

**THE EFFECT OF INSTITUTIONS ON GUATEMALAN FORESTS:**

**CONCEPTUAL, METHODOLOGICAL AND PRACTICAL IMPLICATIONS.**

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**LILIAN I. MÁRQUEZ BARRIENTOS**

**THE EFFECT OF INSTITUTIONS ON GUATEMALAN FORESTS:**

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Challenging socially accepted notions of rural communities' inability to overcome the "Tragedy of the Commons" and amidst international concern for the fate of Earth's remaining forests, resource dependent rural communities (usually poor, barely educated, and neglected) have shown how capable they can be in managing forest resources. Yet resource governance is a complex balance between sustainability and degradation where communities can fail or succeed. Institutional arrangements lie at the core of the explanation of why some succeed and others fail. This dissertation analyzes the institutional arrangements of three Guatemalan community forestry experiences in the tropical dry forests of Chiquimula. Their stories are different, showing both failure and success in managing conflict, involving fruitful and disastrous alliances, and resulting in thriving or declining forests. They offer concrete evidence of how institutional arrangements are created and how they evolve, reflecting on the challenges policy makers, practitioners and researchers face when supporting communities in their governance efforts. Using IFRI's (International Forestry Resources and Institutions Research Program) interdisciplinary approach, institutional and forest ecology analysis constructs a socio-ecological picture of community forestry to assess forest protection and use. The forest showing stronger protection status belongs to the community with stronger resource governance institutions, offering additional evidence that when communities are allowed and supported they can be effective resource users and conservationists. On the other hand, failed community efforts offer a reflection on what

may go wrong and how international donors and state agents supporting local resource governance may do more harm than good if they do not fully understand the complexity of the whole endeavor and the role local institutional arrangements play. A methodological analysis on the challenges of interdisciplinary research is also presented.

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### **LIST OF USED ACRONYMS**

ADECRO	Association for the Entrepreneurial Farmers' Development of Rodeo
ASORECH	Regional Ch'orti' Farmers' Association
BOSCOM	Community Forestry Project
CPR	Common Pool Resource
DBH	Diameter at Breast Height
DIGEBOS	General Forests Directorate
GIS	Geographic Information System
GPS	Geographic Positioning System
ICQ	Indigenous Community of San Francisco Quezaltepeque
IFRI	International Forest Resources and Institutions Research Program
INAB	National Forests Institute
NGO	Non-Government Organization
PINFOR	Forest Incentives Program
PINPEP	Incentives Program for Small Land Possessors
PROZACHI	Zacapa Chiquimula Program

# CHAPTER 1

## FORESTS AND COMMUNITIES

Throughout the world rural resource-dependent communities are increasingly recognized as capable of responsible forest management and conservation. They have gone from being stigmatized as trapped in the irrevocable “Tragedy of the Commons” to being agents recognized as potentially capable of self-organization, governance and adequate resource use and conservation. This shift has come about through increased recognition of the rights of indigenous and local peoples and the realization of government limitations to oversee and protect vast forest resources. The shift was also strongly supported by fruitful decades of research in the study of common property (McCay and Acheson 1987; Ostrom 1990; McKean and Ostrom 1995; Feeny, Berkes et al. 1997; Ostrom, Burger et al. 1999; Arnold 2001; Ostrom, Dietz et al. 2002; Agrawal 2003; White and Martin 2003; Agrawal, Chhatre et al. 2008; Chhatre and Agrawal 2009; Tucker 2010).

The concept of community forestry emerged in the late seventies to address the challenges of local livelihoods and dwindling forest resources. Early on it was interpreted as “*any situation that intimately involves local people and forest activity*” (FAO 1978). More than three decades have gone by, during which community forestry has evolved and learned from both its failures and successes. Some countries embraced the concept early on, while others are just beginning to consider it a valid approach for resource management. Throughout, community forestry has remained a core element of adapting forestry and forest management to the needs of rural people (Arnold 2001). Its relevance

for forest conservation has developed slowly with both supporters and critics (Chapin 2004; Kaimowitz and Sheil 2007; Bray, Duran et al. 2008). However, community forestry is no panacea or silver bullet for reverting resource degradation, ensuring its conservation, or even resolving the many challenges of community livelihoods (Bray, Merino-Perez et al. 2003; Ostrom and Nagendra 2006; Ostrom, Janssen et al. 2007).

Community forestry as an analytic concept was coined in the late seventies, but for centuries it has been a traditional way of life and livelihood strategy of many people around the world. Its history is plagued with invasions, colonization and –in modern times- legislation that expropriated communally owned and managed land and resources in favor of foreign kings, the ruling class or foreign investors (McKean 2000; Arnold 2001). Where their land was expropriated, indigenous peoples were, at best, transformed into land less laborers, or worse, decimated either violently or through disease and marginalization. In Guatemala, people and forests suffered this fate repeatedly during the Spanish domination<sup>1</sup> and then during the first decades post-Independence (1821) under policies that favored Criollo<sup>2</sup> elites and that have continued on to present day Guatemala. These policies expropriated communal lands and disempowered community institutions of social organization, in what is now known among Mayan intellectuals as the “Second Holocaust” (McCreery 1994; Cambranes 1996; Hale 2002).

State or donor-led community forestry initiatives are essentially efforts to rescue or re-create the institutional arrangements that supported local collective action for the joint management of communally owned forests. The task is complex, requiring the restoration of eroded social and ecological systems and colliding with hegemonic market-based policies favoring individual private property in the developing world (McKean 2000).

## **Common Property and Institutions for Collective Action and Forest Governance**

“Common pool resources” –CPRs- refers to a natural or man-made resource system large enough that excluding users from its benefits is costly, yet not impossible. Benefits from common pool resources are subtractable, and thus are resources that can disappear if overused. Most natural resources (forests, fisheries, water basins) are common-pool resources; they offer benefits that are subtractable (felled trees, water consumed, fish caught) and often it is difficult to control or restrict access to them (poaching, uncontrolled deforestation). When these resources lack regulation of their use -anyone can use the resource freely- an “open-access” situation exists in which the resource may be used without any concern for its integrity making it very difficult to protect and very easy to deplete (Ostrom 1990; McKean 2000).

“Open access” situations are clearly identified with resource depletion and the metaphor of Hardin’s (1968) Tragedy of the Commons. Hardin proposed that only private or state property and control of resources could prevent depletion, however open-access is just one of possible scenarios in resource management and can occur in state, private or common property regimes. Establishing limits to regulate who can benefit and how, leads to a different dynamic for the CPR and its users, which may or may not result in the degradation of the resource. (Feeny, Berkes et al. 1990; Ostrom 1990; Feeny, Berkes et al. 1997; Ostrom 1999). These limits are rules or “*institutional arrangements for the cooperative use, management and sometimes ownership of natural resources*” (McKean 2000).

The specific case of common property regimes refer to “*a property-rights arrangement in which a group of resource users share rights and duties toward a resource*” and should be seen as a case of shared private property where a specific group of users hold their rights in common (Schlager and Ostrom 1992; McKean and Ostrom 1995; McKean 2000). Common property may or may not imply government recognized property rights but it does imply the common enactment of both rights and duties towards the jointly managed resource. Whether with government support and recognition or without it, around the world, many resource dependent peoples manage forest resources as common property (White and Martin 2003).

From the 1980's to date, the study of common property has repeatedly shown that it is not a relic from a bucolic and romanticized past but a type of property, as useful as any other in the sound management and conservation of common-pool resources. Such efforts have been fundamental to a shift in the way natural resource management is viewed and how it should be governed (Agrawal 2002; White and Martin 2003). Irrigation systems managed by the users themselves frequently outperform those where government intervenes (Ostrom 1992; Tang 1992; Lam 1998); local and indigenous fishermen can manage the resource responsibly without the fanfare of new technology and scientific development but with locally developed approaches even when they have lacked government recognized property rights (Acheson 1987; Berkes 1987; Schlager and Ostrom 1992). Forest users may create and maintain institutional arrangements that offer sound forest practices both ecologically and economically when their rights to the resource are recognized by central governments (Utting 1993; Ascher 1995; Banana and Gombya-Ssembajjwe 2000; Bray, Merino-Perez et al. 2003; Bray, Duran et al. 2008;

Chhatre and Agrawal 2009).

“Institutions” are rules in use determining what people must, may and may not do in a specific situation. They guide collective action: the coming together of individuals to jointly produce a common good. In regards to community forestry, these rules of collective action define membership (who has the right to the resource), what, when and how much can be harvested of forest products, and who may participate in decisions about the resource (Ostrom, Dietz et al. 2002). The institutional arrangements may be formally written into state legislation or may involve unwritten community rules passed down orally generation after generation. As long as these rules are known and respected they are institutions; when they are not, they are only abstractions (Tucker 2010).

In community forestry, local communities and their institutional arrangements lie at the heart of explanations of forest conditions (Gibson, McKean et al. 2000). Their absence or presence, their recognition and enforcement, and their orientation (rules can be about forest use or about forest products) all help explain forest degradation or sound use. More than the title to the land, common property is about the institutional arrangements (rules) designed, implemented and enforced to support collective action and the maintenance or production of joint benefits.

Stronger common property regimes –institutional arrangements- have been found to be associated with CPRs in better condition, yet for every case of successful collective action there are cases of failed institutional arrangements and degraded CPRs. Empirical and theoretical efforts have been devoted to studying the rules and norms regarding resource governance (Ostrom 1990; Ostrom 1992; Ostrom, Gardner et al. 1994; Lam

1998; Ostrom 1999), identifying the characteristics of those communal settings where CPRs are soundly managed, distilling principles that may facilitate adequate management of resources (Ostrom 1990; Agrawal 2002).

### **Research Questions**

This dissertation seeks to map the institutional arrangements, challenges, and opportunities of community forestry experiences of rural, resource-dependent local groups in the department of Chiquimula in Eastern Guatemala. The dissertation provides empirical evidence about the local institutional arrangements and forest condition of three communities, how they were created and how they have changed. It also analyzes some of the challenges policy makers, practitioners and researchers face when attempting to support communities in their governance efforts.

In the study of community forestry, institutions are both the locally crafted rules that dictate the type of interaction with forest and its resources, as well as the government enacted policies that shape this relationship both locally (municipal and community level) and nationally. This dissertation takes them into account and also looks at international donors, their policies, and their impact on local community forestry efforts.

Specifically, the dissertation focuses on the following issues:

- How locally crafted institutions determine the fate of community forestry experiences in their challenge of balancing livelihoods and forest governance.
- The role of interdisciplinary research in the study of community forestry experiences, its strengths and challenges.

- The role of external agents in strengthening already established rules or creating new local rules so that community forestry experiences can support livelihoods as well as protect forests.

I aim to provide further evidence on the capacity of local resource dependent users to protect and manage forest resources, and call to attention the variables I found to be most influential in their community forestry experiences. I also aim to emphasize the relevance of locally crafted institutions for sound resource use. My purpose is to contribute to the body of knowledge in the study of common property offering one new case and two site revisits for the large N studies carried out by the IFRI (International Forest Resources and Institutions) Research Program, by using its methods and having the data entered in its database for further study.

### **Study Context:**

#### **Guatemala, a Country of Great Social Inequalities**

Guatemala (see Map 1.1) is a highly unequal country; the majority of inhabitants have limited access to land, education, employment and other citizen rights taken for granted in many functioning democracies. Guatemala's GINI coefficient of 53.7 is the highest of all Central American nations, with the exception of Honduras. The Gini coefficient is a measure of the inequality of a distribution (a value of 0 expressing total equality and a value of 1 total inequality); it is widely used to assess income and wealth distribution within a country. Similarly, Guatemala's Human Development Index is second to last in Latin America (ranked 116 worldwide, in Latin America only Haiti is lower at 145), illustrating the dire living conditions of the majority of its population (UNDP 2010).

Furthermore, the Failed State Index (FP 2010) categorize Guatemala as a country “in danger” ranking it as number 73 worldwide and only better than Haiti in Latin America (ranked 11, with rank 1 granted to the most failed state). See Table 1.1 for ranks and values of the coefficient and indices above.

The causes of Guatemala’s present day socio-economic disparities are many and complex. Some are rooted in the thirty years of civil war (1960-1996) and in the drug war that currently bleeds Mexico and Guatemala, but also in the legacy of three centuries of Spanish colonialism followed by the establishment of a republic dominated by wealthy planters.

Peasants conform a large portion of Guatemala’s poor and their poverty is the result of centuries of constant exploitation. The roots of Guatemala’s rural poverty are in its Colonial past: First, the Spanish stripped Maya polities of their political sovereignty, labor and natural resources, including land. Inhabitants of rural areas were forced to resettle in towns called “reducciones”<sup>3</sup> and required to pay tribute and provide unremunerated labor to Spanish ranchers and clergy through the so called “repartimientos”<sup>4</sup> or assigning them to “encomiendas”<sup>5</sup>. In keeping with Spanish interests, agriculture was reorganized into two complementary forms: On the one hand, medium and large-scale planters producing commercial crops such as cacao, indigo, etc. and in the other, subsistence farmers who produced only enough to barely support themselves and their families. Additionally, they had to work as field hands in plantations to make ends meet and to earn cash to pay tributes (Cambranes 1985).

**Table 1.1 Gini Coefficient, Human Development, Corruption Perception and Failed States Indices for Central America and Haiti**

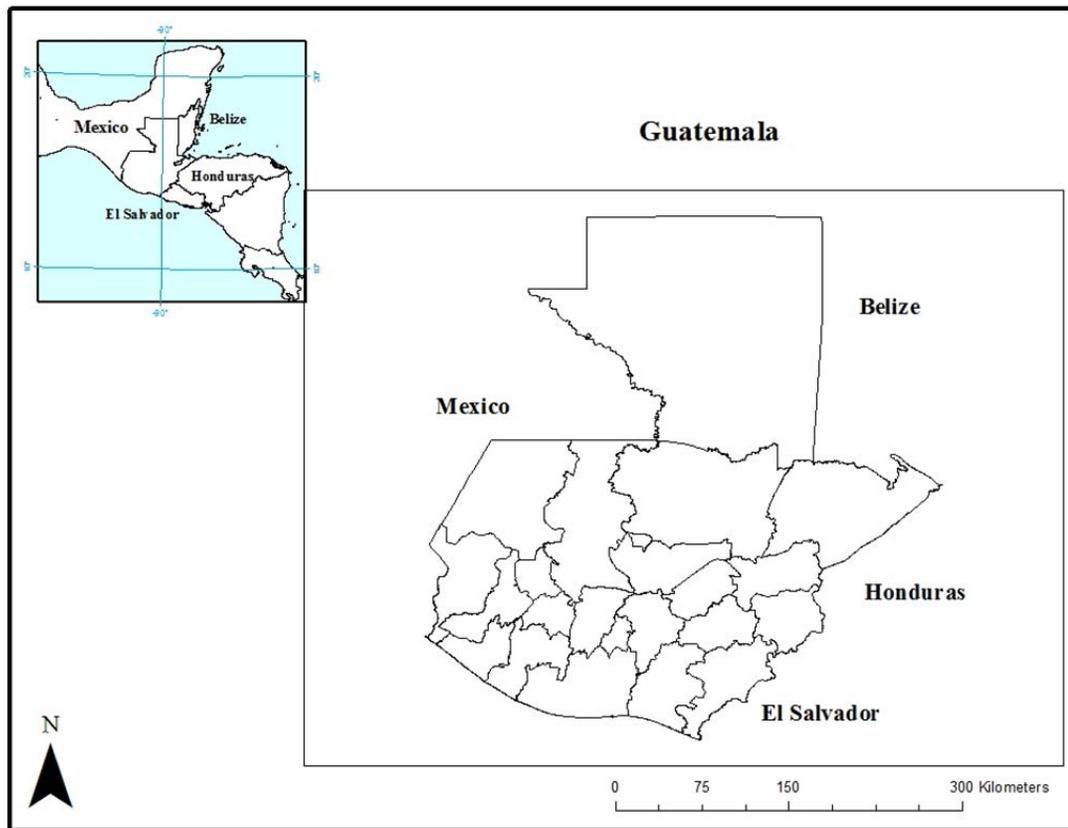
	<b>Belize</b>	<b>Costa Rica</b>	<b>El Salvador</b>	<b>Honduras</b>	<b>Guatemala</b>	<b>Nicaragua</b>	<b>Haiti</b>
<b>Gini</b>	-----	47.2	49.7	55.3	53.7	52.3	59.5
<b>HDI value</b>	0.694	0.725	0.659	0.604	0.560	0.565	0.404
<b>Rank</b>	78	62	90	106	116	115	145
<b>FSI value</b>	68.7	52.0	78.1	80.0	81.2	82.5	101.6
<b>Rank</b>	112	138	85	76	73	66	11

*Gini coefficient (the higher the value the more unequal the country is) compiled from 2009 Human Development Report <http://hdrstats.undp.org/en/indicators/161.html>*

*HDI - Human Development Index (the higher the value the higher human development is) compiled from 2010's Human Development Report Country Profiles <http://hdr.undp.org/en/data/profiles/>*

*FSI –Failed State Index (the higher the value the more failed a state is) compiled from the report prepared by Foreign Policy and the Fund for Peace and can be found at [http://www.foreignpolicy.com/articles/2010/06/21/2010\\_failed\\_states\\_index\\_interactive\\_map\\_and\\_rankings](http://www.foreignpolicy.com/articles/2010/06/21/2010_failed_states_index_interactive_map_and_rankings)*

**Map 1.1 Guatemala and its Neighbors**



The “reducciones” sought to concentrate indigenous populations into Spanish-like towns where they could be more easily controlled. They included communal lands set aside for the local population to farm and thus be able to produce the required tributes to the Spanish Crown. Communal lands were called “ejidos” or “común” and were legally defined by Spanish law as one square league<sup>6</sup> (approximately 1,743.75 hectares) centered on the church or plaza. However, regardless of the clear cut definition provided by the law, official regulations were usually ignored and communal lands were often adjudicated to wealthy planters and government officials. Furthermore, while some communities would be assigned hundreds more leagues than those granted by law, others would be unable to claim not even a third of what the law stipulated and worse others would have none (McCreery 1994). Most communal lands lacked titles supporting their claim as communal lands and their integrity was constantly challenged.

With Independence, communal land ownership was weakened further by Liberal policies. The early Liberal governments of independent Guatemala were in office 1821-1837 and then again from 1880-1920, and established the foundation of present day Guatemala economic-political setting. During Liberal rule, the Church was stripped of its property and power agrarian policies promoted coffee and later bananas and forced peasants out of their villages and into plantations, authoritarian and elite-dominated heads of state favored a plantation economy while eroding the customary rights and freedoms of the rural population. Both through legal mechanisms such as reverting title-less land to national property, as well as, through individuals that would literally encroach communal lands –initially renting but quickly claiming it as private-, communal lands were decimated. As peasants lost the land that sustained their livelihoods, aggressive labor

policies pushed them into near servitude conditions having to sell their labor in the plantations that now resided in their previously communal lands (Cambranes 1985; McCreery 1994; Dary 2003; Thillet, Peralta et al. 2003).

Bouts of forced labor and taxes were imposed on the peasantry to pay to the Spanish conquerors and colonizers. Cacao and indigo but also cotton, cheese, and other goods were accepted as payment while forced labor for public works or in Spanish owned haciendas was required from time to time. Some preferred to submit themselves at the service of a ranch or “hacienda” (large privately owned farm) to avoid paying the overburdening tributes. They entered feudal relationships with hacienda owners (some in land that used to be theirs), joining blacks who had been brought as slaves. Work in Spanish haciendas was an important mixing center (mestizaje) with indigenous, blacks, and ladinos<sup>7</sup> working together (Cambranes 1985; McCreery 1994; Cambranes 1996; Dary 2003; Thillet, Peralta et al. 2003).

In this landscape of Spanish domination, islands of indigenous autonomy remained scattered where indigenous forms of government were recognized within the boundaries of their territory. These groups obtained their relative autonomy through special grants awarded by the Spanish crown to the lands they had historically occupied while others bought the right to their land paying in silver (McCreery 1994; Thillet, Peralta et al. 2003). In fact one of the community groups studied in this paper, the Indigenous Community of San Francisco Quezaltepeque (ICQ), paid for their land with silver reales (Solano 1977). The community of Cebollas, one of the cases included in this study belongs to the ICQ. Although the communal lands afforded their owners a degree of

autonomy, throughout Spanish occupation and even more after Independence communal ownership and local forms of government were constantly battling for their integrity.

By the time of independence in 1821, centuries of Spanish domination had bequeathed a highly stratified class structure based on an agrarian economy subordinated to the interests of a small group of Spaniards and their descendants –the Criollos. Strict supporters of the colonial system of feudal domination, the Criollos were content exporting agricultural products and importing consumer goods manufactured in Europe. They derived prestige from owning large expansions of unproductive land and amassed treasures, with little interest in diversifying or modernizing agriculture. This system was possible during Spanish domination only through the inexpensive and even free peasant labor (McCreery 1994; Cambranes 1996; Dary 2003).

At the end of the 18<sup>th</sup> century, when indigo market collapsed, reliance on a single crop gave way to liberal policies that sought to diversify the commodities grown for the international market. Tax breaks on cacao, cotton, sugar and coffee were established to attract innovation and investment into a plantation economy. At the time of Independence, cochineal, a red dye, was the first crop to replace indigo as the main and almost sole export. From 1820 to 1860, cochineal was the foundation for the economy until its collapse due to the innovation of chemical dyes for the textile industry. By then the necessary components for the consolidation of the plantation economy in Guatemala had taken root with policies that favored large private landholdings, supplied cheap labor and promoted capital investments through tax exemptions. The modern plantation economy shaped the political and social organization of Guatemala from the latter part of

the 19<sup>th</sup> century to the present, tying the country's destiny to foreign neo-colonialism (Cambranes 1985).

As Cambranes (1985) describes it: *“The country became the property of a handful of native oligarchs and foreign capitalists who, after having set up a political dictatorship succeeded in monopolizing the factors of production and the international commercialization of agricultural productions while fostering the pauperization and economic and social oppression of the vast majority of the Guatemalan populations and the country's underdevelopment”*

Little has changed in modern day Guatemala regarding the economic and social destitution of the vast majority of Guatemalans. In recent history attempts to reverse bias towards large landowners have been labeled as communist-inspired and met with state opposition and violence. The civil war, which began in 1960 and lasted 36 years (ending in 1996), greatly undermined social capabilities for civic participation (Trudeau 1993; ODHAG 1998; Chasteen 2001; Thillet, Peralta et al. 2003).

The decade of 1944-54 was a time of significant political and social reforms, including a moderate agrarian reform, which nevertheless was reverted after a CIA sponsored coup led to overthrow President Jacobo Arbenz (1951-54) (Gleijeses 1992). A succession of military governments and the civil resistance they provoked led eventually to 36 years of civil war. The army's brutal counterinsurgent tactics led to more than 200,000 dead, tens of thousands of disappeared and more than two million displaced, especially in rural areas (ODHAG 1998). The war officially ended in 1996 when the Peace Accords were

signed between representatives of the government and the guerrillas (ODHAG 1998). Civil society took years to recover from the terror and social dislocation unleashed by the war. The department of Chiquimula where the communities studied in this dissertation are located did not see comparatively much in terms of military campaigns in the 80's, however, Eastern Guatemala was the object of bloody military repression in the late 60's and early 70's. Thousands died and a culture of fear and connivance with the army especially among the middle classes in the region was established.

In the midst of few recent experiences with free and safe local organization, marginalization, and insecure property rights, resource dependent groups in Guatemala face great difficulties and challenges to engage in initiatives such as sustainable community forestry (Durstun 1998; Durston 1999). Today, governments, academics, donors, and non-government organizations are increasingly willing to recognize and support the rights of local peoples to the land and their capacity for sound resource use; yet the dominant market-based policies prescribed still favor private individual land titling over collective entitlements and sadly allegiance to native people's rights in many settings is mostly only lip-service (Hale 2002; McNeish 2008).

### **Community Forestry in Present Day Guatemala**

Guatemala's terrain is largely mountainous and hilly, rendering 51% of the land mass adequate only for forest cover (Leonard 1987). In such terrain, the loss of forest cover has serious environmental consequences. Furthermore with a predominantly poor and marginalized population, forests are vital to every day livelihoods. According to the national forest inventory of 2002-2003 (see Table 1.2), Guatemala's forests encompass 37.1 % of its territory equivalent to 4.046 million hectares of forest land. Of these four

million hectares, 23% (8.4 municipal and 14.6 communal) or 930,583 of forested hectares are under municipal or communal ownership (FAO 2004). These communal or municipal lands are where most of community forestry experiences take place, although some national lands are also the setting of community based forest management. Thus communities and communally owned management is relevant to close to a fourth (and probably more) of all Guatemalan forested lands.

Regardless of centuries of marginality, rural subsistence agriculture communities have maintained their communal organization and management of communally owned forests and lands. The most iconic example in Guatemala is found deeply rooted in the indigenous legacy of the people of the Western Highlands (Veblen 1978; Utting 1993; Elías 1997; Katz 2000; Reddy 2002; Wittman and Geisler 2005; Elías, Larson et al. 2009). Their institutional arrangements for the governance of common property forest and water resources has been compared against other Guatemalan groups that manage forest resources in the Northern lowlands (Petén) and the Eastern mountains (Oriente) of Guatemala (Katz 2000; Reddy 2002).

**Table 1.2 Guatemala National Forest Inventory 2002-2003**

**Forest Hectares by Property Regime**

<b>Forest property regime</b>	<b>Hectares</b>	<b>% of Total forest cover</b>
<b>National</b>	1,367,732	33.8
<b>Municipal</b>	341,754	8.45
<b>Communal</b>	592,876	14.65
<b>Private</b>	1,531,133	37.84
<b>Regime not determined</b>	212,521	5.25
<b>Total forest cover</b>	4,046,016	100
<b>Total land extension (hectares)</b>		10,888,974
<b>Forest cover as % of total land extension</b>		37.15

*With data from (FAO 2004) Inventario Nacional Forestal de Guatemala 2002-2003*

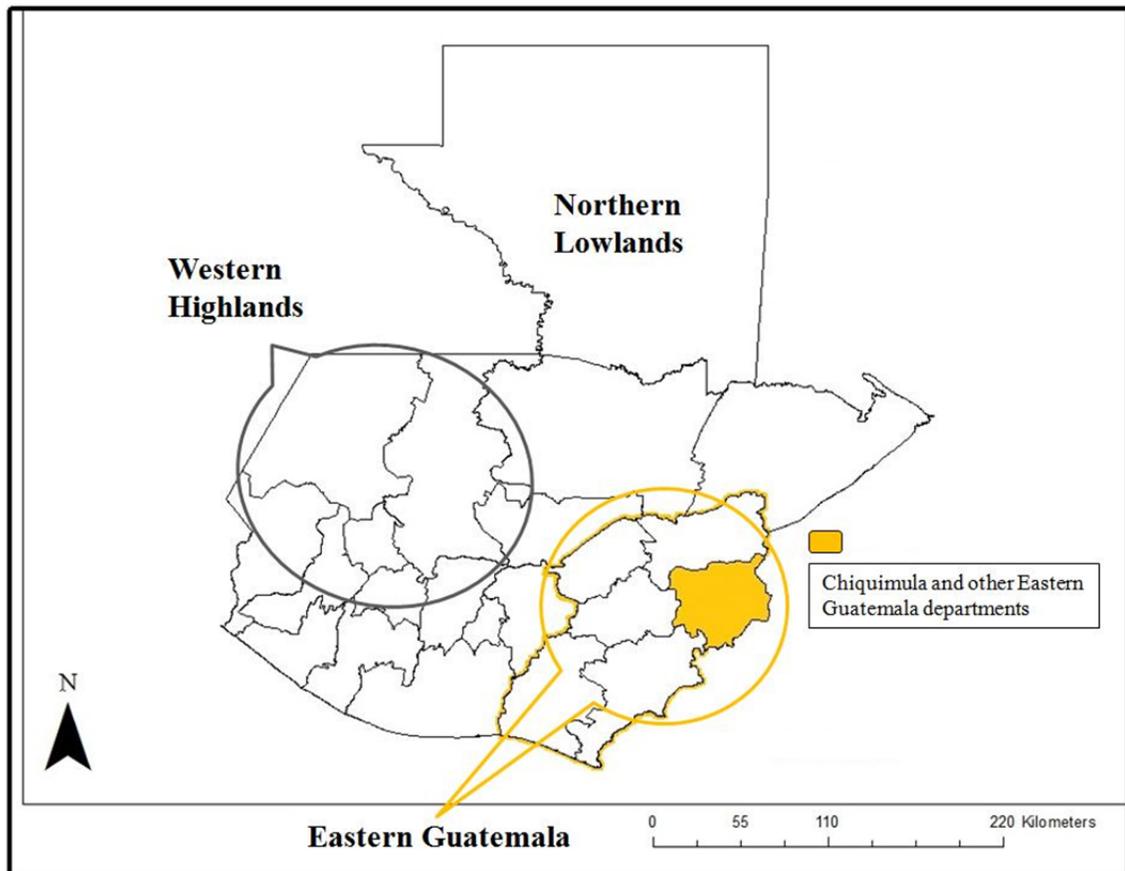
The northern lowlands in the department of Petén are the country's agriculture frontier where cattle ranching and slash and burn agriculture have cleared forested land at alarming rates (Sader, Sever et al. 1994; Sader, Hayes et al. 2001). In 1990, as a measure against deforestation a government-led initiative created the Mayan Biosphere Reserve—a network of management units ranging from strict protection protected areas to forest concessions where responsible forest management is allowed (Hayes, Sader et al. 2002). The forest concessions granted rights to inhabit and harvest forest land in 25-year usufructs to organized communities, including some formed by recent migrants. The rationale was that the tenure security of the usufruct and technological and organizational training would transform farmers into forest managers. Not every concession has resulted in sound community forestry, but a merit of the initiative is the creation and nurturing of such regimes. A recent comparison of the forest concessions against the protected areas shows that neither system (community forestry vs. strict protection) has been more successful in reverting Petén's deforestation. Both management systems have successes and failures (Bray, Duran et al. 2008).

Similarly, in Guatemala's Eastern mountains there are examples of community based resource management that even if not as strong as the Western Highlands should be considered capable of sound resource use. One such case, Rodeo, a community in Eastern Guatemala that has transformed itself into forest conservationists, is presented here.

Other comparative studies of community forestry in Guatemala have contrasted the iconically indigenous Western Highlands against other regions concluding that the centuries old cultural cohesion of the West has a more successful experience (Katz 2000; Reddy 2002). I purposefully decided against an interregional comparison so that I could

develop the case of Eastern Guatemala, a region substantially less studied (Little-Siebold 2001; Dary 2003; Little-Siebold 2006) and thus one whose community forestry experiences are poorly documented, although Dary and colleagues have made important contributions (Dary, Elías et al. 1998; Dary 2003).

**Map 1.2 Eastern Guatemala, the Western Highlands and Northern Lowlands**



## Research Design and Study Sites

The Ch'orti' were the indigenous group originally established in Chiquimula and Zacapa<sup>8</sup>. Some of its towns, like Camotán, date from prehispanic times with the colonial town settled atop prehispanic settlements while other major towns date from early in the Spanish colonization, 16<sup>th</sup> century. The Ch'orti' population suffered great losses due to the epidemics that followed the Conquest and ill treatments inflicted upon them. Aside from keeping subsistence crops (corn, squash, beans), they were required to grow cacao, indigo, cotton and other crops to pay tribute, often cheated by the Spanish buyers when weighing crops and bookkeeping of their debts. They were also forced to work in haciendas and serve as porters in the transport of goods to the Atlantic coast. Forced labor, meager wages, overtaxing, and serfdom conditions endured had a heavy toll in indigenous health and livelihood causing severe population drops (McCreery 1994; Dary 2003).

The diminishing indigenous population, relative absence of state control, temperate climate and pockets of fertile land made Chiquimula a land of small ladino farms, few surviving indigenous communities, and large unproductive haciendas. As indigenous population dwindled, Spaniards and poor Ladinos moved in, the latter to escape forced labor and tribute and the former to amass land into haciendas and pry labor from the weakened indigenous communities. Development of the region was hampered by labor shortages, droughts and plagues and difficult communications. By the end of the colonial period the region was relatively heavily populated and the inhabitants constituted the largest ladino population of rural Guatemala, but most were poor (McCreery 1994).

The indigenous population forced into near servitude by the Spaniards soon incorporated poor “Ladinos” or “castas<sup>9</sup>” those that were not of clearly defined indigenous origin but also not of Spanish descent. (McCreery 1994). This was particularly important in Eastern Guatemala as ladinos and other castas soon became part of the population subjected to forced labor and near servitude, resulting in an ethnic mix beyond the simplistic dichotomy of “indio-ladino” (indigenous and non-indigenous) that has been most frequently used to define Guatemala’s ethnic diversity (Little-Siebold 2001; Little-Siebold 2001). The study of ethnicity in Guatemala has overwhelmingly focused on Maya communities. Until recently Eastern Guatemala was somewhat ignored in the literature in spite of the diversity of ethnic identifications in this area. Similar neglect of indigenous ethnicities in areas purportedly mestizo have been documented in Nicaragua (Gould 1998).

Today ethnic identities in Eastern Guatemala include “naturales”, “ladinos”, “ladinos pardos (Little-Siebold 2001; Dary 2003). In the communities included in this study, the people identified themselves as “naturales”, and as “campesinos” (peasants). Little-Siebold (2001) traces the identification as “campesino” with participation in the establishment of local charters of farmers’ unions and political parties.

### **Forest Types of the Study Areas**

Chiquimula’s terrain ranges from 420 meters to 2,500 meters above sea level and encompasses almost every gradient in humidity from subtropical thorn forest –Motagua Valley thorn scrub- to broadleaved and coniferous mountainous cloud forest forests. Of the forest types present in Chiquimula, the most relevant to this study is tropical dry pine-oak forest.

The temperate, healthy climate of tropical dry forests is suitable for agriculture and thus has always been the most important forest type for human populations. The long human presence on these forests has led to their transformation as human modified landscapes (Leopold 1950; Tosi and Voertman 1964; Murphy and Lugo 1986; Murphy and Lugo 1995).

The tropical dry forests relevant to this study are pine-oak forest types. Pine-oak forest types include several distinctive associations, ranging from lowland dry forest oak scrub to high elevation moist pine forests, including tropical dry pine forests and pine-oak woodlands. Pine forests are dense forests within the pine-oak zone usually made up largely of pines, oaks being subdominant or sometimes absent. Pine-oak woodlands are open, scattered stands dominated by pines in some places, by oaks in others. Elevation wise, these usually occur between the oak scrub and high pine forest. Oak scrub, usually occurs along the lower fringes of the pine-oak zone adjoining semi-arid foothills or lowland basins (Leopold 1950).

In the community cases studied, tropical dry pine-oak forest associations were dominated by *Pinus oocarpa* Schiede. “Pino de ocote”, as it is commonly known, is the most abundant pine in Guatemala found amply both on mountain slopes as well as in plains. It can be found forming almost pure stands and also often associated with oaks and sometimes other pines (Parker 2008). *Pinus oocarpa* has the largest latitudinal range of pines in Mesoamerica, extending from Mexico to Nicaragua (Farjon and Styles 1997). For the studied communities these forests are a source of firewood, timber, livestock grazing, and kindling. The forests experience human induced fires in order to promote grass growth for livestock grazing, a practice that possibly extends the range of *P.*

*oocarpa* thanks to its semi-serotinous cones adapted to fire (Farjon and Styles 1997; Holder 2004).

Oaks often growing together with pines is common through vast areas at mid elevations and drier parts of Guatemala (Parker 2008). The oak species most commonly found in the studied forests include: *Quercus sapotaefolia* Liebm., *Q. crispifolia* Trelease, *Q. peduncularis* Neé, *Q. peduncularis* var. *sublanosa* (Trelease) Muller, *Q. hondurensis* Trelease, and *Quercus corrugata* Hook.

Of the six community forests studied, four are tropical dry pine-oak forests and two are cloud forests. As their name states, cloud forests have persistent cloud contact with tropical mountain vegetation, high precipitation and humidity, dripping moisture, absence of frost, and plenty of mosses and epiphytes on trees (LaBastille and Pool 1978). Given their high humidity cloud forests are known to be more biologically diverse.

For Mexico, Leopold (1950) describes cloud forests as montane hardwood or pine-oak forests with a tropical undergrowth of low trees, shrubs, herbs, vines and epiphytes. Such combinations occur on peaks or escarpments (usually above 1500 masl) that are swept by moisture-laden air currents rising from tropical lowlands. The climate is usually cool and moist but is not subject to freezing. In Eastern Guatemala, cloud forests can be found in unconnected islands on isolated peaks, such as the mountain of Las Cebollas (studied here) or La Union, Zacapa (neighboring one of the studied community forests) and in the Sierra de las Minas Biosphere Reserve. The latter hosts 1300 km of cloud forest and is the largest most significant cloud forest extension in Mesoamerica (Dix 1993). These forests are usually dominated by species of pine or oak but may contain many hardwoods

and an understory of tree ferns, begonias, bromeliads and orchids along with various species of lianas and other climbing forms (Leopold 1950). In the case of the studied forests, the tree species found included pines (*Pinus* sp.), oaks (*Quercus* sp. and *Quercus corrugata* Hook.), and Liquidambar (*Liquidambar styraciflua* L.).

### **Field Sites**

This dissertation was based on fieldwork at three sites that I visited in 2004. All involve community-owned forests, municipal lands assigned to each community for their subsistence needs. Two of the sites, Cebollas and Tesoro, were previously visited by the IFRI Research Program in 1998, thus this study can analyze these sites over time. The third site, Rodeo, was first visited in 2004. See Table 1.3 for an overview of the communities.

Cebollas and Rodeo are mostly subsistence agriculture farmers growing corn, beans and other crops that they sell in nearby local markets (bananas, flowers) and seasonal migrants to work in large coffee or sugar plantations. Tesoro, on the other hand, grows and sells coffee, commercializes timber and owns cattle. The differences in livelihood strategies can be appreciated in their relationship to forest resources. Tesoro harvests timber for commercialization in local markets or clears it for coffee, while in Cebollas and Rodeo most forest harvesting is for personal consumption and subsistence (timber for construction, firewood from small or dead trees, and in Cebollas kindling from large mature pines). An additional difference between Tesoro and Cebollas and Rodeo is that Tesoro harvests significant amounts of mature pines for sugar processing. Sugar processing is a traditional subsistence activity where sugar cane is transformed into candy for trade and consumption. The process requires large amounts of pine trunks leaving a

visible scar in the forest. Rodeo banned this activity given its impact on the forest and Cebollas seems never to have had much of a tradition of sugar processing.

The three communities have ventured into forest conservation, with different results.

Tesoro has a municipal “ejido” of 736<sup>10</sup> hectares of pine-oak forest. In 1998, a conservation committee was formed to regulate forest use but it was quickly dissolved given the conflicting commercial interests of the wealthier individuals of the community who profited most from timber sales or large clearings. In 2004, the committee was only a distant memory.

Cebollas has two forests: one established as small reserve, and another much larger one for the consumptive use of all. The small reserve consists of 20 hectares of broadleaved mountain cloud forest; it is fenced in and clearly identified as a no harvesting zone. The other forest is a pine-oak forest with 457 hectares used for subsistence (occasional timber, firewood and kindling).

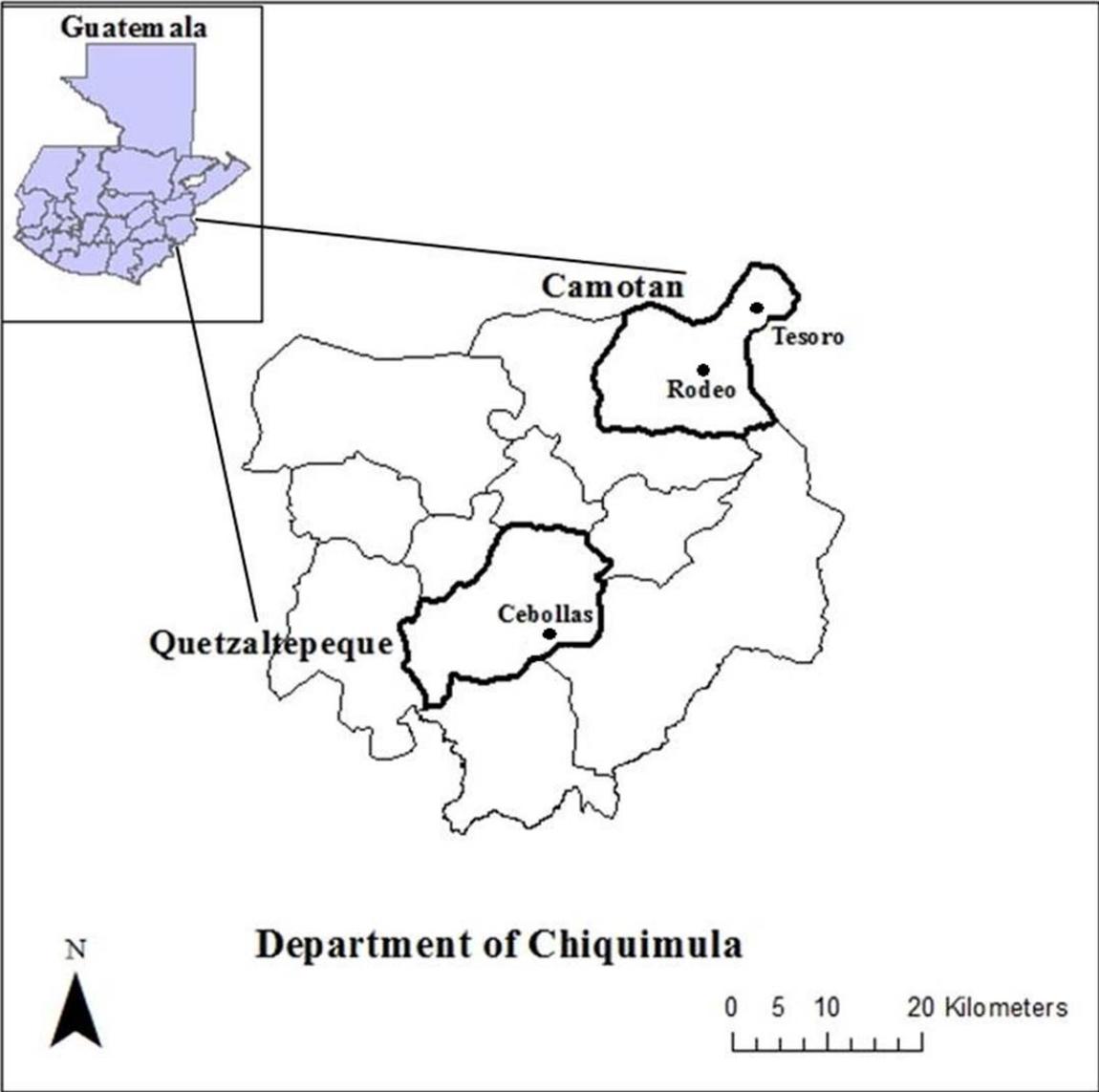
Cebollas’s forest tenure suffers from conflicting and overlapping forest rights, the legacy of Spanish and post-Independence expropriations of indigenous lands. The municipality of Quezaltepeque claims the forest is a municipal ““ejido””, while the Indigenous Community of San Francisco Quezaltepeque (ICQ), a community of 22 villages, claims ownership of the land since they bought it from the Spanish King paying its worth in silver. With independence, royal property deeds lost their legal value, however the ICQ continues to claim legal ownership of the land. Cebollas is sadly “caught in the middle” and their community forestry experience has been hampered greatly by it. Chapter Four will elaborate on the conflict and its implications for community forestry in Cebollas.

Rodeo's 51<sup>11</sup> hectares of pine-oak forest constitute the strongest community forestry experience in this dissertation. In the late 1980's the community started regulating forest use, granting its forest a conservation status. The new status and rules have survived the test of time so far, being clearly recognized and respected by most of Rodeo's community members. The forest is again a municipal "ejido" to which Rodeo has subsistence rights. In Rodeo there is a second forest, an "open access" forest with very little control over its use. This forest, Cementerio, will be explained in detail in Chapter Two.

**Table 1.3 Study Sites**

<b>Community</b>	<b>Number of families and livelihood strategies</b>	<b>Forest size and tenure regime</b>	<b>Dates of visits</b>
Rodeo	200, subsistence agriculture, kindling, firewood and timber for home construction.	Rodeo forest 51 hectares, municipal “ejido” of Camotán, with Rodeo having usufruct rights. Cementerio forest, 73 hectares, “ejido” of Camotán.	March-July 2004
Tesoro	455, Subsistence agriculture, coffee plantations, firewood, kindling and timber harvesting for profit.	736 hectares, municipal “ejido” of Camotán	June 1998 March-July 2004
Cebollas	40, subsistence agriculture, kindling, firewood and timber for home construction.	20 hectares of protected forest and 457 hectares of communal forest, Municipal “ejido” of Quezaltepeque and also claimed as communal land of the Indigenous Community of San Francisco Quezaltepeque (ICQ)	June 1998 March-July 2004

Map 1.3 Study Sites in Chiquimula, Eastern Guatemala



## **Data Sources and Methods**

Understanding community forestry depends on knowledge of the different perspectives and experiences influencing actors' behavior and institutions in current operation. Data were collected through fieldwork in the studied communities as well as in interviews with government and nongovernment personnel interacting with the communities. I spent a total of approximately 8 months in Chiquimula from 2003 to 2004. Data on the resource users, policy context, land use, and institutional change were gathered via the collection of secondary sources, a literature review and in the field via the IFRI Research Program methodology.

### **International Forestry Resources and Institutions (IFRI)**

For each community a case study was constructed from visits carried out with the research protocols designed by the IFRI research program (Gibson, McKean et al. 2000). Chapter Three focuses on methodological implications and will discuss the IFRI methodology in more detail.

The IFRI research instruments<sup>12</sup> are based on a framework for institutional analysis of case studies including both physical forest and socioeconomic and institutional variables. The program aims to gather diachronic data revisiting the sites, ideally every three to five years (Poteete, Janssen et al. 2010). Given that collective action is a dynamic and evolving effort, its study benefits from diachronic data. This dissertation exemplifies this with Tesoro's case. In 1998 the scientific visit found in Tesoro a forest protection committee that had been working for two years regulating forest use (Gibson, Lehoucq et al. 2002) . By 2004 the committee had dissolved, while the encroaching timber harvesting the committee had attempted to regulate continued and even increased.

Using the IFRI protocols also allows case studies to increase the pool of sites to be analyzed as part of future large n-studies of the IFRI Research Program. Large n-studies are seen as an important next step in the study of common property and natural resources (Agrawal, Chhatre et al. 2008; Chhatre and Agrawal 2009).

The IFRI method provides the basis for institutional analysis of each community and its relationship with the forest and relevant external institutions. Ten instruments need to be filled out by the research team with information gathered via unstructured interviews and group exercises for institutional and social variables, and via forest sampling for the forest ecology variables. Aside from interviews, community exercises, meetings with community leaders and other key informants; government officials, archival data and other secondary sources were gathered for the institutional analysis of each community (Tucker and Ostrom 2005; Poteete, Janssen et al. 2010).

The forest assessment is carried out via a random sample of forest plots. Plots can either be square or circular, for this study, square plots (18m per side) were established. All trees whose DBH (diameter at breast height) was larger than 10 cm were measured (-DBH- and height) and species recorded. A second smaller square plot (5 m per side) was established within the perimeter of the first plot. In this plot, saplings' species, height and largest diameter was recorded. Finally a third plot (1 m per side), percent cover of herbaceous vegetation and soil samples were collected. Geographic positioning data for each plot location was obtained with a GPS receiver. The protocols also ask researchers to note evidence of forest pests, diseases, and livestock grazing, soil characteristics and other features of each plot that are useful for analysis (CIPEC 1999; Tucker and Ostrom 2005).

## **Scope and Structure of the Dissertation**

This introductory chapter has outlined how community forestry has survived through centuries of undermining state policies and how it is a valid (but no panacea) model for the sound management of forest resources while supporting local livelihoods. The chapter offered a brief overview of the role that science-based research had in overturning the erroneous perception that likened common property to open access irrevocably doomed to degradation and destruction. The chapter also discussed Guatemala's history of expropriation and disempowerment of local indigenous groups and their ancestral rights to land and culture. This history ends in modern day Guatemala, where local indigenous and non-indigenous groups still struggle to gain their rightful place as citizens in a country deeply imbued with neo-liberal and market forces, narrowly focused on individual private property, and little concern for cultural and environmental rights.

The scope of the dissertation is limited in that I focus on one region of Guatemala, and therefore it does not address the impact of regional cultural differences or differing environmental conditions. The dissertation documents how community forestry develops among poor, resource-dependent peasants in the tropical dry pine-oak and mountainous cloud forests of Chiquimula. Another limitation is that I consider policy in as much as it interacts with the locally crafted institutional arrangements without offering a thorough analysis of the policy context and how it influences and limits community forestry overall. Furthermore, in my analysis, I do not question indigenous rights to their traditional homelands and how modern day Guatemala is or is not addressing past and current grievances between these groups and the state. The conflicts fueled by unrecognized, overlapping rights to land and resources is an important variable for

community forestry in Guatemala and my dissertation discusses it only when relevant to the views of donors and their staff on institutional arrangements for resource management.

In considering forest condition, I compare the studied forests among themselves rather than comparing each of them to a reference forest. My assessment therefore does not determine the condition of any forest but offers only a relative assessment of which among the forests included in my sample is in better condition relative to the others.

One key issue this dissertation tackles is the analysis of how a relatively young community forestry experience meets the challenges of collective action. Chapter Two tells the community forestry story of Rodeo looking at how in a relatively short time this community transformed itself from irresponsible forest users to forest protectors and how they have weathered and survived long-standing conflict within their community.

The dissertation also offers a reflection on the challenges involved in interdisciplinary research. The academic study of common property is interdisciplinary and the richness of methods and theoretical approaches has greatly contributed to its accomplishments on behalf of common property regimes. However, interdisciplinary studies are always challenging and scientists must be extra-careful in respecting the assumptions of sister sciences. Chapter Three offers an example of how delicate this balance is.

In Chapter Four the dissertation offers a reflection on how state and donor agents view institutional arrangements calling attention to how donors and their on-the-ground staff must be respectful and cognizant of their fundamental role if they wish to create and nurture collective action rather than hinder it.

Finally, in Chapter Five, I summarize the conceptual, methodological and practical contributions of the dissertation.

---

<sup>1</sup> Spanish conquest and colonization lasted close to 300 years from 1524 to 1821

<sup>2</sup> Criollos identifies upper class Guatemalans of Spanish descent

<sup>3</sup> The *reducción* relocated indigenous populations to Spanish-style towns.

<sup>4</sup> The *repartimiento* was a forced labor system imposed on indigenous populations.

<sup>5</sup> The *encomienda* was a land grant given to a Spaniard in reward for his services in the conquest, which included the right to use native labor. In exchange, the beneficiary was expected to provide for the evangelization of the indigenous groups under his control.

<sup>6</sup> McCreery states that one square league was equal to 36 “old” (pre 18<sup>th</sup> century) caballerías which in turn are equivalent to 38.75 “new” (18<sup>th</sup> and 19<sup>th</sup> century) caballerías, with each caballería equivalent to 45 hectares, therefore 1743.75 hectares

<sup>7</sup> Ladino is a term used to define identity as non-indigenous but also non-Spanish. The term became predominant at the end of the Spanish colonization and taken up by the Liberal governments following Independence to create a national identity grouping everyone who wasn’t indigenous as Ladinos.

<sup>8</sup> In Chiquimula the counties of Jocotán, Camotán, Quezaltepeque, Olopa, San Juan Ermita, Esquipulas and San Jacinto and in Zacapa La Unión.

<sup>9</sup> Castas was a term widely used during the Spanish colonization to identify anyone who was not indigenous but was evidently not white (McCreery 1994).

<sup>10</sup> All forest extensions are reported as a measure of the GIS coverage used in fieldwork.

<sup>11</sup> As mentioned earlier all forest extensions are reported according to the estimates done of the GIS coverages. In the case of Rodeo, this value is different from those reported by various sources which range from 52 and 56 hectares to 141 hectares.

<sup>12</sup> The IFRI protocols are peer-reviewed and extensively tested tools that explore the relationships between human institutions and their forest resources, addressing the following subject areas: (1) community history, (2) nature of the forest, (3) quantitative definition of forest condition, (4) physical characteristics of the community, (5) definition and description of user groups, (6) formal user group associations, (7) inter-user group relations, (8) forest products, (9) influence of non-harvesting organizations like local NGOs or governments, and (10) interorganizational relations. For more information on IFRI see Gibson et al. (2000, Appendix, pp. 243–268) and <http://www.sitemaker.umich.edu/ifri/home>

## CHAPTER 2

### **LIVING WITH CONFLICT: RODEO'S COMMUNITY FORESTRY EXPERIENCE**

Rodeo is located in the tropical dry mountains of Eastern Guatemala's department of Chiquimula. During a few decades since the late 1970s this community has transformed itself into an example of communally driven forest conservation. However, the price for Rodeo's successful forest protection includes the degradation of an unprotected forest within its jurisdiction –Cementerio forest. Their experience offers insight into the challenges that communities face when developing robust self-governing systems. Intra-community conflict over how communally owned resources should be used has shaped Rodeo's experience.

This chapter will outline how institutionally strong community forestry can coexist side by side with an open access situation. First, efforts to regulate exclusion and subtractability in Rodeo forest will be contrasted to the open access situation of Cementerio forest. Then a forest assessment will compare the two forests offering evidence of the impact open access has had on the degradation of Cementerio forest. The chapter will then move on to present an analysis of Rodeo's development of institutional arrangements for forest conservation using Ostrom's design principles of self-governing Social Ecological Systems emphasizing the role that conflict resolution mechanisms have had in Rodeo's community forestry experience. A timeline of Rodeo's community forestry experience is presented in Table 2.6 as a reference.

## **Self-Governance of Social Ecological Systems**

People dependent on natural resources are potentially capable of self-organizing to manage common pool resources (CPRs) without compromising the environmental integrity of such. Contrary to the prejudices of dominant economic policy and the dictates of governments, resource-dependent peoples (often peasants with little formal education and modest livelihoods) are capable of sound resource management (Ostrom 1990; Ostrom 1992; Feeny, Berkes et al. 1997; Banana and Gombya-Ssembajjwe 2000; Gibson, McKean et al. 2000; Bray, Merino-Perez et al. 2003; White and Martin 2003; Ghatte 2004). Furthermore, the simplistic view dictated by the Tragedy of the Commons - nationalization or privatization of the commons- has been called to pay attention to the complexities of actual, real governance and management of CPRs. Believing in blue-print solutions and panaceas leaves out the constant everyday complexities that are the reality of any collective endeavor and the calling card of social ecological systems and their management (Bray, Merino-Perez et al. 2003; Ostrom 2005; Tucker 2010).

As defined in Chapter One, CPRs have two fundamental characteristics. The first one is that excluding potential beneficiaries is difficult. The second one is that they are subtractable. These characteristics encompass the broad challenges in the management of CPRs: 1) the exclusion of other potential users, and 2) the regulation of use and users to control subtractability. Property regimes can help regulate exclusion and subtractability, however those that have hailed state or private property as the “silver bullet” solution have at times overemphasized their role in sound resource management. Although the property regime under which CPRs are managed influences how they are used, it has been repeatedly shown that the rules –institutions- that accompany these regimes offer

deeper insight into how their use is regulated (Feeny, Berkes et al. 1990; Ostrom 1990; Tucker 2010).

When a CPR lacks both well-defined property rights and rules regulating resource use the resource is vulnerable to degradation and destruction. This set of conditions is found in “open access” situations where the absence of well-defined property rights over a common pool resource creates unregulated access to a resource making it free and open to anyone (Feeny, Berkes et al. 1990). When CPRs are managed as open access, exclusion and regulation are virtually impossible, but if exclusion is enforced, through clearly defined and implemented property regimes and rules that can effectively regulate subtractability, various regimes can sustain sound resource use. These regimes can include state or private property, with private property being either individual or collective. McKean and Ostrom (1995) argue that communally owned resources should be seen as a case of collective private property. Clearly defined property rights along with rules designed, implemented and enforced can address the challenges of exclusion and regulation faced in the management of CPRs.

The complexity of managing the commons can be appreciated in the extensive lists of elements that scholars have found associated with sound resource management (Agrawal 2002). Among these systematization efforts, in 1990 Ostrom proposed eight design principles of robust self-governing institutions. These design principles have since offered an analytical tool for the study of the institutional arrangements designed for CPR management and governance (Ostrom 1990; Morrow and Hull 1996; Sarker and Itoh 2001; Yandle 2003; Ghate 2004; Lobe and Berkes 2004; Ostrom 2005; Cox, Arnold et al. 2010; Tucker 2010).

Rodeo is a case in point: a rural resource-dependent community that has actively protected its forest resources for more than two decades (early 1980s to 2004). This paper examines both the ecological and social aspects of Rodeo's community forestry experience assessing the impact of the devised institutional arrangements in its communally owned forest. The process through which Rodeo established and enforced exclusion and regulated forest use will be analyzed using Ostrom's design principles (see Table 2.5).

### **Methods**

Rodeo was visited in 2004. Unlike the other two communities included in my dissertation this was the first and only visit. The community was chosen based on the references that community leaders provided on my pre-dissertation trips. When I explained my interest in studying community forestry in Eastern Guatemala, scientists and local leaders alike recommended Rodeo, highlighting how important it was to document their experience. The data for Rodeo was collected through interviews and community group exercises and registered in the IFRI protocols (Gibson, McKean et al. 2000), providing the basis for the institutional analysis of Rodeo's resource governance. The variables on rules existence and enforcement, definition of rights to the forest, demarcation of forest boundaries yielded an institutional index of strong or weak community forest-related institutions (see Table 2.2).

Forest sampling was done according to IFRI methodology requiring randomly selected forest plots. In this case, forest plots were square (18m per side). In each 324 m<sup>2</sup> plot, all trees whose DBH (diameter at breast height) was larger than 10 cm were measured (DBH and height) and species recorded. A second smaller square plot (5 m per side) was

established within the perimeter of the first plot. In this plot, saplings' species, height and largest diameter was recorded. Finally a third plot (1 m per side), percent cover of herbaceous vegetation and soil samples were collected. Geographic positioning data for each plot location was obtained with a GPS receiver. The protocols also ask researchers to note evidence of forest pests, diseases, and livestock grazing, soil characteristics and other features of each plot that are useful for analysis (CIPEC 1999; Tucker and Ostrom 2005).

Rodeo's community forestry experience involves two distinct communal forests: Rodeo forest and Cementerio forest. These forests are geographically separate and managed differently, thus they required independent sampling. In Cementerio forest mensuration was done with randomly selected plots while in Rodeo the plots followed a stratified randomly selected sampling. The stratified scheme was used to address Rodeo's forest management units.

### **Rodeo Jurisdiction, Rodeo Community and Rodeo Forest**

Rodeo is a jurisdiction (an aldea) of Camotán, the easternmost municipality (similar to a US county) of the department of Chiquimula (similar to a state or province). In 2004 the jurisdiction had 959 inhabitants belonging to 194 households of subsistence agriculture and migrant labor peasants. Its inhabitants are predominantly Catholic and speak Spanish.

The jurisdiction consists of six villages: Rodeo, Chantiago, Cementerio, Pashapa, Portezuelo and Socotoco. The Cucurjá river runs across its territory dividing it in two: Chantiago, Cementerio and Rodeo on the north side and Pashapa, Portezuelo and Socotoco on the south side of the river (see Map 2.1). The river lies at the bottom of a

ravine, rendering a significant geographic barrier between the north and south side villages. This division implies certain autonomy between the villages especially in regards to everyday livelihood tasks, such as the location of agricultural plots or where they collect firewood. Thus, the community forestry experience focus of this study pertains only to the three villages north of the Cucurjá river: Chantiago, Cementerio and Rodeo (see Map 2.1).

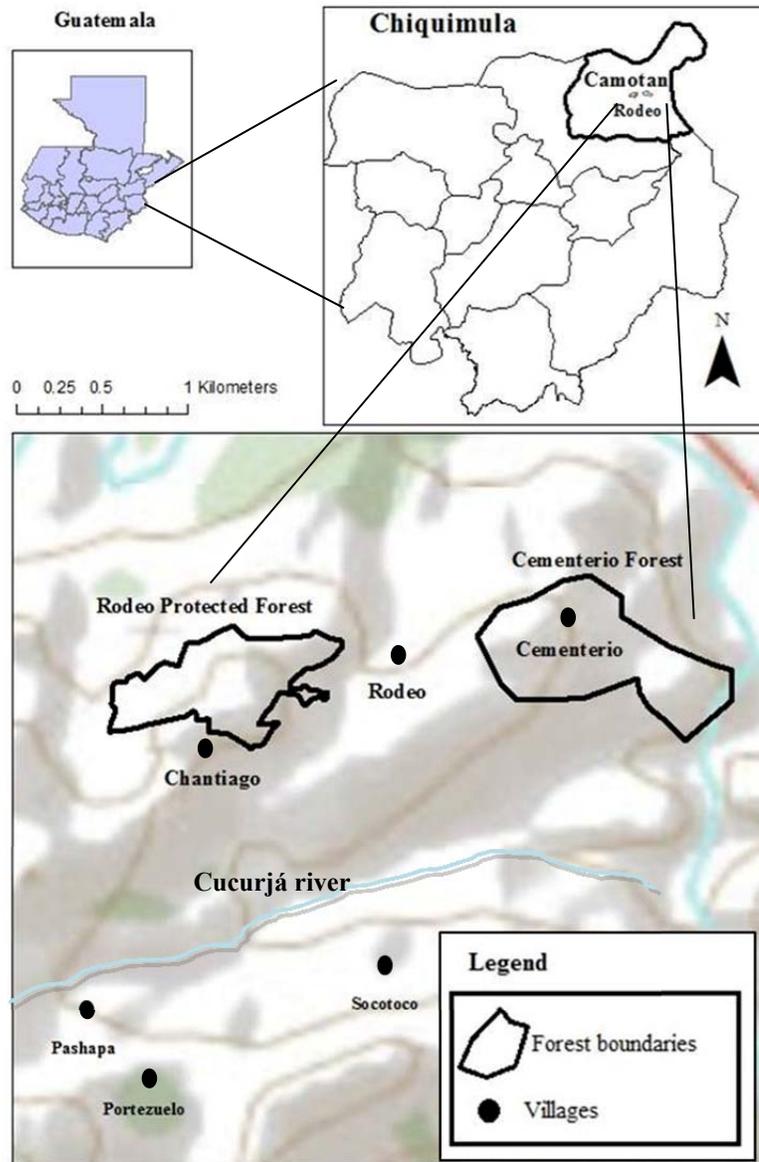
These villages have two divergent approaches to how they manage forest resources, one emphasizes forest conservation led by Rodeo and Chantiago together, and the other emphasizes the right of resource users to benefit from the forested land, led by Cementerio. To simplify and prevent confusion I will group Chantiago and Rodeo together and refer to them as Rodeo community. These two communities are located within one jurisdiction: Rodeo Jurisdiction.

Therefore, the actors in this community forestry experience are Rodeo community and Cementerio community. The communities oversee one forest each: Rodeo community oversees Rodeo forest and Cementerio community oversees Cementerio forest (see Table 2.1).

**Table 2.1 Communities and Forests Studied**

<b>Community name</b>	<b>Villages included</b>	<b>Forest name, size and tenure regime</b>	<b>Formal organization</b>
Rodeo	Chantiago Rodeo	Rodeo forest 51 hectares of continuous pine-oak forest. Municipal “ejido” of Camotán, with Rodeo holding it in usufruct.	ADECRO (Association for the Entrepreneurial Development of Rodeo)
Cementerio	Cementerio	Cementerio forest, 73 hectares of highly fragmented forest with many homesteads lying within forest “boundaries”. Municipal “ejido” of Camotán.	None

**Map 2.1 Rodeo's Villages and Forests**



## **Exclusion and Regulation of Forest Use in Rodeo and Cementerio Forests**

Rodeo forest is best described as a pine-oak woodland, open and scattered stands dominated by pines in some areas and by oaks in others. The dominant pine species is *Pinus oocarpa* Schiede with subdominant oak species including *Quercus sapotaefolia* Liebm., *Quercus crispifolia* Trelease, *Quercus peduncularis* var *sublanosa* (Trelease) Muller, *Quercus hondurensis* Trelease. On the other hand, Cementerio forest consists of small, scattered pine dominated stands (*Pinus oocarpa*).

Both forests are *de jure* property of the municipality of Camotán, municipal “ejidos” for the use of the local inhabitants. The municipal “ejido” law recognizes that these lands are for the use of the people of the jurisdiction wherein they lie. Thus, the municipal “ejido” forests of Rodeo jurisdiction should be available to both Rodeo and Cementerio communities.

However, in this case, the forested “ejido” lands are under differentiated rules regarding forest access and use. In Rodeo forest, the forest closest to Rodeo community, rights to the resource have been restricted for the sake of protection. Whereas in Cementerio forest, the forest closest to Cementerio community the people do not agree with forest protection and believe that the forest should be available for whatever use they may require of it. The divergent approaches to forest management have divided the communities and the forests causing an internal conflict. So in this case the forested “ejido” land is not available to everyone belonging to Rodeo jurisdiction, instead specific forest patches have been assigned to specific communities within the jurisdiction and all members respect these boundaries. Rodeo community refrains from entering Cementerio forest and Cementerio community does the same regarding Rodeo forest.

The above arrangements address exclusion of potential beneficiaries. The conflict between both communities ensures that Rodeo members avoid Cementerio forest to prevent possible incidents and vice versa.

To control subtractability, the second broad challenge of CPR management, Rodeo community has established rules that restrict consumption of resource units in Rodeo forest. Cementerio community on the other hand, allows users to subtract resource units as they wish to from Cementerio forest. Rodeo community institutional arrangements address both exclusion and subtractability resulting in an institutional strength index of strong institutions (see Table 2.2). Meanwhile, Cementerio community is only addressing exclusion from non-members but allowing members to use the resource without control, resulting in a weak institutional strength index and has resulted in the fragmentation of its forested area. Although Cementerio forest may have clearly defined access rules regarding who is allowed to harvest resources from it, community members have created an “open access” situation subtracting the resource freely and openly. Open access situations are those, where access to the resource is unregulated and is free and open to anyone. Table 2.2 details the status of rules regarding exclusion and subtractability for these forests.

The impact these contrasting approaches have had on the forests can be assessed with the analysis of the forest data collected.

**Table 2.2 Forest Rules and Institutional Strength Index**

<b>Existence of rules restricting consumption of: (1 = rule, 0 = no rule)</b>	<b>Rodeo</b>	<b>Cementerio</b>
Firewood (oak)	1	0
Timber (pine)	1	0
Kindling (pine)	1	0
Firewood for sugar processing (pine)	1	0
Land (clearing forest land for another use)	1	0
Clearly defined membership rights (yes = 1, no = 0)	1	1
Demarcation of forest boundaries (yes = 1, no = 0)	1	0
Monitoring (yes = 1, no = 0)	1	1
Rule enforcement (yes = 1, no = 0)	1	0
<b>Index of Institutional Strength (0 very weak, 4 medium, 8 strong)</b>	<b>8</b>	<b>2</b>

## Forest Assessment

### Rodeo Forest

When Rodeo forest was set aside for protection, external partners provided technical assistance. They established forest size, drew the map, defined management units, and outlined the conservation management plan. This management plan is the blueprint Rodeo community uses for its forest activities. Three management units were established according to the ecological characteristics and conservation needs of each area. *Mature pine* is considered a stable stand of pine dominated forest whereas *regeneration pine* is an area where significant forest clearing occurred. This area is where Rodeo forest reforestation activities concentrate. *Broadleaved* is oak dominated where forest laborers are allowed to harvest firewood for personal consumption only. The forest perimeter is constantly managed with fire breaks where needed. The pine species predominant in this forest is *Pinus oocarpa*, known locally as *pino ocote* used as kindling thanks to its high content of flammable resin. *Ocote* is a well-known forest product with a market value. In other communities, *ocote* is harvested for sale however Rodeo community members seem to not have been an avid seller of *ocote* prior to the change in protection status. Women do talk about a time when they would use *ocote* to light their fires, but state that it has been “very long” since then, nowadays they use small pieces of plastic or paper to light fires. All resource harvesting is clearly prohibited unless proper authorization is granted to specific resource users.

## **Cementerio Forest**

Cementerio forest is the name given to the forest patches that Cementerio community uses. The forest has suffered fragmentation and is more a network of small forest patches than a continuous forested area. The forest has been cleared to make room for new homes or agricultural fields. Timber has been harvested, and firewood collected. There are no clear boundaries or regulations for management in this forest, the only rule being that Cementerio community members are the only ones entitled to use the forest as they wish. The fragmentation is such that for the forest sampling the team had to skirt fenced-in homes and agricultural fields to find the randomly selected plot points. Species wise, Cementerio forest is also pine dominated (*Pinus oocarpa*).

## **Forest Analysis**

Table 2.3 summarizes the results from the analysis of forest variables. A first examination of these results highlights the differences between the oak dominant broadleaved management unit and the pine-dominated forests. Both basal area and DBH values are higher in pine-dominated forests. However, these differences can be explained by species composition characteristic of pine-oak woodlands and not due to human impact. Oak and pine are species with different growth patterns and rates, therefore basal area and density will reflect these differences. To assess forest condition in the oak dominated area, it would be best to compare it to another oak dominated area. This study did not identify a second oak dominated area that could be used for comparison.

On the other hand, the three pine-dominated forest areas are ecologically comparable; therefore statistical comparison can assess the impact of different management approaches on forest condition. The pine-dominated forests were compared using the

non-parametric Mann-Whitney two-tailed test. Mann-Whitney has been used in other studies making similar comparisons (Nagendra, Karna et al. 2005; Nagendra and Gopal 2010).

The only significant differences the Mann Whitney tests (see Table 2.4) yielded are for stem density per hectare between Cementerio and Rodeo forest management units. Given the substantially different approaches to forest governance these results illustrate the impact of these approaches in forest condition. Rodeo forest protection status has resulted in a forest with significantly more trees per hectare, albeit of smaller DBH, than those found in “open access” Cementerio forest. Cementerio’s tree density is not only significantly less than Rodeo’s pine area it is even smaller than Rodeo’s oak dominated management unit. Oak dominated woodlands are more sparsely populated than pine dominated areas and its trees are smaller in diameter. Yielding results lower than oak-dominated areas further emphasize the greater human impact that Cementerio’s forest endures. Anything from timber for housing to clearing for homesteads has been happening in this forest.

The lack of significant differences between Rodeo’s two pine dominated management units offers evidence of the consistency of Rodeo community rules and rule enforcement in their forest. The fact that significant differences were found in relation with a separate forest rather than within management units explains that differences are due to the contrasting community approaches to forest resources rather than Rodeo’s forest management plan.

**Table 2.3 Forest Characteristics and Mean Values for Forest Variables**

<b>Forest</b>	<b>Management units</b>	<b>Dominant species</b>	<b>No. of plots</b>	<b>Total mean number of trees per plot</b>	<b>Mean basal area (m<sup>2</sup>/ha)</b>	<b>Mean DBH (cm)</b>	<b>Mean density (stems/ha)</b>
Rodeo	Mature pine	<i>Pinus oocarpa</i>	31	9.8	12.85	22.8	304.7
	Reg. pine	<i>Pinus oocarpa</i>	30	10.3	10.96	20	316.9
	Broad-leaved	<i>Quercus spp.</i>	15	6.4	4.18	14	197.5
Cementerio	N/A	<i>Pinus oocarpa</i>	10	5.4	9.89	26.3	166.7

*Plot size 324 m<sup>2</sup> (square plots 18m x 18m)*

**Table 2.4 Mann Whitney P Values Rodeo and Cementerio Pine Dominated Forests**

	<b>Basal Area P value</b>	<b>Stem Density /ha P value</b>
Cementerio-Rodeo mature pine	0.0835	0.0012**
Cementerio-Rodeo regeneration pine	0.4535	0.0015**
Rodeo pine mature- pine regeneration	0.1596	0.6809

*\*\*Difference between the two samples is highly significant  $P < 0.001$  two tailed test*

## **Rodeo's Community Forestry Experience**

Rodeo's community forestry experience began decades ago when Rodeo community started to protect Rodeo forest from encroachers. Along the way they found allies in the church and the state. In the process, some allies like Maynor Barillas of BOSCOM became true "fans" of Rodeo investing time and energy to ensure Rodeo moved forward. At times, the process was slower than they wished, and though it has taken decades, in 2004 I found a solid community forestry experience. This section will recount their story, examining the experience through Ostrom's design principles of social ecological systems (Ostrom 2005). Table 2.5 outlines these principles while Table 2.6 offers a timeline of their community experience as reference.

### **1. Clearly Defined Forest Boundaries and Clearly Identified Users**

The first time Rodeo community organized to protect its forest boundaries was in the late seventies when powerful individuals from the neighboring village of La Quesera had arranged to have Rodeo's forest land titled over to them<sup>13</sup>. Rodeo challenged the claim successfully, reassuring their rights to the municipal "ejido" located within their town boundaries. Community leaders recall how this was their first experience in forest protection. In Guatemala, it is common to hear of similar experiences among rural communities. Communal and municipal lands occupy the last rung of Guatemala's property scale and are constantly threatened by powerful individuals who manipulate laws in their favor to expropriate land.

**Table 2.5 Design Principles of Robust Social Ecological Systems (Ostrom 2005)**

- 
- 
1. Clearly defined boundaries: physical boundaries of the resource and households with resource access rights are clearly identified.
  2. Proportional equivalence between costs and benefits: rules dictating resource use are related to local conditions and to the rules dictating labor, materials or money inputs.
  3. Collective-choice arrangements: those that are directly affected by the harvesting and protection rules can participate in their modification.
  4. Monitoring: monitors auditing physical conditions and user behavior are at least partially accountable to the users and/or are users themselves.
  5. Graduated sanctions: depending on the seriousness of rule violation, users receive graduated sanctions.
  6. Conflict-resolution mechanisms: users and officials have access to rapid, low cost arenas to resolve conflicts between users and between users and officials.
  7. Minimal recognition of rights to organize: user's rights to devise their own self-governance institutions are not challenged by authorities and users have long-term tenure over the resource.
  8. Nested enterprises: many activities (harvesting, protection, monitoring, sanctions, conflict resolution, and governance) are organized in multiple layers of nested enterprises.
- 
-

In 1995 through the partnership with the state forest agency, demarcation of forest boundaries was emphasized by establishing fire breaks in the communally owned forest. BOSCOM, the national community forestry office (Proyecto Bosques Comunales) helped map Rodeo's forest and supported the yearly maintenance of fire breaks. BOSCOM's main purpose is to support communities in the sound management and protection of their community and municipally owned forests, it belongs to the National Forest Institute (INAB) the state agency in charge of forest resources. INAB was established in 1996 through a new forest law to replace DIGEBOS (General Forest Directorate).

Rodeo forest boundaries are therefore clearly marked and easily monitored by Rodeo community members given its proximity to Rodeo community villages. Cementerio's forest boundaries, on the other hand, are not clearly defined and are not known to outsiders. The forest has been used quite heavily and there is no incentive to maintain forest boundaries. In fact, the dominant attitude towards this forest is against any form of control: mapping it or marking its borders would be interpreted as control and would be unacceptable.

## **2. Proportional Equivalence between Rules Dictating Resource Benefits and Costs**

Proportional equivalence between costs and benefits on the rules dictating resource use refers to the proportionality between what users may harvest from the forest (resource units) and what they are required to provide for its management (costs: labor, materials or money inputs). As summarized in Table 2.2, Cementerio forest has no rules and therefore no need to balance benefits with what is required of its members. The attitude

towards Cementerio forest emphasizes the right of Cementerio community members to benefit from it. The forest has been heavily used and what remains is a fragmented and sparse forest, a clear indicator that not only forest products are freely harvested but that the forest is also cleared to make way for homes and agricultural fields. Cementerio community lies within the forested areas identified as Cementerio forest and its users are from this village. Rodeo community members do not venture into this forest due to a long-standing conflict between the communities.

On the other hand, Rodeo forest has clearly established rules restricting forest use and therefore limiting the material benefits (as in resource units) Rodeo members can access. Table 2.2 summarizes these rules. They do have access to material benefits like resource units (firewood, timber harvested with prior authorization and granted case by case) but their benefits also include taking pride in being part of a forest protection effort, stating how important it is to ensure the resource is available for future generations. In regards to the costs Rodeo members must incur to maintain forest protection, the reforestation and fire break duties are rewarded with authorization to harvest resource units and through in-kind wages (foodstuffs from Food for Work programs used to cover wages for forest activities). Therefore, even though harvesting material benefits from the forest is limited there are other compensations guaranteeing proportionality between costs and benefits.

As of 2004 when I visited Rodeo, no commercial activities were operating in the community. However from secondary sources I have found out that in 2007 two organized community forestry groups were engaging in commercially oriented forest activities (handicrafts and furniture making) (Hurtarte 2007). According to 2004 rules, group members would be allowed to harvest forest resources for their commercial

activities only if they are actively participating in resource management and protection.

The groups venturing in these commercially oriented activities are identified as belonging to ADECRO – Association for the Entrepreneurial Farmers’ Development of Rodeo- Rodeo’s community organization (Ut'zChe' 2011).

### **Rodeo Community Development of Forest Rules**

Rodeo forest rules developed slowly, as Rodeo community became increasingly conscious of its desire to protect its forest (see Table 2.6 for a timeline). Their environmental consciousness began in the eighties and by the mid-nineties it had developed into a forest protection effort.

In the eighties, Rodeo began a partnership with the Catholic priest and nuns of the San Juan Ermita Parish<sup>14</sup>. At first, Rodeo learned about appropriate technology for soil conservation and medicinal herb gardens from the parish priest, sister “Maripol”<sup>15</sup> and the government’s agricultural extension agency. These were their first steps in environmental awareness. Maynor Barillas, a forest technician working for the national forest agency was also an important partner in this process.

By the mid-nineties, Rodeo community was actively engaging in forest protection activities. Maynor worked with Rodeo in establishing the first tree nurseries in 1993,<sup>16</sup> and the first reforestation in 1995. The alliance with Maynor was long lived, years later when he was promoted and left Eastern Guatemala for another regional post his allegiance to Rodeo remained. Ronaldo Camey, the forest technician that replaced him also developed a fruitful relationship with Rodeo, and although he has since departed, he

still is well remembered. These actors helped shape Rodeo's forest conservation commitment and therefore influenced how Rodeo came about designing its forest rules.

Other external agents like the technicians of the donor sponsored project PROZACHI (Proyecto Zacapa Chiquimula) also organized environmental awareness workshops and exchange trips to community forestry experiences in neighboring Honduras that were actually commercializing some forest products. These workshops nurtured Rodeo's environmental awareness and helped them visualize a future that could include not only forest conservation but also the possibility of sustainable forest management. In the words of Humberto Perez Santiago, one of their community leaders, "*we became conscious of our own unsustainable forest use and wanted to ensure we would now protect forest resources for the next generations*".

Before the mid-nineties Rodeo community forest use involved villagers extracting timber for construction and firewood for cooking and sugar processing. Timber harvesting is mostly of large pine (*Pinus oocarpa*) trunks for beams. The preferred firewood for every day cooking is oak (*Quercus sp.*), the slow burning hardwood provides hot coals for longer time. Oak firewood involves a constant but sparse harvest of dead wood, branches, and thinner trees without a visible scar on the forest terrain.

Sugar processing is a long-standing tradition transforming sugar cane into "dulce" – artisanal sugar. Sugar cane is grown, harvested, milled, and its juice transformed into "dulce" by cooking it over a blazing fire for many hours. This requires large split logs of highly resinous pine (*P. oocarpa*) whose resin flames easily yet burns quickly. Large numbers of fully grown pine trunks are needed to keep the fire going for hours. Providing

this firewood for the annual sugar making has a clearly visible impact on the forest given that many large trees are cut at the same time in one area.

When recounting their conservation story, community leaders talk about how Rodeo's sugar processing was clearly impacting the forest and how this was one of the triggers towards forest conservation. This was the first activity to be fully banned. When interviewed, Rodeo people commented on how they have stopped making "dulce". The rule restricting the consumption of pine trunks for "dulce" making was the first rule established, soon after rules restricting the harvesting of forest products and establishing forest management duties (reforestation and fire breaks) were established.

Firewood harvesting for everyday use is banned for most, except for poorer households (widowers, single-mothers, landless families) that cannot access firewood from private lots. The members of these poorer households are active participants of the forest management activities, thus their right to access forest resource units recognizes not only their needs but also their efforts in forest conservation. When interviewing them they proudly told me how they were allowed to go to the forest freely for firewood because they had helped plant new trees and cleared fire breaks to ensure its protection.

Timber harvesting is also banned, with the exception of first time home builders (a specified amount of timber for the first house). Home builders wishing to harvest timber must request permission prior to harvesting; they are expected to harvest no more than the authorized amount. These rules arose during the late nineties, when Rodeo community was consolidating the protection of Rodeo forest.

Aside from regulating harvesting of forest products, rules also regulate Rodeo forest

management. If a user wishes to harvest forest products he or she must partake in the activities of forest restoration and protection. Forest management activities are dictated by the management plan that forest technicians outlined for Rodeo forest (at Rodeo community's request). This technical work plan guides Rodeo's reforestation and fire break efforts.

Membership of the community forestry organization, ADECRO is regulated by rules. Basically, those Rodeo community members that actively participate in forest activities, both through harvesting and management, belong to Rodeo's community organization. These rules have come about slowly, evolving as forest conservation and management rooted itself in the community. They are not written but are known by everyone. ADECRO members know them by heart while non-ADECRO members know them superficially but everyone I interviewed clearly identified Rodeo as a forest where harvesting was not allowed.

### **3. Collective Choice Arrangements**

Collective choice arrangements imply that the users directly affected by the established rules can participate in their modification. In Rodeo community this is relevant at two moments in their experience: First, when Rodeo's forest status was changing in favor of forest protection, and second, in Rodeo's newly established rules for forest protection. When Rodeo began restricting forest use in favor of forest protection, a group of villagers outspokenly opposed any change in forest status. These villagers belonged to Cementerio community, the village furthest away from Rodeo forest. Their opposition to protecting the forest was such that led to the division between those that protect Rodeo forest (Rodeo community) and those against forest protection (Cementerio community).

Cementerio community argued that the “ejido” land forests were for the use of community members and that no one should regulate such use. The solution to this conflict was the decision to protect one forest (the one surrounded by the villages in favor of protection –Rodeo forest) and let the other operate as an “open access” resource (the one closest to the village against protection –Cementerio forest) where the only restriction is that it is open only to community members. See Map 2.1 for a visual reference of this division.

Rules that now dictate use within Rodeo forest are defined and enforced by ADECRO members. Interviews with various members stated that any active member may participate in rule modification, although I did not find any report of a rule having been modified at the request of a member. ADECRO’s 52 active members (one member per household) represent 27% of Rodeo jurisdiction 194 households and an even larger percent of households when only the people living in Rodeo and Cementerio communities are considered. The census data available offered data only at jurisdiction level reporting 194 households for Rodeo jurisdiction. Jurisdiction level (aldea) data includes the six villages that make up Rodeo jurisdiction (see Map 2.1 for a visual reference) and therefore reports a larger number of households than those directly related to Rodeo community forestry experience. If only Rodeo and Cementerio communities are taken into account, ADECRO represents approximately two thirds of the relevant users. ADECRO began as a community committee for self-improvement (Comité Pro-Mejoramiento) in the early nineties and was legally registered in 1997. PROZACHI<sup>17</sup> helped register it, paying a lawyer that helped Rodeo issue bylaws and register it as ADECRO<sup>18</sup>.

#### **4. Monitoring**

In Rodeo forest monitoring is carried out by Rodeo community members, therefore monitors are accountable to resource users themselves. All community members are aware of who gathers firewood, and timber harvests for housing needs are noticed and commented by everyone. ADECRO does not pay guards or assigns community duty to this specific task. Given that Rodeo community borders two thirds of the forest, movement into and out of the forest is clearly visible by most, and this is the basis of monitoring. It is also understood that ADECRO members will report any evidence of infractions they may encounter, when walking in the forest.

The most remote section of Rodeo forest borders the forest of the neighboring jurisdiction of “La Quesera”. This section is the least visible for Rodeo people but is monitored through the management of fire breaks. Although the forest laborers’ duty is only to maintain fire breaks, these mark the border with La Quesera. The maintenance of the fire breaks therefore has the dual function of patrolling the border and detecting infractions. When fire breaks are not being maintained, the men of ADECRO patrol periodically, although these patrols are not programmed according to a clearly designed rule.

The only monitoring of Cementerio forest is to ensure that Rodeo community members do not attempt to use this forest area.

## **5. Graduated Sanctions**

In 2004, Rodeo's sanctions were not designed as a graduating scale. They only had had experience with first time offenders. Just like their monitoring system, their enforcement design is informal in that no specific rules have been designed yet to deal with recurrent rule breaking and sanctioning. Even if the system does not account for graduating sanctions, it seems effective. Everyone interviewed knows the rules regulating forest use, have heard of what has happened to offenders, and seem to be willing to play their part in the system.

In 2004, first time offenders were sanctioned through a verbal reprimand and an invitation to meet with Rodeo community leaders to talk about forest resources. In the meeting, community leaders shared with the offender the reasons for forest protection and emphasized the importance of being an active ADECRO member. The offender was required to work in forest management activities. From the interviews I could gather that ADECRO leadership is quite subtle in how they impose sanctions. One such offender who was not an active ADECRO member was "invited" to join members in their next reforestation effort. The offender "gladly went along" to plant trees on the given date.

## **6. Conflict Resolution Mechanisms**

The process that resulted in the protection of Rodeo's forest evolved slowly, beginning with the environmental awareness some of its members developed through their participation in activities such as soil conservation and reforestation. The timeline included in Table 2.6 is a reference of the process through the decades from 1980 to 2000s. Even though the process did not involve a sudden modification of the forest status, discussions on forest protection led to uncertainty and fear among some of Rodeo

inhabitants. BOSCOM technician, Maynor Barillas accompanied this gradual transformation. He helped clarify doubts and appease fears by organizing workshops on the importance of actively protecting their forest resources and the benefits protection (both environmental and economic) could bring to the community. Antonio Perez Santiago, a village elder and former community president said of these workshops “*when tension in the community built up, Maynor Barillas would host a workshop per week, until it quieted down*”. Reducing the information asymmetries between those actively involved in the dialogues regarding the forest and non-participating members resolved much of the initial doubts. The majority of Rodeo members I interviewed were aware of the forest protection efforts and understood and followed the rules established. Most were either in favor of actively participating, or “neutral”, abiding by the rules and accepting that forest protection activities be carried out yearly.

Although opportune and transparent information on forest activities and goals calmed most people, not all were appeased. As mentioned earlier, the people of Cementerio community, the village farthest from the protected forest, were clearly against any forest protection and have a long history of conflict with pro-conservation ADECRO leaders. For them, the forest should not have any rules; it should be available for any need that may arise without any restrictions or sanctions.

Fortunately, their ideas on forest use extend only as far as their area of residence. Cementerio has a separate forest patch close by which its inhabitants use as an “open-access” forest (Cementerio forest), clearly opposing any attempt to regulate its use. The only rule is that the forest is for exclusive Cementerio community use. The availability of this forest patch and the decision to restrict forest protection activities to the other forest

has kept conflict somewhat under control. In the past conflict has escalated to dangerous levels involving physical violence and serious fear for the lives of community leaders.

Conflict was probably exacerbated by Enriquez Guerra, Cementerio's foremost leader and formerly associated with Guatemala's military. From 1960 to 1996 Guatemala suffered a genocidal civil war with more than 200,000 civilians, mostly indigenous rural farmers, murdered by the military. Although Eastern Guatemala suffered less during the war years, the war was present throughout the country. The army turned neighbors and families against each other. It accused everyone who did not show proof of allegiance to the counterinsurgency project of being communist guerrillas and traitors, punishable by death. In every community military commissioners were handpicked among community leaders to keep villagers under control and to denounce any suspicious behavior to authorities. Military commissioners amassed power and were influenced by the violent policies followed by the army during the war. Cementerio community leader, Enriquez Guerra, was the military commissioner for Rodeo jurisdiction. His actions against ADECRO leaders were more than likely influenced by the military system. One time Rodeo forest was set on fire and in another incident a tree nursery was destroyed. ADECRO leaders received death threats and there was an actual attempt on the life of one of them.

In 1995, Rodeo's forestry efforts were taking shape, fire breaks marking forest boundaries were established, and reforestation began to be carried out yearly. As Rodeo consolidated its community forestry experience the war was coming to an end with the signing of Peace Accords in 1996. The end of the violent legacy that probably exacerbated the community's conflict brought with it the tools needed to mediate it. As

Peace was negotiated between the guerrilla and the army, Human Rights Observers and conflict mediation became available. The Catholic Church and BOSCOM's agents who had been involved with addressing the Rodeo-Cementerio conflict were able to bring Human Rights Observers to assist in mediating conflict. Human Rights Observers who had come to the country due to the end of the war, came to Rodeo community to hear the testimony of those who received death threats. The Church and BOSCOM agents provided moral support and many times facilitated the transparent flow of information among both sides of the conflict, but when needed they also took more radical measures. Once, after tree planters setting out for the forest received death threats, BOSCOM responded by inviting soldiers to come and plant trees with them and reforestation was safely carried out. My skin still crawls thinking of the powerful message sent that day.

Interestingly, decades of fighting and living side by side sustaining collective action, has made their "enemies" reconsider. When I interviewed the leader of Cementerio, Don Enriquez Guerra, he stated interest in organizing development projects and forest conservation for Cementerio community. On their own, of course, as the village is clearly estranged from Rodeo community. After witnessing the benefits Rodeo community has reaped, he would lose community allegiance if he did not try to bring some of them to his village.

The fact that these two divergent approaches have coexisted side by side for almost three decades, offers the opportunity to assess how Cementerio community has changed its perception in regards to forest protection. Their lack of interest in a community forestry initiative led to their separation. However, from my interview with Enriquez Guerra he has slowly transformed his perception on this community effort. In the 90s he threatened

community leaders with death and organized the vandalization of tree nurseries and the forest. In 2004 he talked about his interest in organizing Cementerio to participate in community development projects including forest conservation. This study did not focus on how Rodeo's experience may be impacting Cementerio's outlook in regards to forest conservation, but a future study could.

Rodeo community experience with conflict is vital to understand their self-governance efforts. They had access to low cost conflict resolution mechanisms through the Human Rights Observers that came to document the threats and through the mediation of wise experienced partners (Church and BOSCOM) who helped them keep conflict at a manageable level. The fair solution of having a geographically separate forest whose status remained unrestricted helped keep the conflict at bay. However much mediation did take place and a new violent outburst is still possible.

### **7. Minimal Recognition of Rights to Organize:**

Rodeo's rights to organize and protect its forest are recognized, even if minimally. Guatemala's laws are full of contradictions and given the long-standing lack of support for traditional forms of governance and property, it is no surprise that community forestry makes do with the minimum. The Forest Act enacted in 1996 recognizes indigenous and local groups as actors potentially capable of sound forest management. However, the Act also recognizes municipal governments as stakeholders in charge of planning, authorizing, and overseeing forest activity within their boundaries. The recognition of the municipality as the authority undermines the community based traditional forms of governance of indigenous and other rural groups. By recognizing municipal government as the local branch of the forest service, the Act added extra fuel to centuries of conflicts

between municipal and indigenous/local power struggles especially concerning land disputes.

Although the people of Rodeo are conscious of the fact that their communal lands were expropriated during the government of Justo Rufino Barrios I did not sense resentment towards the municipal power over the land and resources. In this case, Rodeo's self-governance capabilities led the municipality and the national forest agency (via BOSCOM) to rely on them in forest matters both for Rodeo forest but also for other forested "ejido" lands in the municipality.

In support of Rodeo's community forestry efforts, the municipality of Camotán granted Rodeo community usufruct rights to Rodeo forest enabling them to participate in the government sponsored Forest Incentives Program. This program offers economic incentives for reforestation, forest maintenance and standing forest protection. Rodeo's participation in this program would ensure a source of income to fund forest protection activities for five years. The forest incentives program requires legal proof of ownership of forestland, thus the need for a usufruct arrangement from the Municipality. With BOSCOM's help they negotiated with the Municipality of Camotán usufruct rights to the forest<sup>19</sup>. The municipality granted usufruct rights but accessing the program was not possible due to a mortgage previously placed on all of Camotán's municipal land.

Decades ago, a mayor of Camotán mortgaged the municipality's forests to a paper pulp company. The municipality never paid the debt and the paper pulp company could not harvest the trees (the pulp mill was never built) so the debt was left standing. Even if this strategy failed to allow Rodeo access to a program that would strengthen them, the Municipality of Camotán is Rodeo's partner.

In 2004, when I studied Rodeo, they were waiting for the PINPEP program to begin (Forest and Agroforestry Incentives Program for Small Land Possessors), a forest incentives program for smallholders whose property ownership requirements would be community-friendly. This program was created to help communities like Rodeo overcome the obstacles that the “regular” incentives program (PINFOR-Forest Incentives Program) had. Although I have not visited Rodeo since 2004, I have learned from a newspaper article that PINPEP has since engaged Rodeo community members in community forestry activities (Hurtarte 2007). In the website of the Guatemalan Community Forestry Association Utz’ Ch’e, ADECRO is reported as a member having two organized groups within its structure: a women’s group working with pine needle handicrafts and a men’s group making furniture (2011). When interviewing community members, they talked about potential projects like these ones, but at the time of my visit none were operational.

## **8. Nested Enterprises**

Even if national policies are generally not supportive of local community self-governance systems, Rodeo’s appropriation, monitoring, sanctioning and governance activities are nestled within “welcoming” municipal and national agencies and policies. They have forged positive alliances with local (Catholic Church, Municipality of Camotán) and national authorities (BOSCOM and INAB). The municipality of Camotán recognizes their leadership in community forestry and appointed the municipality’s forest technician to be based in Rodeo, and from there offer his services to other towns. Their reputation precedes them; every municipal and regional authority I talked to recognized their merit and commented on how good it was that I was documenting their experience.

**Table 2.6 Timeline Rodeo’s Community Forestry Experience**

<b>Date</b>	<b>Event</b>
Late 70s	Rodeo forest titled over to powerful individuals in neighboring La Quesera. Rodeo challenged the claim and restored rights to the community “ejido” lands.
Early 80s onwards	Catholic church and government agricultural extension agency engage Rodeo in agriculture, home medicinal gardens, and agroforestry projects.
1980	Rodeo’s Comité Pro-Mejoramiento established (committee for community improvement), ADECRO’s predecessor.
1985	Drinkable water comes to Rodeo
1991	PROZACHI project begins
1993	First tree nurseries established
1995	Fire breaks established along the border of the communal forest Rodeo
1995	Reforestation Rodeo forest begin
1995-1997	Cementerio community leader threatens to burn Rodeo community tree nurseries Cementerio community leader threatens Rodeo community leaders (death threats) Catholic church and BOSCOM mediates Rodeo-Cementerio conflict
1996	New Forest Law establishes INAB (National Forest Institute) Peace Accords signed, ending 36 year long civil war
1997	ADECRO (Rodeo’s community organization) formally established.
1998	Forest Incentives Program (PINFOR) begins
2002 - 2003	To help Rodeo participate in PINFOR the Municipality of Camotán issues a formal usufruct of the Rodeo forest to Rodeo community Electricity installed in many but not all of Rodeo town
2003	PROZACHI project ends
2004	IFRI first site visit
2006	Incentives program for forest and agroforestry smallholders (PINPEP) begins
2007	Rodeo community begins process to request monetary incentives for Rodeo forest protection from PINPEP
2007	Rodeo community women organize and establish Corazón del Bosque, a women’s organization dedicated to pine needle handicrafts.

## **Conflict Resolution Mechanisms**

Ostrom (1992) indicates that the application of rules is often ambiguous; the simplest rule can have as many interpretations as there are users. Therefore, for users to abide by rules over long periods of time a mechanism for discussing and resolving what is and what is not an infraction is necessary. Having inexpensive, readily accessible spaces where such discussions can take place allows users to adjust and develop rules as needed.

It is expected that most conflict will arise at the collective choice level, where rules affecting the everyday use of a resource are crafted. Having a space to discuss and solve difference on rules defining who, when, how much product can be taken, who monitors, and what sanctions are imposed is necessary. These collective choice rules define the framework in which rules dictating day to day functions are designed and enacted (Ostrom 1990; Ostrom 1992; Ostrom 2005).

In the case of Rodeo community a fundamental change in the collective choice rules came when they decided to change the “open access” status in favor of almost exclusive protection for its forest. Not everyone agreed to the radical change in forest status, much less to the new rules that would severely limit the extraction intensity the town was accustomed to. Information and environmental awareness workshops addressed the fears of most and members agreed to the collective choice decision and policy change. The forest’s status changed and Rodeo community devised new operational rules for Rodeo forest.

But Cementerio’s leader and members continued to oppose the changes and much conflict mediation was required. Ostrom (1992) posits how difficult it would be for a

long enduring self-governing system to survive without some version of conflict resolution and also emphasizes how these mechanisms are mostly born informally with leaders taking a core role in resolving conflict, thus emphasizing the role of leadership. If leaders are not able to address conflict, it will hinder sustained collective action.

Rodeo was able to find a way around the conflict. A middle ground was found, where differences were not resolved but held at manageable levels. The forest patches in Cementerio's vicinity remained "open access" so that those against any protection continue using the forest resources as they always had. As the forest analysis shows the "open-access" situation of the Cementerio forest has led to serious degradation.

### **Conclusions**

The forest analysis shows that Rodeo forest has bigger stem density and basal area, indicators of the area's larger number of trees and less fragmentation than Cementerio forest patches. The data documents the level of degradation that Cementerio forest fragments have suffered. Regarding the state of Rodeo forest, it is in much better shape than Cementerio forest. Considering the intensity of previous use, it is likely that protection and management action in Rodeo forest are facilitating its recovery, especially in the areas that are being reforested.

These results are a reflection of how Rodeo community changed its approach to forest governance two decades ago; they have planted trees and prevented fires. As the trees grow, forest management will need to shift to include thinning and other tasks required to help the forest develop into a mature stand. Also, as forest business opportunities have arisen new rules will have to be devised to responsibly harvest timber. Their collective

action experience is abundant and their experience with conflict will be especially useful as rules evolve to accommodate new tasks.

Rodeo's experience facing and standing up to conflict is worthy of attention, not so much because they have been able to solve conflict but because they have been able to keep it under control. Death threats haven't been more than threats, and vandalism of tree nurseries or reforestation efforts have not occurred since the late 90s, but when one talks to both sides of the conflict, the divide between them is palpable and very much alive. Any moment, further violent conflict could start again.

Rodeo and Cementerio communities and forests offer a case of side-by-side protection and degradation. One jurisdiction, under the same property rights, state and national laws, has two diverging approaches to forest management and two forests where these approaches are implemented. While it crafts, implements and enforces rules to regulate forest use in one, it leaves the other as an "open access" resource. The protected forest has significantly more trees; the "open access" forest is greatly fragmented and sparse.

In 2004 Rodeo community forestry did not include an income generating, sustainable timber management operation or a non-timber forest extraction initiative. The forest is also not associated with protection of water sources and it doesn't hold an explicit spiritual value. Only two decades ago, they were harvesting firewood and timber without a thought about its well-being or integrity. Awareness on how the health of the ecosystem affected their own livelihood was instilled in Rodeo's people in such a profound way that it effectively transformed their views on the forest and its value. They wanted to protect it for future generations; they also hoped to create one day a forest based business initiative.

Their experience can attest to the many ways that successful collective action comes about, as well as, the challenges self-governance of the commons must face and overcome.

Locally crafted institutions lie at the core of CPR governance, when these are allowed to evolve, adapt and change, they can guide enduring successful self-governance. Rodeo's ability to overcome collective choice level conflict and shift from "open access" to regulated use and protection, while dodging death threats is admirable. Around the world, resource-dependent rural communities are showing how capable and talented they can be in managing forest resources. Rodeo is one such case. It continues to evolve and grow.

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<sup>13</sup> As mentioned in the introduction, Guatemala's consistent undermining of indigenous and local traditional peoples has allowed for all sorts of atrocities done against community land. Titling of communal or municipal land to powerful, politically connected individuals is common in Guatemala's history from the time of the Liberal governments that expropriated land in favor of foreigners and wealthy locals to the civil war that ended in 1996, during which many army generals ended up owning vast expanses of land that traditionally had been used and held in common by local rural poor communities.

<sup>14</sup> The Parish of San Juan de la Ermita serves the municipalities of Jocotán and Camotán.

<sup>15</sup> Antonio Perez Santiago was the key informant for Rodeo's history. Names like nun Maripol are rendered here as he recalled them, without any archival verification. The priest's name was Juan Maria Boxer.

<sup>16</sup> Bosques Energéticos project and Maynor Barillas, the technician in charge. He would later on work with them through BOSCOM, the forest agency community forestry office. Maynor Barillas and BOSCOM are key in Rodeo's community forestry experience. Ronaldo Camey would later on replace Maynor and also play a core role.

<sup>17</sup> PROZACHI I and II-Rural Development Project for Small Producers in Zacapa-Chiquimula- project ran from 1991 to 2003 (two phases).

<sup>18</sup> ADECRO was officially registered in the Acuerdo Ministerial 416-97 issued on December 4 1997 and published in the Diario de Centro América on December 26 1997, Volume CCLVIII, Number 5, page 109.

<sup>19</sup> To participate in the program, proof of legal ownership of the land is required. This requirement greatly reduces the ability of community owned forests to participate. The program recognizes usufruct rights as acceptable proof of ownership; some communities have been able to enter the program this way. Rodeo was hoping they could do so.

## **CHAPTER 3**

### **METHODOLOGICAL CONSIDERATIONS FOR MULTIDISCIPLINARY COMPARATIVE RESEARCH ON FOREST MANAGEMENT INSTITUTIONS**

Research centers involving not only multiple disciplines and methods, but often multiple centers in various countries have rapidly emerged to work on anything and everything from cancer and evolution to deforestation and human dimensions of global change. The International Forest Resources and Institutions (IFRI) research program is one such effort, an interdisciplinary and international network that for over 15 years has contributed to the study of collective action in forests around the world. Its efforts bring together social and natural sciences committed to the advancement of what we know of collective action, common property, institutional arrangements, and forest governance. In most IFRI sites a well-trained forester leads the team doing forest mensuration and a well-trained social scientist leads the team assessing social processes and outcomes. Occasionally, teams have been composed primarily of social scientists or foresters and may not fully understand the implication of the way they define a study unit. Studying multiple levels of governance to understand how users make decisions about forest resources and their outcomes is a delicate balancing act. This fruitful alliance has resulted in significant contributions to the study of diverse institutional arrangements and forest resources. As with any serious science, the program does revise its methods, tools and approaches. This chapter contributes to the program's reflection on the challenges faced when joining different disciplines to contribute to the knowledge of forest governance.

## **Interdisciplinary Research and the Study of Common Property**

Interdisciplinarity has catalyzed (beyond what traditional disciplines could have achieved) the advancement of research for today's important scientific challenges. The global environmental problems that we face require the breakdown of traditional disciplinary boundaries to systematically approach the complexities of human-environment interactions (Moran 2010). Understanding land-use and land-cover change greatly benefits from interdisciplinary approaches (Geist and Lambin 2001; Dietz, Ostrom et al. 2003) and so has the study of collective action for the governance of the commons.

The study of collective action and the commons is an area of study that has been a fertile ground for growth in the juncture of multiple disciplines and methods (Gibson, Ostrom et al. 2000; Moran and Ostrom 2005; Tucker and Ostrom 2005; Poteete, Janssen et al. 2010). Our understanding of collective action, common property, common pool resources (CPRs), and their governance is largely due to the fruitful crossroads of multiple disciplines, methods and scales of analysis. Common-pool resources generate goods that are subtractable, therefore depletable, and whose control by potential users is possible only at a cost to themselves. These characteristics require institutional arrangements to manage subtractability and excludability for their management.

When the institutional arrangements are designed communally, common property regulates the preservation, maintenance, and consumption of a common-pool resource (Ostrom 1990; McKean 2000). Common-pool resources include forests, fisheries, and irrigation systems among others. Multiple disciplines including anthropology, political

science, geography and ecology and methods ranging from ethnographic research and Geographic Information Systems to theoretical games and mathematical models have come together to study the integrated biological-social nature of CPRs and their management (Ostrom, Walker et al. 1992; Ostrom, Gardner et al. 1994; Tucker 1999; Gibson, McKean et al. 2000; Evans, Munroe et al. 2005; Nagendra, Karna et al. 2005; Tucker and Southworth 2005; Hayes 2006; Ostrom and Nagendra 2006; Vogt, Banana et al. 2006).

### **The International Forest Resources and Institutions –IFRI- Research Program**

For more than 15 years, the IFRI Research Program has brought together social and biological scientists to study forests and diverse institutional arrangements. IFRI is the only international and multidisciplinary forest monitoring and research program for forests under a broad range of property regimes –community managed, government owned, and private. It is also the only research network to focus primarily on forest governance over time and space (Wollenberg, Merino et al. 2007).

IFRI is a global network of 13 research centers that monitors forest condition at community level, seeking to understand how institutional arrangements define the governance of communally owned forest resources. It has brought together not only multiple disciplines but also scholars from many countries all concerned with the state of forests and the local communities that manage them. IFRI has worked in 18 countries since 1992, using the same methodology and protocols across 239 unique sites and 471 forests<sup>20</sup> offering a systematic and comparable data set across countries, landscapes, and cultures. IFRI's use of multiple methods combine “micro scale” field visits that map out

the biophysical, social, economic, political, and institutional factors that define forest governance with “macro scale” methods such as satellite imagery, geographic information systems (GIS), and modeling for an in-depth analysis of each forest-community relationship and its linkages to broader scale policy and theory research. Data collected by multidisciplinary teams around the world is comparable given their adherence to a specifically designed set of protocols for collecting and analyzing social, institutional, biophysical, and remotely sensed data. The program has the added value of offering comparable data over time since IFRI sites are revisited every three to five years when possible. In 2011 the database included 54 sites that have been visited at least twice, 23 sites that have been visited three times, and two sites have been visited four times. (Tucker and Ostrom 2005; Wollenberg, Merino et al. 2007; Poteete, Janssen et al. 2010; Tucker 2010)<sup>21</sup>.

IFRI has made a valuable contribution to the knowledge of how local communities manage forests, their strengths and challenges (Gibson, McKean et al. 2000; Wollenberg, Merino et al. 2007), beyond the network it is seen by scholars and policy analysts as a valuable platform for the study of communally owned forests and the locally crafted institutions (Wollenberg, Merino et al. 2007). Methodologically, it offers insight on how to design a multi-country interdisciplinary long term research program and network.

Being an interdisciplinary long-term program IFRI provides a unique opportunity to explore the strengths and challenges of interdisciplinary international research networks (Wollenberg, Merino et al. 2007). For IFRI one of such balancing acts is between the disciplines of forestry and social science. The methodology is designed to understand the result of diverse institutions for forest governance, relying in both social and forestry

methods to adequately represent a social and ecological snapshot of a community's forest and members (Wollenberg, Merino et al. 2007). IFRI's emphasis on resource governance has sometimes put forest sciences in a somewhat disadvantageous position because a few field studies have favored the social methodologies and have undertaken a minimum of forest sampling or none. Regardless, IFRI publications are valued for the studies are based on much more forest data than most community forestry studies (Wollenberg, Merino et al. 2007).

The network is committed to providing a sound and strong dataset of community forestry experiences but it faces many challenges including time and money constraints to carry out its multidisciplinary case studies. For example, some IFRI scholars argue that the intensity of some forest mensuration (such as measuring ground cover in a well-defined but small area) is either prohibitively costly or too time consuming for the level of analysis given to this data. IFRI scholars recognize that they need to reassess their forest methods to have them be more feasible to reduce the cumbersomeness and make better use of the data.

Currently, some IFRI studies are beginning to use "reference forests" as a baseline against which the studied forests can be compared. Such comparisons help control for the biophysical factors that shape forests, allowing for a stronger analysis of the institutional factors that influence forest outcomes. Reference forests, are ideally old growth forests that have had very little human and natural disturbance. By comparing the studied forests to them, ecological differences between them could help strengthen institutional analysis of forest governance (Tucker, Randolph et al. 2007; Tucker, Randolph et al. 2008).

The IFRI social-ecological interface has conducted in depth analysis of specific cases, as well as, compared multiple cases using appropriate statistical tests. However, some IFRI studies have not taken into account the biophysical factors that could explain the findings that they attribute on institutional arrangements. One such case is the one studied here.

### **Revisiting IFRI Sites**

In 2004, I carried out site revisits for two IFRI sites in Eastern Guatemala that were first visited in 1998. I purposefully included these IFRI sites in my dissertation research design because it allowed me to study the sites overtime. During the revisit, I found significant discrepancy with the interpretation of the forest data collected in 1998. This chapter will offer an alternative interpretation.

In 1998, an IFRI team compared forest condition between two private and three community owned forests, thus contributing to the long standing debate on the role property rights play in collective action situations. Their conclusions were based on the statistical analysis they did of the collected forest data. The statistical analysis of forest variables showed that one community-owned forest had a significantly different (and better) forest condition than any of the private or other communally owned forests. This forest was also the only forest actively protected by a community, so they concluded that even in the absence of the *de jure* private property rights, the institutional arrangements designed and enforced to protect a communally owned resource can be a stronger indicator of conservation (better forest condition) than the *de jure* property rights of the privately owned forests (Gibson, Lehoucq and Williams 2002).

Gibson, Lehoucq and Williams (2002) used the 1998 data to argue that de jure property rights were not a better indicator of forest conservation than de facto institutional arrangements crafted for forest protection with the help of a t-test showing that Cebollas Protective (the communally owned forest with strong institutions) was in better forest condition than any of the other communally or privately owned forests. The core argument of this chapter is that ecological differences among these forests are significant, and therefore institutional differences are an improbable explanation for contrasting forest conditions. This study therefore points to the importance of genuinely multidisciplinary collaborations among biological and social scientists, a principle that is central to IFRI, but which is hard to maintain.

The study *"Does Privatization Protect Natural Resources? Property Rights and Forests in Guatemala"*(2002) offered an additional peer reviewed publication supporting the explanatory power of institutions for collective action over property rights. The article is cited repeatedly (31 times according to a search on Google Scholar and ISI Web of Knowledge) to highlight the power of *de facto* institutions that dictate forest governance in communally owned forests over *de jure* property rights of privately owned forests and to discuss the conditions that lead to the crafting of institutions for collective action.<sup>22</sup>

In 1998, the community forests of Cebollas and Tesoro (see Map 3.1) were compared with the privately owned forests San Jose and Tachoche<sup>23</sup> visited during that same field session. In 2004, the second IFRI team re-visited only the communally owned forests and was particularly interested in the community owned protected forest that had offered such compelling institutional results. It was my intention to see if the status of this protected

forest had changed five years later, specifically whether the reported better forest conditions and stronger institutional arrangements had prevailed.

Cebollas, Quezaltepeque is a community in the department of Chiquimula where the local community set aside 20 hectares of forest as a reserve; known as the Cebollas Protective Forest. The community also has 457<sup>24</sup> hectares of unprotected forest identified as the Cebollas Communal Forest. Map 3.2 illustrates the location of Cebollas community and its forests. The institutional arrangements of Cebollas Protective include strictly enforced rules against any use (timber, firewood, cattle grazing, or land clearing) except for occasional hunting while in Cebollas Communal the one, and rarely enforced, rule is that the forest is for community subsistence (i.e. timber can only be harvested to meet household needs)<sup>25</sup> and should not be cleared for other purposes.

Not only are institutions different for both forests but ecologically they are significantly different. Cebollas Protective is a broadleaved cloud forest while Cebollas Communal is a pine-oak forest.

Tesoro is the other community forest visited in 1998 and 2004 (see Map 3.3). This forest comprises 736 hectares of pine-oak forest, similar in tree species composition (pine-oak) and rainfall to Cebollas Communal forest. The rules for this forest are also similar to Cebollas Communal in that they are poorly enforced and allow all community members to use and harvest forest products for subsistence needs. Tesoro has had major infractions (large clearings to establish coffee plantations and significant timber sales for profit) and has attempted to tighten its rules but unsuccessfully. In 1998, the team found a recently formed Forest Committee, which by the 2004 visit had dissolved. In 2004, additional

large forest clearings were reported and some community members expressed their concern for the fragmentation of their communally owned forest.

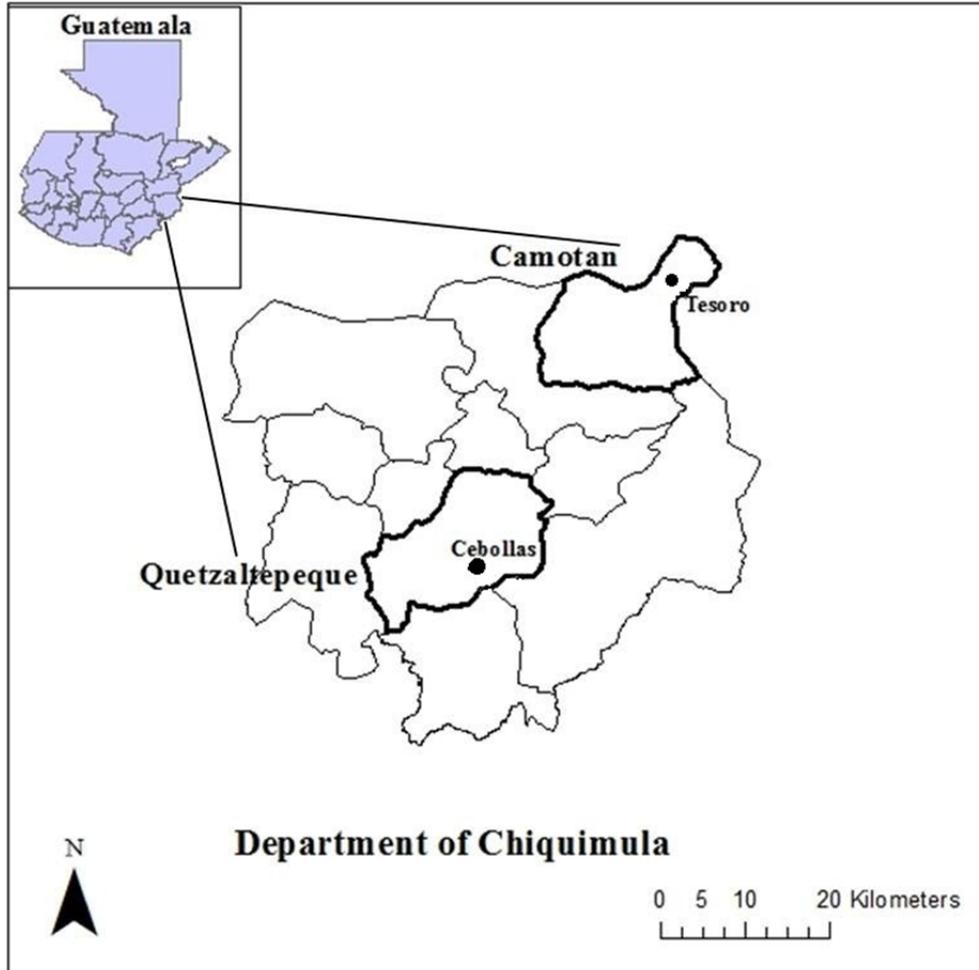
When the forest sampling began in 2004, it was quickly obvious that Cebollas Protective Forest was an ecologically distinct forest from the pine-oak forests to which it was previously compared. Every other forest included in the study was a tropical dry pine-oak forest. Gibson, et al (2002) identified all forests as tropical dry forests. However, like other broad-leaved cloud forests, Cebollas Protective has persistent cloud contact with tropical mountain vegetation, high precipitation and humidity, dripping moisture, and plenty of mosses and epiphytes on trees (LaBastille and Pool 1978). Given their high humidity cloud forests are known to be more biologically diverse. The dominant tree species in Cebollas Protective were *Liquidambar* *Styraciflua* L. and oaks (*Quercus sp.*).

The remaining IFRI forests studied in these sites are pine-oak forests. Pine-oak forests are usually made up largely of pines, oaks being subdominant or sometimes absent; they can also resemble more open woodlands, scattered stands that may be dominated by pines in some places, by oaks in others (Leopold 1950). Both Cebollas and Tesoro communal forests are pine-oak woodlands with most areas dominated by pine (*Pinus oocarpa* Schiede) and some smaller areas dominated by oaks (*Quercus sp.*).

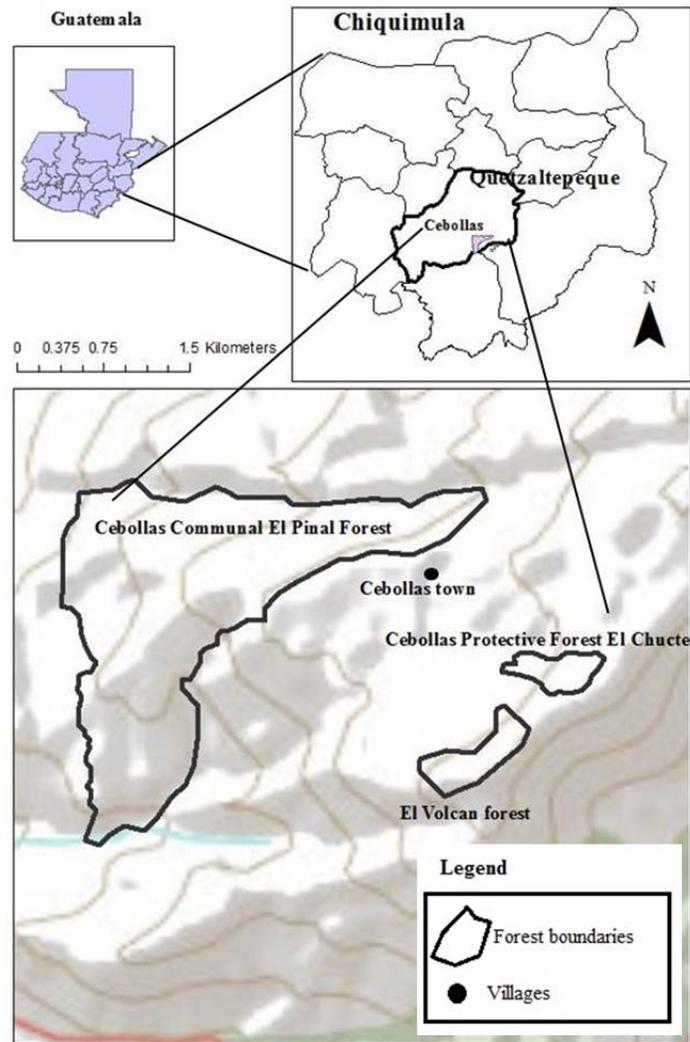
Tropical dry pine-oak and broadleaved cloud forests are ecologically different enough to render their comparison of forest variables highly problematic. When broadleaved forests are also cloud forests, they are even more diverse due to the higher humidity and more different from pine-oak forests. Therefore any comparison between these ecosystems must be done carefully.

To address this issue, the 2004 team identified an ecologically similar (but unprotected) forest to Cebollas Protective so that these forest could be compared and therefore assess if Cebollas Protective is in fact in better forest condition (than the unprotected cloud forest). The comparison will control for ecological variables, if this analysis confirms that Cebollas Protective is in better condition, it can be ascertained that enforced *de facto* institutional arrangements are protecting the forest even in the absence of *de jure* property rights, as Gibson et al argued. The unprotected forest is known in Cebollas as El Volcán (see Map 3.2).

**Map 3.1 Cebollas and Tesoro Sites**



**Map 3.2 Cebollas Forests Sampled in 2004**

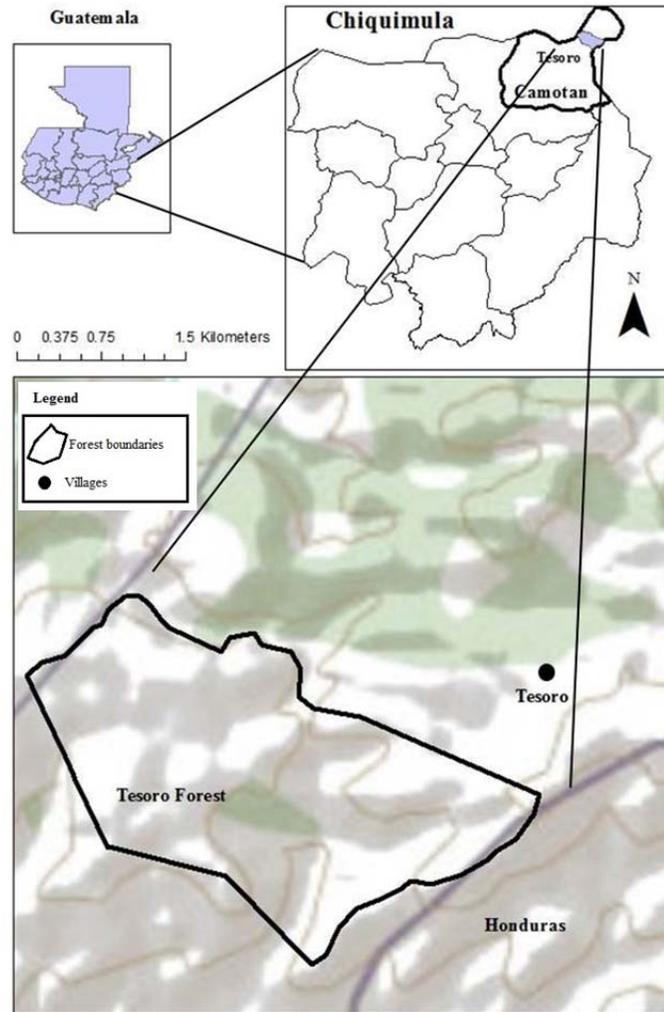


*Cebollas Communal Forest is known by Cebollas's members as El Pinal Forest*

*Cebollas Protective Forest is known by Cebollas's members as El Chucte Forest*

*The unprotected forest identified for the 2004 study is known by Cebollas's members as El Volcán Forest*

**Map 3.3 Tesoro Forest Sampled in 2004**



## Methods and Analysis

Forest plots using the IFRI methodology were done in all of Cebollas and Tesoro forests visited in 1998. The 2004 plots were established trying whenever possible to approximate the actual location of the original plots.<sup>26</sup> The 2004 study was able to establish additional plots, increasing the representativeness of the dataset to actual forest conditions.

In addition to the forests sampled in 1998, the team identified the cloud forest “El Volcán” to have an ecologically comparable forest for Cebollas Protective. El Volcán neighbors Cebollas Protective, being separated only by about 150 meters. These forests were connected in the past (see Map 3.2). Both forests lie in the land of Cebollas but the community actively protects only Cebollas Protective.

Rules for the conservation of Cebollas Protective were drafted in 1995 to assure the protection of the community’s water source (the water distributor for Cebollas lies within this forest) against encroachers. These conservation rules were crafted for Cebollas Protective after an outsider cleared 1.4 hectares of the forest to grow coffee. The outsider claimed a Cebollas member had sold him the land and an additional 1.4 hectares in the same forest. The community argued that the communal land could not be sold and negotiated with this outsider allowing him to keep the hectares already cleared, but prohibiting him from further encroachment. The community also asked that in exchange for the 1.4 hectares granted that he cover the costs of fencing in the remaining 20 hectares of the Protective Forest to prevent a similar situation from happening.

El Volcán is a tract of 29 hectares of cloud forest where community members occasionally hunt, this being the only forest product identified by the community for this

forest. Firewood, kindling and timber are more easily harvested in Cebollas Communal given its forest species composition, proximity and easy access. Cebollas's communal pine-oak forest is dominated by *Pinus oocarpa*, a highly resinous pine tree used for kindling (ocote). Pine trees are also optimal for timber with their tall straight trunks and easy to work wood. In addition this forest neighbors the community and is quite sparse making it easy to reach and walk in. Neither Cebollas Communal nor El Volcán have clearly enforced rules regulating forest use.

Comparing IFRI forest variables between El Volcán and Cebollas Protective offers an ecologically sound comparison of forest conditions to assess the impact of institutions in the protected forest. Both are cloud forests, but differ in regard to the forest protection status. If the forest variables assessed are significantly different the results could lead to a conclusion regarding the reasons for any significant differences found.

IFRI's forest mensuration methodology relies on sample plots (in this case square plots 18 x 18 m). In each plot, diameter at breast height (DBH), height, and species was recorded for trees and saplings (saplings in a smaller nested 5 x 5m plot). Trees were either identified to species level or samples collected for later identification. A second smaller square plot (5 m per side) was established within the perimeter of the first plot. In this plot, saplings' species, height and largest diameter was recorded. Finally in a third plot (1 m per side), percent cover of herbaceous vegetation and soil samples were collected. Latitude and longitude data for each plot location was recorded with a Geographic Positioning System (GPS) receiver. The protocols also ask for evidence of forest pests, diseases, and livestock grazing, soil characteristics and other features of each plot (CIPEC 1999).

A non-parametric Mann Whitney test was used to assess whether ecologically comparable forests differed significantly in measures of basal area, density and diversity. The Mann Whitney test has been used by other IFRI colleagues in similar analysis (Nagendra, Karna et al. 2005; Nagendra and Gopal 2010).

**Table 3.1 Forest Characteristics**

<b>Forest name</b>	<b>Type of forest</b>	<b>Mean elevation (masl)</b>	<b>Mean slope (degrees)</b>	<b>Mean annual temperature (C°)</b>	<b>Mean annual rainfall (mm)</b>
Cebollas Protective	Cloud	1671	29.6	18	1750
El Volcán	Cloud	1676	14.3	18	1750
Cebollas Communal	Pine-oak	1362	22.6	24	1350
Tesoro Community Forest	Pine-oak	953	23.6	21	1350

*Elevation, slope and forest size are based on field data collected in 2004. Mean annual temperature and annual rainfall are based on (Tucker, Randolph et al. 2007)*

**Table 3.2 Mean Values for Forest Variables**

<b>Forest name</b>	<b>Forest type</b>	<b>Forest size (ha)<sup>27</sup></b>	<b>No. of plots</b>	<b>Mean number of trees/plot</b>	<b>Mean DBH (cm)</b>	<b>Mean basal area (m<sup>2</sup>/ha)</b>	<b>Mean stem density/ha (stems/ha)</b>
Cebollas Protective	Cloud	20	12	22.5	23	39.07	694.4
El Volcán	Cloud	29	14	20.8	23.4	35.62	639.3
Cebollas Communal	Pine-oak	457	61	11.6	22.9	17.29	358.2
Tesoro Community Forest	Pine-oak	736	80	9.4	28.5	21.6	284.3

**Table 3.3 Mann Whitney Test P Values**

	Basal Area P Value	Stem Density/ha P Value
Cloud forest vs. cloud forest (Cebollas P. vs. Volcán)	0.5371	0.7772
Cebollas Protective cloud forest vs. Cebollas pine-oak	0.00002*	0.00004*
Cebollas Protective cloud forest vs. Tesoro pine-oak	0.0005*	0.0000002*
Volcán cloud forest vs. Cebollas pine-oak	0.0005*	0.00002*
Volcán cloud forest vs. Tesoro pine-oak	0.0084**	0.00000003*

*\*Difference between the samples is highly significant ( $P < 0.001$ , two tailed test).*

*\*\*Difference between the samples is highly significant ( $P < 0.01$ , two tailed test).*

### **Mann Whitney Test Analysis**

Table 3.3 offers the results of the Mann-Whitney test performed between both cloud forests and between these and the pine-oak forests. In the comparison between the two cloud forests, neither basal area or stem density/ha resulted in significant differences. Although Cebollas Protective is actively protected by the community and El Volcán is not, both forest present similar forest metrics. Given that core forest dependence needs are met elsewhere (Cebollas Communal forest) the lack of significance shows that at the time of the study human impact on the remaining cloud forest area of Cebollas is minimal. The latter, however, does not imply that strict and enforced rules are unnecessary to sustain the Cebollas Protective. Cloud forests are threatened by human territorial expansion clearing them for agriculture or coffee; this could affect El Volcán in the future and it is hoped that strictly enforced rules will prevail in Cebollas Protective.

On the other hand, when comparing the institutionally strong cloud forest- Cebollas Protective- against the pine-oak forests of Cebollas and Tesoro every test yielded statistically significant differences. At first sight, the results suggest an indication of institutional strength (Cebollas Protective has strong protection oriented institutional arrangements). However, since there are major ecological differences between these forests, this result may not reflect any difference from institutional impact.

Just like the tests were statistically significant between Cebollas Protective cloud forest against the two unprotected pine-oak forests, the results between the unprotected El Volcán cloud forest and the pine-oak forests were again statistically significant, emphasizing that the differences are ecological and not institutional. El Volcán is the forest with weak institutional arrangements.

Results from the Mann-Whitney test on the cloud versus pine-oak comparison are very similar to the results obtained in the t-test comparison that Gibson, Lehoucq and Williams (2002) did of the 1998 data for the same forests. A t-test was used to compare the forest variables of five forests finding that Cebollas Protective forest variables were significantly different (and greater) than those of the other forests. These results were offered by the authors as indicators of how the institutional arrangements of Cebollas Protective were ensuring the forest's integrity. However, the results probably did not reflect management differences but ecological ones given it is the only cloud forest in the sample. Both statistical tests applied to the same community forests yield similar statistically significant results. Given the strong ecological differences between the forests, it is questionable to assert that institutional arrangements are responsible for the

differences. The differences appear to come from comparing ecologically different forest ecosystems.

Having said that it is important to clarify that other studies have found that locally crafted and enforced institutional arrangements for forest governance are related to forest stability and integrity (Ascher 1995; Banana and Gombya-Ssembajjwe 2000; Gibson, McKean et al. 2000; Bray, Merino-Perez et al. 2003; Ghate 2004; Gibson, Williams et al. 2005; Hayes 2006; Agrawal, Chhatre et al. 2008; Elías, Larson et al. 2009).

### **Conclusions**

Statistically significant results frequently provide support in favor of or against a theoretical puzzle, but one needs strong research design to use statistical analysis well. In this case, there is an underlying ecological reason for the statistically significant differences across the forests discussed in Gibson et al 2002 study. The data used in the test might have been generated as a result of two processes— one ecological and one institutional. Comparing the protected cloud forest to a second ecologically similar unprotected forest gives some assurance that the ecological structure was primarily responsible for the result and not the institutional structure. Therefore, the conclusions found in the 2002 publication, which stresses the institutional causes of the difference are misleading.

For the IFRI community this study supports the network's efforts in revising its forest methods and ensuring they are well applied to adequately support its research effort. For multi-disciplinary initiatives in general it offers an example of how delicate field site

interpretations can be, and how necessary it is to have strong representation of all the relevant disciplines.

For the study of common property and the role locally crafted institutions play in the governance of CPRs the study offers a reflection of the challenges faced when trying to devise measurable indicators. Previously Cebollas Protective results were interpreted as a robust example in favor of communally designed and enforced institutional arrangements. Yet, Cebollas Protective forest condition is no different from the condition of an ecologically comparable unprotected forest.

However, the lack of differences between an unprotected and protected forest does not mean that Cebollas Protective institutional arrangements have been unsuccessful in ensuring forest integrity. The rules established in 1995 are still recognized and enforced in Cebollas, and up to 2004 had been successful in protecting it from further encroachment. Human threats to the cloud forests studied here come from clearing forest land to make way for agricultural or agroforestry crops (coffee) more than from human consumption for forest products, since forest users have access to a third forest (Cebollas Communal) where the species optimal for firewood and kindling are available. The fact that the fence circling Cebollas Protective has not suffered any vandalism, shows how members have respected the established forest boundaries and protection rules and thus it can still be considered an example of how locally crafted institutional arrangements can protect a forest.

IFRI strongly advocates that field teams identify reference forests whenever possible. This case offers an example of how this can happen in the field. By selecting a nearby

ecologically similar forest but under different management arrangements, I could compare the forests and offer institutional insights. Some IFRI discussions on the importance of sampling reference forests point to the cost and extra effort required. Finding El Volcán so close by, offered the opportunity to provide a sound ecological assessment without much extra cost in time or budget.

Recent analysis comparing IFRI forests to reference forests are bridging previous divides in how forest data can support institutional analysis of forest governance. IFRI will certainly continue to offer valuable insights into community forests for years to come.

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<sup>20</sup> Information provided by Rachel Kornak, IFRI database administrator  
<http://www.sitemaker.umich.edu/ifri/home>.

<sup>21</sup> Detailed information on the methods used by IFRI and the Indiana University research centers that developed and use it the Workshop in Political Theory and Policy Analysis and CIPEC (Center for the Study of Institutions, Population, and Environmental Change) can be found in Moran and Ostrom (2005), Gibson et al. (2000), and the CIPEC <http://www.indiana.edu/~cipec/> and IFRI websites <http://www.sitemaker.umich.edu/ifri/home>

<sup>22</sup> Aside from arguing that community created institutions can protect a forest better in the case of Cebollas Protective, Gibson, Lehoucq and Williams 2002 argue that salience and scarcity are CPR characteristics that motivate the creation and enforcement of rules.

<sup>23</sup> Both these forests have clearly demarcated boundaries and prohibit both cutting trees and livestock grazing within the forest. Although they showed somewhat stronger forest condition indicators when compared to the communally owned pine-oak forests, they were no match for the Cebollas Protective cloud forest. See Gibson, Lehoucq and Williams, 2002 for additional information.

<sup>24</sup> Forest hectares for all forests included here are approximate, reported here according to measurements of the GIS coverages, this measurement does not coincide with either official measurements or previous measurements of other GIS coverages.

<sup>25</sup> Cebollas is an “aldea” (jurisdiction) belonging to the Indigenous Community of Quezaltepeque, a group of 22 villages holding a collective property deed, granted to them during the time of the Spanish Colonization. All members of the 22 villages (that have paid their membership dues and follow the rules) are allowed to harvest firewood, kindling and timber from the forests of the Indigenous Community, one of which is Cebollas’s. Most members rely on the forest nearest to their community; so most harvesters in the Cebollas forests are the people of Cebollas or the few villages nearby.

<sup>26</sup> In order to increase the strength of the forest analysis through time, IFRI methods request latitude and longitude coordinates for each plot so that the same locations within a forest can be revisited. However given “selected availability” that was in place in 1998 and poor GPS reception in both 1998 and 2004, it is difficult to estimate how accurate navigation was and therefore how close to the original plot location, the 2004 plots were established.

<sup>27</sup> Forest size is calculated from GIS coverages of forest boundaries used for fieldwork.

## CHAPTER 4

### INCHING FORWARD OR CHARGING AHEAD: DONOR AND STATE AGENTS APPROACHES TO COMMUNITY FORESTRY IN EASTERN GUATEMALA.

Community forestry projects have been promoted by the international donors and state agencies with the two-fold goal of reducing environmental degradation and increasing community well-being. In this chapter I compare the contrasting approaches I found donors and state agents used to engage Cebollas and Rodeo in community forestry projects. I identify them as: *inching forward* and *charging ahead* based on how they engaged each community and how they envisioned the community forestry experiences they accompanied. In Rodeo, external agents and community forged a relationship that has *inched forward* community forestry for almost two decades while in Cebollas a donor led project *charged ahead* with disastrous consequences for local institutions. I conclude that when well-intentioned donors and state agents 1) neglect local institutional arrangements, 2) fail to understand and address conflict, and 3) have a simplistic vision of how subsistence agriculture farmers can be transformed into forest business owners, the probability of long term success is reduced. Technology driven initiatives may do more harm than good if they fail to understand the participants' institutional arrangements. Additionally, project evaluation frameworks can hide poor results by not including indicators that take into account the social/institutional implications of the intervention. On the other hand, willingness to understand the complexity and dynamics of the local institutional context, and creativity and innovation for project design and execution all

nurtured by structured learning fora may allow for initiatives to increase the success of community forestry initiatives. Much of what I propose is akin to adaptive management, considering policies and instruments as experiments to be evaluated and adapted to ever-changing and uncertain circumstances

## **Introduction**

Concern for the state of the world's forests and the rates at which forests, especially tropical forests, are disappearing brought attention to a set of forest actors originally overlooked: traditional forest users, local communities dwelling in the vicinity of forests, some with ancestral ties to the land. Historically, governments have not recognized these communities' original claims to the land and forests (White and Martin 2003), conservationists have not taken them into account (Schwartzman, Nepstead et al. 2000; Chapin 2004; Kaimowitz and Sheil 2007) and development agents have even typified them as backward (Loomis 2000). Only after years of research and advocacy efforts supporting the rights and capability of indigenous and other local groups to own and manage their land and resources has policy shifted towards actively including forest users as rightful owners and sound forest managers (Ascher 1995; Gibson, McKean et al. 2000; Bray, Merino-Perez et al. 2003; White and Martin 2003; Molnar, Scherr et al. 2004; Tucker 2010).

Traditional forest users are closely linked to forest use and condition (Gibson, McKean et al. 2000), they have been recognized as adequate forest managers when they have central government support (Utting 1993; Banana and Gombya-Ssembajjwe 2000; Bray, Merino-Perez et al. 2003), have been acknowledged as equals to private owners in their capability for resource management (Tucker 1999) and are as good or as bad as protected areas for

the conservation of natural resources (Bray, Duran et al. 2008). However, the research community also acknowledges that recognizing the rights of traditional and indigenous groups to historically communally owned resources is no panacea for the conservation of these resources (Bray, Merino-Perez et al. 2003; Molnar, Liddle et al. 2007; Tucker 2010).

Forest users' interaction with forests is partly determined by the institutions (or their absence) that rule their relationship (Leach, Mearns et al. 1999; Gibson, McKean et al. 2000; Poteete and Welch 2004). Institutions refer to the "rules in use" that establish what people may, must, or must not do in a specific context (Ostrom 1990; Ostrom 2005). Institutional arrangements are then the rules in use by which communities define their relationship to communally owned forest resources. Better forest condition is linked with stronger local and enforced institutional arrangements (Gibson, Williams et al. 2005; Tucker, Randolph et al. 2007).

Both national and international policy have linked the sustainable use of these resources to poverty reduction for resource dependent groups (Arnold 2001; Schreckenberg and Luttrell 2009). However, results from these efforts have been mixed (Leach, Mearns et al. 1999; Molnar, Liddle et al. 2007; Tucker 2010) and point to the complexity of managing communally owned resources and improving livelihoods.

An important set of actors in forest-community efforts are the international aid agencies and conservation organizations that design and fund projects to address forest conservation either solely for conservation purposes (Chapin 2004; Kaimowitz and Sheil 2007) or both to protect natural resources and consolidate self-organization and economic

opportunities for forest users (Leach, Mearns et al. 1999; Arnold 2001; Schreckenberg and Luttrell 2009). Projects and initiatives are designed with the best of intentions and with the most up to date tools and approaches. The projects are monitored and evaluated, hired technical experts are hand-picked, and are coordinated with the state agencies spearheading forest conservation and development. Despite the heavy investments of funds and professional expertise, these efforts have not led to consistent outcomes, and their effectiveness in establishing socially and environmentally sustainable ventures has been highly variable (Leach, Mearns et al. 1999; Gibson, Andersson et al. 2005; Molnar, Liddle et al. 2007; Tucker 2010).

Since the 1960s, development assistance has been questioned for its effectiveness to increase economic growth, reduce poverty, improve livelihoods or protect valuable natural resources through sustainable use and has even been blamed for the underdevelopment of countries and even entire continents. Almost every aspect of aid has been criticized finding hundreds of problems and yet it remains a key policy instrument (Gibson, Andersson et al. 2005; Easterly 2006; Moyo 2009; Carbonnier 2010).

### **External Agents-Community Relationships in Eastern Guatemala**

On my first visit to the selected communities for my dissertation, I was told of the difficult situation Cebollas community was facing. They had had a serious conflict with the authorities of the Indigenous Community of San Francisco Quezaltepeque (ICQ) due to the community forestry project they had participated in: project Jupilingo-Las Cebollas. In 1998 when the first IFRI visit occurred, the project was actively engaged in establishing a community forestry project in Cebollas. As I heard more of the story, I knew I wanted to document how a well-intentioned project had unraveled into such

negative consequences for its intended beneficiaries.

Meanwhile, in the community of Rodeo, of which I didn't know much prior to my dissertation fieldwork (this was the new community selected for my study), the more I learned of their community experience, the more I felt that the way external agents and local people had approached the process of community forestry needed to be documented to highlight its positive outcomes and accomplishments. As it turned out, both Cebollas and Rodeo participated in different multimillion development projects that sought to bring community development alternatives to the rural communities of Eastern Guatemala. These projects had diverging development objectives and approaches.

This chapter compares these projects' objectives and approaches and how they shaped their interaction with Cebollas and Rodeo. At the time of my dissertation research, both Cebollas and Rodeo had recently finalized their participation in their respective donor led community development projects. The contrasting approaches and differing outcomes of these projects are presented as a reflection of how central local institutional arrangements are to any community development endeavor and how neglecting to appreciate their relevance can lead to disastrous consequences.

I identify donors and their hired technical experts as external agents that interact with the local communities promoting community forestry solutions to environmental degradation and community development. Although donors are not the agents directly involved in project execution, the approved designs and funds available define, to a large extent, the interaction between project executioners and beneficiaries. Hired technical experts abide to the rules and requirements donors establish, playing their part in the bureaucracy of

development.

In Cebollas and Rodeo I found that external agents had established their community interactions with different and contrasting approaches. I name these approaches: *Inching forward* and *Charging ahead*. I compare both approaches and assess the relative success or failure of their interactions with the communities and reflect on the effectiveness of external agents' interventions in community forestry initiatives.

- **INCHING FORWARD:**

I characterize this approach as one that accompanies community forestry efforts that develop slowly and incrementally through long periods of time. It lacks the funds and objectives of a specifically designed project and is driven by overall community well-being and participation. Rodeo's community forestry experience has been a long-lived process of inching forward the goal of a community based sustainable forest use endeavor.

- **CHARGING AHEAD:**

I characterize this approach as one also concerned with overall community well-being but specifically focused in technology-driven income-generating initiatives to be implemented in a limited time-frame. Funds and staff are plentiful. The project Jupilingo-Las Cebollas established its relationship with Cebollas by charging ahead to establish a community based sustainable timber harvesting operation.

Regardless of the pace and characteristics of each, both projects (and approaches) shared goals of increased community participation, and ensured environmental benefits. Their outcomes therefore could be similar and comparable, even if achieved with varying

methods. However, what I found on the field was that the experience of Rodeo and Cebollas was substantially different.

In Cebollas where the external agents and the community “*charged ahead*” the process affected the community in a negative way. Donors funded community forestry efforts without taking into account the complexities of local institutions and governance structures, which led to a cancelled project and an estranged community. The project that interacted with Cebollas was Jupilingo-Las Cebollas, whose goal was “*to bring sustainable economic options to the population promoting local organization, capacities and increased well-being in the region*” ran for about 5 years from 1997 and 2003.

On the other hand, in Rodeo where external agents “*inched forward*” community members talked positively of the community forestry activities that the external-local partnership had created and sustained for almost two decades. Here external agents established a long term relationship with the community and accompanied its efforts to protect and restore its forest’s condition. The relationship was established without the “promise” of a well-funded sustainable forestry initiative. It started as a modest effort in increasing the sustainability of the community’s way of life, evolving later into a community forestry effort. The multi-year multi-million project that worked with Rodeo was PROZACHI. The Rural Development Project for Small Producers in Zacapa-Chiquimula -PROZACHI- ran from 1991 to 2003 (phases I and II) and aimed “*to strengthen local negotiation and propositional capacities in the region so that actors could better access state and private goods and services*”. The project’s focus was to support local organizational and negotiation capacities of already established (and new) community organizations. Although the project’s budget was in the millions, the budget

did not imply large monetary investments in the participating communities.

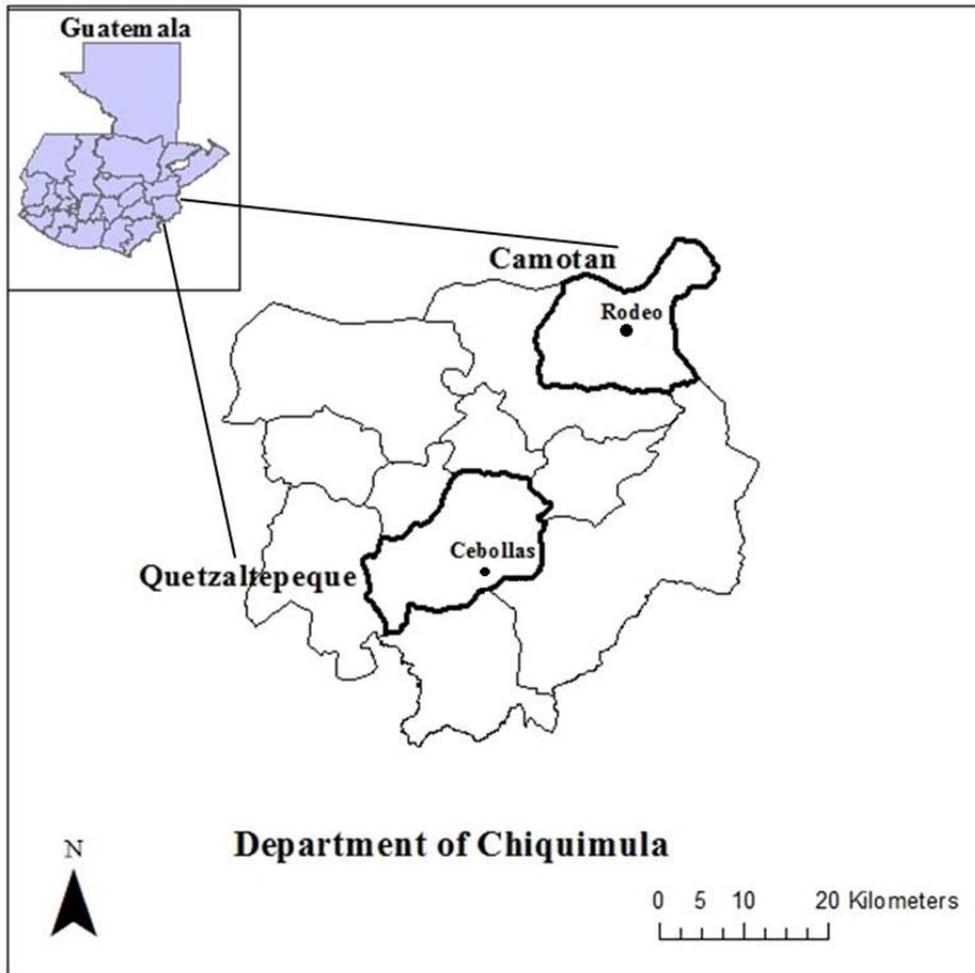
## **Methods**

The case studies constructed with the IFRI methodology and protocols provided the basis for institutional analysis of each community and its relationship with the forest and external institutions relevant to the forest. IFRI's focus on forest governance provided the framework to analyze the multiple layers of external agents-community interactions. Testimony from community members and project staff interviewed, the projects' publications and reports, were used to understand the community-external agents relationship. The focus was the relationship between each community and its external agents and how did these agents nurtured or undermined local institutional arrangements and the impact the outcomes had within each community and its forest. Given that institutional strength is tied to the relative success or failure of the community forestry approaches analyzed here, an index to measure institutional strength was developed. The variables on rule existence and enforcement, definition of rights to the forest, and demarcation of forest boundaries were used to construct an institutional index of strong, intermediate or weak community forest-related institutions (see Table 4.2).

**Table 4.1 Community and Forest Characteristics and External Agents Present**

<b>Community</b>	<b>Number of families, forest products harvested</b>	<b>Community Forest size (has) and tenure regime</b>	<b>Dates visited for IFRI case studies</b>	<b>External agents</b>
Rodeo <sup>28</sup>	Approx. 100, kindling, firewood and timber for home construction.	Rodeo forest 51, municipally owned by the Municipality of Camotán, granted in usufruct to Rodeo	March-July 2004	Catholic Church BOSCOM <sup>29</sup> PROZACHI <sup>30</sup>
Cebollas <sup>31</sup>	40, kindling, firewood and timber for home construction.	457, communal property of the Indigenous Community of San Francisco Quezaltepeque, also municipal property of the Municipality of Quezaltepeque.	1 <sup>st</sup> visit: June 1998 2 <sup>nd</sup> visit: March-July 2004	INAB <sup>32</sup> Jupilingo-Las Cebollas <sup>33</sup>

**Map 4.1 Cebollas and Rodeo**



## Community Case Studies

Rodeo and Cebollas have experience with local organization and have strong linkages to their forest resources. Each has successfully established a community organization: in Cebollas a co-operative Volcancito-Las Cebollas and in Rodeo ADECRO. Each is also actively protecting forest resources: Cebollas Protective Forest and Rodeo Forest. These actions have been undertaken with assistance from external agents. Regardless of the similarities, their experiences have also had very different results regarding a sustained effort at forest governance and also regarding the type of relationship they have had with the external agents.

In what follows I describe the relationship each community had with its external partners and recount their community forestry experience. As already indicated, I will use the term *Inching forward* when describing Rodeo’s community forestry process and the term *Charging ahead* to describe Cebollas’s process.

**Table 4.2 Index of Community-Forest Institutional Strength**

Community	Forest name	Recognition of rights 0= Minimal 1= Some 2 = High	Demarcation of boundaries 0= No 1 = Incomplete 2= Complete	Effective monitoring 0 = None-rare 1 = Intermittent 2 = Consistent	Rule enforcement 0 = None-rare 1 = Intermittent 2 = Consistent	Index	Institutional strength rank Strong (7-8) Intermediate (4-6) Weak (1-3)
Rodeo	Rodeo	2	2	2	2	8	Strong
Cebollas	Cebollas	1	1	1	1	4	Intermediate

## **Inching Forward: Rodeo's Long Path towards Community Forestry**

As I started to understand Rodeo's community forestry story I found it was an adapting and incremental approach to community-donor relations. The relationship is built slowly outliving a specific project's lifetime; those involved develop a strong long lasting bond. The relationship is built without heavy investment in income generating or technology transfer projects at community level, and relies on the willingness and creativity of participants to continue collaborating. In other words, it "inched forward."

This adapting and creative approach has resulted in almost two decades of sustained community forestry activities. The process has contributed to the robustness of Rodeo's institutional arrangements. Rodeo has clearly defined forest boundaries, rules regulating consumption and an operational monitoring and enforcement system. Together, these elements indicate strong institutional forest governance arrangements (see Table 4.2).

Rodeo's community forestry experience *inched forward* with the help of long lasting partnerships with external agents. The donors and agents who have partnered with Rodeo include the Catholic Church, donor funded project PROZACHI, and state-led program BOSCOM. Proyecto Bosques Comunales (BOSCOM) is the branch of the National Forests Institute (INAB) with the mandate of supporting communal and municipal forestry efforts. None of these external agents had large amounts of external funding for Rodeo, thus all investments were small like a medicinal plant garden, improved nutrition, and appropriate technology for erosion control and organic fertilizing through composting. Through the collaboration with state and project technicians and catholic nuns and priests, the community began to focus on forest protection.

Forest activities responded to concern for protecting the forest from encroachers but also from uncontrolled use by the community itself. By 2004, when I first visited Rodeo, they had more than a decade of sustained forest protection activities. Accompanied by the Catholic priest and BOSCOM technicians they developed rules to control forest use, dealt with various internal conflicts, and organized yearly activities for reforestation and maintenance of fire breaks. PROZACHI helped them legalize their community association.

The legalization of the community's local organization was characteristic of PROZACHI's community approach, being its overall goal "*strengthening community propositional and negotiation capacities*". When the project's first phase had finished, community based organizations in Eastern Guatemala (departments of Zacapa and Chiquimula) had increased by 28 percent<sup>34</sup> and were organized into a regional association ASORECH -Regional Ch'orti' Farmers Association- that represents community level interests in dialogues with government agencies (Durstun 1999).

Although they participated in a multi-million dollar project, the funds that reached Rodeo were limited, thus creativity was central for yearly forest activities. Rodeo's forest management plan included reforestation and fire prevention for which there were no funds to pay for wages, tools, or seedlings. External agents couldn't offer funding but were able to secured in-kind donations for tools and seedlings and proposed that community members work for food rather than wages. "Food-for-work" programs have been used in other countries to promote sustainable land use at times paying for reforestation of degraded lands (Holden, Barret et al. 2006). In Rodeo, the food-for-work

scheme has and continues to sustain forest protection and provide food security for the most vulnerable of Rodeo's members: widows, single mothers, and their children.

The challenge of any community forestry project is the survival of the established project beyond the initial project's lifetime. In the case of Rodeo given that community forestry was not born through a single project, sustaining its activities has been a challenge from the start. Every year, community leaders and their external collaborators have to identify new sources of funding or goods for their forest actions. Their consistency for many years is their best "calling card" and to date support, whether monetary or in-kind, continues to be identified and used creatively.

Of course, not all is well in Rodeo. Like any community, not all approve of the efforts on forest protection and there have been various conflicts. Of the approximately 100 families that have direct access to the forest resources, only 52 households are active participants in the forest association. The majority of Rodeo households are aware of the forest protection efforts; they understand and follow the rules established, but seem "neutral" as to whether forest protection activities are carried out. On the other hand, a group of households are clearly against any forest protection and have a long history of conflict with the leaders of the pro-conservation group. Conflict divides the community between those in favor or neutral (the majority), and those against forest protection. Those against its protection claim the forest should not have any rules; available for any need that may arise without any restrictions or sanctions.

Conveniently (or fortunately), those against forest protection reside in the village of Cementerio, which is furthest from the protected forest. The villagers of Cementerio have

always disagreed with any and all forest conservation efforts. These villagers have a closer patch of forest (Cementerio forest) that they use as rule-free forest area and clearly oppose any attempt to protect it. The availability of this forest patch has prevented conflict from escalating. Chapter Two, devoted solely to Rodeo, offers a more ample explanation of the conflict.

Geography helps maintain the conflict at bay, but many times conflict has escalated to dangerous levels. Community leaders talk about death threats they have received or the time when they were very much afraid that the young saplings just planted could be burned. When these conflicts have escalated, external agents accompanied community leaders guaranteeing their safety.

Throughout, conflict has been identified and addressed both by community leaders and external agents. They have invited Human Rights Observers to document threats; they have hosted workshops and meetings to socialize the topics of forests, conservation and sustainable development. Drastic measures, such as inviting Army soldiers to the community to participate in reforestation have been taken, all to maintain cordial and diplomatic relationships between those in favor/neutral and those against forest protection.

The soldiers were invited to plant trees sometime between 1995 and 1997. At the time, the 30 year long civil war was ending; yet inviting soldiers to plant trees was a controversial and probably difficult measure to undertake. During Guatemala's long civil war the army was responsible for hundreds of thousands of deaths, mostly among rural peasant Guatemalans (ODHAG 1998). During the war Cementerio's leader and most adamant

oppose to forest protection was the military commissioner for Rodeo, the local in charge of “order” in the community. Inviting army soldiers to plant trees was a bold move from the community and its external agents (Catholic priests who also suffered violent deaths at the hands of the military) as they had to personally deal with the symbolism of reaching out to one considered “the enemy” and making a statement to the Cementerio leader (former military associate) about how times were changing.

Interestingly, the decade and a half of Rodeo’s sustained collective action has even made their “enemies” reconsider. When interviewing the leader of Cementerio he stated that he is trying to organize “his people” around development projects and forest conservation, separately of course. After witnessing the benefits Rodeo has had, he is trying to bring some of them to his village.

Rodeo has positively “inched forward” towards sustainable forest use and protection. The road began decades ago when the community started to protect its forest from encroachers. Along the way, they began to work with the Catholic priest and BOSCOM. Together those involved developed strong bonds and became “fans” of Rodeo going beyond their duties to make sure that Rodeo could overcome obstacles and move forward. At times, progress has been slower than they wished, and it has taken decades of having a vision greater than any specific project or program. Community leaders and external partners committed to a goal, regardless of whether their job descriptions include it or whether there is any funding available for it, have built this vision slowly. These actors believe in their goal, they have a commitment to Rodeo, and are willing to invest their time and effort even if material retribution is far from ideal. Donors and projects have come and gone, each time Rodeo has accrued something valuable from them.

I have not visited Rodeo since my fieldwork in 2004, but from news clippings I have found out that they were able to participate in the forest incentives program PINPEP (Incentives Program for Smallholders of Forest and Agroforestry Systems). PINPEP was established in 2006 to allow community groups like Rodeo to access funds to develop community forestry activities. With the help of the program, they have established a women's group named "Corazon del Bosque" to make handicrafts using pine needles while the men are finally able to work on the woodshop they had envisioned long ago to make furniture. In the interviews I held in 2004 they talked of the possibility of establishing a woodshop and using timber grown in their private lots as well as timber from sustainably managing their communally owned protected forest.

### **Charging Ahead: Cebollas Path towards Mistrust and Betrayal**

Nothing could have been more contrasting to Rodeo's story, than the experience Cebollas members had to share when I visited them in 2004. In 1998, when the first IFRI team visited this community, the people interviewed referred to the community forestry project they were establishing with hope and enthusiasm. Yet in 2004 what I found was a disillusioned community with an ongoing conflict with the authorities of the Indigenous Community of San Francisco Quezaltepeque.

*Charging ahead* the external agents focused on transforming subsistence agriculturalists into resource entrepreneurs with a fast-paced, technology-driven effort. Their relationship with the community was well-intentioned aiming to bring sustainable development but given its hurry to implement technological transformations it neglected the social-institutional landscape. With these characteristics is that Jupilingo-Las Cebollas project accompanied Cebollas community forestry experience.

The project aimed to bring to Cebollas “*sustainable economic options*”. Enthusiastically they received in their community the state forest agents (INAB) that assessed the potential of their 457 hectare forest for a sustainable timber harvesting operation. They participated in meetings, received training, and provided state agents all the information required to take part in the initiative. External agents wanted to work with Cebollas because they had a forest of adequate size for a forest management project, had an already established cooperative, and had enthusiastic and environmentally aware community members. The reasons why external agents were interested in working with Cebollas are reflected in the community’s institutional strength index developed from IFRI variables. Cebollas has developed institutional arrangements for its communally owned forest, although these are not as strong as Rodeo’s (score 8, strong), they are relatively strong (score 4, intermediate), see Table 4.2.

State agents and donors were so enthused with Cebollas’s potential that they named the project Jupilingo-Las Cebollas, even though the project assisted many more communities besides Cebollas in the provinces of Chiquimula and Zacapa. All seemed ready for a successful transformation from subsistence farming towards forest based entrepreneurs. At this moment the story is not much different from Rodeo: a community interacting with external agents walking its own path. Cebollas had established a co-operative and had participated in agricultural development projects, including PROZACHI with whom Rodeo developed a fruitful partnership. External agents designing a project saw a promising community ready to take on the opportunity to consolidate its own capacities.

Yet, the outcome was quite the opposite. While external agents have “come and gone” helping Rodeo *inch toward* its vision of community forestry, in Cebollas the external

agents and community members *charged ahead* towards an unprecedented and serious conflict with their neighbors and peers.

Cebollas is a member of the Indigenous Community of Quezaltepeque (ICQ) who owns the communal lands that comprise both the village of Cebollas and its forest. It holds a property deed to the land dating back 400 years to the Spanish colonization. Twenty-two different villages, one of which is Cebollas, form the ICQ. The communal forests are viewed as a resource open to all members (approximately 2,000 families in all 22 villages) of the community as long as everyone pays an annual fee. Outsiders are not allowed to harvest the resources and communities neighboring the various forests are responsible for monitoring forest use.

Conflict arose when the ICQ opposed the forest management project. Opposition was unexpected since community and external agents (INAB and Jupilingo-Las Cebollas) together had requested (and were granted) authorization to go ahead. Between authorization and project start-up, ICQ leadership was reneged and permission revoked, accusing Cebollas of betrayal to the ICQ. From that day onwards, Cebollas leaders are considered traitors, the community is ostracized, and any stranger venturing to take the road (through the ICQ owned forest) towards Cebollas is threatened with lynching. In 2004, cadastral state agents surveying the area were held hostage for several hours and their car was nearly burned.

ICQ leadership states that Cebollas failed to recognize the ICQ as the rightful owner of the land, partnering with the Municipality of Quezaltepeque to destroy the forest while getting rich. The Municipality of Quezaltepeque and the ICQ have a long standing

conflict both claiming property to the communal forests “belonging” the ICQ. Cebollas found itself in the middle. External agents and Cebollas community members did not understand or take as seriously as they should have the complexity of overlapping and conflicting rights to land. A common element of the interviews with community members and external agents was bewilderment at how the conflict escalated. They claim they had the proper authorization. The ICQ says that authorization from a previous leader had to be verified with the new current authorities and that Cebollas shouldn’t have sought authorization and support from the Municipality, a gesture interpreted by ICQ as denying them the rights they historically hold to the land. From the interviews I can interpret that once ICQ granted permission, they weren’t taken into account again or informed of project progress. When asked if the project team (agents and community) had “paid their respects” to the new ICQ authorities, answers were ambiguous, but everyone claimed permission was in order and that betrayal came from the new ICQ administration and not the other way around.

When the new ICQ leadership charged Cebollas with treason, the project was halted and the external agents turned towards ICQ for “damage control”. The ICQ engaged external agents diverting project funds and efforts to other of its 22 villages and banning Cebollas from any further initiatives. The project supported a legal inquiry to determine the ICQ’s validity of their royal property deed signed by the Spanish King 400 years ago.

In the best case scenario, what happened was a problem of absence of transparent clear information, not socializing the project thoroughly with every one of the neighboring communities and paying special attention to the ICQ leadership. In the worst case scenario, external agents and community members were star-struck with the promise

technology offered and “*charged ahead*” confident that written consent from ICQ (by a previous leader) was enough. In any scenario, external agents would have benefited from a clearer understanding of power asymmetries and institutional complexities and their fundamental role in any initiative concerning a communally owned resource.

Furthermore, regardless of how poor was their understanding of power asymmetries or institutional complexities, if external agents would have been capable of facing the conflict and mediated a more equitable solution, Cebollas would not be as ostracized and disillusioned as it is now. Their actions assisting the ICQ in their legal claims were a valid response to the crisis, but the people of Cebollas claim that external agents simply turned their backs towards the ICQ without much consideration for them.

Conflict was also fueled by other elements including the sale of communal lands to outsiders. Some Cebollas members (with permission from previous ICQ leadership) had sold land they held in “possession” to the technical personnel whom they collaborated with through the project. Jealousy and mistrust arose among neighboring villages (also members of the ICQ) due to the land sales, and expensive vehicles, foreigners, important-looking individuals, all constantly visiting Cebollas. Rumors that the forest would be gone and Cebollas would keep the money fueled the conflict, which grew to the verge of violent confrontation.

INAB and Jupilingo-Las Cebollas assisted the ICQ with legal advice regarding their historic property deed to the land and establishing various projects with them. In these new activities, the people of Cebollas did not take part. The leaders of the ICQ embraced the opportunity to partner with an internationally funded project. Cebollas on the other hand, lost standing in the eyes of the ICQ and almost all of its previous partnership with

the international donors. Some minor project related activities continued, but none aimed at increasing their “sustainable economic opportunities” as the project first envisioned.

Jupilingo-Las Cebollas evaluations do not report negatively on Cebollas or consider it a project failure. There are no documented lessons learned on how the institutional weave of Cebollas, ICQ and the Municipality of Quezaltepeque played a role on any activity related to a communally owned resource or how to face conflict. All projects design performance indicators to aggregately represent their impact, given that Cebollas was one of a few target communities and given that the project could transfer Cebollas goals to the ICQ, there is no need to even mention the shortcomings. And yet, Cebollas is worse off now than before, and the project directly participated in its demise; project staff even own land that lies at the very heart of the conflict.

It was unfortunate to see how disappointed and frustrated the people of Cebollas were when talking about the state agents and international donors, that in 1998 had them speaking with enthusiasm about the future. It is also quite worrisome to see that communities who once did not bother each other are now continuously threatening and at times clearly inflicting violent acts on each other’s property. Just a few weeks prior to our visit in 2004 members of other communities belonging to the ICQ vandalized several fenced-in landholdings belonging to people of Cebollas. Our team was itself threatened by the ICQ, stating they could not be responsible for any acts (burning our vehicles or personal harm) inflicted upon us if we were considered to be trespassing. Throughout our visit all team members had to carry a letter signed by the ICQ president clearly stating who we were and what the extent of our permitted activities was.

Rather than choosing to mediate a conflict they in part began, external agents neglected to accompany Cebollas through its conflict. There is no evidence of the external partners engaging in any of the actions that would be required to remedy the existing conflict between Cebollas and the ICQ, a conflict they are partly responsible for.

The people of Cebollas were ready to begin a sustainable timber harvesting operation and now are only bitter and frustrated with the external agents and with their ICQ peers. Their conflicts with the ICQ have led to a desire to break away from an organization to which they belong to historically and ethnically. Their internal social organization has also weakened, several members are now afraid of any type of participation and the community finds itself divided between those that side with the ICQ and those that are upset with it. When visiting Cebollas, I could not help but think that at times outside funding creates more trouble than brings benefits.

*Charging ahead*, with a well-funded project that was determined to carry out every needed action to transform subsistence agriculture farmers into forest entrepreneurs led Cebollas to disaster. They have lost any opportunity of reaping an economic benefit from the forest that they protect (and were entitled to as an ICQ member); they have alienated their kin, and are now under the watchful eye of the ICQ leadership.

*Inching forward* may allow Cebollas to recover their eroded relationships and their ability to self-organize for a community project. External agents could facilitate the process, but they must first understand that their actions although well-intentioned, can potentially harm them even more. External agents must be willing to work slowly toward progress, even if project time frames and designs call for rapid and intensive actions.

Communication and conflict mediation and negotiation would be valuable tools to engage.

If external agents had been willing or prepared to understand the local institutional context and the historical setting in which they were interacting much of the damage could have been avoided. Likewise, if external agents had been sensitive to the power asymmetries between the ICQ and Cebollas and the ICQ and the Municipality and their standing conflict, project strategies could have been different and less damaging.

Collective action is a complex challenge, however one that can be navigated and facilitated.

### **Can External Agents Inch Forward?**

*Inching forward* implies commitment to accompany a community paced process, even if agency timetables and requirements collide with community realities, even if the agents' technological or professional training taught them all about chainsaws and annual workplans and nothing about institutions, consensus, or conflict. *Inching forward* does not require academic credentials, but does require a non-patronizing attitude, which respects local capacities and considers local partners as equals. It also requires patience, flexibility, and creativity to withstand setbacks, respect and understand local perspectives, find alternative approaches, and face conflict.

Most external agents work for organizations associated with the delivery of aid and development, organizations with perverse institutional incentives that frequently have to play in politically charged arenas where even more perverse incentives abound. Given the

perverse incentives that plague the organizations that structure aid, aid delivered rarely does offer viable long term solutions for development (Gibson, Andersson et al. 2005).

In a study of the perverse incentives that abound in the Swedish development agency – Sida- Gibson et al (2005) find that the staff is highly motivated to work for development, yet they have very few opportunities to link their work with actual development achievements. Staff evaluations are not linked to project performance and the constant assignment rotations limit staff from seeing a project through from design to final evaluation. A learning program for employees is lacking, leaving it to their own personal motivation to seek out new knowledge that could enhance the probability of success of the projects or programs they design or lead. There are no structured methods or programs for learning from past projects. Although mid-term and final evaluations of projects are common (as well as for other aid agencies), findings may help adjust the project (if midterm) but usually they are not used for learning and are considered a bureaucratic burden (Gibson, Andersson et al. 2005). Additionally project evaluations tend to overemphasize the successes and underreport project failures, making it even more difficult to learn from mistakes (Botes and van Rensburg 2000).

My assessment of project outcomes considers that Jupilingo-Las Cebollas failed to deliver the intended results in Cebollas community, however project evaluations assessed the project as successful (INAB 2003). PROZACHI project also had evaluations that were positive (Durstion 1999; PROZACHI-2 2004). Given that both regional projects were designed to assist more than one community, the aggregated results can easily highlight the positive experience of successful communities and hide the shortcomings experienced by other communities. Third-party evaluations can easily oversee the

particular case of one community or fail to perceive a setback if the project adjusted for it by switching approaches or project sites. In Cebollas's case, the project switched to the ICQ, continued with project activities and resulted in a positive result at project end.

Over-reporting of successes and under-reporting of failures have been identified as one of the "plagues" undermining development achievements (Botes and van Rensburg 2000).

Just like donors, state agents belong to organizations that do not link project performance to job evaluations and offer few (if any) incentives for learning. In the case of Guatemalan community forestry initiatives, the state agencies associated with these ventures are INAB's Community Forestry Project (BOSCOM) and INAB itself -the National Forest Institute. INAB's staff is composed mostly of foresters; therefore their technological bias is unquestionable. Like any third world bureaucracy, resources for learning or career advancement are limited and rarely include institutionalized fora dedicated to learning from previous projects or for evaluating or adapting of current strategies.

This context is the norm for development projects and therefore the many evaluations showing mixed results, at best, are not surprising. The compelling question is why Rodeo and its external partners developed a promising long term partnership that has strengthened the institutional arrangements of the community?

The first answer could point towards the presence of the Catholic parish, an organization structured with very different incentives and time frames. Parish priests and nuns do not rotate every four years and their career goals are different. Yet, other studies have found

Catholic priests unable to facilitate adequate appropriation of development initiatives (Shepherd 2009).

But Rodeo did not only associate with Catholic priests and nuns, it also has long term relationships with BOSCOM and INAB (like Cebollas) as well as with donor led projects (PROZACHI). In fact, most of its forest related initiatives have been “non-Catholic” in association with INAB and BOSCOM and just like Cebollas Rodeo has had its share of community conflict.

A second answer can highlight the important difference between both experiences, the presence of an economic development, technology-driven project: Jupilingo-Las Cebollas. Both communities interacted with well-funded projects, but PROZACHI’s approach in “strengthening community negotiation and propositioning skills” was not technology-driven, had institutional arrangements at its core, and accompanied Rodeo for a longer amount of time (project was operational for 10 years). Jupilingo-Las Cebollas aimed to “establish sustainable economic options for communities” and was designed to bring Cebollas a timber harvesting operation. When that goal could not be achieved (and conflict ensued), the project shifted attention towards the ICQ with minimal presence in Cebollas and overall only remained in the area for 5 years.

Thus, a possible answer can highlight PROZACHI’s “pro-institutional” stated objectives nurturing Chiquimula’s (including Rodeo’s) community institutional arrangements, while Jupilingo-Las Cebollas pro-income objectives resulted in a serious blow to Cebollas’s institutional arrangements. Others have found that community forestry projects achieve

pro-poor outcomes only when projects have poverty reduction as a stated objective (Schreckenber and Luttrell 2009).

However, a fourth answer should focus on the restricted funding but unrestricted time frames in which Rodeo has developed its community forestry experience. In Rodeo, PROZACHI's pro-institutional goals found the ideal setting to nurture organizational and negotiating capacities without having to offer any major monetary investment, given that Rodeo had ample experience with this approach. Unrestricted time frames with strictly limited funding are significant elements of Rodeo's inching forward model.

It is not clear whether the contrasts between these cases resulted from differences in stated objectives, time frames, agency staff incentives, field staff flexibility, understanding of community ways, or ability to face conflict. The important issue is to recognize the core role that institutional arrangements have in any effort regarding a communally owned resource (Ostrom 1990; Ostrom 1992; Leach, Mearns et al. 1999; Ostrom 2005; Tucker 2010).

Agencies wishing to engage communities in sustainable development opportunities of any kind, but especially those centered on a communally owned resource, must be sensitized to the role of institutions in any collective action endeavor, be flexible to accept the many setbacks and deviations from the planned linear course envisioned, and should consider their community partners as equal team members. It is also important to emphasize that structured venues for learning within the organizations delivering aid (both donors and state or civil agents) are essential.

## Conclusions

External agents play a decisive role in community forestry projects (Ascher 1995; Morrow and Hull 1996), and a delicate one too, like the stories of Rodeo and Cebollas show. At times they can successfully nurture a long-term sustained community effort but they can also harm local institutional arrangements terribly. When external agents *charge ahead* with goals and time-frames restricted by the lifetime of a funded project, favoring technology transfers over understanding local institutional arrangements, and evaluating projects leaving out troubling outcomes, external agents can do more harm than good.

I propose that an approach characterized by *inching forward* can illustrate a possible change in how donor interventions should be designed. If Rodeo's story can be considered a replicable experience, then staff permanence and motivation, respect and understanding for local institutional processes, preparedness to understand and address conflict, flexibility and creativity can reap stronger, positive, longer term results than projects emphasizing technology transfer and strong monetary investment in technical personnel and equipment.

Understanding local governance structures and contexts both historical and customary, does not imply a university degree or extensive training in the social sciences. It does imply, an openness to appreciate local knowledge and capacities, and considering local people as partners and active participants in an ongoing struggle. It also implies respect for local dynamics and humility in accepting the fact that technology and investment brought in by external agents is helpful, yet it alone doesn't represent the totality of factors that take part in any development endeavor.

Frequently, development agencies –both international and national- view institutions as organizations, arguing that they take them into account by offering funds for equipping their offices (computers and vehicles) and training for their leaders. Yet institutions are not organizations but the rules that define behavior within organizations (North 1990; Ostrom 1990; Leach, Mearns et al. 1999; Ostrom 2005). Scheduling training events or creating local community organizations wrongly assumes that institutional strengthening will follow.

Institutional strengthening begins by recognizing the rules and norms a community has already developed and follows. It involves mapping out the various levels in which decision making and institutions play out, taking the time to read between the lines of what have local leaders shared and what they have left out, and being extra careful not to make assumptions that can lead to terrible institutional disasters. In Cebollas, external agents neglected to appreciate the powerful influence of 400 years of history had in the community forest they wanted to transform. At times, projects and their personnel do err from paternalistic approaches to local capacities and potential (Leach, Mearns et al. 1999; Botes and van Rensburg 2000).

Understanding and appreciating institutions and institutional arrangements would benefit from structured knowledge sharing and learning means within aid and development organizations. If aid and development related organizations could make one change, incorporating effective means for learning could enhance their knowledge and allow them to adjust and adapt towards positive community and development results. Although international aid agencies may be better able to implement such measures within their

organizations, it would be more important that they assist their national counterparts (INAB and BOSCOM in this case) in securing such mechanisms.

Much of what is discussed above reflects what adaptive management proposes. Adaptive management posits that policies and actions are experiments from which actors can learn. It assumes that scientific research is available to monitor and provide input to adjust actions and learn from what had been tried to date. Trial and error then becomes central to the approach taken by organizations responsible for the care of natural ecosystems and their resources. It includes accepting that the uncertainty and instability present in complex social and ecological systems requires efforts that focus on adaptability and continuous learning (Bray 2004; Bray, Duran et al. 2008).

What adaptive management posits for ecosystems, social scientists propose for policy design, seeing public policy as a set of experiments, of constant trial and error where policy designs and management instruments should go hand in hand with monitoring and evaluation and adapting to ever-changing and uncertain circumstances (Ostrom 1999; Wilson 2002). Effective and non-bureaucratic responses to monitoring and evaluation and knowledge management could emphasize the concept that development is an on-going collective action effort, filled with uncertainty and experimentation. In this dynamic and complex setting, *inching forward* while granting adequate weight to the struggles of collective action and the local institutional arrangements can provide a more solid approach toward increasing the chances of beneficial and enduring outcomes.

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<sup>28</sup> As stated previously Rodeo has two forests, Rodeo and Cementerio. Cementerio forest did not participate of PROZACHI activities and therefore is not included here.

<sup>29</sup> BOSCOM is the Community Forestry office of the National Forest Institute (INAB). Its main purpose is to support communities in the sound management and protection of their community owned forests.

<sup>30</sup> PROZACHI I and II-Rural Development Project for Small Producers in Zacapa-Chiquimula- project ran from 1991 to 2003 (two phases). Project goal was to **strengthen local negotiation and propositional capacities in the region so that actors could better access state and private goods and services.**

<sup>31</sup> As stated previously Cebollas has two forests: Cebollas communal and Cebollas protective, however in this chapter only Cebollas Communal is studied given that the project Jupilingo-Las Cebollas had no interaction with the Protective Forest.

<sup>32</sup> INAB is the National Forest Institute, state agency in charge of forest resources.

<sup>33</sup> JUPILINGO LAS CEBOLLAS, whose goal was **to bring sustainable economic options to the population promoting local organization, capacities and increased well-being in the region,** and ran for about 5 years. This project ran between 1997 and 2003.

<sup>34</sup> Measured by number of community organizations established and operating, see Durston 1999.

## **CHAPTER 5**

### **CONCLUSIONS**

This dissertation aimed to contribute to the study of collective action and the commons by documenting the experience of community forestry initiatives in Eastern Guatemala, specifically in the department of Chiquimula. It offers conceptual, methodological and practical implications of community forestry institutional arrangements. The community experiences of Rodeo, Cebollas and Tesoro were recorded through case studies done with the IFRI Research Program social-ecological methods.

The study documents the successes, failures, and challenges community forestry has faced in less studied Eastern Guatemala complementing what is known of community forestry in other sections of Guatemala. The Western Highlands and the Northern lowlands have been studied more thoroughly given their specific contexts of a rich indigenous legacy in the West, and government-led efforts to halt the advance of the agricultural frontier in the North: the largest remnant of forested land north of the Amazon.

This dissertation shows that Chiquimula's resource-dependent rural inhabitants are capable of sustained community forestry initiatives. Furthermore, their communal experiences show that institutions matter. When local institutional arrangements are respected and nurtured these can sustain collective action, whereas when they are ignored and trampled collective action fails.

## **In Resource Governance Institutions Matter**

In 1998 when the first IFRI team visited Cebollas it found the 20 hectares of cloud forest (Cebollas Protective) that surrounded their water collector fenced in and with clearly established rules against encroaching and consumption of forest products. These institutional arrangements were dramatically different from those found in other communally owned forests, including Cebollas's 457 hectares of pine-oak communal forest. The solid institutional arrangements were interesting not only to the IFRI team but helped a donor-driven development initiative select them for a forest management endeavor. However, Cebollas's participation in this development project highlights how essential it is to understand the role local institutional arrangements have in resource governance. When the local institutional arrangements are misunderstood or underappreciated, the consequences can be tragic.

External agents that sought to support Cebollas in a sustainable timber operation ended up alienating this community from the communal organization they have belonged to for 400 years. The project staff failed to take into account the intricate institutional arrangements between Cebollas, the Indigenous Community of San Francisco Quezaltepeque (ICQ) and the Municipality of Quezaltepeque. They failed to appreciate the underlying tension that preceded their presence in the area. They also failed to assess the critical role that Guatemala's history of undermining communal property has had in community forestry experiences like that of Cebollas. Technology transfers, business administration capacity building, organizational strengthening as well known components of projects seeking to establish community based timber management operations. All of these components are necessary for such an endeavor, but if institutional arrangements

and the historical and cultural context and legacy are neglected efforts to bring development options can result in failure.

### **Institutions for Resource Governance can be Created and Nurtured**

Institutions for the governance of resource system can be created in relatively short time frames. Rodeo's almost two decades of forest protection offer a clear example of how a community can go from using its resources as open access to strictly regulating its protection. Only twenty years ago, Rodeo used its ejidal forest for firewood, timber and kindling without any control. They wouldn't hesitate to cut down large numbers of pine trunks to keep a blazing fire going for hours while they transformed cane juice into sugar. Nowadays, Rodeo no longer grows sugar cane or makes sugar, nor does it harvest firewood or kindling from the forest. Instead it established rules that regulate forest use. These rules are strictly enforced and everyone interviewed is fully aware of them. Signs of forest management and recovery are visible and were confirmed by the analysis of forest data collected during field visits. The transformation was slower than the time frames of donor designed projects, yet in less than twenty years this community dramatically transformed its relationship with its forest resources. Their experience offers insight into the process of institutional transformation for resource governance and the role state agents can have in it (BOSCOM).

The design of the institutional arrangements present also matters. In Rodeo the capacity of local institutions to address conflict creatively allowed the community to overcome significant setbacks and make progress in their community forestry endeavors, even though it meant ensuring the protection of one forest while allowing the other to degrade as an open-access resource. The opposite happened in Cebollas, where conflict was not

successfully addressed, and conflict escalated halting community forestry activities and outside investment in the 457 hectares of communally owned forest.

## **Methodological Contributions to the Study of**

### **Resource Governance Institutions**

Methodologically, this dissertation highlights the delicate task that interdisciplinary scientists embark on when using multiple methods and data sources. Within one jurisdiction, even if relatively small in extent, distinctive forest associations may be active and scientists must be careful in defining how to compare them. One of IFRI's methodological challenges is the limited availability of reference forests –forests that represent the “optimal” state that IFRI forests would have if they were undisturbed. Having reference forests assists scientists in designing ecologically valid comparisons for the studied forests.

The IFRI cases included in this dissertation offer an illustration of what may happen if the analysis of forest variables is not an ecologically valid comparison. When the cloud forest of Cebollas Protective was compared against pine-oak forests the resulting analysis showed that Cebollas Protective had a superior forest condition. However, these results reflect ecological differences between forest types rather than differences resulting from institutional arrangements for resource governance. To ascertain whether the differences found in 1998 reflected actual differences in resource governance the 2004 IFRI team sought a second cloud forest in order to have an ecologically valid comparison for Cebollas Protective. The team found El Volcán, a cloud forest nearby Cebollas Protective under different institutional arrangements. The team could not ascertain that this forest

presented the optimal forest condition sought in a reference forest; nonetheless it did offer an ecologically comparable forest. The proximity of this forest to the studied area and accessibility allowed the team to collect the data with a couple of extra days of forest work at very little extra cost. The analysis of forest variables between the two cloud forests showed that the forest condition in both forests was not significantly different, confirming that the previous findings could not reflect the impact of institutional arrangements but were the result of ecological differences. These results emphasize the importance of verifying the comparability of forest types and how the challenge of identifying reference forests may be solved, when such forests are not readily identified or when funds are scarce.

Methodologically, this study also shows the value of site revisits. In 1998, the IFRI team found two community forestry groups that were actively engaged in forest protection. Cebollas had fenced in 20 hectares of cloud forest while Tesoro had established a forest protection committee for its 736 hectare pine-oak forest. By 2004, Cebollas Protective forest remained fenced and the protective institutional arrangements had endured, while Tesoro's committee had dissolved along with every effort to control extraction of forest products. A third site revisit may allow researchers to explore how resource extraction has continued in Tesoro and how the conflict in Cebollas has evolved. It would be interesting to discover if now cautious external agents have begun to return to Cebollas and if some of the broken bonds between Cebollas and the ICQ are on the mend. A second site visit in Rodeo could document how the possibility of income generation via forest products is influencing the institutional arrangements already designed and what new rules have been developed (or not) to deal with the issues that accompany a business

oriented forest operation. As mentioned in Chapter Two, in 2006 Rodeo was able to access PINPEP forest incentives for a pine needle women handicraft project and a men's carpentry operation. In 2004, when the site was visited the possibility of an income generation forest activity was still only an idea.

### **Insights for Donors and State Agents**

This dissertation stresses how fundamental it is for agents to understand the role of institutional arrangements in collective action. Furthermore, rather than funding or technical skills, what state agencies and project staff require to effectively support community forestry initiatives is openness and respect for local institutional arrangements, to strengthen them instead of trampling them. It may seem a matter of fact and simple observation to make, but projects are repeatedly designed to transfer technology, bring knowledge to "ignorant" beneficiaries, and "organize them", yet still fail to understand them.

In Rodeo, staff permanence and limited funding did more for building a solid community based forest protection effort than what a multi-million dollar project brought Cebollas. With limited funds, progress was slow, its pace allowed for obstacles and challenges to be addressed and resolved when possible. Some of these challenges have remained constant throughout their experience, specifically conflict with the leader of Cementerio. However the challenges have not prevented the people committed to forest conservation from constantly inching forward.

Specifically, I recommend donors and state agents pay close attention to how BOSCOM (Proyecto Bosques Comunales), INAB's branch for community forestry, effectively

supported Rodeo's process. The forest technicians working for BOSCOM, Maynor Barillas and Ronaldo Camey, are identified by Rodeo members as key players in their successful process towards a consolidated community forestry initiative. Although I do not know how other BOSCOM technicians have developed their relationship with the communities they work with, the approach Maynor and Ronaldo took in Rodeo is an example of how to build the necessary long term alliances resource governance requires. Staff permanence, long term goals aimed at supporting community based forestry, and limited funding were characteristics of how they worked with Rodeo. Their goals were not those of a donor-funded project required to deliver dramatic results in short time frames, neither did they have access to significant sources of funding for any major investment for forestry operation in Rodeo. Maynor Barillas went on to become BOSCOM's coordinator, an indicator of how valued his previous performance had been. Further study of BOSCOM's structure and strategy would be of policy relevance. Donors, perversely motivated to allocate large sums of money into one-size-fits-all projects, could consider strengthening BOSCOM instead.

Donor and state agencies should also reflect on how the perverse incentives that abound within their structures can be minimized. As mentioned above, the time constraints on budget allocations favor projects with large funding investments, even if less funding but long term permanence could yield more solid results as happened in Rodeo. Similarly, reports favor emphasizing successes and underreporting of failures or setbacks. At every level, learning from past experiences is not promoted or facilitated. In the documents I reviewed and with the people I interviewed no one seemed to understand how the institutional arrangements and historical legacy of Guatemala's undermining of common

property had affected project outcomes in Cebollas. They knew the result was terrible and there was a voiced recognition of how project actors failed to be sensitive to the underlying issues, but no one clearly identified the role that institutional arrangements had to play in the ensuing conflict. Promoting learning from such mistakes and an active commitment to mending the followed approaches could prevent other possible similar outcomes or potentially could help Cebollas mend its relationship with the ICQ.

### **Community Based Resource Governance is Possible but Challenging**

The forest communities studied offer evidence on how unique each community forestry experience is: some are actively working to protect and soundly manage the forests they are historically linked with; others have not been so successful. Some have transformed themselves from potentially unsustainable forest users into forest caretakers in a relatively short period of time. In others, timber harvesting and land for coffee have toppled conservation concerns. It is fundamental to understand the intricate power structures implicated in any collective struggle.

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## EDUCATION

- Indiana University** ▪ Bloomington, Indiana, USA 2011  
**PhD in Public Policy**  
Joint Program: School of Public and Environmental Affairs/Political Science  
Thesis: The Effect of Institutions on Guatemalan Forests: conceptual, methodological and practical implications.  
Advisor: Dr. Elinor Ostrom  
Minor: Human Dimensions of Global Change
- Universidad del Valle de Guatemala** ▪ Guatemala, Guatemala 1997  
**B.Sc. and Licenciatura in Forestry Engineering**  
Thesis: Field Methods for Quantifying Carbon in Agroforestry Systems  
Distinguished Student Award: 1995, 1996
- Facultad Latinoamericana de Ciencias Sociales** ▪ Guatemala, Guatemala 1996  
1° Mesoamerican Course on Community Forestry
- Population Reference Bureau** ▪ Washington DC, USA 2003  
Policy Fellows Program in Population Policy Communication
- UNDP-GEF – Latin America and the Caribbean** ▪ Panama, Panama  
Consultants' Training Workshop Biodiversity, Land Degradation and International Waters July 2007
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## PROFESSIONAL AND RESEARCH INTERESTS

Institutional arrangements for robust self-governance, rural livelihoods and development, land tenure, vulnerability, governance, community forestry ecosystem services valuation, human dimensions of land use/land cover change, environmental services and climate change,

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## PROFESSIONAL EXPERIENCE

- WWF Mexico-MAR** ▪ Guatemala city, Guatemala 2009-2011  
Institutional Development Regional Officer
- Responsible for fundraising, donor relations, strategic planning and communications for the Mesoamerican Reef ecoregion. Brand management, technical proposal writing, reports to donors, citizen campaigns, centralization and systematization of information and knowledge.
- WWF Central America** ▪ San Jose, Costa Rica and Guatemala city, Guatemala 2008-2009  
Information Director
- Information Management, Communications, Fundraising, Knowledge Management.
  - Responsible for fundraising and communication needs for the five WWF Central America offices located in Belize, Guatemala, Honduras, Costa Rica and Panama. This includes press relations, brand management, communication materials, technical proposal writing, reports to donors, citizen campaigns, centralization and systematization of information and knowledge.
- Environmental Studies Center Universidad del Valle de Guatemala** ▪ Guatemala, Guatemala 2006-2008  
Independent consultant and Research Associate,
- Research, publications and various consultancies
  - Project: Strengthening of Transdisciplinary Capacities for the Study of Indigenous Institutions associated with Natural Resource Management.
  - Instructor postgraduate courses in Collective Action, Governance and Resource Management for FLACSO Guatemala and Universidad del Valle de Guatemala
- United Nations Development Program –PNUD- Guatemala** ▪ Guatemala, Guatemala 2005-2006  
Program Officer Environment and Energy
- Technical and administrative accompaniment of environmental projects funded by the Global Environmental Facility (GEF) in topics of biodiversity, climate change, international waters, land degradation and drought; specifically in protected areas, renewable energy, capacity building, and biodiversity friendly commerce. Revision of annual work plans, project

evaluations, and budgets. Monitoring and evaluation, lessons learned and systematization of experiences. New project design and proposal preparation.	
– Represented UNDP in various thematic fora, contact person for the Ministry of Environment and other government and civil society offices.	
– Knowledge of Atlas software for project management.	
<b>CIPEC-Center for the Study of Institutions, Population and Environmental Change</b> ▪ Bloomington, Indiana	2005
– Course instructor for training on the methods of the International Forests and Institutions Research Program (IFRI) Oaxaca, México. June-July, 2005.	
<b>CIPEC</b> ▪ Bloomington, Indiana	2000-2005
Research Assistant:	
– Data base and field data management.	
– Fieldwork on institutional analysis, forest ecology and GIS tools in Mexico and Guatemala.	
– Course assistant for the training course on the methods of the International Forests and Institutions Research Program (IFRI).	
<b>Fundación Solar</b> ▪ Guatemala, Guatemala	1998-2000
Consultant in Environmental Services and Carbon Monitoring:	
– Research project and proposal design for the project: “Carbon and Sustainable Coffee” in San Juan la Laguna, Atitlán.	
– Preparation of the national inventory of Green House Gases in the Energy sector.	
– Training in carbon monitoring methods.	
– Proposal design, budget and annual work plan experience.	
– Carbon accounting in forest and agroforestry systems (coffee and rubber).	
<b>Asociación Nacional del Café</b> ▪ Guatemala city, Guatemala	1998
Responsible for the project “Carbon Sequestration Potential of Guatemalan Coffee”	
<b>Winrock International</b> ▪ Little Rock, AR	1997
Field tested carbon monitoring methods in coffee plantations in Zacapa, Guatemala.	
<b>Universidad del Valle de Guatemala</b> ▪ Guatemala city, Guatemala	1994-96
Biology Lab Instructor	

#### AFFILIATIONS

- Environmental Studies Center, Universidad del Valle de Guatemala, Guatemala.
- Fundación Defensores de la Naturaleza, Guatemala.
- International Forest Resources and Institutions (IFRI)
- United World Colleges National Committee Guatemala, member since 1989, Chair 2006-2008
- United World Colleges National Committee Costa Rica 2008-2009
- United World Colleges National Committee Belize since 2009

#### GRANT AWARDS

Population Reference Bureau Policy Communication Fellowship (\$2,000)	2003
National Science Foundation Dissertation Enhancement Grant (\$11,340)	2003
CIPEC Summer Field Research Award (\$1,000)	2002
Center for Global Change Pre-dissertation Grant (\$2,600)	2001
WWF grant for women working on the Mesoamerican Biological corridor (\$1,500)	1999
Central American Commission for Environment and Development (\$200)	1997
Guatemala Forest Action Plan (\$500)	1996
Universidad del Valle de Guatemala Fee scholarship (\$400)	1995
Canadian International Development Agency, L.B. Pearson United World College of the Pacific (\$CAN 32,000)	1989-91

## PUBLICATIONS

2003. Contribution to the online supplement to T.Dietz, E.Ostrom, and P.C. Stern, Science 302(2003):1907-12. The link to *The Struggle to Govern the Commons* online supplement can be found at: <http://www.sciencemag.org/cgi/content/full/302/5652/1907/DC1>, pdf version: <http://www.sciencemag.org/cgi/data/302/5652/1907/DC1/1>

Márquez, Lilian. 2000. Elementos Técnicos para Inventarios de Carbono en Uso del Suelo. Fundación Solar, Guatemala. pdf copy available at: [http://www.winrock.org/REEP/PDF\\_Pubs/fundacionsolar.pdf](http://www.winrock.org/REEP/PDF_Pubs/fundacionsolar.pdf)

Márquez, Lilian. 1998. Field Test of Carbon Monitoring Methods in Agroforestry Projects in Guatemala in *Field Tests of Carbon Monitoring Methods in Forestry Projects*, Winrock International, Little Rock.

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## PRESENTATIONS

Márquez, Lilian and Doris Martínez. 2007. ¿Paso a paso o en Embestida? Cooperantes, agencias de gobierno y experiencias de acción colectiva en casos de forestería comunitaria en el oriente de Guatemala. I Latinamerican Gathering on Development Models and Access to Natural Resources. Guatemala, Guatemala, 30 may-1 june 2007.

Márquez Barrientos, Lilian. 2006. Donors, state agents and collective action in poverty reduction and community forestry experiences in Eastern Guatemala, IASCP biannual meeting, Bali, Indonesia June 2006.

Márquez, Lilian, 2006. Markets, Rural Development, and Biodiversity Conservation. Conference on Sustainable Commodities Trade and Ethical Corporate Practices. Contributions by Business to the EU Commodities Action Plan. Centre for European Policy Studies-Kraft Foods, Brussels, Belgium April 26, 2006.

Márquez Barrientos, Lilian. 2005. Donors, state agents, and community forestry: approaches to community forestry in Guatemala. Working Forests in the Tropics, University of Florida, Gainesville, Florida. February 14-15 2005.

Márquez Barrientos, Lilian. 2005. Inching forward or charging ahead? Foreign aid approaches to community forestry and their experiences in eastern Guatemala. SPEA Research Conference, Indiana University, Bloomington, Indiana. February 5, 2005.

Marquez, Lilian. Elaboración de Proyectos para Fijación de Carbono. July-August 1999. Guatemala and Panamá.

Marquez, Lilian. Métodos para Cuantificar Carbono en Sistemas Agroforestales. November, 1997. Guatemala.

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## LANGUAGES

Spanish: Native language English: Fluent both written and spoken French: Written and spoken, intermediate

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