

The Politics of Decentralizing Natural Resource Policy

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As human populations and their demands on natural resources continue to grow, citizens and officials from around the world search ever more intensely for effective solutions to environmental problems. Various factors conspire to make natural resources difficult to govern well. First, since many larger scale natural resources can be common pool resources, they pose different—and arguably more difficult—challenges to governance than private or public goods. Second, the use of natural resources can produce significant externalities. Third, the complex spatial and temporal nature of natural resources along with their potential externalities rarely conform to existing political institutions. Environmental problems often take decades or even centuries to emerge; their solutions may take equally long.

Ideas about how to govern natural resources have evolved significantly over the last 30 years. Many perceive centralized, top down approaches as having failed and advocate for more decentralized policies. Two major forms have emerged. The first seeks to devolve property

rights over natural resources to local individuals and communities. The second advocates the decentralization of the formal powers of government to its own subunits. Both kinds of decentralization make claims that outcomes will be more efficient, flexible, equitable, accountable, and participatory.

While popular, there

are few systematic, comparative studies of these experiments in environmental policy. Scholars and policymakers do not have adequate answers to even the most basic of questions, such as what determines successful decentralization policy? Why would some local politicians exploit while others ignore the opportunities that decentralization provides? In this essay, we draw on our earlier work in comparative politics to improve our understanding of this increasingly common form of authority migration (Andersson 2003; Gibson and Lehoucq 2003; Andersson, Gibson, and Lehoucq 2004). We review the existing arguments and present some of our empirical work on decentralized forestry policy in Bolivia and Guatemala. We find that decentralized policies create different patterns of incentives for local politicians, patterns that help determine their efforts—and degrees of success—in the sector.

Recent Changes in Natural Resource Governance

The poor performance of central governments in the protection of natural resources has led to new ideas about their governance over the past few decades. Among other ideas (like new ways to privatize negative externalities like pollution), one major approach advocates the decentralization of the formal powers of government to its own subunits.¹ Decentralization's proponents argue that making local governments responsible for the provision of a wide variety of goods and services should result in more efficient, flexible, equitable, accountable, and participatory government (e.g., Oates 1972; World Bank 1988; Rondinelli, McCullough, and Johnson 1989; Ferejohn and Weingast 1992; Crook and Manor 1998). Local politicians and officials should design more appropriate policies since they have more information about their environment and local residents' needs. According to the World Resources Institute, at least 60 countries are decentralizing some aspects of the governance of natural resources (Ribot 2003).²

Debates exist within this intragovernmental decentralization approach about the factors necessary for successful decentralized natural resource policy. Two theories are most prominent. First, many analysts contend that decentralization efforts fail because central governments do not provide sufficient financial and administrative resources (Adamolekun 1991; Smoke 1993; Prud'homme 1994; Parry 1997; De Mello 1999; Crook and Manor 1998; Agrawal and Ribot 1999; Blair 2000; Bird and Vaillancourt 1999; Bahl and Linn 1994; Bahl 1999; Kaimowitz et al. 1998; 1999; 2000).³ Even if some political power were decentralized to some degree, central governments may prevent the actual decentralization to take place by giving local governments an unfunded mandate (e.g., Gibson 1999; Ferroukhi 2003). For example, in 1997, Nicaragua's central government decided to pass off some of their environmental duties to municipal governments, but because of inadequate financial support, most local governments were unable to perform their new duties (Larsson 2003).

Second, in addition to the lack of resources argument, scholars insist that effective decentralization requires accountability. Several recent studies assert that no decentralized strategy will work without institutions to tie local politician's actions to the preferences of their constituents (Manor 1999; Crook and Manor 1998; Agrawal and Ribot 1999; Blair 2000; Rolla 1998). Local-level elections are the form of accountability most scholars explore; they find that regular, fair, and competitive

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elections induce politicians to create policies that can turn decentralized powers into efficient and equitable outcomes (Crook and Manor 1998; Echeverri-Gent 1992; Fiszbein 1997; Blair 2000). This body of work (unlike the public finance literature in which local politicians are assumed to be benign implementers) assumes that local politicians and officials have in mind their own goals which might impede or distort decentralized policy.

Both the lack of resources and accountability approaches are useful in moving us away from an uncritical acceptance of

decentralized policy as the panacea to all environmental ills. But even these studies are hampered by certain methodological and substantive issues. First, analyses are generally composed of in-depth, qualitative case studies. While irreplaceable with regard to their detailed information (for instance, see the excellent overview of decentralization laws in Latin America by Larson 2003),⁴ such work cannot make confident generalizations given their small sample sizes and research designs. Second, authors treat elections as the only influence on local politicians' actions. In this study we develop a more appropriate research design to test our hypotheses and a more nuanced view of the politics of decentralized environmental policies.

Modeling Local Politicians' Interest

We suggest that analysts studying decentralized natural resource policy focus on the perspectives of local-level politicians. As opposed to many decentralization studies that assume beneficent local governments interested in maximizing social welfare (and falling short only because of a lack of technical competence or appropriate financial resources), we view local politicians as individuals who worry about staying in power. Staying in power, in turn, means that local politicians must make choices about how to employ their limited time and resources to serve political as well as policy goals. Given this view, the shift to decentralized natural resource management may or may not change local politicians' preferences in a way that protects forests

and other resources. Local politicians will care only as long as the new policy fits their political preferences, which may overwhelm the dictates of economic or environmental efficiency. Given that local politicians are the individuals charged with carrying out decentralized policies, explaining the success or failure of such policies requires the exploration of the incentives and constraints that local politicians face.

In the study we present here regarding the decentralization of forestry policy, we argue that local politicians will invest their time and resources into forestry activities if they reap political or financial rewards from doing so. Only with such incentives can any decentralized policy hope to be effective. For example, investing in a municipal forestry program may enhance or constrain their official powers, their municipality's revenues, or their electoral chances. More specifically, we argue that these benefits will vary with three conditions:

- 1) The degree of fiscal and/or regulatory gains granted to local governments (May et al. 2002; Oakerson 1999; Hadenius 2003). We hypothesize that local politicians are more likely to express interest in forests if the decentralization policy grants them more fiscal and regulatory powers. Local politicians are ever searching for an increase in revenues, which is more likely under circumstances in which they have greater fiscal authority (Kaimowitz et al. 2001). Regulatory powers would increase their ability to reward followers. In either case, fiscal and regulatory benefits would give local authorities incentives to participate actively in a decentralized policy.
- 2) The strength of demands from organized interest groups (Agrawal and Ostrom 2001; Birk 2000; Muñoz and Elsnor 2000). Whether accountable to an electorate or not, we reason that organized interest groups at the local level can influence a politician's interest and actions. Such interest groups may be local, as in a farmers' cooperative, or generated by outsiders, as in an international conservation group. Agricultural interest

Table 1
Municipal Forestry Mandates in Bolivia and Guatemala

	BOLIVIA	GUATEMALA
Mandate	Tasks	Tasks
Judicial	<ul style="list-style-type: none"> ■ The State owns all forest resources; ■ Municipal Governments (MGs) are asked to assist the central government in monitoring and enforcement of national forestry Law and regulations; ■ MGs may propose municipal forest reserve for community use on up to 25% of the total forested public land within the municipality; ■ MGs should assist local user groups in making forest management plans; ■ MGs should report transgressions of the forestry law to the central government, who decides what sanctions to impose, if any. Fines paid go to central government. 	<ul style="list-style-type: none"> ■ Private ownership of forest resources is possible; ■ Municipal Governments (MGs) may own and manage forest resources; ■ MGs may make user and management rules and decisions in municipally owned forests; ■ MGs are asked to monitor compliance with forestry law and offer technical advice when it comes to other parties' activities in public and private forests; ■ MGs authorized to issue forest management licences for up to 10 cubic meters of timber ■ MGs may apply sanctions and collect fines directly from transgressors.
Fiscal	<ul style="list-style-type: none"> ■ MGs receive 20% of commercial logging royalties collected by the central government (USD 1 per hectare of managed forest); ■ MGs are not allowed to charge user fees for services provided or to charge any property or management taxes in the forestry sector. 	<ul style="list-style-type: none"> ■ MGs receive 50% of all commercial logging taxes collected by central government (10% of commercial value of standing timber); ■ MGs may charge user fees for services provided; ■ MGs may rent out forested municipal ejido-land to residents.
Technical	<p>MGs give technical advice to local forest users to acquire formal management rights and to prepare forest management plans.</p> <p>Support the National forestry registry (database of forest resources).</p>	<p>MGs give technical advice to local forest users to acquire formal management rights and to prepare forest management plans.</p> <p>Support the National forestry registry.</p>
Socio-economic	<ul style="list-style-type: none"> ■ Organize training for user groups; ■ Facilitate, promote commercial undertakings and private sector participation in the municipality. 	<ul style="list-style-type: none"> ■ Disseminate forestry legislation; ■ Help users legalize their forest use; ■ Formulate sector investment projects.

Source: For Bolivia: 1996 Forestry Law (Law 1700) and the 1994 Popular Participation Law. For Guatemala: 1996 Forestry Law (Decree number 101-96), Ferroukhi and Echeverria (2003), and FLACSO (2002)

lands; conservationists may influence politicians to invest in the protection of forests.

3) Central government support and supervision (Andersson 2002; Altman and Lalander 2003; Behrendt 2002; Pacheco 2000). If there are no gains from the decentralized policy, and the central government does not monitor local politicians' compliance, it is less likely that a politician will invest much time or energy into the policy. Even if a policy carries no benefits for a local politician, central governments can assert influence by imposing costs for noncompliance.

There are also several structural variables that might influence the motivation of local politicians. The availability and value of forest resources may increase political interest in forest conservation (Andersson 2003). If a local politician's district has extensive forests with significant timbering opportunities, for example, then that politician might respond positively to any new powers bequeathed by a central government. Market access (Hecht 2001) may also increase the value of forest resources and encourage local governments to protect (or cut) these natural resources. Some scholars also argue that the presence of indigenous populations—groups that possess long-term knowledge and even dependence on forests—will result in better protection of environmental resources (Becker and León 2000; Birk 2000; Elias 2000).

A Study of Bolivia and Guatemala

We test our hypotheses about the factors that lead local politicians to invest in decentralized forestry policy with data from Bolivia and Guatemala. In 1996, Bolivian and Guatemalan policymakers both enacted new forestry laws that devolved significant authority and financial incentives to municipalities to administer public forests within their jurisdictions. Under the new policies, both countries' municipal governments are responsible for providing technical advice to local forest users, assisting the central government's forestry authority to enforce the national forestry laws, and helping local forest users obtain formal property rights over forest resources.

The differences between the two countries' decentralized forestry policy are apparent in three main areas (see Table 1). First, Bolivian municipalities cannot collect any taxes on forestry activities, charge user fees for the forestry services produced, or impose fines on individuals who are caught disobeying the government laws and regulations. In contrast, Guatemalan municipalities enjoy those rights (Ferroukhi and Echeverría 2003). Second, municipal governments in Guatemala, but not in Bolivia, have the authority to own the forests on their municipal land, which they can manage according to their management rules. Finally, the local governments in Guatemala, but not in Bolivia, may cede the responsibility for resource governance to the community via local agreements.

We employ a variety of data and tests to explore our argument about the causes for local politicians' interest and actions in the context of decentralized natural resource policy. To obtain data about mayoral incentives and actions, we surveyed randomly

selected samples of 100 municipal governments in both Bolivia and Guatemala.⁵ In each selected municipality, we interviewed the elected mayor who held office during the 1996–2000 term; each face-to-face interview took approximately 2 hours. The survey instrument (258 questions) is designed to elicit information regarding each mayor's policy priorities, staff, relationship with central and non-governmental agencies, and relationship with citizens. Checking the mayors' responses with archival data, we believe the survey is highly reliable. The surveys were completed between 2000 and 2002. A difference of means test

using a variety of community characteristics, including population density, rural population, per capita income, forested area, and literacy, demonstrates that each sample is representative of each country's population of municipal governments. We also collected socioeconomic information derived from census data for each municipality.

We begin with some simple descriptive statistics that show the low relative importance that mayors in Bolivia and Guatemala give to the forestry sector. We asked mayors to consider the importance of different sectors relative to others according to an ordinal scale ranging from 1 (much less important than other sectors) to 5 (much more important than other sectors). Their responses reveal that mayors in both countries are less interested in forestry than in other important municipal services, with forestry ranking as one of the least important sectors in both Bolivia and Guatemala. The median ordinal score given to forestry by the mayors in the two countries corresponds to "less important than other sectors." While forestry ranks relatively low in both countries, Guatemalan mayors rank forestry higher than their Bolivian counterparts (mean of 3.3 to 2.7) and this difference is statistically significant ($p < .05$). Guatemalan mayors also give a significantly larger proportion of their municipal budgets to forestry activities than their Bolivian counterparts. These descriptive statistics indicate that forests are not a priority for the majority of mayors in either country as measured by their rankings of sectoral priorities and staff and budgetary allocations. But they also indicate that there is variance within and between the countries. To unpack these variations, we proceed to multivariate tests.

We use two measures to capture the mayors' actions in the forestry sector. These include the proportion of the municipal budget allocated to forestry activities and the proportion of

Table 2
Results for two models of mayoral actions

Independent Variables	Model 1 Share of forestry in municipal budget.	Model 2 Municipal staff assigned to forestry.
Political Economy		
- Timber income	0.379 (0.157)**	0.161 (0.172)
- Local demand	0.313 (0.086)***	0.269 (0.091)***
- Central supervision	0.396 (0.133)***	0.402 (0.142)***
Personal Characteristics		
- Education	0.081 (0.157)**	0.118 (0.041)***
- Political orientation	-0.029 (7.752)	9.813 (8.511)
- Party affiliation	-0.252 (0.343)	0.081 (0.374)
Structural Characteristics		
- Municipal income	1.111 (3.103)**	9.151 (6.384)
- Indigenous population	0.963 (0.501)	-1.178 (0.520)**
- Infrastructure	-0.036 (0.569)	-0.425 (0.626)
- Population density	0.000 (0.001)	0.000 (0.001)
- Forest cover	0.338 (0.347)	0.345 (0.379)
Bolivia Pseudo R²	0.338 (0.347)	0.718 (0.509)
	0.16	0.18
N	200	200

*** Significant at the 99% confidence level

** Significant at the 95% confidence level

* Significant at the 90% confidence level

municipal staff assigned to forestry. Both measures are three-category ordinal variables, for which a value of 1 means “low,” 2 means “medium,” and 3 means “high.” Our independent variables are intended to operationalize our hypotheses about what drives a mayor’s actions: demands from local community-based organizations and nongovernmental organizations (NGOs), mayors’ perceptions of central government supervisory efforts in forestry, and mayors’ perceptions of the importance of timber income to their municipal budget. We control for the personal characteristics of the mayor (education, political orientation, and political party affiliation) and structural variables regarding the municipality (percent forest cover, per capita municipal income, population density, proportion of indigenous population, level of infrastructure development). We also include a dummy variable for country to measure the policy differences between the two governments’ decentralizations. Since the dependent variables are ordinal, we use logistic regression in our estimations.

Table 2 presents the results of the two regression models. For both models, mayoral incentives (i.e., the political economy variables) perform consistently better than both structural and personal characteristic variables in explaining variation in mayoral decision making in the forestry sectors of Bolivia and Guatemala. Demands from local organizations have a positive effect, which is statistically significant at the 0.01 level on both measures of the local executive’s actions in forestry. Timber income is significantly related to increases in the share of the municipality’s budget (at $p < .05$). Central government supervision is also highly significant for both the municipality’s budget and its own level of forestry staff. The share of the municipality’s population that is considered indigenous by census enumerators is significant at different levels in each equation ($p < .10$, $p < .05$), as is

the mayor’s education level ($p < .05$, $p < .01$).

We transform Table 2’s results into conditional probabilities in Table 3 (setting all other independent variables at their mean values). For the budget model, the significant variables with the largest predicted change are the political economy variables. Moving from minimums to maximums, local demands increase the probability of the municipality being in the “high” category of budgetary allocations to forestry by nearly 57%; timber income increases the same probability by 39% and staffing from the central government by 34%. A move from a minimum to maximum of mayoral education also increases forestry’s budget share by nearly 27%, and indigenous populations increase it by 18%.

Political economic variables also account for the strongest effects on the mayor’s decision to assign municipal staff to forestry activities. Again moving from minimum to maximum for significant variables, local demands increase the probability of a mayor’s forestry staff being in the high category by 51%; central supervision increases the probability by almost 37%. The mayor’s education also results in a strong positive increase, nearly 39%. Interestingly, a shift from minimum to maximum

for indigenous population decreases the probability that the municipality has a high number of staff allocated to forestry by 25%, as opposed to the increase in budget of the last model.

We find some support for our hypothesis that decentralizing powers to the municipal level encourages mayors to act differently in Guatemala than in Bolivia. According to our results, Guatemalan mayors are almost 20 percentage points more likely to invest a high proportion of their budget in forestry than their Bolivian counterparts.

These results provide support for the theoretical

expectation that a mayor who can gain politically from increased control over the forest will devote more resources to it. Guatemalan mayors use their control over local forests to either increase municipal revenues or please their constituents in order to get re-elected; the forestry sector may provide opportunities less evident in Bolivia. Bolivian mayors have much less room for political maneuvering in this sector than their Guatemalan counterparts who are entitled to devolve governance responsibilities to local communities, issue permits for harvesting timber, rent out their municipal forests, and sell technical services to local forest users.

This interpretation raises the question as to why the difference between the countries does not show up in the proportion of municipal staff that is assigned to forestry. One plausible explanation is that staff allocation is a more complex indicator of mayoral motivation. The complexity is related to what seems to be a threshold effect that influences the mayors’ staff allocation decisions. While all municipal governments—regardless of income levels, size, and availability of forest resources—are able to assign some proportion of their budget to forestry, not all municipalities can afford to hire a forester. Though Guatemalan mayors have a more extensive mandate in the forestry sector than their Bolivian counterparts, this advantage is likely offset by their generally smaller budgets, which limits their staff.

Conclusion

Forests, like many natural resources, exhibit characteristics that defy simple policy solutions. Forests can be common pool resources, making the exclusion of potential users difficult. Forests have important externalities with regard to atmospheric, hydrological, and biological services. Forests (and their associated subsystems) take far longer to develop than the sitting

Table 3
Changes in Predicted Probabilities for Mayoral Action From Table 2

	Model 1 Share of forestry in municipal budget is high.	Model 2 Municipal staff assigned to forestry is high.
Local Demands		
- min (1)	0.113	0.144
- max (10)	0.680	0.654
Difference	0.567	0.510
Timber Income		
- min (1)	0.152	-
- max (5)	0.543	-
Difference	0.391	-
Central Supervision		
- min (1)	0.4753	0.233
- max (5)	0.8187	0.602
Difference	0.3434	0.369
Education		
- min (1)	0.135	0.104
- max (18)	0.401	0.492
Difference	0.267	0.388
Indigenous Population		
- min (0.01)	0.180	0.472
- max (0.99)	0.361	0.220
Difference	0.181	-0.252
Country		
- Guatemala (0)	0.389	-
- Bolivia (1)	0.194	-
Difference	-0.196	-

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 either 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.

Decentralized natural resource policies emerged as an alternative to central government control due, in part, to these difficulties in finding simple policy solutions. But decentralized natural resource policy depends on more than the hopes of the central government or international organizations, more than the time- and place-specific knowledge of local politicians.

We have argued that the political incentives of local politicians will determine their interest and actions in the forestry sector. Decentralized policies that bestow advantages to incumbent politicians (or significant costs on those who fail to act) are far more likely to be pursued. The Bolivia-Guatemala comparison

Notes

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1. Another major approach advocates decentralizing management of natural resources to the community level (Ostrom 1990; Arnold 1990; Ascher 1995; for reviews see Baland and Platteau 1996; Agrawal and Gibson 1999).

2. As with any general concept, there are as nearly as many definitions of decentralization as there are studies themselves. But for most researchers, and for the purposes of this proposal, we define decentralization as any act in which a central government formally cedes power to actors and institutions at lower levels in a political-administrative and

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shows that the institutional design of decentralization reforms is crucial to their outcomes.

There is a dearth of studies with appropriate research designs and systematic evidence regarding decentralized natural resource policy. At this point, instances of decentralization can offer few generalizations based on robust evidence, despite

the conventional wisdom that touts their benefits. Research is needed to explain why such policies are adopted in the first place. Are these unfunded mandates brought about through the pressure of donors and environmental groups? Are they

strategic choices that empower local political operatives? Other studies are needed to explore the actual impact of decentralized natural resource policies on the resources themselves. Studies of forestry may be advantaged: unlike most evaluations of public policy, measurement of forest change cannot come just from data provided by the governments under review, nor only from poor proxy measures often found in the literature. Instead, a panel study of satellite images of forest cover can, if properly executed, provide excellent information about changes due to policy.

decentralization to extend rather than diminish their authority (e.g., Murombedzi 2001; Gibson 1999).

4. Other notable studies in this genre are Contreras and Vargas 2001; Enters and Anderson 1999; Ferroukhi 2003; Fisher 1999; Johnson and Forsyth 2002; Lindsay 1999; Ribot 1999, Silva et al. 2002; Wyckoff-Baird 2000.

5. There are 314 municipalities in Bolivia and 331 municipalities in Guatemala.

6. Local demands are measured as a 10 step ordinal variable that describes the mayors' perception with regards to the intensity of the pressure from local organizations on the municipal government to invest in forestry sector goods and services. The Central government enforcement and support variable measures the mayors' perception of the frequency of central government visits to the municipality to (a) carry out joint activities, (b) train municipal staff, and (c) monitor performance through unannounced visits. The mayors' responses are combined and ordered from 1 (never or very infrequently) to 5 (very frequently). The variable called Timber Income denotes the mayors' perceptions of the importance of timber income to their municipal budget, regardless of whether this comes from central or local sources. This is an ordinal variable ranging from 1 (very low importance) to 5 (very high importance).

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