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## Understanding decentralized forest governance: an application of the institutional analysis and development framework

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This paper analyzes how local institutional arrangements shape outcomes in the increasingly decentralized policy regimes of the non-industrialized world. The goal is to evaluate local institutional strategies associated with effective forest governance. I use the Institutional Analysis and Development (IAD) framework to study the institutional conditions conducive to effective decentralized forest governance and how these relate to sustainability. The IAD-guided analysis allows me to formulate a series of testable hypotheses about which institutional factors influence the likelihood for successful governance outcomes in a decentralized context. I then test the hypotheses using recent empirical data from forestry-sector activities in 32 randomly selected municipal governments in Bolivia. Preliminary results suggest that local governance systems are more successful when the system's governance actors enjoy favorable conditions for information exchange and learning.

KEYWORDS: local planning, local politics, developing world, forestry, resource management, development policy

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### Introduction

During the past two decades, extensive policy reforms have fundamentally transformed the institutional conditions for natural-resource governance in most developing countries. In the aftermath of colonialism, centralized governments in the developing world took it upon themselves to govern all of the valuable resources under their territorial control. More recently, however, practically all non-industrial nations have witnessed major policy shifts. As both centralized and free-market-oriented solutions have floundered, new, more decentralized institutional arrangements that seek to incorporate local actors and communities have emerged. Today, a much larger number of actors have come to influence how environmental assets are used.

These ongoing policy reforms have attracted the attention of policy analysts, academics, and activists. The literature on the subject has literally exploded in the last decade. For many observers, decentralization policies are a panacea that will solve all past problems regarding unsustainable development. For others, they are a tragedy that will lead to disordered resource use and a "race to the bottom" in which local governments will undercut each others' leniency to attract investment. For yet another group of commentators, nothing much has changed. The existing ambivalence is likely related, at least in part, to inconclusive empirical evidence. There is also a lack of

studies that move beyond the in-depth, qualitative examination of selected localized experiences, making it difficult to draw general inferences about tendencies in governance outcomes.

The emerging, complex governance regimes call for new methods and evidence to untangle how policy reforms have changed the way different actors relate to each other and the environment. This paper presents an analytical approach that seeks to assist students, researchers, and practitioners interested in the prospects for local actors to achieve sustainable outcomes within the new context of decentralized forest governance. The paper proposes a framework to help analysts systematically structure the empirical study of policy and institutions.

In this paper I outline the analytical agenda for improving our understanding of how local institutions related to policy reforms end up shaping decisions, actions, and environmental outcomes in the developing world. I start out by reviewing the existing literature on decentralized natural-resource management and discuss underlying assumptions about the relationships among reforms, local resource users, their decisions, and observable policy outcomes. After identifying the main analytical constraints to date, I propose a local governance approach to the study of natural resource policy reforms in developing countries. This approach advances the study of sustainability in developing countries by defining the process by which reforms affect governance outcomes

and by specifying the decentralized decision-making process and context. After explaining the approach, I present the various components of the analytical framework and describe the data-collection procedure. To illustrate the viability of the “local governance approach” to the study of decentralization policy, I apply the Institutional Analysis and Development framework to the case of Bolivia. I conclude with a discussion of implications for sustainability policy and future research.

### **Core Findings in the Decentralization Literature**

As decentralization reforms become a more popular means for national governments to reconcile competing natural resource management challenges, an increasing number of empirical studies have examined the conditions under which such reforms succeed. While theoretical thrusts, geographical areas, and thematic foci vary a great deal across these studies, many of them arrive at similar findings. These, what we might call core findings of the decentralized governance literature, may be summarized as four overarching conclusions.

First, most studies agree that positive outcomes in decentralized environmental governance are unlikely in the absence of popular participation in local decision making (e.g., Singleton, 1998; Blair, 2000; Larson, 2002). One of the basic premises for successful decentralized governance is the relatively superior cost-effectiveness of local vis-à-vis central authorities to incorporate local information of time and place into public policies. Such improvements are not likely to materialize, however, unless local resource users are allowed a seat at the decision-making table. Resource-user participation may require national government recognition of local political authority to adopt the rules agreed upon in the participatory decision-making forum, something that is not always the case in decentralized systems (Agrawal & Ribot, 1999; Agrawal & Ostrom, 2001; Smoke, 2003).

Second, most researchers agree that positive outcomes in a decentralized environmental-governance framework rely on local governments being downwardly accountable to resource users (e.g., Crook & Manor, 1998; Agrawal & Ribot, 1999; de Oliveira, 2002; Ribot, 2002). These mechanisms provide essential checks and balances between the different governance actors involved in the public-policy process and, perhaps most importantly, give resource users a voice to hold officials responsible for their actions. While democratic elections of local officials seem necessary, elections are hardly sufficient to guarantee a transparent and demand-driven public

economy. Traditional and informal social networks characterized by severe power asymmetries and patronage relationships often trump formal democratic structures and hamper any real democratic decentralized governance of natural resources (Andersson, 2002; Platteau, 2004).

Third, one of the most universally accepted findings is that successful decentralized governance of natural resources relies on the technical capacity of the local unit to which governance responsibilities have been devolved (e.g., World Bank, 1988; Kaimowitz et al. 1998; Flores & Ridder, 2000; Pacheco, 2000; Contreras & Vargas, 2001). Even if local governments are downwardly accountable and include users in decision making, such efforts are not likely to succeed unless the governance system can generate appropriate technical responses to problems. For example, what are the best forest-management options for local users, or what species seem most adequate for soil conservation and watershed management? If no available technical expertise can proficiently address these questions, the action taken may not solve the problem.

Finally, all studies also agree that without a secure source of funding, local governments can do little about natural-resource governance (e.g., Fiszbein, 1997; Kaimowitz et al. 1998; de Mello, 2000; Pacheco, 2000). Financial resources are needed not only to hire professional staff, but also to equip and train these professionals to effectively carry out their activities, as well as for activities in resource-user communities. Despite the widely recognized need for financial resources, most local governments in decentralized public sectors in developing countries have a largely underfunded mandate (Gibson, 1999; Boone, 2003; Andersson et al. 2004).

These core contributions to the decentralization literature share several important limitations that this paper seeks to address. While many of these studies consider how local variations in institutional performance affect overall governance outcomes (i.e., Crook & Manor, 1998; Agrawal & Ribot, 1999; Pacheco, 2000; Agrawal & Ostrom, 2001; Larson, 2002), most of this extant work focuses exclusively on the performance of a single local organization such as a village council, a municipal government, or a regional agency (but see Carrol, 1992; Brinkerhoff, 2000; Andersson, 2004). I argue that by doing so, one overlooks a large part of the picture. I suggest an approach that widens the unit of analysis from the local *government* to the local *governance* system, so as to explicitly recognize the important governance role played by other political actors, such as resource-user groups, non-governmental organizations (NGOs), and private firms.

Many existing studies do not use measures of governance outcomes as their dependent variables. Arguably, the measures used in previous research represent input variables in the local governance system rather than outcomes. For instance, several studies estimate whether decentralization reforms have contributed to building capacity in the local government or whether there is more participation in decision making after the introduction of reforms (Fiszbein, 1997; Blair, 2000). Still others investigate how the reforms have affected the amount of resources that local governments spend on resource-management activities and the type of activities undertaken (i.e., Pacheco 2000; Larson, 2002). While these measures are important aspects of decentralized environmental governance, they do not represent *outcomes* of the governance activities.

Finally, the vast majority of research in this area relies on isolated case studies of a small number of selected local governments. While these case studies are unparalleled in terms of rich details on how local actors perceive the new decentralized policy environment, it is difficult to draw more general conclusions from them about the most important tendencies related to governance activities and their results in a particular region or country.

This paper seeks to address these shortcomings in the current literature. A useful start is to construct an analytical framework that will help organize the relationships among the central concepts in decentralized environmental governance. The next section describes the framework that I use to organize my study of decentralized forest governance.

### An Institutional Framework for Environmental Policy Analysis

This study emphasizes the role of local institutions in shaping how decentralization reforms affect governance outcomes. I use a theoretical framework, adapted from earlier efforts by Ostrom and her colleagues (1994); Andersson (2002), and Gibson and his colleagues (2005) to specify the process by which local institutional arrangements affect governance outcomes. Figure 1 displays this framework.

The most important aspect of this framework is that it introduces the context in which local actors interact to create the institutional arrangements that shape their collective decisions and individual actions. Regardless of how resource policies at the regional, national, or international levels might change, the ultimate effects are filtered through the local context. The local actors—which may include resource users and their communities, municipal-government officials, central-government representatives who work in the locality, private firms, and NGO

representatives—will interpret these policy changes according to the specific institutional context as shaped by biophysical and socioeconomic attributes. For instance, the interests of local actors in organizing institutions for forest-management activities depend on the specific context. The interests to manage a forest will be quite different for a community controlling forestlands that contain several valuable timber species than for a community that owns only degraded forestlands, or no forest at all. The interest to protect a forest will be different in a poor community in which livelihoods depend on non-timber forest products compared to a community where most of the members rely on urban employment.

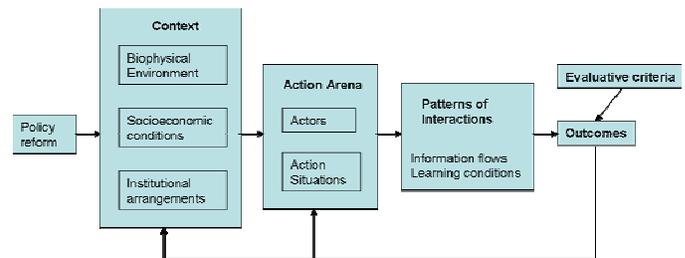


Figure 1. The Institutional Analysis and Development (IAD) Framework

In a nutshell, the framework conceptualizes the outcomes of the decentralization reforms as the result of how local governance actors organize the institutional arrangements to respond to the post-decentralization opportunities and constraints. In the next section, I apply this framework to the study of decentralized forest governance.

### Institutional Analysis of Decentralized Forestry Governance

#### *What is the action arena?*

The very first step in an institutional analysis is to establish the boundaries of the analysis: to delineate the action arena. To identify the factors that influence the variation in local government success in a country's forestry sector, the action arena may be defined as the forestry sector, or even the forestry sector in a particular part of the country or level of governance. The ultimate level of specificity applied to the analysis will depend on the researcher's objectives.

#### *Who are the actors?*

Once the general arena is defined, it is necessary to identify the main actors. Outcomes in a decentralized forest-governance regime depend on the behavior of several actors. Those most important to consider depend on the particular institutional design of

each country's forestry policy, and may include any combination of private landholders, rural community groups, forest-user groups, NGOs, externally funded project representatives, municipal governments, central-government agents, private forestry firms, and others.

What action situations do actors in the decentralized regime participate in? The different groups interact to produce the collective goods and services that make up forest governance. Central government representatives may, for example, decide to devolve responsibilities to municipal governments, as they are believed to perform these responsibilities more efficiently. The action situation refers to the specific type of interaction that these actors engage in to arrive at such a decision. Another example of an action situation is the possible conflicts that may arise between different forest-user groups with unclear boundaries, or forest property rights. The behavior of each of the actors in these action situations can be explained in terms of a set of contextual factors that the IAD framework breaks up into three main categories: 1) physical conditions, 2) community attributes, and 3) local institutional arrangements.

### ***The Biophysical Environment: What is the nature of the good?***

Perhaps the most important issue in institutional analysis is to define the nature of the good that is involved in the action situation. At the most fundamental level, the general characteristics of the country's forest resources frequently resemble a loosely regulated common-pool resource (CPR) and such a characterization helps to define the physical conditions of the action arena's context.<sup>1</sup> Prior theoretical knowledge of CPRs suggests that human institutions are needed to prevent a "tragedy of the commons outcome" in which individual forest users pursue their narrowly defined, short-term, self-interest, which ultimately destroys the resource. Collective-action institutions are needed to stymie this short-term self-interest. One of the central aims of forest-resource governance is, therefore, to provide the institutions needed to constrain the individual, short-term incentive to over-harvest. The traditional way of providing these institutions has been for the central government to introduce either command-and-control rules (prohibitions or quotas) or individual forest privatization. However, both of these traditional policy remedies have been largely unsuccessful, especially in developing countries, in regulating access and enforcing exclusion rights to forests (Gibson et al. 2000). Yet the provision of the required human in-

stitutions or set of agreed-upon rules, to solve the CPR dilemma is far from a straightforward process, as the establishment of human institutions is subject to its own social dilemmas.

### ***Socioeconomic Conditions: How do actors associate in forestry?***

The physical conditions set the stage for the community attributes. Under this heading we examine how actors relate within and between clusters of other actors. We consider the historical background, culture, religion, values, beliefs, knowledge, skills, health conditions, poverty level, and other socioeconomic characteristics of the groups defined as the main actors. If groups of actors share a history of mutually beneficial interactions, chances are that trust has developed in their relationship and this sense of mutual reciprocity will, in all likelihood, facilitate solutions.

### ***What are the rules-in-use of the local institutional arrangements?***

The rules-in-use refer to the norms that are actually respected by the actors participating in an action situation. These are the most important independent variables in an institutional analysis because these rules influence the incentives that each actor faces and thus ultimately help determine behavior (for more on how rules-in-use relate to incentives, see Gibson et al. 2005; Ostrom, 2005). The focus on the rules-in-use requires the institutional analyst to rely on first-hand field observations rather than on secondary data about formal rules. It is what is actually acted upon that counts when documenting rules-in-use, not just what is written (the rules-in-form). One of the central questions that the analyst should ask here is whether the observed rules-in-use are likely to solve the previously identified social dilemmas related to forest governance.

### ***Patterns of Interactions: The conditions for learning***

The multiple interactions in the different action situations create patterns of interaction that, over time, result in predictable outcomes. By studying these patterns, one can identify the institutional incentives of the different actors in a given action situation. Because of the framework's design, these incentives can be traced back to specific contextual factors that seem to generate the observed incentives. The outcome, the extent to which the social dilemmas are resolved, may be evaluated with different criteria such as sustainability, equity, efficiency, and effectiveness. The process is reiterative, as whatever outcome results will affect the contextual variables as well as the action arena in future interactions.

<sup>1</sup> Common pool resources have attributes that make them easy to deplete and difficult to protect (McKean, 2000).

Within the patterns of interactions, actors face varying opportunities to learn from the experience of other individuals, depending to a great extent on the social connectivity. From organization learning, we know that information diffuses by three broad processes (Levitt & March, 1988): 1) diffusion from a single source such as governmental agencies and professional organizations; 2) interactions with individuals who work for the organization as temporary resource people, representing links with experiences, ideas, and information from other, similar organizations (examples of such individuals are consultants and contractors); and 3) normative processes through experts and through trade and popular publications.

The IAD framework-guided analysis explicitly relates the information available to different groups of actors and asks the researcher to characterize the information flow in the action arena. We try to answer two main questions in this part of the analysis: Who has access to what information? And to what extent is the flow of information transparent to others? Below we consider three dimensions of information flow that seem crucial for organizational learning and good local governance.

*Downward flow:* This form of information movement can occur when a central-government agent or a national expert informs local government representatives or citizens about decisions or new knowledge. Without a constant downward flow of information, local people will not learn about formal government rules that may (or may not) protect their rights to natural-resource management or government programs. Citizens also need a transparent process to learn about government performance to hold the relevant officials accountable (Putnam, 1993; Ribot, 1999; Andersson, 2002). A transparent downward flow of information allows citizens better engagement in upward learning, that is, learning about processes at higher levels of the governance hierarchy.

*Upward flow:* This form of information movement occurs when officials learn about local conditions, problems, and needs. With an effective upward flow of information, conceivably through recurrent meetings between government officials and local people, both local and national officials will be in a position to differentiate policy interventions according to important local variations (Korten, 1980; Ostrom et al. 1988; Pretty & Chambers, 1992; Oaker, 1999). Government officials can improve the upward flow of information about local conditions by inviting stakeholders to participate in policy decision making (Ascher & Healy, 1990; Varughese, 1999; Blair, 2000; Klooster, 2000; Osmani, 2001). When there is a transparent upward information flow, government actors are in a better position to engage in

downward learning, that is, government officials can learn about the local realities.

*Horizontal flow:* This form of information movement occurs when groups of local farmers travel to a neighboring village to learn about accessing technical assistance from a governmental agency. Farmer-to-farmer extension activities are another example of horizontal learning. Within a local cluster, information barriers are often less constraining, making information sharing within each cluster relatively easy. This makes the possibility of acquiring information from outside the cluster even more important, as such contacts might generate new ideas and new learning experiences (Chambers et al. 1989). The links with the outside may be strong and formal in character, but sometimes weak, informal links can be just as important. Granovetter (1973) recognized the strength of such “weak links” after identifying their pivotal importance in improving job applicant success rates. Within the decentralized regimes, this means that municipalities should benefit from experience in other municipalities by exchanging information on successes and failures in forestry governance. Such exchange might be facilitated by governmental information sources or meetings of municipal representatives.

The institutional analysis has led us to hypothesize that if successful municipal governance of forests is to emerge from the decentralized regime the actors at the municipal level need to organize themselves to share essential information about resource-management activities and results. I test this hypothesis empirically using field data from 32 randomly selected municipalities in the forest-rich lowlands of Bolivia.

## Decentralized Forest Governance in Bolivia

According to Bolivia’s decentralized forestry regime, the governance functions are shared by six different organizations, as illustrated in Table 1. The bulk of the funding for these functions comes from private forestry firms. Each year they are charged one dollar per hectare of forest that they hold. Municipal governments that host such concessions on their territory receive 25% of the centrally collected concession fees and, in return, they must establish a municipal forestry program within six months of receiving their first payment (Government of Bolivia, 1996).

Many of the tasks that the decentralized regime asks of municipal governments relate directly to improving forest-tenure security for smallholders. For instance, the municipal government may propose to set aside up to 20% of the public forestland in its territory for the creation of a municipal forest

**Table 1** The Municipal Mandate for Forest Governance in Bolivia

Organization	Competence and Functions
Ministry of Sustainable Development and Planning (MSDP)	<ul style="list-style-type: none"> <li>■ Formulate forest policies, strategies, and regulations</li> <li>■ Classify land and evaluate its forest management potential</li> <li>■ Demarcate concession areas for timber companies and local groups</li> <li>■ Set prices for concession fees and volume-based taxes</li> <li>■ Promote research, extension, and education</li> <li>■ Look for technical assistance and funding for plans, programs, and projects</li> </ul>
Superintendencia Forestal (SIF)	<ul style="list-style-type: none"> <li>■ Supervise overall technical compliance with the forestry regime</li> <li>■ Grant management rights to eligible forest users</li> <li>■ Approve management plans and private sector agreements with indigenous territories</li> <li>■ Enforce forest regulations and sanction illegal forest users</li> <li>■ Organize register of concessions, authorizations, and logging permits</li> <li>■ Inspect forest areas and activities, expropriate unauthorized timber and auction it through public bidding</li> <li>■ Request external forest audits of forest operations</li> <li>■ Collect concession fees and volume-based taxes and distribute them</li> </ul>
Municipal Governments	<ul style="list-style-type: none"> <li>■ Propose to MSDP the boundaries of municipal forest reserves to be granted as community concessions to local user groups</li> <li>■ Offer technical assistance to local user groups</li> <li>■ Organize training for local user groups</li> <li>■ Facilitate and promote local commercial activities in their sectors</li> <li>■ Inspect local forestry activities and request external audits as needed</li> <li>■ Set up municipal databases of existing forest plantations in their sectors</li> </ul>
FONABOSQUE	<ul style="list-style-type: none"> <li>■ Finances projects related to the sustainable management and protection of forests</li> </ul>
Ministry of Economic Development (MED)	<ul style="list-style-type: none"> <li>■ Promote forest investments, production, and productivity of the forest industry</li> <li>■ Promote forest marketing and the introduction of lesser known species in national and international markets</li> <li>■ Promote value-added production in coordination with prefectures and municipalities</li> </ul>
Prefectures	<ul style="list-style-type: none"> <li>■ Design and implement public investment projects at departmental level in the fields of local forestry development, research and extension, afforestation, reforestation, and watershed conservation</li> <li>■ Support municipalities in their forestry activities</li> <li>■ Execute functions delegated to them by MSDP, MED, and SIF</li> </ul>

reserve (Government of Bolivia, 1996). It is also the municipal administration's task to facilitate the organization of previously informal user groups into official forest-user groups with formal rights to manage forests. Once groups are formally organized and recognized, the municipal government asks the Ministry of Sustainable Development and Planning to allocate forest-user rights in the form of community-forest concessions within the municipal forest reserve.<sup>2</sup> If such rights are granted, the local groups must develop a formal forest-management plan to be eligible for the required commercial extraction permits. The municipal government is then to provide technical advice to the user groups in developing such a plan, but final approval rests with the Superintendencia Forestal (SIF) that serves as the central government's technical forestry agency (see Table 1). Once harvesting is underway by the formally recognized user groups, the municipality is to assist the SIF in monitoring and enforcing the rules associated

with the granted management rights (Government of Bolivia, 1996).

Whether or not municipal governments will actually act in the best interest of the collectivity of local forest users is a different question. The next section explores the hypothesis that sustainability enhancing governance outcomes are more likely in municipal systems that have developed institutions for regular information exchange and organizational learning.

### Empirical Analysis

To test the above hypothesis, I draw on fieldwork in the Bolivian Lowlands carried out in 2001. Fieldwork consisted primarily of in-depth interviews with regional forestry-sector actors in a random sample of 32 municipal governments that had a forestry program in 1999–2000. Interviews were structured to record the different actors' perceptions about their internal relationships and those with external actors, such as central government agencies, forest-user groups, NGOs, and private groups operating within the forestry sector. In each of the selected municipalities, three different actors were interviewed: 1)

<sup>2</sup> The Forestry Law refers to these community concessions as ASL concessions. ASL stands for *Agrupaciones Sociales del Lugar*, loosely translated to Local Social Groups.

the mayor who held office between 1996 and 1999;<sup>3</sup> 2) the municipal forestry officer; and 3) the president of the municipal oversight committee, a group consisting of representatives from the municipal territory's rural communities.

In each selected municipality, our field-research team interviewed these three actors in face-to-face meetings that lasted about one hour each. The survey instrument was designed to elicit information regarding each actor's perception of policy priorities, staff, relationship with central and non-governmental agencies, and relationship with citizens. It employed a variety of techniques to understand incentives and behavior. Based on crosschecks with census data, we believe the survey is highly reliable.<sup>4</sup> In addition to the survey data, the research teams collected structural, biophysical, and socioeconomic information for each municipality from subnational census data and the national forestry databases (INE, 2002; INE, 1993).

### **Dependent Variable**

As a proxy measure for successful municipal governance I employ the scores of user satisfaction with the municipal provision of forestry services. The user ratings have been converted into a dichotomous variable indicating whether the quality of forestry services provided by the municipal government in 1999–2000 was regarded as either “responding well to the rural population's needs in the forestry sector” or “responding poorly.” The variable was derived from interviews with the presidents of the municipal oversight committees in the 32 municipal governments providing forestry services in 1999–2000.

### **Independent Variables**

- *Upward Learning:* The conditions for upward learning were estimated by combining the number of monthly, forestry-related direct interactions between representatives of rural community-based organizations (*Organizaciones Territoriales de Base*) and 1) mayor; 2) municipal council, 3) technical municipal staff, and 4) central government Forestry Superintendence (the formal entity ultimately responsible for municipal forestry unit performance). The number of monthly interactions with the different actors

was then added to form an additive index. As such, this independent variable is not a direct measure of transparency or accountability, but rather a proxy variable for the underlying conditions that allow for rural resource users to hold municipal officials accountable.

- *Downward Learning:* This independent variable was created by aggregating three different variables: 1) the permanence of municipal forestry staff, 2) the number of days per week that forestry staff spends in the field, and 3) whether the forestry unit has transportation to the municipality's rural areas. The scores of the three variables were then added to represent the capacity of municipal staff to learn about local conditions.
- *Horizontal Learning:* The variable measured the relative frequency of meetings between the municipal government and organizations that work in the municipal territory, such as 1) the forestry superintendence, 2) the land-reform agency (INRA), 3) associations with other municipal governments (*mancomunidades*), and 4) NGOs. As such, the variable reflects the conditions for the exchange of important information for forestry-sector planning, coordination, and implementation. The theoretical prediction of the influence of this variable is that for any given municipality, the more interinstitutional coordination and information sharing, the better the quality of forestry sector municipal services.

Taken together, these independent variables reflect the conditions for achieving cooperation between the crucial actors of municipal-forest governance. The theoretical prediction of the influence of these variables is that, for any given municipality, the more interactions, the more successful will be the cooperative outcomes of municipal-forest governance. Given the binary-outcome variable, the effect of these variables will be analyzed using a logit regression model.

To control for other possible influences on the dependent variable, the analysis incorporates the following municipal-level control variables:

- *The ratio of municipal government budget per capita:* A municipal government with more resources per capita could provide effective services more easily than a poorer municipality.<sup>5</sup>
- *The average literacy rate in the municipality:* Municipalities that have a higher proportion of literate people are likely to achieve better results, because cooperation between a government au-

<sup>3</sup> If the mayor was not able to be interviewed his or her designated alternate participated instead.

<sup>4</sup> We took several steps to ensure the interview data's reliability, first field-testing questions in several municipalities to make sure they were well understood, and then adjusting the survey before interviewing. We also carefully avoided pitching this as an interview about forestry, but presented our research topic as the general performance of the municipality in dealing with the new decentralized structure.

<sup>5</sup> The variable was constructed with data from Superintendencia Forestal (2001) and Government of Bolivia (2000).

thority and literate forest users is likely to be easier (Government of Bolivia, 2000).

- *The amount of available forest resources per capita:* It is easier for the governance actors to be effective in allocating and enforcing formal property rights in municipalities where forest resources are more abundant and there is less rivalry among users.<sup>6</sup>

**Results**

Why are some decentralized modules more successful than others in delivering services? I suggest that the local governance system’s adaptive capacity is critical, as the local actors must be able to learn what activities to do and how to implement them effectively. Employing citizen-satisfaction ratings of the municipal-forestry programs as a proxy for governance success, I test this argument by carrying out a logit regression analysis in which variables measuring the conditions for the three types of learning and three control variables are included.<sup>7</sup> The result of the binary logit regression is displayed in Table 2.

The results in Table 2 indicate a systematic association between the conditions for the various types of learning and the citizen-satisfaction ratings. The model is statistically significant (p=0.0290) and about 28% of the observed variance in the satisfaction ratings is explained by the six independent variables included in the analysis. None of the three control variables are significant at the 0.05 level.

**Table 2** Binary Logit Estimates

Independent variables	Coefficients
Horizontal Learning	1.1712** (0.4730)
Downward Learning	0.9482** (0.4527)
Upward Learning	0.7432** (0.3836)
Per capita municipal resources	-0.0003 (0.0003)
Literacy rates	-0.0392 (0.0438)
Population density	-0.0403 (0.0968)
<i>n</i>	32
<i>Prob. &gt; chi<sup>2</sup></i>	0.029
<i>Pseudo R<sup>2</sup></i>	0.2809

\*\* Significant at the 95% confidence level  
 Note: Logit estimators. Standard errors are in parentheses.

Controlling for other possibly influential variables—such as literacy rates, population densities, and financial endowments of the municipal govern-

ment—all three types of learning have positive and statistically significant coefficients at the 0.05 level. Results in Figure 2 suggest that all three variables positively affect the probability of users perceiving governance success.

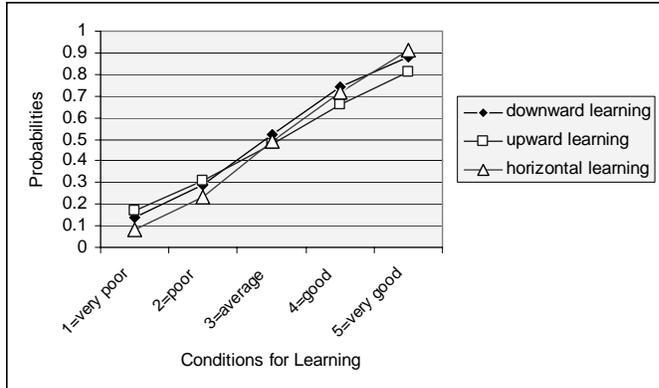


Figure 2. Changes in Probabilities for Achieving Positive Citizen Ratings under Varying Conditions for Learning

**Downward Learning**

The conditions for government officials to engage in downward learning about local conditions are associated with the transparency of upward information flow. This aspect seems essential for institutional innovation since, as the government agent communicates about other local group actions and organization, this may stimulate groups to learn. The results confirm this relationship, as the probability of the governance system receiving high approval ratings goes from 15% when conditions for downward learning are poor to over 85% when those conditions are high.

**Upward Learning**

The conditions for upward learning represent the ability of resource users to learn about government programs, formal rules, and government officials’ performance. These conditions relate to the transparency of downward information flow. Empirical analysis confirms that hierarchically vertical information exchange is essential for making accountability mechanisms work locally. The better the conditions for upward learning, the higher the likelihood resource users approve of their municipal governance systems.

**Horizontal Learning**

The conditions for horizontal learning correspond to the predisposition of local actors to learn about each others’ activities. Horizontal learning

<sup>6</sup> This variable was calculated using a geographic information system by overlaying INRA’s population and municipal boundary records with the SIF’s map of lands designated to forestry by the national land-use planning process. The SIF map is referred to in Spanish as the *Tierras de Producción Forestal Permanente*.

<sup>7</sup> According to the responses from the presidents of the municipal oversight committees, the forest users in 50% of the municipalities rated the municipal services in the forestry sector as successful.

among municipal-level actors seems essential for coordination and institutional innovation, especially when addressing management issues that overlap the boundaries of several municipalities. In the quantitative analysis, this has the most dramatic effect on governance outcomes of all three learning conditions. When these conditions are at their minimum, the likelihood of successful governance is less than 10%, but when those conditions are at their maximum the same likelihood increases to above 90%.

## Discussion and Conclusions

The results of the institutional analysis suggest that successful outcomes within a decentralized governance regime—here defined as positive forest-user ratings of local government performance—rest to a significant extent on the institutional conditions for exploration and learning among the local actors. These conditions include the institutional incentives that may be seen as an underlying structure influencing the predisposition of actors to learn.

This is not to say that other factors, for instance personality and monetary resources, would not also influence the likelihood of successful governance outcomes. In fact, among the 32 cases included in this analysis, in at least three municipalities the local learning conditions were far from optimal, but the municipal government nevertheless achieved positive user ratings. These apparent successes were at least partly the result of the mayors' personal leadership, and in one case a very active NGO. On the other hand, in an even greater number of municipalities, the professional staff, and even the mayor, were personally motivated regarding the forestry sector, but local conditions were not otherwise supportive. These circumstances stifled municipal actors' from addressing of forestry-sector issues.

The most common institutional hurdle to successful municipal governance of forest resources in Bolivia may be the extremely high turnover rates of both mayors and municipal professional staff. Based on our data for 1996–1999, municipal staff working on forestry issues had an average professional life expectancy of just 13 months (Andersson, 2004). Such circumstances severely reduce the overall likelihood of developing effective and lasting local governance. In our interviews, we explored this problem with the municipal actors and found two main reasons for these discontinuities.

First, the provisions of the Municipal Law of 1999 made it easy for members of the Municipal Council to “censure” the elected mayor, which entailed voting for removal on grounds of incompetence, inefficiency, or corruption. Second, an election's winning coalition would often negotiate to

have each party's leader be mayor for part of the term, resulting in a rapid rotation. Such administrative changes would automatically precipitate a complete replacement of all municipal staff, even if the departing mayor came from a party within the same coalition as the entering mayor. A presidential decree in 2001 made the frequent change of mayors more difficult, requiring councils to present evidence of illegal activity in order to strip sitting mayors of their offices. Although no data are available for the subsequent period, recent conversations with colleagues in the Bolivia Forestry Service suggest that, despite the new formal rules, the lack of continuity among municipal staff remains a significant constraint.

The conditions for three different forms of learning explain, at least in part, why some municipalities' forestry-related services achieve relatively higher ratings among forest users. One should note, however, that this measure of success does not necessarily coincide with the goals of sustainable forest governance or the central government's policy objectives. It is possible that local users think that good governance occurs when the municipal government minimizes their interventions into the users' forestry activities. Future research should seek to sort out such plausible discrepancies between different proxy measures of good governance and sustainability. One way of doing this would be to employ ecological-outcome variables as proxies for good resource governance (for efforts along these lines, see Agrawal & Ostrom, 2001; Oyono, 2005; Andersson & Gibson, *in press*).

It also merits noting that, while the conditions for learning seem systematically linked to positive perceptions of governance among resource users, this does not mean that these conditions alone will improve governance. Consistent with earlier findings by Leeuwis (2000), this analysis suggests that favorable conditions for the three different types of organizational learning seem necessary for promoting good governance and sustainability, but they are not sufficient.

This study illustrates the usefulness of considering a wide variety of cases, not just the successes. The random selection from all municipalities with a forestry program—regardless of their level of success—allows the analyst to make more generalizable inferences. One important advantage of this approach is the possibility of identifying key elements in successful governance. These elements may be used as indicators in monitoring the effectiveness of existing policies. Such monitoring programs would be important means for learning about how the decentralization experiment evolves, and how existing policies might need adjustment to improve municipal governance performance.

The IAD framework is a useful analytical tool, especially when studying how variations in local institutional arrangements influence natural-resource governance. For the study of decentralized forest governance, the IAD framework may be useful for a variety of tasks, such as 1) diagnosing the local context in new sites and using this to select sites adequate for the research design; 2) identifying conditions conducive to good natural-resource governance; and 3) structuring efforts to monitor and learn about the impact of past and current policy interventions to foster sustainability.

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