

**Public Policy Reforms and Indigenous Forest Governance:
The Case of the Yuracaré in Bolivia**

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ABSTRACT

The recent surge in the efforts to reform forest governance—both through decentralization and tenure reforms—has been coupled by an increase in empirical studies that assess the virtues and limitations of the new regimes. Despite an increasing body of literature, however, there is still limited knowledge about the effects of these reforms on indigenous groups and their forest governance institutions. This study seeks to contribute to the empirical literature by analyzing how policy reforms in Bolivia have affected one indigenous territory, its inhabitants, their de facto property rights regime, and their consequent efforts to govern their forest resources. The case study, about forest use decisions and actions among the Yuracaré people in the Bolivian lowlands, is an example of what the Amerindian indigenous societies face in terms of both opportunities and limitations associated with the implementation of formalized de jure rights to forest. We pay particular attention to the effects of the 1996 forestry reforms on the institutional conditions for governing common pool forests resources. The study is unique in that its analysis draws on primary field data that were collected both before *and* after the implementation of the reforms. We find that the introduction of formal rights has led to increased security in tenure rights and the emergence of more opportunities for diversifying the sources of income for the Yuracaré. But there are also significant costs associated with the achievement of these benefits. The reforms induced the Yuracarés to integrate with the surrounding public and private economies, but we find that these interactions have strained traditional governance arrangements.

Keywords: Bolivia, governance, indigenous people, property rights, public policy

INTRODUCTION

Few public sectors in the developing world have been subject to as many public policy reforms as the forestry sector. In the last 20 years, a number of reforms aiming to change forest tenure and degree of decentralization in decision making have helped to transform the way public administrations around the world govern forests—at least on paper. One of the core findings of research on local forest governance is that political reforms do not always change the way things are actually done on the ground (Gibson et al, 2005; Lindsay, 1998; Bruce, 1998; Allston et al, 2000).

Nevertheless, based on governments' self-reported figures there is a major forest tenure transition underway by which more and more of the world's forest is controlled by rural communities and indigenous groups (White and Martin 2002). This transition is due, in part, to government-led land reforms that recognize indigenous people's ancestral land rights. These reforms grant, to varying degrees, ownership of these lands to its historical stewards (ibid). The changing distribution of forest lands has been welcomed not only by indigenous people themselves, but also by policy scholars and practitioners concerned with the undervaluation of forest resources, associated with insecure land rights. Recent studies show, however, that the countries that have carried out land reforms have experienced mixed results with regards to delivering increased tenure security for the rural poor, forest-dependent populations (Fisher, 2009; Larson et al 2008). Formalization of rights, it appears, is an important first step towards improved forest tenure security but it does not seem to be sufficient for achieving improved governance outcomes. This observation raises the question as to which institutional conditions—in addition to de jure property rights—are conducive to socially fair, economically viable, and ecologically sustainable forest governance outcomes. Ultimately, that is the question that motivates this study.

While there is an increasing body of literature that considers how forest policy reforms at a central level of government affect, or fail to affect, human decision-making about forests locally, there is surprisingly little systematic empirical research to assess the impact of the reforms on indigenous populations, and their governance of forest resources. Scholars who seek to address this knowledge gap face several methodological challenges. One of the trickiest problems is related to the difficulty of attributing observed user patterns in the field to the enactment of the particular land reform. Part of the problem of establishing causality is due to the lack of relevant data on behavior and decision making *before* the reforms were passed—the interest in assessing the effects of a particular policy often arise *after* the policy has been in place for some time. As a result, policy analysts and policy makers are still in the dark not only when it comes to the results of the reforms but also about the most appropriate policy adjustments that are needed to meet original policy objectives.

This study seeks to contribute to the contemporary empirical literature by analyzing how forestry reforms have affected indigenous forest users at the local level. We present the results of a longitudinal, in-depth case study of an indigenous territory, its inhabitants, and their efforts to govern their forest resources. The study is unique in that its analysis draws on primary field data that were collected before *and* after the implementation of the public reforms, which enables us to test some of the main hypotheses about the effects of these reforms on indigenous people and their governance arrangements.

The case study presented here is based on the IFRI (International Forestry Resources and Institutions) research program, which investigated these communities at two points (1996 and 2007), gathering qualitative and quantitative data which can be combined and compared. In each one of the studied communities, we organized meetings with the

majority of local inhabitants, collecting data about local peoples' interactions with the forest. We also gathered genealogies of the primary local leaders of the Yuracaré people, and conducted semi-structured, detailed interviews with other community leaders. In both the 1996 and 2006 visits, the same forest areas were studied and surveyed.¹

The study is about the Yuracaré people whose ancestral territory is located in the Bolivian tropical lowlands. This case study represents an example of what the Amerindian indigenous societies face in terms of both opportunities and limitations associated with the implementation of forestry sector reforms, in this case entailing parallel tenure and decentralization reforms. Our analysis pays particular attention to how the reforms have affected the institutional conditions for addressing a series of collective action problems that are inherent to all local efforts to managing common pool resources.

We begin the paper by reviewing the contemporary literature that speaks to the issue of local forest governance and indigenous societies. Drawing on the common pool resource literature we then select a series of variables describing the conditions conducive to effective collective action and use our observations of these variables to assess the effects of the forestry reforms. We proceed to describe the reforms themselves, followed by a description of the Yuracaré society, and we conclude by assessing the degree to which the principles of self-enduring institutional conditions drawn from the common-property literature help to explain the ways in which the Yuracarés responded to the forestry sector reforms.

PREVIOUS RESEARCH

The literature on property rights has mostly been concerned with what are the types of tenure are associated with better forestry conditions. One of the key findings of institutional analysis with regards to common pool resource management is that well-

defined boundaries regarding where one person's right begins and where another's right ends, facilitate the effective governance of such resources (Ascher 1995; Baland and Platteau 1996; Dietz, Stern, and Ostrom 2003; Gibson, Williams, and Ostrom 2003; Meinzen-Dick et al. 2002; Ostrom 1999). They do so by increasing the probability of sustaining local collective action (Gibson, Ostrom, and McKean 2000; Meinzen-Dick et al. 2002; Ostrom 2003).

Another central result of recent empirical work is that tenure type is not as important as tenure security (Gibson, Lehoucq, and Williams 1998; Tucker 1999). Moreover, McKean (2000) argues that common property is the type of tenure that is most suitable for forest management because holding forests as a commons diminishes many of the risks and externalities involved with managing fragmented forests.

Much of previous research on forestry reform in developing countries focuses on how public policy reforms affect government decisions and actions at various levels of governance, especially in the case of decentralization reforms (Ferroukhi 2003; Kaimowitz 2001; Larson 2002; Andersson, 2003; Pacheco 2002a). Few studies specifically address how indigenous institutions are affected by the reforms (but see Pacheco, 2008; Larson et al., 2008, Andersson and Pacheco, 2006) though it is now widely recognized that forest user groups at the local level play a crucial role in crafting and enforcing forest governance rules (Becker and León 1999; Gibson, Ostrom, and McKean 2000).

Agrawal and Ostrom (2001) point to the importance of considering the role of local user groups when analyzing how decentralization and land reform policies affect forest outcomes. In a comparison between forest communities in Northern India and Nepal, the authors find that local communities who have been given more extensive formal property rights through the reform process tend to be more motivated to govern forests, and in

general do so more effectively. Agrawal and Ostrom further suggest that reforms are not likely to succeed in contributing to improved conditions for forest self-governance unless local forest communities are recognized as proprietors of the forests that they use. In this paper, we build on the approach developed by Agrawal and Ostrom (2001) and study how a government-led effort to reform the forestry sector in Bolivia has affected one particular user group, their property rights regimes, and their struggle to govern a vast forestland. In doing so, we seek to combine insights from the literatures on property rights and natural resources governance.

The role of indigenous common property institutions in local forest governance regimes is not without controversy. Ribot (2001), for example, suggests that customary authorities are not “necessarily representative, legitimate or even liked by local populations” (Ribot 2001, p22). The presence of local strongmen or a corporatist dictator is only a small part of the organizational problems facing indigenous institutions (Baland and Platteau, 1996). Other problems include how larger indigenous organizations may continue to make decisions by consensus, how to complement small size communities with larger communities to be successful in the provision of important larger-scale services, and to what extent the local governance organizations are able to match the preferences of a variety of actors within smaller communities (Chandra 2001; Coleman 1990; Ostrom, Schroeder, and Wynne 1993).

While we agree that in developing countries some indigenous social organizations present a variety of organizational problems, it does not mean that they should be ignored by analyses that assess reform impacts. In fact, only if we consider indigenous groups and how they are affected by reforms are we in a position to assess the extent to which reforms have contributed to governance outcomes that are more socially just. Moreover, indigenous

institutions represent a genuine and crucial component of many modern political systems, especially in Bolivia where indigenous groups have emerged as forest governance actors of increased importance.

BACKGROUND: BOLIVIA AND THE YURACARÉ

The Bolivian lowlands represent an appropriate study area of the relationship between policy reforms and indigenous forest governance for at least three reasons. First, the country is ranked in the top of all Latin American countries in terms of indigenous populations' territorial rights (IDB 2004). Second, an extensive process of political decentralization has been implemented since 1994, seeking to improve public service performance by bringing government closer to the people. And third, the majority of indigenous territories are located in forest-covered areas, and indigenous lowland populations manage multiple forest products as an important source of their livelihoods. The indigenous' commons in Bolivia encompass an area up to 20 million of hectares, which represents about a third of the total Bolivian lowlands and a large proportion of the country's forest areas.

The Yuracaré people live in a territory of 247,165 hectares. The Yuracarés were one of the first groups in Bolivia to acquire a government-approved forest management plan, which formally gave them the formal rights to use the forests to meet their household needs. This achievement gave them a fairly complete “bundle of rights” with regards to their forest use. This process was supported by CERES-Bolivia, which has been engaged in collaborative research activities with the Yuracaré people since 1993 to the present. The references related to the Yuracaré society in this paper are the result of the IFRI-based field research in two time periods 1994-1996 and a repeat study in 2005-7.

The Bolivian Forestry Reforms

Beginning in 1986, Bolivia started to launch a series of reforms to “modernize” the state to meet the criteria laid out in Structural Adjustment Programs supported by the World Bank and International Monetary Fund. In turn, in order to mitigate the negative social and environmental impacts of such programs, a set of “second generation” reforms were launched. These included the Popular Participation Law (1994), the Land Reform Law (1996), and Forestry Law (1996). The formulation of these regulations was influenced by several sources, including international agreements and conventions, historically unresolved local demands for increased autonomy, new political party strategies that responded to local interests, as well as a new national constitutional order (Urioste and Pacheco 2001; O’Neil, 2003). In Bolivia, forestry sector reforms were characterized by efforts to democratize the public policy process and to revise the previous forestry regulatory framework, which was considered outdated and increasingly irrelevant (Pacheco 2004). Of these three laws, only the forestry law (ley 1700) explicitly focused on the forestry problem. In addition, a 1995 administrative decentralization law and the law of municipalities could be added to this list (Wil de Jong 2004), but these complement the others.

We continue with a short chronological explanation of each of these, identifying the importance of each and their relation to the forestry sector, as well as the possible effect of each on indigenous communities’ land tenure.

The Popular Participation law of 1994 was, essentially, a municipal decentralization law. It created municipal governments in both rural and urban areas, with popularly elected authorities who were granted the power to manage local government finances. The most substantial source of local government financing in Bolivia comes from transfers from the

central government, but local governments also have the authority to raise small amounts of money from taxes and fees. Another important characteristic of this process was the creation of *Comités de Vigilancia* (Oversight Committees), composed of representatives of civil society present in the municipality, referred to in the law as *Organizaciones Territoriales de Base* (OTBs—Basic Territorial Organizations). OTBs are charged with participation in the municipal planning process, which essentially means identifying needs in each group’s area of influence. The popular participation law, however, does little to direct the management of forests and provides few specific powers for doing so.

The land reform law of 1996 (*Ley N 1715 INRA*) ratifies the *de facto* rights obtained by indigenous peoples in mobilizations during 1990, recognizing indigenous lands as “Original Community Territories” (TCOs). The Bolivian government also ratified the OIT convention, which requires signatory countries to recognize property rights of indigenous populations to forestlands as common property regimes in areas that had previously been considered as public or open access. Through this process, indigenous communities have been recognized with rights of access, withdrawal, management, and exclusion (but not alienation rights) to the land. Moreover, the legislation recognizes the social, cultural, and economic rights of indigenous peoples and allows these groups to rely on traditional governance institutions and customary rights.

The strongest effect of this reform has been the land titling process to indigenous lands, in which indigenous groups demanded 29% of the national territory as TCOs. In the lowlands, 51 TCO demands cover 17,494,677 hectares (Cronkleton and Albornoz 2004a, cited in Cronkleton and Pacheco 2008), of which, only 4.2 percent has effectively been titled (Pacheco 2008).

Finally, forestry law 1700 specifies the method of access and use of forest resources. In doing so, it radically changes the structure of incentives faced by forest users (Contreras-Vargas 2002) with the goal of promoting sustainable forest use. For example, forest concessionaires now pay a fee to the government not per volume extracted, as used to be the case during the old regime, but a flat fee per hectare of concession land. (Pacheco and Kaimowitz 1998). The law recognizes the exclusive rights of indigenous people to extract forest resources from their TCOs. All forest users, however, are obliged to develop a management plan before any commercial extraction activities. This implies organizational and technological problems for forest users who, for example, are not permitted to use chainsaws and other modern technology.

Possibly the most striking feature of the reforms was the devolution of forest property rights to indigenous territories in common-property regimes. In the forestry sector, powers over natural resources and financial resources allocated to local authorities are extremely limited, forest activities are highly controlled through oversight and management planning requirements, local government agents are not well equipped to deal with delegated functions, municipal authorities are not sufficiently accountable to local populations, and jurisdictional problems between municipalities and indigenous groups produces a great deal of local tension (Hernández 2000). These tensions are exacerbated by the fact that the State is the sole owner of all forest resources and retains the right to allocate usufruct rights selectively and conditionally.

Devolution of property rights to indigenous people

Ever since its foundation in 1825, Bolivia's government has sought to claim control over its vast and sparsely populated territory of forests and lands. The indigenous population has

historically been displaced and pushed away from their ancestral lands. Historically, indigenous people in Bolivia held fewer formal rights than the non-indigenous, reflecting prejudice that persists and was reflected in policy until the late 20th century. According to dominant thinking of the late XIX and early XX centuries, the bulk of the lowland area was not inhabited but ‘ill-inhabited’ (Fawcett, 1910).

The International Labor Organization’s (ILO) Convention No. 169, which was ratified by Bolivia in 1996, had an important effect on the country’s indigenous land tenure issues. This Convention deals with land rights as part of the basic human rights of indigenous and tribal peoples in UN member countries. The convention requires signatory countries to recognize property rights of indigenous populations to forestlands as common property regimes in areas that had previously been considered as public or open access. Meeting the requirements of the Convention, Bolivia’s Land Reform Law, which was passed in 1996, recognized indigenous territories as indigenous common property through a title regularization process for the entire country. This included joint rights over both land and forests. Through this process, indigenous communities have been granted rights of access, withdrawal, management, and exclusion (but not alienation rights) to the land. Moreover, the legislation recognizes the social, cultural, and economic rights of the indigenous peoples and allows these groups to rely on their traditional forms of governance institutions and customary rights.

The Yuracaré indigenous society

The Yuracaré group is one of the 32 indigenous groups in Bolivia, located in the Chapare river basin. The river constitutes a natural border between the provinces of Chapare and Carrasco, both part of Cochabamba, and is over 300 kilometers long. This river basin is a

mostly unexplored zone of forests and humid natural pastures, with some crude oil and natural gas, and a deficient road network. The only road access is through a small road to the entrance port of the area, Puerto Cochabamba. The Yuracaré people have been located, for centuries, throughout the Chapare region; however, the process of colonization has moved them to their current settlement.² In this way, the actual Yuracaré Territory, with an extension of 247,165 hectares is just a small part of the spatial extent that the Yuracaré people have occupied historically. This area has been progressively reduced as other settlements appeared (Becker and León, 2000).

The Yuracaré people are in a process of changing their traditional forestland use patterns, from highly mobile households over large areas of forests, to more permanent settlements. However, the Yuracaré people still live on their river banks and continue to hunt, fish, gather forest products, cultivate subsistence crops, and extract timber and non-timber forest products as their main sources of livelihood. Today, this indigenous society has contact with market networks, and through these, other parts of Western society. Their lifestyle is undergoing a rapid process of change, in which they adapt to the socio-economic dynamics of the modern Bolivian tropics. They are also impacted by substantial illegal coca leaf production, which is closely connected to the international economy (Uberhuaga, 2001: 46).

Today, the Yuracaré population encompasses roughly 3,000 inhabitants dispersed in 18 communities along the Chapare River.³ Its main social unit institution is the clan, a consanguineous population, which constitutes the lowest unit of decision-making. In ancient times, each clan was located in a settlement called a port, since the river was the main ecological feature ordering the territorial arrangements of this population. At a higher level of organization, Yuracaré are organized into “corregimientos”, which are groups of

extended and nuclear families holding rights over a larger territory, electing their representatives usually by consensus. As illustrated by Figure 1, at the highest level of organization, there is a Yuracaré Council, consisting of, a Cacique Mayor and eight secretaries” (CERES, 1997: 14-15).⁴

The Yuracaré territory is located in a flood zone in different stages of succession formed by different ancient riverbeds of the Chapare River, which form potential areas for the reproduction of fish and fauna in general. The territory has multiple plant formations and settlement areas correspond to the riverbed forests, located in the high-terrace areas where they develop agrosilvocultural practices (Uberhuaga, 2001: 46). The management of this area is through trough rotation cycles of farming plots named *chacos y barbechos* (*fallow*).⁵

The population depends on the forest as the main source of food, based mostly on highly seasonal agricultural practices. From the forests they obtain game and fish, fruits and seed for food and medicine, harvests of rice, yucca and bananas, construction materials for building their dwellings, and timber products to sell in the marketplace. Thus, their economy is based on the supply of forest products, which are subject to the internal and external market demand dynamics.

The Yuracaré population also interacts with western society, as a result of interaction with the market. The efforts of the Yuracaré to insert themselves into the Bolivian society at large were motivated by a combination of wanting to generate increased income from timber sales and the desire to acquire legal recognition and formal property rights for their land and natural resources.

[Figure 1 about here]

ASSESSING THE REFORM EFFECTS ON LOCAL FOREST GOVERNANCE

To govern forests well requires strong local institutions because forests are common pool resources, making the exclusion of potential outside users difficult and costly (Ostrom, 1999; Gibson et al 2000). Forests have important externalities with regard to atmospheric, hydrological, and biological services. Forests (and their associated sub systems) take far longer to develop than the sitting terms of parliamentarians or presidents. And forests are complex: they can generate multiple products -- wood for construction and/or fuel, wildlife, water, leaves, fruits, fodder, seeds, straw, shade, fertile soil, stones, etc. These products may be consumptive or non-consumptive, mature at different rates, and have the characteristics of common pool, private, or public goods providing ecosystem services for regions, countries, and continents. In other words, forests are complex resources and as such they defy simple policy solutions (Andersson and Ostrom, 2008).

Any systematic assessment of political reform effects must develop a set of applicable criteria and indicators that reflect the objectives of policy reforms. To assess the extent to which decentralization reforms have affected indigenous community forestry activities we draw on previous research by Ostrom (1999) that highlights the principles that characterize a long-enduring common pool resource institution: “Robust institutions are found in systems that have survived for long periods of time. Such institutions survive, when operational rules are adapted in relation to a set of collective choice and constitutional rules” (Shepsle, 1989, cited by Ostrom, 1997). Indigenous groups have developed deeply rooted and persistent institutions, often in spite of deep external challenges. We argue that the effects of public policy reforms on these indigenous institutions depend on the degree to which the reform process helps to create institutional conditions that are more supportive of

robust, self-governing institutions. We draw on a selection of Ostrom's institutional design principles to assess how the reforms have influenced these conditions for effective self-governance (Ostrom, 1990, 1999)

We expect reforms to produce positive governance outcomes for indigenous people when local conditions for developing robust local institutions are supported rather than challenged (Diezt, et al. 2003). According to Ostrom's institutional design principles, these conditions include: rules that are congruent with ecological conditions, clearly defined boundaries of resources and user groups, accountability mechanisms for monitoring, applying graduated sanctions for violations, low/cost mechanisms for conflict resolution, the inclusion of interested parties in informed discussion of rules, allowing adaptive governance at multiple level, and the employment of mixtures of institutional types (Ostrom, 1990).

We choose to use Ostrom design principles as our main evaluative criteria for governance performance because many, if not all, of Ostrom's design principles have been corroborated by a large number of empirical studies. These studies have involved experimental work (Ostrom et al 1994; Ostrom, 2003; Cardenas, 2000, Janssen et al 2010), large-n studies, (Gibson et al 2000, 2005, Agrawal and Chhatre, 2006. Chhatre and Agrawal, 2009, van Laerhoven, 2010), comparative case studies (Andersson and Pacheco, 2006; and spatial analyses (Nagendra, 2007; Ostrom and Nagendra, 2006). Hence there is a strong empirical and theoretical justification for using these as criteria.

These design principles are used as evaluative criteria in our comparative analysis of the institutional conditions for effective forest self-governance by the Yuracarés before and after the policy reforms, in particular the forestry reform of 1996. We expect that some of the principles are more affected than others by the institutional reforms, organizational

transformations, assignment of new rights and responsibilities. Table 1 summarizes the findings of the inter-temporal comparison.

Devise rules that are congruent with ecological conditions

Before the reforms, de facto rights to carry out commercial forest extraction were held by Yuracaré individuals or families. Extraction formed part of a highly mobile pattern in which logging activities were spread out throughout vast areas of forest. One of the implications for this management system as a whole was that it allowed participants to gain a deep knowledge of the forest ecological system and its complexities (Becker and León, 2000). By 1992, the Yuracarés had organized a forestry association which received an annual government logging permit from the national forestry agency at the time (the Center for Forestry Development--CDF). Within the association, each Yuracaré negotiated the amount of timber to be harvested individually--according to the needs and preferences of the participating individuals and their families.

Rules for forest practices during this pre-reform era were rather general in nature and allowed for local adaptation by the Yuracaré. Moreover, monitoring and enforcement activities of the CDF were highly irregular and ineffective, making the de jure regime less relevant for local forest governance activities. For example, before the reforms, there were no specific technical rules for cutting trees (in terms of DBH or size). The Yuracarés had their own indigenous rule system for timber harvesting: each individual authorized internally to harvest products had to abide by the Yuracaré's own forest classification system and rules related to the maturity of the product. The overarching principle that guided all forest use was : “use without depleting” (León, 1993: 10). This general rule reinforced the group's knowledge of the territory as a whole. According to the resource

users and professional foresters who jointly conducted the forest mensuration activities during our first site visit in 1994-1996, the ecological conditions of the territory's forests were healthy and in better condition than forests adjacent to the territory. At the time of our second visit, about ten years later, forest conditions remain stable throughout the territory. Comparing basal area and species diversity values from the 1996 and 2007, we found no statistically significant differences for any of these variables.

Our field observations during the second visit, ten years after the reforms, revealed that much of the previous pattern of forest governance changed with the reforms. The combined land reform and forestry decentralization reforms of 1996 not only recognized the territorial land rights of the Yuracaré and granted land title, but also gave the group the opportunity to formalize their management system and comply with the new forest management regulations as laid out in the Forestry Law 1700. The reform acts promoted commercial timber harvesting in indigenous societies and offered tax incentives for timber harvesting. However, formal management plans were required for the implementation of commercial timber harvest

Indeed, the Yuracaré developed a management plan, and purchased a sawmill to begin the production under their Management Plan. A forest engineer was hired, and timber harvest was regulated in three-month periods, with careful measurement of the timber extracted. Over the first three periods, timber harvest increased, from 8700, to 11000, and 36000 board feet respectively, shipped to the city of Cochabamba by logging truck.

Prior to the implementation of their management plan, it was difficult to estimate the amount of timber harvest, as timber harvest was conducted in small quantities by family groups, with timber sold only locally. Typically, timber harvest at one time was not

sufficient to require the use of logging trucks (Freddy Cruz, Personal Communication 12 march 2007).

As a result of the forestry law, operational rules on the ground for forest management were no longer imposed by the Yuracarés themselves but rather by the central government agency for forestry (The Forest Superintendence) which were based solely on technical norms and with little regard for local knowledge of the ecological system, and new technologies for new scales of production

Following the rules of the new formal forest management plan, which was officially approved by the national government in 1998 (the first in Bolivia), it no longer made sense for the Yuracarés to carry out the spatially extensive forest activities like they did before the reforms. Rather, their Management Plan defined very precisely the areas in which products were to be harvested and these areas represented, for practical reasons, a small fraction of the land area that was previously accessed for harvesting. The Management Plan also determined the exact volumes of each species that the community members were authorized to harvest from each harvesting unit of the plan, all according to the volume of growing stock as calculated in the plan's forest census.

As noted above, the formal legal reforms in the forestry sector imposed regulations with regards to forest management that were not mindful of the Yuracaré peoples' local traditions, knowledge, or governance arrangements. The expectation on behalf of the central government's forestry agency was that the Yuracaré would adopt a Western scientific model of forest management, which was very different from their own traditional approach. It is not surprising that many problems occurred as the Yuracaré began to manage forests according to these new rules of the game. Just as Holt (2005) argued for a return to people-centered conservation strategies that allow for social learning "in a

culturally respectful manner" (Holt, 2005: 212), our analysis suggests that in order to make sustainable forest management work in the Yuracaré territory and in other indigenous territories, legal regimes must be flexible to the local context. Bolivian forestry reforms, however, did not permit this flexibility, instead inducing the Yuracarés to modify their collective-choice and constitutional rule systems to accommodate the new operational rules, to learn new technological processes, and to adapt to new productions processes.

[Table 1 about here]

Clearly defined the boundaries of resources and user groups

One of the most striking effects of the reforms has been the recognition of property rights for the indigenous ownership of land (land reform), which means involving rights for the access, withdrawal, management, and exclusion (forestry reform). Partial alienation rights were granted that are conditional upon the formal forest management rules in the 1996 forestry law. Indigenous populations in Bolivia are now owners of at least part of their ancestral lands, but not of the forest that grows on them, as the Bolivian state has retained formal ownership of these. The current bundle of rights stands in sharp contrast to the pre-reform situation. For example, during our first visit to the territory in 1993, one of the Yuracaré leaders told us “We are tired of outsiders entering our communities and our territory to hunt and fish. They are abusing the animals, using dynamite to fish, and the fish are dying... These people don’t respect anything and when we have confronted them they just tell us ‘show us your papers’ and ‘you think you own this land or something?’... That is why we want to learn how we might get the government to recognize our territory as our property as they have done with other groups like us. I think the law supports our cause (Juan Rojas, 1993, personal communication). In 1998, the Yuracaré people received the title to their land and can take legal action to protect their territorial integrity.

Prior to the reforms, even though there did not exist any legal recognition of Yuracaré property rights, there did exist a general idea, of the boundaries of the Yuracaré territory and their forests (*de facto*). At the interior of the territory access was regulated according to the type of product and its destination (products for family consumption could be taken in the whole territory, but if they were for commercialization only in the area of influence, i.e. where they lived). User groups followed these rules and were easily recognized in the territory as no others accessed these lands. The quantity the users took during the pre-reform period was limited to a certain amount decided collectively in negotiations with the State Forest Office.

One of the most striking impacts of clarifying boundaries over the indigenous commons is that it has reinforced forest tenure security. The increased security, in turn, has induced more intensive timber harvesting. Before the entitlement forests were thought of as resources to be used in emergencies—acting much as a savings account--by converting these resources into cash by selling timber. The law, however, recognized their rights of traditional uses but did not give them any power to sell wood. Today, however, rules limit forest exploitation without a management plan to traditional uses. For example, the Yuracaré can use timber for personal uses, but they cannot sell this wood as their doing before for cash or for emergencies. To sell wood, over which they have exclusive rights (forest law), they had to implement a management plan, implying large scale production. To date, the Yuracaré have been given ownership of 247,165 hectares of territory, of which the vast majority is covered by moist tropical forests (INRA, 1998; CERES, 2004). This large territory, however, is in a process of internal fragmentation into three different sections. The causes of the division can be multiple and difficult to explain. One of the reasons is the implementation of the Law of Popular Participation, which forces settlements to be

legalized as territorial grassroots organizations to be included in the municipal planning. Each grassroots organization claimed a territorial area, leading to the fragmentation of the original indigenous territory. It also has produced the division of the forestland into three main areas of governance, each area under the independent governance arrangements of the three groups of settlements. This internal fragmentation of groups makes the boundaries of each group's rights to resources less clear for everyone, both internal and external actors.

Local monitoring and the accountability of monitors

Before the forestry law and the decentralization law, monitoring of the forests was a collective enterprise, which was organized around personal observations by the individuals who were moving around the territory for hunting, fishing, and timber harvesting activities. This was an activity organized by the forestry association and its associates to whom the patrolling individuals reported any observed infractions.

After the reforms, local monitoring became largely limited to the reduced areas of harvesting of the management plan. Further, monitoring is reduced to persons more knowledgeable about the operational rules, and about the structure of the formal forest management plan. Since the plan includes an explicit ban for entry to some of the areas under management, these are areas that have not been regularly monitored after the reforms. Much of the post-reform monitoring activities lie in the hands of the forestry professional, which the government requires the management plan holders to utilize for periodic assessment studies.

The drawback of this monitoring arrangement is that the indigenous population no longer participates as actively in the monitoring of harvesting activities, thereby losing many potential observers throughout the territory. Less eyes observing means less effective detection of rule infractions. Shifting responsibilities of monitoring and control from local inhabitants to professional foresters weakens the internal accountability system.

Apply graduated sanctions for violations

Before the reforms, the sanctions among the Yuracarés were based on their established mores and norms, which implied that they should be adjusted to the situation of the infraction and, as a general rule, the punishment should be ramped up according to the severity and frequency of the act of breaking particular rules. In general, reforms have not produced changes in these forms of sanctioning. Social control functions are still very important. The sanctions for violations of rules were incremental in nature, (from initial warnings to posterior permanent suspension of harvest rights) according to the rules of the Yuracaré forest association. Conformance to these rules was relatively high, given the credible threat of social sanctions. If an individual broke a rule (like harvesting in a forbidden place, harvesting with a chainsaw, or selling illegal timber) local authorities would typically talk to the person, demanding the immediate cessation of these activities. The second time the same individual was caught, the infraction became an issue for discussion at the next Communal Assembly, which could potentially limit rights of access to the forest resources. The threat of losing face and personal reputation in front of the community authority worked remarkably well, and during our first site visits (1994-1996) our team did not find evidence that suggested that the community assembly had had to deny access to forest for any community member.

In the wake of the reforms, however, a formal design of gradual sanctions to the infraction of the new management rules has yet to be formulated and enforced. Because the new governance process is still in the process of consolidation, collective rules and their fulfillment are still emergent and only vaguely defined. Currently, no formal system of graduated sanctions exists. The general rule is that everyone has to follow the specifications of the forest management plan and any violation to the rule implies a loss of such rights. However, informally enforced social sanctions exist to regulate illegal activities of the Yuracaré, thorough family clans, even during the period after the introduction of the Forest Management Plan. At present, a redefinition of the formal

requirements of the management system is underway with the Morales government, which is likely to affect the Yuracaré system of social control and sanctions.

Establish low-cost mechanisms for conflict resolution

The Yuracarés have traditionally resolved conflicts within their territory using their customary system, which means that all the problems are discussed in the communal assembly until reaching, to the extent possible, a consensus on the course of action to manage or resolve the dispute. The purpose of the deliberations in the assembly is to reach a consensus-based resolution, although leaders recognize that complete consensus is sometimes not possible and a compromise is then needed. The mechanisms for resolving conflicts vary in relation to the nature and intensity of the conflict as well as to who is involved. It is often the case that the conflict is resolved in a communal assembly, but there are some exceptional cases in which a couple of cases have been submitted to an external judge to make a ruling according to the national laws. The costs for using the Bolivian State's judicial system, however, are quite high. The high costs are related to the difficulty of mobilizing all the concerned parties within the communities throughout the large territory to come up with a unified stance.

There are an increasing number of conflictive situations, however, in which the traditional arrangements for conflict resolution are no longer adequate. We note that after the reforms, the role of external actors in community affairs have become more prominent, including relationships with representatives from the Forest Superintendence, the elected municipal government authorities, and the National Institute for land reform (INRA). In the post-reform era, there are more conflicts with external parties because of a general increase in the number of interactions with actors who are non-Yuracarés. This new reality puts

new demands on the customary system for conflict resolution, and our field observations suggest that traditional forums for conflict resolution are no longer able to respond effectively to these demands. Although, it might make sense, in theory, for the Yuracaré to increase their reliance on the State judicial system to better manage the conflicts with outsiders—since the non-Yuracaré parties to the conflict may not recognize the legitimacy of the rulings of a the Community Assembly—in practice such a shift does not yet represent a viable alternative because of the high transactions costs associated with such a change.

Involve interested parties in informed discussions of rules

Before 1996, decisions about how and where to harvest forest products were made by Clan families in agreement with the Forest Association and the local authorities (Community Assembly). These rules had evolved over a very long time, and were closely associated with established norms of hierarchy and other forms of community structure. These rules were well understood by all members of the community and the decision process was such as to allow for possible amendments. The local rule system involved defining appropriate times for marking trees for harvest and defining actual harvest practice. All these constraints were defined as a function of the seasons of drought and rain, but there was flexibility built into the decision process so that every individual could define the exact timing of the harvest so that it made sense for the broader production system of individual families.

After the reforms, however, the process of forest management acquired other mechanisms for operationalizing the rules handed down by the Forest Superintendence. Thus, for forest harvesting, it is only the forest technician who transmits information about regulations to community members, without discussion or much respect for the local ways of decision making. This is a top-down process that largely ignores local knowledge, needs, and customary ways of

territorial governance. It leaves out the possibility of discussing the process according to the rhythms of those involved in forest activities. Moreover, the formal forest management model that was introduced by the 1996 reform package is based on the false premise that indigenous production systems are collective in nature. Hence, regulations for the formal forest management plan presumed that indigenous groups only want to harvest forests collectively, not individually, while individual harvest had been typical for many of the Yuracaré members. As a result of this vision of collective forest management, the Yuracaré were introduced to the idea of forming a forest enterprise to organize a vertical chain of small-scale industrialized production, including the operation of a mobile sawmill. The technical decisions associated with this idea did not involve the broad participation of indigenous people engaged on wood extraction, and therefore, regulations for wood extraction did not take into account that Yuracarés, as well as other ethnic groups, were accustomed to cutting wood from areas of easy access for each family. Under the new system, a management plan designates specific areas for the collective process of legal extraction.

Allow adaptive governance at multiple levels

The nested Yuracaré system of forest management is in crisis because of the incongruence between exogenous changes and the local institutional response. Great technological changes at the operational level have produced changes in the organization of collective decisions. There are no clear relationships among the different levels of decision making—changes were imposed from the Forest Law (constitutional level) and its implementation (collective choice level) according to the technical specifications (operational rules). Operative changes have modified the traditional patterns of forest access, limiting the timber harvesting management in a collective form under rigid schemes and calendars, but have not enabled the creation of alternative opportunities of access for inhabitants undertaking commercial small-scale timber activities, allowing families to harvest for emergency such as was customary before.

Employ mixtures of institutional types

Relationships between the Yuracaré leaders and external governmental organizations used to be quite diverse. These developed slowly during a long period of time and responded to an indigenous logic of articulation. In the Yuracaré territory, an intense process of negotiation between local and external organizations mobilized both the internal and bridging social capital of the Yuracaré. These strategies of relationship building, however, have become less diversified as a result of reforms.

Figure 1 illustrates how the configuration of the dynamic relationships has evolved over time.

[Figure 2 about here]

As is evident from the figure, today's relationships respond to more individualistic articulations, with few relationships appropriate for the articulation of the general demands of the territory. Relationships have become particularized and reforms have failed to create a governance structure that fit the Yuracaré institutional context. First, most indigenous families cannot participate in democratic municipal elections because they do not have the documentation to vote. Second, municipalities' jurisdictions overlap with indigenous territory in a contentious, not complementary, way. Third, outside settlers are envious of the indigenous populations since they consider their territories too large to be managed by so few indigenous families. Our field observations lead us to conclude that the forestry reforms largely failed to create the appropriate mix of complementary competence among institutional arrangements at different scales.

CONCLUSION

This analysis of the Yuracaré case shows that although the forestry reforms favored indigenous forest tenure security by granting indigenous groups legal access and title to their ancestral lands, the same process implied institutional adjustments that have been problematic for the Yuracaré. Moreover, other indigenous groups of the Bolivian lowlands, fourteen years after the reforms, still do not hold alienation rights because of the slow bureaucratic procedures for obtaining such rights.

There is no doubt that forestry reforms had the best intentions for indigenous groups. The problem with the reforms, however, was the almost complete neglect of local institutional context, as exemplified by the reforms' assumptions of collectivist management schemes, which were out of touch with reality. Another problem was the disenfranchising of previously established monitoring arrangements--vesting all powers of formal monitoring and control with a professional forester--which weakened the role of indigenous institutions of management.

In the end, the introduction of the reforms produced a great deal of internal tension among the Yuracaré people. The Yuracaré example shows that the transition from subsistence to surplus-generating production through the market can be a difficult process to navigate. Despite a rocky start, the Yuracaré have had some success in making this happen. Although it is impossible to tell what would have happened in the absence of the reforms, most Yuracaré do not want to go back to the way things were before they gained their legal title.

One of the broader lessons that we can glean from the Yuracaré experience so far is that the formalization of rights is an important step towards increased control and security of forest tenure, but to achieve increased benefits from the governance of forests, a host of other factors need to be considered. Many other institutional characteristics—both internal and external—also influence the ability of the group to take advantage of the new opportunities for investment and production that come with increased tenure security.

NOTES

1. The International Forestry Resources Institutions (IFRI) research program and its Collaborative Research Center in Bolivia, with the support of Forest Trees and People Program (FTPP) of Bolivia and the Center of Studies of the Social and Economic Reality (CERES), began the IFRI research in the Yuracaré Territory in 1993 with a study named the “Current Situation of Forest Management”. It had the objective of supporting the territorial demand of this area and elaborating a Forest Management Plan. This process engaged a multidisciplinary team and an indigenous technical team, constituted by young Yuracarés. After the approval of the Forest Management Plan, their first phase of implementation, and the acquisition of the territory property title, CERES was not able to continue field research in the area during 1998-2003 because of funding constraints. In 2004, CERES began a repeat study of the Yuracaré Territory with the goal of comparing the governance conditions before and after the reforms.
2. The colonization brought people from the Andes to the lowlands. This started with the 1952 Agrarian Reform and continued to the 70’s (Uberhuaga, 2001: 38).
3. The Yuracaré forest management plan indicates that 385 families are distributed all over the territory, 51 per cent in the north, 15 per cent in the middle, and 34 per cent in the south CERES-CONIYURA 1988: 84).
4. The territorial order was based in three forms of “order” with specific rules. They refer to nested levels of order relationships. There are the Settlements, *corregimientos*, and the Territory. They characterize the occupation forms of the space and their limits in three levels of institutional order: operational, collective and constitutional, respectively (CERES, 1997: 14).
5. *Chacos* are farming plots (banana, rice, cassava and corn). Generally located around the family houses with extensions between of ½ and 5 has. (CERES-CONIYURA, 1998: 88). *Barbechos* (fallow) are areas left with farming activities for around 15 and 25 years, where they plant perennial products (coffee, orange and forest species). It allows soil regeneration processes (Idem.)

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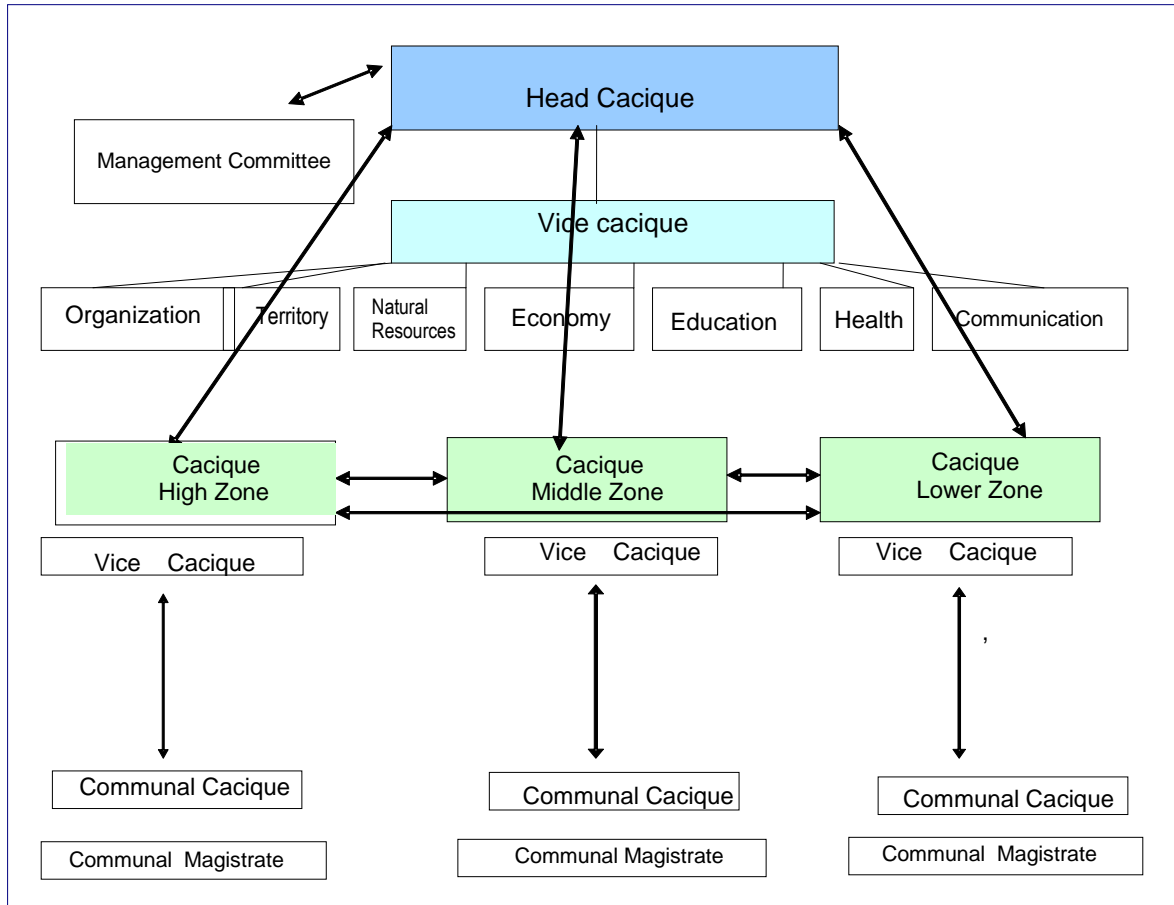
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TABLES AND FIGURES

Table 1: Comparison between governance indicators before and after 1996 reforms

<i>Indicators</i>	<i>Before</i>	<i>After</i>
Congruence of rules with ecological conditions	High. Flexible system that was adaptive to the needs and productive preferences of individual families.	Low. Top-down imposition of regulations that are identical for everyone, regardless of local institutional context.
Clarity of boundaries	Moderate. de facto rules of access not always respected.	High. de jure property rights and title acquired from government.
Accountability of monitors	Moderate. Spatially extensive monitoring without external back-up. .	Low--formalized monitoring and control activities limited to the area for the forest management plan.
Application of graduated sanctions	Active --self-organized system that relied on social pressure	Inactive/emergent--the formalized system does have graduate sanctions but these are not enforced locally.
Low-cost mechanisms for conflict resolution	Available. Less need for external intervention since most conflicts were localized and were few in numbers.	Less available. More demand for external interventions because of more conflicts concerning land use and market transactions.
Involve stakeholders in rule creation	Moderate/high for Yuracaré members. No external stakeholders recognized by rule systems	Low. Top-down imposition of new legislation regardless of local institutional context.
Adaptive, multi-level governance	Moderate/low. Self-regulation with minimum external intervention.	Moderate. Centrally enforced rules and regulations with some co-production of monitoring and enforcement.
Mixtures of institutional types	Diverse and complex social structure	More homogenous institutional arrangements imposed from the top.

Figure 1. Structure of Authority



Source: Authors' elaboration based on field observations 1996-2007.

Figure 2. Institutional relationships before and after reforms

