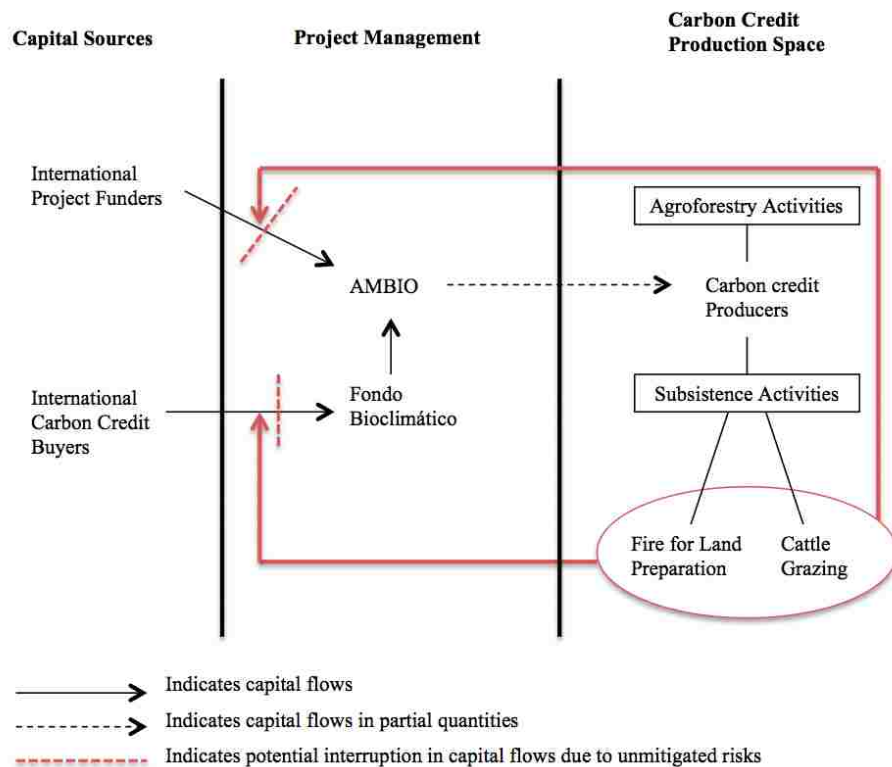


Figure 5.3 Carbon Capital and Risk Mitigation in Scolel' Te

Participant Training

While Plan Vivo mapping is central to achieving community buy-in, particularly by encouraging farmers to come to see Scolel' Te as their own, it is not the only means through which AMBIO attempts to engage participants and to solidify farmer dedication to Scolel' Te. In addition to the Plan Vivo mapping AMBIO draws on a multi-pronged education program through which it

attempts to enhance farmer awareness on issues regarding climate change and the potential for PES projects to address such concerns. It is, as Tania Li (2007: 5) says, an effort to “educate desires” and “configure habits, aspirations and beliefs.” In other words, the education program is designed to change what farmers believe to be true about the natural environment and natural resources, and to educate new desires and aspirations that are in-line with those new beliefs. More specifically, AMBIO wants farmers to come to understand the issue of climate change as a concept and a problem, to value forests as a means to mitigating climate change, and to want to mitigate it by participating in PES projects, particularly Scolel’ Te. In other words, it is concerned with inducing farmers to accept a discursive construct that runs counter to their manner of framing climatic changes in the natural environment - a construct that also displaces the issue of climate changes from the problem of overconsumption to its symptomatic greenhouse gases.

AMBIO’s education program consists of three mediums: pamphlets, videos and workshops (which are held within participating communities and in San Cristóbal de las Casas). In the Sierra Madre region of Chiapas, are designed for both adults and children, and tend to take place 2-3 times per year, although communities reported a declining number of workshops as of 2012.³⁶ The pamphlet and video, on the other hand, were produced by AMBIO with support from various organizations, including Conservation International (CI), the local college, El Colegio Ecológico de la Frontera Sur (ECOSUR), and government organizations such as the Ministry of the Environment and Natural Resources (SEMARNAT). These materials are distributed to the técnicos comunitarios (discussed in Chapter 4) to share with their communities. AMBIO’s goal is to draw on these three mediums in order to provide multiple means through which to engage farmers, participating communities and project managers so that they may learn about climate change, learn to value forests in their relation to climate change, and to become involved in payment for ecosystem services projects such as Scolel’ Te.

Educating Desires, Configuring Habits and Beliefs

One key goal for AMBIO is to induce farmers to care and worry about climate change and to want to work to mitigate its advance. For this reason, AMBIO engages rural communities in classes, and distributes pamphlets and videos to Scolel’ Te participants. These three mediums attempt to achieve this goal in several ways: 1) they present the issue of climate change, suggesting that it is a threat to the well being of the natural environment and to rural communities

³⁶ This was not verified by AMBIO. However, given the challenges faced by AMBIO as described in Chapter 3, a decline in education programs would not be altogether surprising.

in Mexico; 2) they present forests as valuable – both in a scientific context and a more culturally-specific manner, demonstrating that they should be protected and enhanced; and 3) they present PES projects as the answer to mitigating climate change and protecting valuable forests. In this segment I analyze the manner in which each medium addresses climate change, forests and PES programs as a means to inducing farmers to conceptualize their participation in *Scolel' Te* in new ways.

Climate change is a term that is used pervasively by governments and development organizations to justify the establishment and management of PES projects. However, in many rural communities in the Sierra Madre of Chiapas, 'climate change' – *cambio climático* – is not a term that is commonly used. While farmers may discuss shifts in the rainy and dry seasons, greater intensity in rainfall and hotter dry seasons, such discussions are often linked to personal localized experiences rather than to the abstract globally-applicable term of climate change. This became clear in conversations with farmers who would employ the term 'climate change' to describe entirely different processes. "Climate change means that the weather is getting better," suggested one farmer. "Before we started this project [*Scolel' Te*] the climate was very hot. But because we are planting trees and taking care of the forests, the climate is now changing and becoming cooler." As this farmer's comments illustrate, although climatic changes are perceived and experienced by farmers, such shifts are not necessarily known as 'climate change.'

Given AMBIO's position within global voluntary carbon markets, its relationship to organizations such as the World Bank who funds its activities, and the positionality of its members who have been educated at universities and colleges across Mexico and abroad, the use of 'climate change' as a term describing human-induced climate change is not surprising. In the video, which was disseminated by AMBIO to the *técnicos comunitarios*, 'climate change' is described as human-induced (i.e. the result of forest loss, land-use change and excessive fossil fuel use), and is presented as a threat to society and the natural environment. Interestingly, in the pamphlet, which was also distributed to the *técnicos comunitarios* to share with farmers working in *Scolel' Te*, the effects of climate change are also described, although the term is not used as a referent. Here, the causes and effects pertain more closely to the reality of rural life in farming communities in the Sierra Madre Region. The causes mentioned include the use of fire to prepare land for farming and the clearing of trees along river banks, while the effects described include an increased incidence in hurricanes, stronger rains and swollen rivers, and the need to look increasingly further from the community for firewood and water.

Although the treatment of climate change is different in the video and the pamphlet, the purpose is shared. In each case, climate change is framed as a concept ready for participant

consumption – even if the word is not directly used – so that farmers may come to think about the natural environment as troubled and as in need of a committed response. “We want farmers to participate [in Scolel’ Te] because they care about the natural environment and want to fight climate change, not because they are being supervised by us,” mentioned one employee with AMBIO. Thus, the idea is to create the problem for the farmer – the reason (beyond monetary gain) for their participation in Scolel’ Te.

In addition to creating the problem of climate change, the pamphlet and the community workshops take steps to induce farmers to value their forests as they pertain to PES projects. In the pamphlet, forests are considered valuable according to both scientific and locally specific rationale. On the one hand forests are discussed in terms of their ability to regulate water and carbon cycles, while on the other hand they are discussed in terms of their importance to families and communities. In the pamphlet forests are referred to as “a piece of paradise” (*un pedacito de paraíso*), where families and communities can escape the heat and enjoy the company of one another. The “piece of paradise” is presented as a diminishing resource that all communities once had, but which is now held only by a few.

Courses carried out by AMBIO in participating communities share this sentiment, placing value on forests and the natural environment more generally. As the mother of two girls who had attended the classes suggested:

“In the classes our children were given two maps: one that showed the Mother Earth smiling and another that showed the Mother Earth crying. The kids were told that Mother Earth was happy when she was taken care of, but cried when we threw trash on the ground or killed animals. They were then asked which Mother Earth they preferred, the happy Mother Earth or the sad Mother Earth. They were told that when we cut down trees Mother Earth is sad because it is as if we are pulling out her hair.”

Here, children are presented an anthropomorphized version of the natural environment with which they are able to develop either nurturing or harmful relationships. By linking environmentally friendly actions to emotions of happiness, and environmentally harmful actions to sadness, children are taught to value the natural environment as something that should be cared for.

Finally, the pamphlet combines the issue of climate change and the value of forests and the natural environment within PES projects. Here PES projects are presented in terms of their potential to respond to climate change while preserving the valuable forests in the region. Moreover, farmers are told in the pamphlet that for their efforts in preserving and expanding

existing forests, they will be reimbursed monetarily. The pamphlet addresses common concerns held by farmers, such as why they should have to work to mitigate the problems caused by people living in other countries, or insecurities regarding what might happen to their land and forests once they decide to participate – i.e. whether they will be sold and who will have control over them. Farmers are told that PES projects depend on cooperation among communities wherein in ne must play their part to fight climate change, including women who have a right to participate.

Ultimately, AMBIO wants participating communities to work in *Scolel' Te* because they care about the natural environment and want to bring an end to human-induced climate change. This is important given AMBIO's limited resources. In addition to *Plan Vivo* mapping, AMBIO relies on three aspects of an education program to do this: a pamphlet, a video and classes for participating communities. Together, the three mediums attempt to do several things: 1) frame and present the problem of climate change to participating communities; 2) induce farmers to value forests and the natural environment as keys to mitigating climate change; and 3) to promote PES projects such as *Scolel' Te* as a means to protect forests and respond to climate change. As such, they are designed to create a multi-media means to reconfiguring farmer beliefs, attitudes and desires regarding *Scolel' Te*, the natural environment and their relationship to it.

In the end, despite AMBIO's efforts, the education program is limited by several factors. To begin, some *técnicos comunitarios* do not share the videos and pamphlets provided to them with their communities. *Técnicos comunitarios* are not paid for this work and many do not want to take the time to distribute the materials. Additionally, farmers whose relationship to their community has been strained by their work with *Scolel' Te* (see Chapter 4) are hesitant to enthusiastically share this information with fellow participants in their communities. In some cases the materials provided by AMBIO stay in the home of the *técnico comunitario* and are never shared with fellow participants. In instances where *técnicos comunitarios* are willing to share the materials, dispersion of the information is challenged by the fact that many farmers are illiterate and unable to read the text in the pamphlet. Moreover, many people do not have access to a DVD player with which they may watch the video. Thus, although the educational training carried-out by AMBIO involves several mediums, its dissemination to project participants has been limited in some cases.

Conclusion

In this chapter, I draw on critical development literature, social theory, political ecology and labor process theory, in order to examine community participation in Scolel' as a discourse and as a labor practice designed to assist AMBIO in its efforts to achieve community buy-in. I make use of both Anglo-American Marxist perspectives and Foucauldian optics as a means to assessing the ways in which workers are enrolled in labor processes by the remaking of the subject and the incentives forms and 'game-playing.' Such enrollment methods are important to consider given the mistrust of development organizations in the Sierra Madre region, and the disappointing and destructive effects of carbon forestry as experienced by farmers looking to improve upon marginal livelihoods through participation in carbon forestry.

In this chapter I argue that participatory practices are motivated by a discourse about farmers with regard to who they are and who they may become as a result of their participation in Scolel' Te. These assumptions about who farmers are as resource managers come into conflict with the perceptions and logics held by the farmers themselves. Moreover, the land planning practices encouraged by AMBIO through the Plan Vivo mapping are blind to the many factors that shape farmer land-use decisions. Despite AMBIO's sensitivity to participants' productive activities, they often view land-use decisions through a lens altogether different than that of project participants. For AMBIO, smallholder land is valuable not only because of its potential to produce corn, beans, cattle and coffee, but also because of its potential to capture CO₂ and to produce carbon credits. Moreover, land is seen by AMBIO to be a resource, that, when managed in a specific fashion, could facilitate poverty alleviation by integrating farming communities into global carbon markets. However, these narrow perspectives motivate the pursuit of participatory activities that ultimately undermine the social relations of production between AMBIO and participating farmers.

CHAPTER 6: CONCLUSIONS

In this dissertation I examine a carbon forestry project, which, despite an outward appearance of success, generated negative social consequences that belie its stated objectives. The case of the Scolel' Te carbon forestry project managed by AMBIO, despite its positive image and the sincere efforts of its many project officers, unfortunately undertakes a variety of actions that degrade the social contracts and labor relations upon which their conservation efforts depend. I make the case, moreover, that social relations are undermined in three particular respects: 1) by enrolling farmers in unequal labor arrangements that disenfranchise participants; 2) by threatening the standing of participating farmers within their communities; and 3) by altering farmer relationships to their land in a manner that is blind to the many factors that shape farmer land-use patterns and resource management practices. Such outcomes are damaging to farmer livelihoods and are detrimental to carbon forestry initiatives as they erode the diverse social relations upon which farmer livelihoods and project success depend.

In this dissertation, I combine critical labor studies, commodity chains, and political ecology approaches, showing how carbon market dynamics and existing inequalities combine to undermine social relations and alienate labor arrangements within rural farming communities. These social effects threaten the long-term success of carbon forestry. However, despite their implications, they often go unnoticed by practitioners and researchers who privilege social capital and transactions costs approaches that are blind to the broader social relations in which farmers interact, and the implications of their work in carbon forestry within that broader social setting. By contextualizing farmers and their work within broader intra-community social relations I show how participation in development does not automatically equate empowerment as some practitioners would have it, but that empowerment must be considered within the context of development and the broader social relations that form part of a person's life. Transactions cost and social capital perspectives are also blind to inequalities in the carbon credit commodity chain – inequalities that emerge from the efforts of AMBIO to overcome 'buyer flight' and project costs through exploitative labor arrangements. In this dissertation, I show how attempts by AMBIO to overcome these factors by turning to cheap técnico labor effectively undermines farmers who feel marginalized within the project. Finally, I show how participatory mapping exercises and member education programs designed to achieve community buy-in contradict farmer land-planning and resource management practices, thereby paradoxically undermining their willingness to participate in Scolel' Te.

In Chapter 2 I turn to Marcos' impassioned critique of Chiapas' development history, arguing that carbon forestry represents a continuation of a trend of destructive development in the state. I argue, moreover, that the nature of carbon forestry and similar development projects is not arbitrary, but rather, emerges within established relations of exploitation and domination, thereby leading to trends in project design and project outcomes that are often predictably destructive. In order to analyze how this occurs, I examine how environmental conservation – a key tenet of carbon forestry – came to be defined by the commoditization and marketing of environmental qualities, thereby obtaining many of the same characteristics of past market-based development projects. I then assess the nature of broader carbon markets in which AMBIO sells carbon credits produced in Chiapas. These markets are necessary to understand for clarifying in Chapter 3 how shifting market conditions impact project participants on the ground. Finally, I examine the regional and historical dimensions of development in Chiapas and the Sierra Madre more specifically, underscoring several ways in which carbon forestry is linked to this history.

The first manner in which carbon forestry is linked to Chiapas' development history is through the diverse actors on which project success depends – actors that are intimately connected to broader patterns of social life, including past development initiatives within the state. Second, Scolel' Te exhibits several elements of past development practice in Chiapas. On one hand, processes of carbon credit production tied to Scolel' Te in the Sierra Madre region hint at the longstanding relationship of the region as defined by the production and export of agriculture-based products such as coffee for consumption in the global north. On the other hand, fluctuating carbon markets stand to impact producers in a manner not altogether different than the boom and bust cycles associated with colonial and post-colonial markets for fine wood and contemporary global markets for corn, coffee and cacao. Finally, the interactions between AMBIO and participating communities reflect tensions, concerns and conflicts related to the past experiences of AMBIO and participating communities with development in the state.

In Chapter 3 I build on the discussion of the broader carbon market elucidated in Chapter 2. I note that as AMBIO expands Scolel' Te into the Sierra Madre region, the project becomes exposed to market risk and rising transactions and production costs that restrict AMBIO's ability to expand the Scolel' Te program. I draw on transactions cost, global commodity chains, and political ecology perspectives, along with critical labor studies to examine AMBIO's efforts to overcome these challenges and to continue with expansion into the Sierra Madre region. I argue that AMBIO's efforts to do so resulted in a horizontal swelling of the carbon credit commodity chain that included the incorporation of pre-production and auxiliary labor into existing practices – work that was carried out by actors who were deeply implicated in Chiapas' broader

development landscape and the region's development history. I argue, however, that these labor arrangements are disenfranchising for farmers who feel exploited within Scolel' Te.

Técnicos comunitarios are paid for only a portion of the labor they carry out, and in the face of diminishing salaries for monitoring work, some have discussed abandoning the project. Ultimately, this scenario demonstrates the capacity of those in relative positions of power to shift the consequences of limited resources and market fluctuations onto those with no ability to influence budgeting and management decisions. Such labor arrangements create tensions between técnicos comunitarios and AMBIO, many of which feel that their work is underpaid and unjust. As técnicos threatened to leave the project, social relations between técnicos and the managing NGO became weak, threatening the program's long-term success. The marketization of carbon credits, although seemingly different than other commodities traditionally extracted from Chiapas, depends on similar exploitative labor arrangements within the commodity chain.

AMBIO's efforts to overcome shifting market conditions and prohibitive production and transactions costs also involved the enrollment of other actors and organizations into the carbon credit production process. AMBIO relied on an extended division of labor that involved a variety of actors in addition to técnicos comunitarios, including NGOs, governmental ministries and international organizations. The enrollment of these actors in the carbon credit production process amounted to an extension of the carbon credit commodity chain, and involved efforts to continue carbon credit production in participating communities while enhancing the value of Plan Vivo Certificates by measuring the social and environmental effects of the Scolel' Te program. However, as became clear in the work of técnicos comunitarios, inequalities persist within the carbon credit commodity chain as some actors are disproportionately exposed to risk and asked to bear the brunt of prohibitive project costs.

Social relations, however, are not only undermined through unequal labor arrangements, but also by the loss of social status by técnicos comunitarios within their communities. Farmers participating in Scolel' Te enroll for a variety of reasons, one of which revolves around the opportunity to enhance their standing within their respective communities. Social standing is an important component of rural community life in Mexico that shapes one's access to resources and access to opportunities within and outside their community. Social standing is important to take into consideration because for many, the consequences of improving upon their status, or conversely, of diminishing it, may become materially and emotionally manifest in damaged relationships, reduced mobility within a community, and limited access to resources and opportunities. In Chapter 4 of this dissertation I argue that prestige may be earned through participation in Scolel' Te, thereby constituting an important factor for why those with relatively

little prestige in a community may choose to participate. However, looking at the case of técnicos comunitarios, it becomes clear that involvement in Scolel' Te may also threaten a person's standing, thereby undermining their status within the community, an effect that although unseen by AMBIO, has significant implications for project participants.

Senior members of AMBIO discuss the work of the técnicos comunitarios in terms of participation and empowerment, a perspective that stems, in part, from their concerns to democratize development. Moreover, such language conveniently builds on AMBIO's broader efforts to demonstrate the participatory credentials of Scolel' Te to project funders and potential carbon credit buyers. However, as liaisons between AMBIO and their fellow community members, técnicos comunitarios are at once asked to respond to the needs of AMBIO, while fulfilling the expectations of their fellow community members. Moreover, they are uniquely exposed to criticism when projects go against participant expectations. These pressures create tensions that, for técnicos comunitarios, alter their standing within their communities and transform their relationships with fellow community members, effects that are visible in the concerns addressed by técnicos in meetings, the comments made by técnicos in interviews and informal discussions, and by the manner in which some técnicos' movements within their communities are restricted out of a desire to avoid what they consider to be inevitable conflict with fellow community members.

Finally, social relations within communities are undermined through Scolel' Te through the use of participatory exercises that alter farmer relationships to their land in a manner that is blind to the many factors that shape farmer land-use patterns and resource management practices. This is especially visible in Plan Vivo participatory mapping. The persistent failure of development projects in southern Mexico has fomented feelings of resentment and mistrust among farming communities that have come to question the ability of projects to adequately respond to their needs. Thus, AMBIO spends significant time and energy working to create trust with project participants in the form of buy-in to Scolel' Te. I argue that participatory exercises in Scolel' Te must be assessed from two perspectives: 1) as a discourse, and 2) as a labor process. The first approach is essential to clarifying how AMBIO thinks about farmers and who they may become through their participation in Scolel' Te, while the second allows for analyzing how farmers are expected to enact carbon forestry within their communities, and why AMBIO needs to produce a certain pattern of activity and relationship to the land among farmers.

While community buy-in is a central component of AMBIO's operations, it how this buy-in is perceived and the underlying logics that inform the participatory activities used to pursue buy-in that are of interest in this study. In Chapter 5 I argue that AMBIO's efforts to achieve

buy-in through mapping exercises are founded on assumptions of who farmers are as resource managers and who they might become through their participation in Scolel' Te. These expectations are visible in AMBIO's perceptions of rural smallholder work ethic, land-use patterns and entrepreneurial ambition. Although AMBIO has significant experience working in Chiapas, its understanding of farmer land-use and resource management practices is confined narrowly to the issue of carbon credit production. Given this narrow approach, AMBIO is often blind to the fact that land-use decisions made by rural farmers are influenced by a variety of political, social and environmental factors that are invisible when considered in the context of AMBIO's carbon credit producing objectives which privilege divergent considerations regarding resource management. In the context of Scolel' Te, the motivations behind participatory activities are often incommensurate with participant land-use decisions, which marginalize farmer knowledge and threaten their long-term commitment to the project. Social relations between AMBIO and participating farmers are thus undermined as farmers become frustrated with having to adopt land-use practices that run counter to the reality of farming in the Sierra Madre region.

In the end, carbon forestry, although a novel form of environmental conservation and rural development based in the production and sale of carbon credits, takes on many of the same characteristics of development projects in region, past and present. First, it undermines social relations that not only threaten the future success of the project, but which also damage the relationships that are central to rural livelihoods. In this way, carbon forestry, although having the appearance of success and gaining momentum through continued investment in REDD+ initiatives, replicates many destructive trends in the region, albeit in a more subtle fashion than the highway and cacao projects. Social relations are undermined through inequalities in commodity chains that Marcos alludes to at the beginning of Chapter 2. Moreover, social relations are undermined by participatory activities that are incommensurate with the land-use practices of participating farmers. Finally, social relations are undermined in participating communities as farmers become the subject of rumors and trust is eroded. In the end, it becomes clear that the social effects of carbon forestry may only be seen once such projects have been situated within broader intra-community relations. Moreover, this dissertation makes clear that meaningful empowerment does not emerge simply through participation in a project, but is influenced by a broader set of social relations that extend beyond the realm of that project.

Future research on carbon forestry must proceed as it continues to gain steam, particularly within emerging REDD+ projects. Future research, however, must make a stronger effort to decenter the analysis from the experience of the male farmer, focusing additionally on the extent to which such projects impact women's livelihoods in rural Mexico. Studies of

participation must not be confined to the experience of male participatory labor, but must also ask why more women are not included in project design. Access to participation in development projects is not limited only to non-ejidatario men. As indicated in Chapter 4, such limitations are every more real for women who must navigate what is largely a paternalistic development industry in southern Mexico. Such analyses are essential to beginning to understand more fully the social implications of carbon forestry, and development more generally, in Mexico.

Appendix A: Dissertation Research Methods

In this appendix I outline the multiple methodological and data analysis techniques employed in this study. Moreover, I identify the people who collaborated with me in this work and the places in which the collaboration occurred. Specifically, I examine the multiple ethnographic methods employed, including participant observation, semi-structured interviews and data analysis from NGO videos and documents, and outline coded terms and phrases extracted from field notes.

Semi-Structured Interviews

One key method employed in this dissertation involved semi-structured interviews, which were conducted with AMBIO employees and farmers participating in Scolel' Te. In total, 80 semi-structured interviews were conducted – 20 with AMBIO, 55 spread across two communities in the Sierra Madre region of Chiapas, and 5 more in a third community in the same region.

Interviews with AMBIO employees were conducted while visiting communities in the Sierra Madre region, and a limited number were carried out in San Cristóbal de las Casas. In Table 1A I provide the names and educational backgrounds of those AMBIO employees interviewed for this study, and highlight their positions within the organization (please note that the names provided in this dissertation have been changed in order to protect the identities of project participants). The people interviewed from AMBIO included three of six total full-time employees. Additionally, four técnicos regionales who are paid to carry out significant work in participating communities and in AMBIO's offices were interviewed for this study. These contacts were recommended by Enrique who first provided me with permission to conduct research with the organization. However, each interviewed employee was necessary to the project given their leadership positions within AMBIO and their long-term experience working with Scolel' Te.

Interviews with AMBIO employees were designed to determine project management strategies, challenges associated with project management, and the logics and modes of thinking that motivated such activities. One half of the interviews were recorded using an audio recorder, while the other half were recorded via note taking due to the impromptu nature of the interviews. The audio-recorded interviews, once finished, were transcribed in Spanish. Afterward, transcribed interview notes and additional notes taken during unrecorded interviews were subjected to thematic coding during which key terms and phrases were identified in an effort to identify patterns in how interviewees spoke about the program and their work more generally.

Table 1A Interviewees from AMBIO

Name	Education	Position in AMBIO
Enrique	Engineer in Agricultural and plant sciences	Partner
Pilar	Engineer in Agroecology sciences	Partner
Lorena	N/A	Partner
Efraín	B.S. in Biology	Técnico Regional
Fausto	N/A	Técnico Regional
Eloy	N/A	Técnico Regional
Edmundo	N/A	Técnico Regional

The key words and phrases used in the coding process were those that emerged in the interviews with AMBIO employees. The key words and phrases identified in interviews with AMBIO are highlighted in Table 2A and are related to Plan Vivo mapping, its role in Scolel’ Te, and the justifications for employing the activity as a means for securing community buy-in. Interviews conducted with AMBIO employees proved to be essential to understanding project management strategies and activities, and the logics motivating them. However, when conducting these interviews I was often faced with the challenges posed by time shortages on the part of the interviewees whose schedules did not permit longer than an hour. Additionally, some interviewees were hesitant to conduct interviews, referring me instead to AMBIO’s website for generic information regarding the participatory mapping exercises.

Table 2A Coded Words and Phrases from Interviews with AMBIO Regarding Plan Vivo Mapping, its Role in Scolel’ Te, and Justifications for Using it to Secure Community Buy-in

Key words and phrases indicating justification for the use of Plan Vivo mapping in Scolel’ Te
<p><u>Lack of Planning</u></p> <p>“no tienen una <u>planeación</u>” “buscamos la <u>planeación</u>” “Mira para nosotros es este... es el principio del <u>planeación comunitario</u>. O la <u>planeación del territorio</u>” “El Plan Vivo es la <u>planeación</u> de ellos” “pueden <u>generar</u> una <u>esquema de planeación</u>” “La primera <u>acción</u> es la <u>planeación</u>.”</p>

Table 2A (continued)

<p><u>Need for Land Arrangement</u></p> <p><i>“ordenamiento del uso de sus tierras”</i></p>
<p><u>To support long-term success of Scolel’ Te</u></p> <p><i>“damos <u>permanencia</u> a las actividades”</i></p>
<p>Key words and phrases indicating relevance of Plan Vivo mapping to community buy-in</p>
<p><u>Importance of Participation</u></p> <p><i>“es importante que la gente <u>participa</u>”</i> <i>“ellos <u>participan</u> las definiciones del uso de suelo”</i> <i>“El proceso de <u>planeación</u> rompe sin <u>participación</u>”</i></p>
<p><u>Creates Trust</u></p> <p><i>“Que ellas tengan la <u>confianza</u>”</i> <i>“que la gente empieza tener <u>confianza</u>.”</i> <i>“Plan Vivo es ya la <u>confianza plasmada</u> en tu documento”</i> <i>“ellos empiezan dibujar y <u>perder ese miedo</u> y empiecen ellos a <u>tener mas confianza</u> entre ellos y trabajar juntos”</i></p>
<p><u>Creates Sense of Ownership</u></p> <p><i>“va a <u>sentirse parte</u> de proyecto”</i></p>

However, despite these hesitations on the part of AMBIO’s employees, over half agreed to participate in interviews. As will become clear below, participant observation provided an important addition to the interviews as other data became available in the context of less formal interactions.

Semi-structured interviews were also conducted with farmers participating in Scolel’ Te in three different communities in Chiapas’ Sierra Madre region. The majority was concentrated in two communities located in two different municipalities, while the third community was located in a third municipality. Ultimately, I chose not to conduct extensive fieldwork in the third community given the financial costs and time demands doing so would have required. However, it was necessary to conduct fieldwork in at least two communities so as to diversify the

information received regarding rural livelihoods and Scolel' Te. The two communities studied in this dissertation were chosen based on several criteria:

1. Their location in the Sierra Madre region: past studies of Scolel' Te and on community life in Chiapas in general have tended to be concentrated in the central highlands and Lacandón regions of Chiapas. Given the cultural, ecological and political variability across Chiapas' multiple regions (see Rus and Castillo et al, 2003), it was necessary to understand how AMBIO operated in the Sierra Madre region – a region into which it had only recently begun to expand.
2. The past experience of each community with development programs more generally: one of the two communities studied in this project was often described by AMBIO as a “model community” for development projects and as a community that had traditionally enjoyed significant experience with a variety of development programs. The second community, however, had relatively limited experience in government- and NGO-led development projects. By working with both communities I was able to learn about the implications of Scolel' Te for those communities for whom work in development programs is the norm and for those communities for whom access to participation has been relatively limited.
3. The experience of each community with Scolel' Te: the community identified by AMBIO as a “model community” was considered by AMBIO to be an ideal case for project implementation and management. AMBIO noted high degrees of participation among community members and an overall interest in pursuing carbon forestry. The other community, however, was often described by AMBIO as lacking the interest, motivation and community organization needed to successfully recruit participation and implement and manage Scolel' Te at a large scale. By working with both communities I was able to learn about attitudes toward Scolel' Te within communities experiencing diverse degrees of success within the project, and was able to learn about project management strategies pursued by AMBIO in diverse contexts.

The purpose of the interviews with farmers was to clarify their perceptions of Scolel' Te and development programs more generally, and to learn about the implications of their participation in these programs for their everyday lives. More specifically, they were designed to obtain data regarding farmer land-use patterns and decision-making strategies surrounding farming practices. Interviews were conducted largely with male farmers participating in Scolel' Te so as to obtain data regarding the program within the community. However, it was not uncommon for additional family members – spouses, in particular – to be located in the area of the interview, and to

contribute opinions and comments as questions were asked. Interviews were especially useful during the early stages of the fieldwork process for establishing familiarity with community members, and for obtaining general information about each of the communities and their experiences in *Scolet' Te*. In tables 3A, 4A, and 5A, I highlight the people I spoke with in the three communities, the estimated level of education attained by each person, their position within *Scolet' Te* and their approximate ages. I also indicate primary sources of income and/or employment, almost all of which involved selling limited agricultural commodities in nearby cities and other goods informally within the community. Levels of education are estimated based on each person's approximate age. Older community members (ages 30 and older) generally reported having attended school to the level of the *primaria* (elementary school). Although secondary schools have been built in the two communities collaborating in this project, teachers assigned to work in the two communities are often absent, leaving children with intermittent educational training.

The majority of the interviews conducted with farmers were audio-recorded and were transcribed in Spanish. Afterward, transcribed interview notes and additional notes taken during unrecorded interviews were subjected to thematic coding during which key terms and phrases were identified in an effort to uncover patterns in how interviewees spoke about land-use planning, farming practices, reasons for participating in *Scolet' Te*, and their perceptions of various components of the project. Tables 6A and 7A illustrate the key words and phrases associated with farmer land-use activities and farmer perceptions of key concepts related to *Scolet' Te* and carbon markets more generally. Table 8A shows key words and phrases used by farmers indicating their attitudes toward *Scolet' Te* in the context of late and unrealized compensation for participation. However, despite the useful nature of semi-structured interviews for this research, this method was limited by one key factor: interviews were largely conducted with men participating directly in *Scolet' Te*. This was due, in part, to the fact that I actively sought out male participation in interviews, and to the fact that women were hesitant to be interviewed about *Scolet' Te*, often advising that I speak with their husbands or sons instead. Given the fact that interviews were conducted largely with male participants in *Scolet' Te*, future research must more actively include the voices and experiences of women in interview processes.

Table 3A Interviewees from One Community Participating in Scolel' Te in the Sierra Madre Region

Name/ Ejidal Authority	Education Attained	Employment/ Income Source	Position within Scolel' Te	Approx. Age
Rufino	Elementary School (<i>Primaria</i>)	Sells agricultural commodities; Family sells goods informally within community	Participant	50-60
Renato	Elementary School (<i>Primaria</i>)	Sells agricultural commodities; Family sells goods informally within community	Participant	50-60
Don Zacarías	Elementary School (<i>Primaria</i>)	Sells agricultural commodities; Family sells goods informally within community	Participant	50-50
Hernán	Elementary School (<i>Primaria</i>)	Sells agricultural commodities; Family sells goods informally within community	Participant	40-50
Horacio	Elementary School (<i>Primaria</i>)	Sells agricultural commodities; Family sells goods informally within community	Participant	40-50
Jaime	Elementary School (<i>Primaria</i>)	Sells agricultural commodities; Family sells goods informally within community	Participant	30-40
Ismael	Limited Middle School (<i>Secundaria</i>)	Sells agricultural commodities; Family sells goods informally within community	Técnico Comunitario	25-35
Don Jorge	Elementary School (<i>Primaria</i>)	Sells agricultural commodities; Family sells goods informally within community	Participant	50-60
Alejandro Comisariado Ejidal	Elementary School (<i>Primaria</i>)	Sells agricultural commodities; Family sells goods informally within community	Participant	40-50
Jacinto	Elementary School (<i>Primaria</i>)	Sells agricultural commodities; Family sells goods informally within community	Participant	50-60
Pedro	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	50-60

Table 3A (continued)

Bautista	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	30-40
Carlos	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	30-40

Table 4A Interviewees from a Second Community Participating in Scolel' Te in the Sierra Madre Region

Name/ <i>Ejidal Authority</i>	Education Attained	Employment/ Income Source	Position within Scolel' Te	Approx. Age
Heberto	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	30-40
Roberto	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Works outside community in a nearby poultry processing plant	Participant	30-40
Rosalba	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	N/A	30-40
Bernardo	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Works outside community as contract worker with construction crew	Participant	30-40
Benito	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	30-40
Cesar	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	50-60
Eusebio	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant (Conditional Status)	30-40

Table 4A (continued)

Felipe	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	50-60
Estaban	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	40-50
Guillermo	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	30-40
Chus	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	30-40
Javier <i>Comisariado Ejidat</i>	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	40-50
Rosario	Limited Middle School (<i>Secundaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Técnico Comunitario	20-30
Rafael	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	40-50
Porfirio	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	30-40
Raúl	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	30-40
Rubén	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	30-40
Sergio	Limited Middle School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Técnico Comunitario	15-25
Vicente	Elementary School (<i>Primaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Participant	30-40

Table 5A The Single Interviewee from a Third Community in the Sierra Madre Region

Name/ Ejidal Authority	Education Attained	Employment/ Income Source	Position within Scolel' Te	Approx. Age
Don Sebastián	Elementary School (<i>Secundaria</i>)	Sells limited agricultural commodities; Family sells goods informally within community	Técnico comunitario	50-60

Table 6A Coded Words and Phrases from Interviews with Farmers in Two Communities Regarding Land-Use Decisions and the Factors Shaping Decision-Making Processes

<p><u>Land-Use Planning Process Exists in Communities</u></p> <p><i>“Hago un <u>plan de trabajo</u>... <u>que voy a sembrar</u>... <u>cantidad y lugar</u>”</i> <i>“Cada uno tiene un <u>plan de trabajo</u> – <u>que materiales va a usar</u>”</i> <i>“<u>Allí (en AMBIO) es teórico porque es letras, libros, formatos, cuadernos, y aquí no. Aquí es campo, practica</u>”</i></p>
<p><u>Land-Use Decisions Made in Relation to Resource Availability</u></p> <p><i>“Somos gente de <u>poco recurso</u>... <u>sembramos lo que podemos</u>”</i> <i>“Hago mi <u>plan de trabajo</u> según el <u>dinero que tengo</u>...”</i> <i>“muchos ya no siembran tanto maíz por el costo de la semilla y los fertilizantes...”</i> <i>“Bueno la decisión es fácil hacerlo – si tenemos el dinero para hacerlo o no tenemos el dinero para hacerlo... Si no hay dinero, no hace nada”</i> <i>“no tenemos en donde sembrar... que opción tenemos?”</i></p>
<p><u>Government Resources are Unreliable</u></p> <p><i>“Dice el gobierno que va a invertir en el campo pero <u>no llegan los recursos</u>”</i> <i>“<u>recursos del gobierno se quedan en el municipio y no llegan a nosotros</u>...”</i></p>
<p><u>Land-use Decisions Related to Environmental Factors</u></p> <p><i>“El <u>maíz</u> requiere <u>suelo duro y poco pedregoso y no muy pendiente</u>..”</i> <i>“para <u>café, pendiente o plano</u> – con cubierto de vegetal. “</i> <i>“<u>frijol que sembramos en mayo es ‘frijol venturero’</u> – sembramos poco dado las lluvias que complican la cosecha”</i> <i>“sembramos lo que se llama ‘<u>frijol del norte</u>’ en <u>septiembre</u> – de este sembramos bastante, 3 o 4 costales”</i> <i>“hay que sembrar maíz en los terrenos planos y el <u>frijol</u> está bien en los <u>lugares pendientes</u>”</i></p>

Table 7A Coded Words and Phrases from Interviews with Farmers in Two Communities Regarding Climate Change, the Relationship of Scolel' Te to Climate Change, and Their Motivations for Participating in Carbon Forestry

<p><u>Defining Climate Change in Communities</u></p> <p><i>“<u>ya no viene el calor... ya no quemamos los arboles</u>”</i> <i>“<u>es mejor conservar la reserve... está mas fresco... este es el cambio climático</u>”</i> <i>“<u>Ya hay menos calor y hay mas frescura</u> porque estamos sembrando estos arboles”</i> <i>“<u>llovía mucho cuando nosotros lleguemos aquí... ahorita no llueve tanto como antes</u>”</i> <i>“<u>no se mucho del cambio climático... solo lo que observo... allá abajo pega el sol, pero aquí en las montañas está mas fresco</u>”</i></p>
<p><u>Defining Importance of Reforestation</u></p> <p><i>“<u>si no sembramos los arboles, no cae el agua</u>”</i> <i>“<u>estamos reforestando y cuidando los arboles. Está regresando la lluvia de antes.</u>”</i> <i>“<u>tenemos que sembrar arboles para que se normaliza la temperatura</u>”</i> <i>“<u>los arboles jalan lo malo</u>”</i></p>
<p><u>Motivations for Participating in Scolel' Te</u></p> <p><i>“<u>nos dan un pequeño apoyo</u>”</i> <i>“<u>aquí no hay trabajo... es la única oportunidad que tenemos</u>”</i></p>

Table 8A Coded Words and Phrases from Interviews with Farmers in Two Communities Indicating Farmer Attitudes Toward Scolel' Te

<p><u>Perceptions of Unrealized Payments</u></p> <p><i>“<u>Se pone triste pues, porque hay una esperanza que cae para comprar azúcar, algo para la casa.</u>”</i> <i>“<u>No hay nada pues. Y eso es lo mas triste porque trabaja uno y hay paga.</u>”</i> <i>“<u>se desespera la gente</u>”</i></p>
<p><u>Reactions to Late Payments</u></p> <p><i>“<u>piensan que el proyecto no va a seguir</u></i> <i>“<u>tal vez nos abandonaron... saber si existe el proyecto todavía</u>”</i> <i>“<u>ya desatienden sus plantas... Ya no quieren seguir. Son muy tardados los pagos.</u>”</i></p>

In the end, semi-structured interviews conducted with AMBIO and with members of two communities participating in Scolel' Te proved useful for obtaining information regarding project management strategies, challenges associated with project management, and the logics motivating

such activities. Moreover, they were essential for uncovering farmer perceptions of *Scolel' Te*, and for obtaining data regarding farmer land-use patterns and decision-making strategies.

Participant Observation

In addition to semi-structured interviews, I conducted participant observation with AMBIO and in two participating communities, with limited engagement in a third community. Participant observation with AMBIO was designed to obtain data by observing the many issues discussed in interviews as they unfolded in the course of daily practice. These included project management, participant training workshops and meetings with collaborating organizations such as Conservation International. Moreover, participant observation conducted with participating communities was designed to observe the everyday actions and activities that give meaning to certain behaviors and beliefs (Bogdewic, 1999), and to learn about the experiences of people in particular settings (Watson and Till, 2010). More specifically, my goal was to obtain insight into what it means to live in the rural Sierra Madre region of Chiapas, and thus, what it means to participate in development projects, including *Scolel' Te*. In this segment I first outline participant observation as it pertained to AMBIO, and then I discuss participant observation in relation to participating communities.

Participant observation with AMBIO involved accompanying employees through several facets of project management. These included *técnico* training workshops at AMBIO's offices in San Cristóbal de las Casas, meetings with community members in the region to attend to general administrative affairs, and to conduct *Plan Vivo* participatory mapping exercises in communities across the Sierra Madre region. The *técnico* training workshops, referred to as *reuniones semestrales*, were held in AMBIO's offices in San Cristobal de las Casas, and were notoriously long, lasting from around 9:00am until around 6:00pm. For these meetings, *técnicos regionales* and *técnicos comunitarios* travelled from their communities across the state to attend. For many, the trip was long, and implied a significant sacrifice in order to attend. Those travelling, for instance, from the municipality of Ocosingo near the Lacandón region, faced travel times ranging from 5-7 hours. Other *técnicos* from the Lacandón were forced, due to unreliable transportation means, to make the trip in two days. This, however, was not the case for *técnicos* from the Sierra Madre region who were able to make the trip on the same day as the meetings, leaving their homes as early as 3am in order to arrive to San Cristobal at the start of the meeting.

The time-consuming nature of such trips stems from the fact that transportation in the state is often unreliable, and in order to travel from a rural community to San Cristobal, one must use several modes of transportation. Participant observation for this dissertation involved using

these travel networks to travel regularly from communities to San Cristobal de las Casas. In Table 9A I illustrate the modes of transportation required to travel from a rural community in the Sierra Madre region to AMBIO’s offices in San Cristóbal de las Casas, and the times required to travel from one place to the next. While each of the travel times would appear to be fairly straightforward, the experience is complicated by several variables at each point along the way.

Table 9A Modes of Transportation and Travel Times Required to Travel from Communities in the Sierra Madre Region to AMBIO’s Offices in San Cristobal de las Casas, Chiapas

Location	Mode of Transportation	Time
Community to Municipal Seat	Bus or Van	2 hours
Municipal Seat to Tuxtla Gutierrez	Bus or Van	2 hours
Bus Station to Bus Station	Taxi	20 minutes
Tuxtla Gutierrez to San Cristóbal	Bus or Van	1 hour

First, transportation from a community to the municipal seat is only available on select days, in some cases leaving the community on a daily basis, and in other instances, leaving only two or three days each week. Additionally, despite the efforts of drivers to maintain a regular schedule, automobile malfunction, washed-out roads and swollen rivers often make travel impossible, thereby restricting transportation opportunities and complicating the plans of community members to travel to the municipal seat. In such instances, people must either postpone travel plans for another day, or hike from the community to the nearest road where they may hitchhike to the municipal seat – a hike that may take up to three hours. Once arriving at the municipal seat, técnicos must make a three-kilometer walk to the bus station where buses and vans depart for the state capital. Buses and vans depart on a regular schedule from these state-run transportation centers. However, trips are at times slowed-down by the breakdown of a vehicle or by accidents on the poorly maintained roads. Once arriving in Tuxtla Gutierrez, técnicos take a taxi from the bus station to a second bus station in order to travel to San Cristobal de las Casas. Traveling with técnicos to San Cristóbal de las Casas provided unique opportunities to not only experience first-hand the sacrifices associated with working in Scolel’ Te, but also provided opportunities for candid discussion about the program.

Inconsistent transportation methods not only complicated my ability to carry-out fieldwork for this project, but also severely complicate the efforts of técnicos to attend meetings in AMBIO's offices in San Cristóbal de las Casas. On one occasion, after receiving last-minute word of a meeting at AMBIO's offices, one técnico comunitario and I departed for San Cristóbal the following day. However, owing to the fact that the meeting started at 9:00am we could not afford to wait for public transportation to leave from the community for the municipal seat. Thus, we left his home at 3:00am, hiking in the dark for three hours to the nearest community that would afford us transportation to the municipal seat, and from there to Tuxtla Gutierrez and San Cristóbal. We were tired as we arrived to San Cristóbal at 9:00am for the meeting with AMBIO, but were not alone given that others had also sacrificed their time and their sleep to make the trip. While AMBIO reimbursed travel expenses made by técnicos, the physical burden of travel for the técnicos comunitarios was undeniable.

Meetings were designed to train técnicos in their work in Scolel' Te, but also provided a problem-solving opportunity in which técnicos could share complaints, problems and other issues related to Scolel' Te's management in their communities to AMBIO. These meetings were especially useful for obtaining information about the experiences of técnicos and communities across Chiapas as they relate to Scolel' Te. Field notes taken during and immediately following these meetings and while travelling with técnicos from the Sierra Madre revealed, through thematic coding, the opinions of many toward the program, and shed light on their experience of the project as it relates to their work in the project. Representative key words and phrases emerging in these notes are detailed in Table 10.0. These phrases and comments are commonly expressed among técnicos from various regions of the state, indicating similar attitudes and experiences throughout Chiapas. They indicate, not only community responses to the project management, particularly related to late payments, but also indicate ruptured relationships between técnicos comunitarios and disillusioned participants in Scolel' Te.

In addition to conducting participant observation with AMBIO and técnicos comunitarios in the context of training workshops, I also accompanied AMBIO on project management trips to participating communities. In one particular occasion we travelled to four communities in the Sierra Madre region over the course of three days where AMBIO employees carried out Plan Vivo mapping and met with community leaders and técnicos comunitarios to address concerns related to project management and the monitoring of agroforestry systems. We travelled in one of AMBIO's vehicles, a marked difference from the complicated travel logistics faced by most técnicos comunitarios. This trip provided a unique opportunity to observe the use of participatory activities such as Plan Vivo mapping in project management and to speak with AMBIO

employees in the context of their direct work with participating communities. Key words and phrases obtained through field notes about AMBIO’s attitudes about the value of participatory activities such as Plan Vivo mapping may be found in Table 2A.

Table 10A Coded Words and Phrases from Field Notes from Participant Observation with Técnicos Comunitarios While Travelling to San Cristóbal, While Participating in Reuniones Semestrales, and While Living in Their Respective Communities

<p><u>Payments and Community Discontent</u></p> <p><i>“no llegan los pagos y se desespera la gente... se enoja...”</i> <i>“la gente se enoja por lo de los pagos... ya no quiere limpiar sus parcelas... quieren sus pagos”</i> <i>“algunos se abandonaron el proyecto por lo de los pagos...”</i> <i>“se enojó mi suegro porque los que entraron después de 2011 no han recibido nada”</i></p>
<p><u>Community Discontent and Técnico Unease</u></p> <p><i>“ya no queremos volver a hacer los monitoreos... se enoja la gente”</i> <i>“siempre nos preguntan de los pagos... se desespera la gente”</i> <i>“no quiero salir de mi casa... nos acusan de haber robado el dinero”</i></p>
<p><u>Técnico Unease and Project Perceptions</u></p> <p><i>“AMBIO paga muy barato... es muy barato”</i> <i>“A mi no me conviene trabajar así...”</i> <i>“trabajo tanto pero no nos están pagando muy poco”</i></p>

Finally participant observation with AMBIO also took place in the context of meetings with Conservation International. AMBIO invited me to attend two meetings with Conservation International in which efforts to increase the value of Plan Vivo certificates through additional certifications were discussed. The meetings were held in AMBIO’s offices in San Cristóbal, and were followed by field visits to participating communities. I was only able to attend the meetings, but found them useful for learning about the challenges faced by AMBIO with regard to balancing trends in international carbon markets with the on-the-ground challenges associated with project implementation and management. AMBIO’s efforts to overcome these challenges through certification emerged as a key strategy for responding to shifting supply and demand dynamics. Participation in these meetings was essential to understanding issues associated with preserving the future of Scolel’ Te in the face of growing market uncertainty.

For this project I also conducted participant observation with non-técnico farmers participating in Scolel' Te. Participant observation was designed to obtain information regarding land-use decisions and practices among farmers, to understand farmer work in Scolel' Te and to clarify the implications of development programs more generally for farmers in the region. To this end, I accompanied técnicos comunitarios in two communities as they monitored the agroforestry plantings of fellow community members participating in Scolel' Te. As we hiked for up to four hours per day, it became clear that the energy expended in carrying-out monitoring activities is significant, and that a large gap in technical knowledge exists between técnicos comunitarios and the farmers whose agroforestry plantings were being monitored. At times this knowledge gap led to questions regarding why some trees were discounted from total tallies – tallies upon which reimbursement decisions were made. Such questions often manifested themselves in the debates about community discontent alluded to by técnicos comunitarios across the state at the reunions semestrales in AMBIO's offices.

Additionally, I accompanied farmers to their fields, planting and harvesting beans, corn and coffee, and joined them on trips to sell agricultural products to buyers in nearby cities. Farmers, for instance, showed me land parcels where corn was planted, showing how land-use decisions shifted from past years depending on the price of corn and availability of resources from government programs. Another farmer, for instance, highlighted segments of his land that had been recently dedicated to cattle grazing activities – a conversion that was motivated by the fact that inputs for corn production had increased at the same time government subsidies for cattle grazing increased. This work demonstrated that land-use decisions are based on a variety of factors, and that development programs shape how farmers interact with their land in complex ways. In the context of Scolel' Te, it showed that conceptualizing land in terms of its capacity to produce carbon credits comes into conflict with other land-use practices such as grazing cattle, which threatens the long-term health of young tree saplings.

Finally, I joined community members in community celebrations of religious holidays such as Easter, weddings, and annual community festivities. These occasions were held in private homes, in public spaces such as the community basketball park and the *casa ejidal*, and in the community's Catholic church. In the case of weddings, extended families and friends would gather to celebrate, while religious holidays and community festivals involved broader community participation. Such occasions provided valuable opportunities for learning about how people interact with one another, who attends the events and who chooses to stay home. Moreover, as people interacted (or did not interact) with one another in these events, how people felt toward one another began to emerge. Figure 1A shows a cockfight that took place as part of a

community celebration in the Sierra Madre. Such events provided an important opportunity for viewing how people interact in within the context of the broader community.

Such attitudes also became apparent in nightly conversations with friends. Evenings were largely spent socializing or watching *telenovelas*. During this time, families and neighbors discussed a variety of themes regarding life and ongoing events in the community. Topics ranged from migrating family members and rumors about family disputes and crop success (or failure), to gossip about new marriages, and other family and community affairs. These gatherings usually involved extended family with all eating crackers or tortillas and drinking sweetened coffee. This time allowed for the candid and willing sharing of rumors and gossip within the community. These experiences were central to building trust with farmers and with the community more generally, and provided a unique opportunity for candid discussion about the realities of social life in their communities. Participant observation provided an important addition to the semi-structured interviews, but was also complemented by data analysis of NGO videos and documents.



Figure 1A Cockfight in the Sierra Madre Region

Photo Credit: Author

While participant observation provided a key component of this research, it was limited by the fact that outside of community events, and evening socializing, the majority of my time

was spent with the farmers and families most closely tied to Scolel' Te. More work is needed to understand how those not participating in Scolel' Te view the project, why they do not participate, and their engagement with development programs more generally within the community.

Data Analysis from NGO Videos and Documents

In addition to semi-structured interviews and participant observation, I also conducted data analysis from NGO videos and documents. The resources analyzed included a training video produced to explain to farmers the problem of climate change, the importance of Scolel' Te as a means to responding to climate change, and how to participate in Scolel' Te by planting trees and caring for them by pruning and by clearing land parcels of unwanted vegetation. The video was provided to técnicos comunitarios to share with fellow participants in their respective communities. The booklet analyzed was titled, *Guía Didáctica para la Participación Local en Programas de Servicios Ambientales*. The booklet, which was co-produced by AMBIO, Conservation International and other organizations, explained the problem of climate change using stories designed to relate the issue to local values and concerns.

Table 11A Key Words and Phrases from Analyzed Documents Illustrating the Logics and Modes of Thinking AMBIO Sought to Diffuse to Participating Communities Through Member Education Programs

<p><u>Presenting the Climate Change Threat</u></p> <p><i>“viene otro huracán... con este tiempo tan loco uno ya no sabe cuando nos tocara a nosotros”</i> <i>“hay muy pocas comunidades con un lugar así... antes todas lo tenían...”</i></p> <p><u>Images:</u> Climate change as threat to family Climate change as threat to livelihoods</p>
<p><u>Presenting Payment for Ecosystem Services Projects</u></p> <p><i>“es un programa que beneficia al bosque pero también a la comunidad...”</i> <i>“podemos cuidar el pedacito de paraíso”</i></p> <p><u>Images:</u> By safeguarding the natural environment, family and livelihoods may also be safeguarded</p>

Moreover, it explained how monitoring activities might be carried out within payment for ecosystem services programs as a means to mitigating global climate change. Like the video, this book was given to técnicos comunitarios to share with fellow project participants as a means to generating awareness about the problem of climate change and to motivate farmers to become dedicated to their work in Scolel' Te.

These forms of media represent one component of AMBIO's participatory efforts to achieve community buy-in to Scolel' Te. I analyzed this video and document for the logics underpinning their creation – those ways of thinking that AMBIO wanted participating farmers to adopt through their diffusion. Both forms of media included images and text, while the video also included spoken text. The key words and phrases identified in these forms of media are outlined in Table 11A.

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PROFESSIONAL PUBLICATIONS

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